

ES 36A

THE NATURAL  
HISTORY MUSEUM  
- 5 MAR 2009  
PRESENTED BY  
ENTOMOLOGY LIBRARY

# The Bulletin

*of the Amateur Entomologists' Society*

Volume 68 • Number 482

February 2009



ISSN 0266-836X

Editors: Dr P. Wilkins & M. Hough



000174461

The Amateur Entomologists' Society



Founded in 1935

The AES • P.O. Box 8774 • London • SW7 5ZG

<http://www.amentsoc.org>

### Officers of the Society

*President:*

*Secretary:* Dafydd Lewis

*Treasurer:* Peter May

*Acting Registrar:* Dafydd Lewis

*Bulletin Editors:* Phil Wilkins & Martin Hough

*General Editor:* Jacqueline Ruffle

*Advertising Secretary:* Peter Hodge

*Exhibition Secretary:* Wayne Jarvis

*Youth Secretary:* Kieren Pitts

*Conservation Secretary:* David Lonsdale

*Webmaster:* Kieren Pitts

*ICN Editor:* David Lonsdale

*Wants & Exchange:* Peter May

---

THE AES WORKS TO PROMOTE AND DISSEMINATE ENTOMOLOGICAL KNOWLEDGE AND TO ENCOURAGE AN INTEREST IN ENTOMOLOGY AMONG THE YOUNGER GENERATION.

---

#### **BULLETIN ADVERTISING RATES:**

Advertising in the AES *Bulletin* is a cost effective way of reaching all AES members and many others who benefit from institutional subscriptions.

Full page £75 for each advert or £375 for six adverts in the same year.

Half page £40 for each advert or £250 for six adverts in the same year.

Quarter page £30 for each advert or £150 for six adverts in the same year.

---

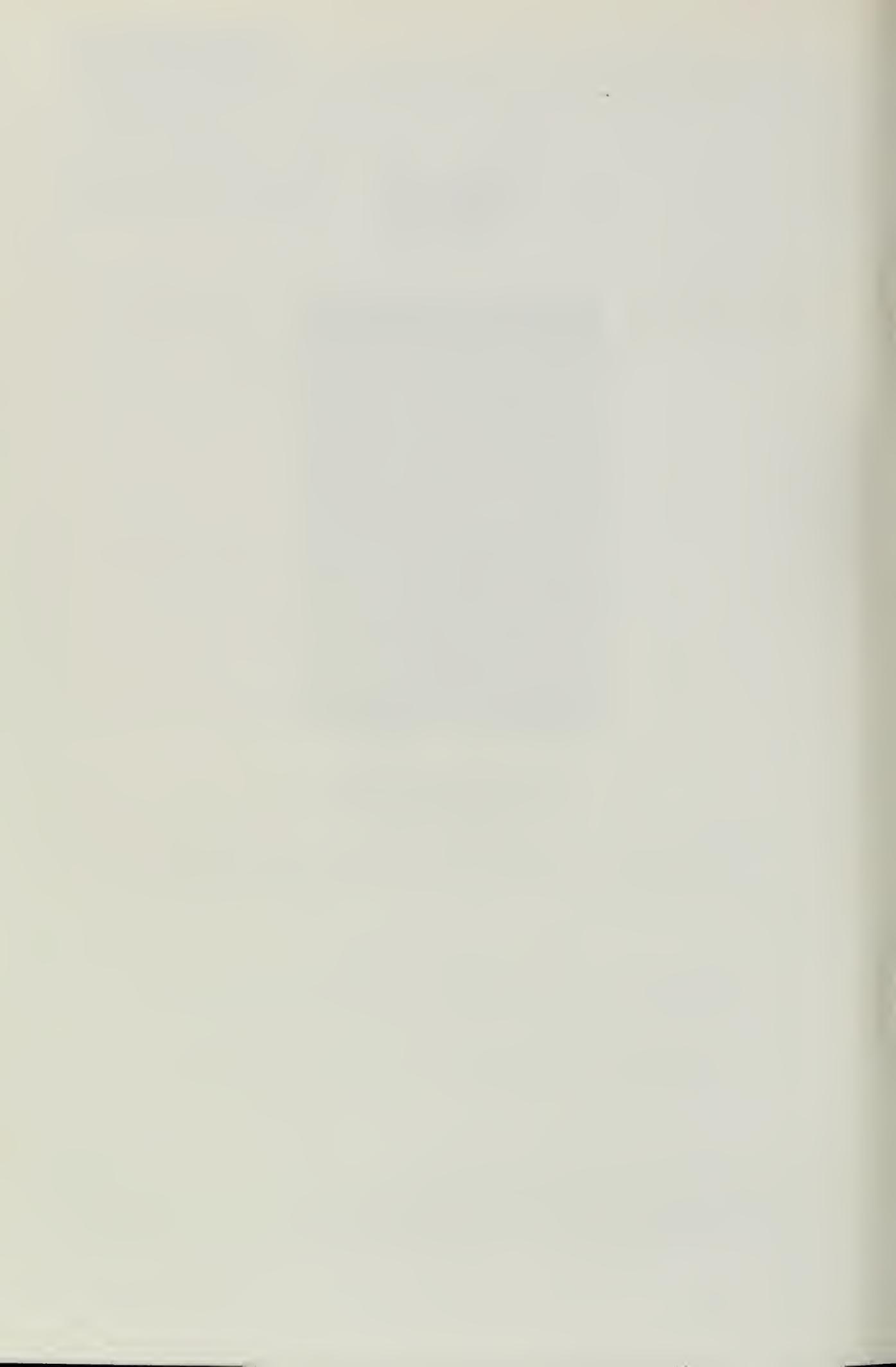
#### **NOTICE**

It is to be distinctly understood that all views, opinions, or theories, expressed in the pages of this Journal are solely those of the author(s) concerned. All announcements of meetings, financial grants offered or sought, requests for help or information, are accepted as bona fide. Neither the Editor, the Officers and Council of the Society, nor its Trustees, can be held responsible for any loss, embarrassment or injury that might be sustained by reliance thereon.

THE NATURAL  
HISTORY MUSEUM  
- 5 MAR 2009  
PRESENTED  
ENTOMOLOGY LIBRARY



**Professor Mike Majerus**  
1954 – 2009



# Worldwide Butterflies [www.wwb.co.uk](http://www.wwb.co.uk)



## The new Goodden Light 12v for use in remote areas

By studying the light output from MV, Robert Goodden has developed this sophisticated portable unit with aspects in common with MV, using so little power that it runs all night on a 7.5Ah battery. It attracts insects much better than actinic lights, even powerful ones requiring heavy batteries. **Rainproof and safe.** An in-line photoswitch puts the light on and off automatically. With this switch the unit can be used vertically or horizontally in any moth trap.

See [www.wwb.co.uk](http://www.wwb.co.uk) for prices and more.

Now  
available  
alone or  
with the  
Moonlander  
Moth Trap

## Moonlander Moth trap

Folds totally flat and is contained in a convenient slim shoulder bag. Very lightweight.

**The Moonlander turns the principle of moth trapping upside down!** Moths enter from the bottom and cannot escape through the top. **Works as sheet and trap combined.**

Better than traditional egg boxes, moths prefer the new **reticulated foam moth shelters** and cone.

**The Moonlander** is now available **without electrics, or with Battery, Mains or BOTH.**

See the options on [www.wwb.co.uk](http://www.wwb.co.uk)



*No escape through the top*



**Both trap and light are total innovations by Robert Goodden.**

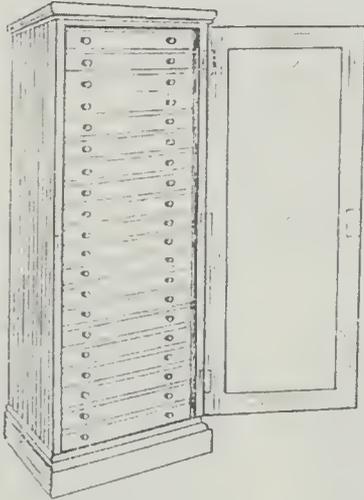
They are tried and tested in Europe and the tropics. In good conditions the results are spectacular.

**Worldwide Butterflies** website offers **Livestock and Equipment for breeding and study. Specimens for specialist collectors will be added as available.** The system enables you to see exactly what is currently available as the season changes. From time to time there are special **Sale Offers** of equipment, books, livestock and specimens - an ever changing situation.

[www.wwb.co.uk](http://www.wwb.co.uk) Add it to your **Favorites** - **check it regularly.**

# ATROPOS ANTIQUES\*

## PURVEYORS OF FINE COLLECTOR'S CABINETS



*Many of you will have met us at the AES  
London Fair where we regularly show  
entomological cabinets for sale*

- We are specialist dealers in fine collector's cabinets.
- We can offer a choice of at least 30 cabinets, varying in purpose, construction, quality and price.
- We can supply both restored and un-restored cabinets and will undertake to restore and paper cabinets for clients.
- We are always interested in the purchase or exchange of cabinets, with or without a collection.
- Callers to our showrooms are always welcome by appointment.
- We offer a specialist collection and delivery service throughout the UK and have full expertise in the safe transportation of cabinets and collections.

**George Morgan**

**97, West Street, Hartland, N. Devon EX39 6BQ**

**T: 01237-441205/984 M: 07973 302190**

**E-mail: [george@atropos.wanadoo.co.uk](mailto:george@atropos.wanadoo.co.uk)**

\* We are an independent dealership of 30 years standing and have no association with any similarly named business.



# Ian Johnson Natural History Books

(Pemberley Books)

Specialist in *Entomology* and related subjects  
Also *Zoology, Ornithology, Botany* etc.

- CATALOGUES – Second-hand, Antiquarian and New books – free catalogues available on request.
- SPECIALIST BOOKSHOP at Richings Park, Iver, just to the West of London – easy to reach by car or train. Visitors are welcome to visit and view our stock, but please telephone first to confirm opening times.
  - \* *By car*: only 10 minutes drive from the M25 via the M4 (Junction 5), or M40 (Junction 1). 15 minutes from Heathrow Airport.
  - \* *By train*: 20 minutes from London Paddington to Iver Station on the Paddington-Slough Thames Trains service (2 trains every hour). We are 1 minute's walk from Iver Station.
- WEBSITE – view our stock on our website: [www.pemberleybooks.com](http://www.pemberleybooks.com).
- BOOKS BOUGHT – We are always interested in purchasing books in our specialist field, particularly antiquarian, academic and scholarly works on insects and other invertebrates.

18 BATHURST WALK, RICHINGS PARK, IVER, BUCKS SL0 9AZ  
Tel: 01753 631114/Fax: 01753 631115 • e-mail: [ian.johnson@pemberleybooks.com](mailto:ian.johnson@pemberleybooks.com)



## ARE YOU MISSING OUT? THE ENTOMOLOGIST'S RECORD and Journal of Variation

Publishes notes, observations, articles and reviews, mainly on the Lepidoptera and Coleoptera of the British Isles and Europe.

Founded in 1890 by J. W. Tutt, and still going strong, we publish six issues a year – alternating with the *AES Bulletin*. This means there is now a first class entomological journal available every month of the year!

Our subscription price is £25 per year. If you would like to see a specimen copy, please send your name and address, and a couple of second class stamps to cover postage to:

**The Editor, 14 West Road, Bishops Stortford, Hertfordshire CM23 2QP.**

***Write now! You never know what you could be missing.***

The Entomologist's Record is a publication of the Amateur Entomologists' Society.  
To ensure high standards of production we use Cravitz Printing Company.

**£14.99 (inc. UK p&p)**

£16.99 (overseas)

## **Rearing Stick and Leaf Insects**

by Ronald N. Baxter

Fifty species described in detail: how to care for eggs prior to hatching, caring for small and large nymphs and adults. Including information on distribution, descriptions, egg and egg laying, list of foodplants and general rearing requirements.



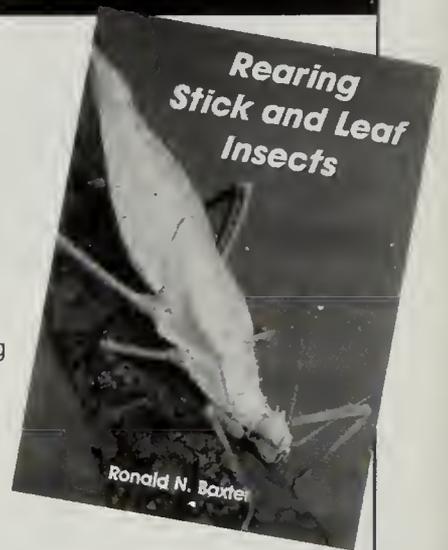
112 superb colour photographs and 12 stunning plates of 146 illustrations of Phasmid eggs, of a quality never before published.

**ORDER YOUR COPY NOW FROM**

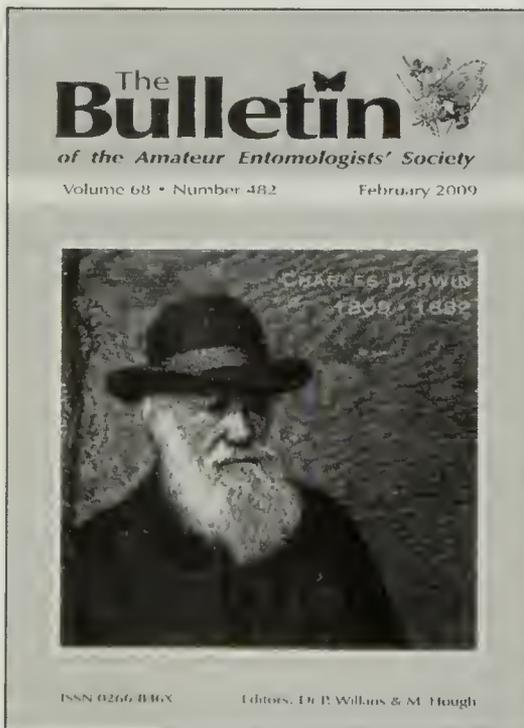
Cravitz Printing Company Limited

1 Tower Hill, Brentwood, Essex CM14 4TA.

Tel: (01277) 224610 • Fax: (01277) 262815 • E-mail: [CravitzPrinting@btconnect.com](mailto:CravitzPrinting@btconnect.com)



## **Bulletin Cover**



This is from a photograph by Messrs Joseph Elliott and Clarence Edmund Fry and depicts Charles Darwin in 1881.

ISSN 0266-816X

Editors: Dr P. Williams & M. Hough

# The Bulletin

*of the Amateur Entomologists' Society*

Volume 68 • Number 482

February 2009

## Editorial

This is a rather special issue of the *Bulletin*. As you will have seen from the cover, we are celebrating the 200th anniversary of the birth of Charles Darwin, and the 150th year since the publication of *The Origin of the Species*. His contribution to Natural Science cannot be underestimated.

Sadly, this must also be the *Bulletin* in which we record the death of the society's President, Michael Majerus. He was diagnosed with a terminal illness late last year, and passed away peacefully in his sleep in the early hours of Tuesday morning, 27th January 2009.

A professional geneticist, Michael was passionate about Darwin's work and did much to promote knowledge of the theory of evolution, especially with respect to entomology. Michael has helped the society a great deal, first joining the Council in 1969 as a Youth Representative and, having achieved eminence in his profession, returning as President in 2005, greatly increasing our profile and building much improved contacts with others in the field. Mike will be sorely missed but his legacy to the AES and to British entomology and evolutionary biology will live on. Our thoughts are with his wife Tina and his children at this difficult time. They requested no flowers at his funeral but suggested that donations to the AES could be made in lieu. All such donations received will, of course, be properly notified.

With this issue, we are reverting to an A5 format- providing just a little extra space and more comfortable reading. All members should also have received a sample copy of our new partner publication, the *Entomologists Record*. Details of how to obtain it regularly can be found on the Subscription Details page in this *Bulletin*.

**Martin Hough**





# Bright defensive colour patterns of insects, Part I: The conundrum of the evolution of true warning colouration

by AES President Michael E. N. Majerus

## Foreword

2009 is the 150th anniversary of the publication of Charles Darwin's great book *The Origin of Species by Means of Natural Selection*, as well as being the 200th anniversary of Darwin's birth. In *The Origin of Species*, Darwin explains the theory of evolution by natural selection that was first given to the world on 1st July 1858, when two essays, one by Darwin, the other by Alfred Russell Wallace, were read to a meeting of the Linnaean Society of London. Darwin and Wallace formulated their views on evolution by the process of natural selection independently. Both had a great interest in natural history, and in the almost endless variety of insects that make up the greatest proportion of species on Earth. For example, Darwin spent much of his time while at Cambridge pursuing beetles; collected huge numbers of new species of insect on his voyages on H.M.S. *Beagle*; and wrote extensively on the various adaptations that insects show to their ways of life. Wallace, similarly, was an accomplished entomologist, and wrote extensively on the reasons for the colour patterns of insects (e.g. Wallace 1889).

To celebrate the 150th anniversary of the *Theory of Evolution by Natural Selection*, I here, and in ensuing issues of the *Bulletin*, present a series of five articles on the evolution of bright defensive colour patterns in insects. In the first, I will consider the evolution of true warning colour patterns, before dealing with Müllerian mimicry, monomorphic Batesian mimicry, polymorphic Batesian mimicry and exceptional colour patterns in the later articles.

{Note, Parts I and III of this series will appear in *Bulletins* lacking a colour section. As the illustrations that accompany these articles rather lose impact if shown in black and white, the illustrations for these articles will appear with parts II and IV of the series.}

## Introduction

"We have now to deal with a class of colours which are... ..developed for the express purpose of rendering the species conspicuous. The reason of this is that the animals in question are either the possessors of some deadly weapons, as stings or poison fangs, or they are uncatable, and are thus so disagreeable to the usual enemies of their



kind that they are never attacked when their peculiar powers or properties are known. It is, therefore, important that they should not be mistaken for defenceless or eatable species... ..since they may suffer injury, or even death, before their enemies discovered the danger or the uselessness of the attack. They require some signal or danger-flag which shall serve as a warning to would-be enemies not to attack them, and they have usually obtained this in the form of conspicuous or brilliant coloration." (Alfred Russell Wallace, 1889)

Many insects have spectacularly bright colouration. In some, these beautiful colour patterns appear to serve a purpose in mate attraction, recognition and excitation. In a few, they constitute part of a specialist camouflage. For example, the Elephant Hawkmoth (*Deilephila elpenor*), with its beautiful pink and olive green livery merges in well both when resting by day on honey-suckle, which adults visit at dusk for nectar, or amongst the green foliage and pink flowers of the various willow herbs that their larvae feed upon. It is the third group of brightly coloured insects that are the focus of this article. These are those insects that use bright colour patterns to advertise to potential predators that they are not good to eat. Such insects are said to have warning colouration.

### Terminology

At the outset, it is necessary to clarify two possible areas of confusion in connection with so-called warning colouration. First, it should be recognised that of those species that use warning colouration as a defensive strategy, some species do so honestly, while the warning colour patterns of others are a sham. This second group comprises those insects that, although palatable, have evolved to resemble unpalatable species closely. By so doing, these species avoid being preyed upon by predators that have experienced the unpalatable model species and have learned to avoid it. Species with this type of false warning colouration are known as Batesian mimics, after H. W. Bates, who first described the phenomenon in 1862. It is the existence of these Batesian mimics that means that when talking about insects with bright defensive colour patterns we need to specify whether we are discussing true warning colouration, which scientists term aposematic colour patterns, or false warning colouration (Batesian mimicry).

A second area of confusion concerns the phrase warning colouration. Many commentators give the impression that certain colours, such as red, orange, yellow and black, are inherently warning



colours and so are avoided. This is rarely the case. One has only to consider the fruits of many plants and trees to see that this is not so. Why, for example, are ripe hawthorn berries red or ripe blackberries black? These berries are palatable, and their bright colours make them highly apparent to birds, which eat them in great numbers. This is to the benefit, rather than the detriment, of the plant, for the birds do the plants a service. The seeds inside the berries usually pass through the bird's gut unharmed, and the bird eventually deposits the seeds some distance away from the parent tree or plant in bird-droppings. Therefore, by having highly apparent, brightly coloured fruits, these plants improve seed dispersal and have their seeds deposited with a small amount of a natural fertiliser that gives them a good start when they germinate. In a more human context, many retailers use bright colours on the packaging of their products to attract the attention of consumers. And, for those old enough to remember the Hollywood starlets of the 1950s, I do not think it likely that these actresses wore bright vermilion lipstick to warn men away. So, certain colours should not be thought of as inherently warning. Rather, such colours should be considered memorable, whether the rationale for them to be remembered is in connection with a pleasant or an unpleasant experience. To avoid perpetuating this problem with the phrase warning colouration, in this article the term aposematic colouration will be used for true warning colouration.

### **Aposematism**

Aposematic insects have, by definition, two features. First, they have some feature that makes them unpalatable to certain predators. The feature may be a sting or bite; physical features, such as spines or barbed, urticating hairs; or chemical features that make them poisonous or at least foul smelling or tasting. Second, they have a bright memorable colour pattern: usually comprising two, or sometimes more, bright and strongly contrasting colours. It is the combination of these two features, bright colouration and unpalatability, that both defines aposematism and presents the difficulty in imagining how aposematism could have evolved.

The conundrum of aposematism is that a brightly coloured and so apparent prey species that is palatable would be picked off quickly. Moreover, due to its memorable colouration, any other similar individuals would become targets for the predator that had eaten the first one, as long as the predator had the capacity to remember the first one's appearance. Conversely, an inconspicuous unpalatable insect,



such as a caterpillar, would gain little benefit from its unpalatability, because if found it might be attacked and severely injured or killed by a predator before the predator discovered it was unpalatable. Furthermore, as the caterpillar was not memorably coloured, the predator would not easily learn to avoid similar caterpillars. So the difficulty in understanding the evolution of aposematism is 'a chicken and egg' problem. Which came first, the unpalatability or the memorable colour pattern, because it seems unlikely that the same genetic mutation would cause both a change in colouration and confer unpalatability?

To solve this conundrum, we may consider three alternate scenarios.

### ***First become unpalatable, then become conspicuous***

Insects may become unpalatable in a number of ways. For example, they may have a sting that has evolved for hunting purposes, which may also then be used in defence. Alternatively, they may possess a mutation that causes them to produce an unpalatable feature, such as urticating hairs or spines. If they feed on a food plant that develops defensive chemicals, they may co-evolve with it, finding a way of coping with this chemistry, and then storing these chemicals for their own defence. Or perhaps they develop a mutation that allows them to switch to, and cope with, a food plant that already has a defensive chemistry and then develop ways of using this chemistry for their own purposes.

Let us consider this final possibility in more detail. Imagine, if you will, a camouflaged species of insect that feeds on a small range of relatively palatable plant species. As these plants are relatively palatable, it is likely that our subject insect is in competition with many other insects that feed on the same plant species. Therefore, if our insect can switch to feeding on a plant that fewer other herbivores feed on, it may gain an advantage through reduced competition. The problem is that if there is an alternative plant that is fed on by fewer other species, it is likely that there is a reason that this species suffers less herbivory. Often the reason is that this plant has chemical defences against herbivores. Should our insect have a metabolism that allows it to counteract this chemical defence, it is likely to incur an energetic cost in so doing. The question is then whether the benefit our species gains through reduced competition by switching food plants compensates it for having to detoxify its food.

Let us assume that it does, and so the switch is made. Once that has happened, the next question is, how does our species detoxify its



food? There are various possibilities. It may simply avoid eating those parts of the plant that are chemically defended. Alternatively, it may have the ability to break down or transform the defensive chemicals into harmless compounds. Third, it may develop immunity to the effects of the plant's defensive chemicals, so that it can keep these chemicals intact, storing them for its own use. If our insect follows this last option, it will become unpalatable. However, it is still cryptic. Should a mutation occur that makes this unpalatable insect more easy to recognise, we should expect it to spread because predators would be more easily able to learn of this species' unpalatability and so leave it alone. However, there is still a problem. Mutation is a rare event. If a mutation occurred that made a cryptic species conspicuous, it would attract the attention of predators that could have no previous experience of it and so could not have previously learned to avoid it. In the ensuing attack, our new mutant aposematic insect may be fatally injured, and then the new mutation would be lost. But what if the mutation occurred in the germ line cells of an insect that lays its eggs in large batches? Then, following Mendel's laws of inheritance, if the mutation were genetically dominant, half the offspring of this insect would have and express the mutation and many of these would be likely to be found within the forage range of the same predators. So, our new conspicuous unpalatable insect would not be alone. Then, should a naïve predator attack and kill one of these new mutants, it would learn from the unpleasant experience and leave its conspicuous siblings alone. This then is a case of kin selection, whereby the cost suffered by one individual due to its genetic characteristics, leads to a benefit to others that carry the same genes as a result of common descent. Producing progeny within a small area leads to a local abundance of individuals that are both unpalatable and conspicuous.

Kin selection is often evoked in the explanation of the 'unpalatable first, then conspicuous' hypothesis of the evolution of aposematism, because it is the most extreme and easily understood pathway. However, as long as the development of unpalatability confers a greater defensive benefit than cost, unpalatability should evolve. There is some evidence that being distasteful may increase the chances of surviving a predator's attack. If this advantage were sufficient to outweigh any physiological cost of having defensive chemicals, we would expect unpalatability to evolve because it is beneficial, even without advertisement. Thereafter, conspicuous colouration would also evolve if the increased chance of surviving an attack through being more easily remembered outweighed the cost of injury from extra attacks resulting from increased apparency. Here then, aposematism may evolve without invoking kin selection.



Once a species has become aposematic, other traits that are beneficial in concert with this defensive strategy may evolve. These include increased grouping behaviour, resistance to injury, resting by day in exposed positions and having the ability to release volatile foul-smelling secretions to emphasise that their bright colouration is a true advertisement of unpalatability. I will return to these secondary traits at the end of this article.

### ***First become conspicuous, then become unpalatable***

There are a number of reasons why a palatable prey species might evolve to be conspicuous. Four cases will be considered here. First, bright colouration may evolve for sexual reasons. Second, some bright colours may have thermoregulatory functions. Third, palatable insects may evolve specific bright colour patterns to resemble unpalatable species (Batesian mimicry). Finally, some predators may have an inherent avoidance of certain bright colours.

The first two of these cases need little explanation. It is well known that in many species of animal, including many insects, bright colour patterns are used in species recognition, in attracting mates and in assessing the quality of potential mates. Darwin (1859) speculated thus when he defined sexual selection, and expanded on the theory of sexual selection in his second great book, *The Descent of Man, and Selection in Relation to Sex* (Darwin, 1871). His views that many conspicuous features of animals are the result of selection to increase reproductive success, rather than selection to increase survival success, have been shown by a huge wealth of studies across animal, and indeed plant, taxa.

That some conspicuous colours play a role in thermoregulation has been shown both by studies comparing the colouration of closely related species living in warmer and cooler climates, and by research on many insect species that exhibit melanic polymorphism. Such studies have shown that black, or very dark colours are beneficial in cool climates as they allow cold-blooded animals to heat up more rapidly in sunlight because dark colours absorb heat more rapidly than do pale colours. It is notable that black is a very obvious colour, and is the commonest colour in aposematic patterns.

If an insect evolves bright colouration for either sexual or thermal reasons, it is likely that selection will then favour the evolution of unpalatability.

Turning to Batesian mimicry, this subject will be considered in detail in a later article in this series. For the present, I will simply note that,



by definition, a Batesian mimic species is a palatable species that gains protection by a close resemblance to an unpalatable conspicuous species (the model). A great many examples of Batesian mimics are known, particularly among the insects. For our purposes here, we may simply ask what would happen were the model of a Batesian mimic to become extinct. The selective factor that favoured the evolution of the conspicuous colouration of the Batesian mimic has now been removed. There would appear to be four possibilities. First, the Batesian mimic may simply suffer very heavy predation as a result of its conspicuous colouration, and so also go extinct. Second, it may evolve to resemble a different unpalatable species, thereby changing its model. Third, it may lose its conspicuous colour pattern, reverting to camouflage or some other defensive strategy that depends on either not being seen or not being recognised as potential prey. Finally, it might evolve to become unpalatable itself, thereby taking advantage of its conspicuous colouration. In this latter case, a 'conspicuous first' Batesian mimic becomes 'then unpalatable' to convert to an aposematic strategy. Although there is no case in which this evolutionary pathway has been proven, it is possible that the unpalatability of the Hornet Clearwing moth, *Sesia apiformis*, has arisen along these lines.

The final case of conspicuous first, then unpalatable, is in fact two variant cases, in both of which predators have evolved, through experience, to leave prey of certain colours alone. The difference between the two variants depends on the rationale for avoidance of items with specific colour patterns. The first variant we may call 'inherent avoidance of the nasty'. Here, we might imagine a bird that lives within the geographic distribution of a highly unpalatable prey, such as a stinging wasp, that has the capacity to injure (and so lower the fitness of) naïve predators that attack it. In such a situation, any genes that caused naïve birds of this species to avoid black and yellow, wasp-like insects would be selectively favoured. Such genes would increase in frequency over the generations, until all birds of this species had an inherent avoidance of black and yellow wasp-like insects. Here, avoidance of a particular colour pattern is not a result of an individual's own experience, but rather a consequence of selection acting on birds of many previous generations.

The second variant might be termed 'avoidance of novelty'. The idea is simply that there are some colours that predators rarely encounter in the food that they eat. For example, few food items of birds are bright blue. In consequence, if a bird encountered a blue food item, it might ignore it simply because it did not recognise it as food. There is some evidence to support this idea. At one time, chickens were thought to



be blue-blind because in feeding tests they tended to ignore blue food items. However, this was later shown to be a misinterpretation: chickens can see blue, but do not associate the colour with food.

Irrespective of whether a particular species of predator has an inherent avoidance of the nasty, or simply avoids novelty, the potential impact on the evolution of aposematism is more or less the same. There will be some colours that one or more species of predator in a particular location will not attack. Should a mutation occur in a palatable prey species that gave it one of these colours, it would not be attacked by these predator species. As long as the reduced predation of this colour mutant by these predator species was sufficient to compensate for increased predation by other predators that did not avoid prey of this colour, the mutation would spread. The prey would thus become conspicuous. However, unless all predator species avoided the new colour, there would still be a selective benefit in evolving unpalatability secondarily.

### ***Flashy males may promote aposematism***

In exceptional circumstances, it is possible to envisage an evolutionary scenario in which the order in which unpalatability and bright colouration evolve varies between the two sexes of a species, with bright colouration evolving before unpalatability in males, the reverse being the case in females. In most Lepidoptera, males have the capacity to mate many times, given the opportunity. If one considers those butterflies and day-flying moths in which males and females look markedly different, it is usually the males that are more brightly coloured. This is true both in the human visible spectrum, and in the ultraviolet spectrum, to which humans are almost blind but which Lepidoptera and most birds can see. The reason for the males being the more colourful sex is thought to be that females chose the brightest males to mate with, and this has been shown to be the case in many birds, mammals, fish, reptiles and insects, including some butterflies and moths. As males of many Lepidoptera simply mate with any female of their own species that will accept them, the brightness of the female's colour pattern is of less importance. All that the females require is some species recognition feature. Of course, bright colouration is likely to have a cost for the males by making them more apparent to predators. However, this cost may be more than compensated for by increased mating success when only the brightest males are permitted to mate by the picky females. Indeed, the cost side of the equation for males may be lower than that for females, simply because males are lighter in weight than females which carry a heavy



egg load. A predator that catches and eats a fecund female is more likely to form a searching image to help it seek more of this type of profitable prey than one that has eaten a male of the same species that provides far less nutritional profit. So, we might expect that males are more likely to evolve bright colour patterns for sexual purposes, while females remain more dowdy and less memorable. In most cases of this type of sexual dimorphism, the genes that control the bright colours of the males are also carried by the females, but the expression of these genes is limited to males. This is similar to the genes that control beard colour in humans. The genes are present in females, but because hormones control the production of beards, the beard colour genes are only expressed in males. Such genes are said to be sex limited in their expression.

In our scenario, we may therefore expect males to become brightly coloured to increase their reproductive success, even though this is at the expense of their likelihood of survival, while females remain inconspicuous, with the differences between the colour patterns of the two sexes being sex limited. For the males, then, because of the cost of their apparency to predators, there would be a selective benefit if they evolved to be unpalatable. The memorability of their colour pattern would then become an asset, and they would become fully aposematic. So, in this pathway, the males become conspicuous first and unpalatable second. The males might become unpalatable by manufacturing defensive chemicals or taking them in with their food. As long as there were no great cost to this process, we might expect that the females of this subject species would also become unpalatable, almost by coincidence. However, once the females were also unpalatable, they would gain a selective benefit from conspicuous colouration so that predators could learn to avoid them also. This could be achieved either through the selective evolution of a new set of conspicuous genes, or, more easily, by a breakdown of the sex limited expression of the male colour pattern genes. The result is that in the females of this species, unpalatability would have evolved first and bright colouration second.

### ***Unpalatable and conspicuous together***

I said earlier that it is unlikely that a single genetic change will give rise to both conspicuous colouration and to unpalatability. This is because the pathways involved in colour production and in making or storing defensive chemicals are generally very different. Moreover, due to the rarity of mutation, it is also unlikely that mutations in two different genes, one affecting colouration, the other defensive



chemistry, would occur concurrently in the same individual. However, unlikely is not the same as impossible, and the scenario whereby both conspicuous colouration and unpalatability arise together should not be totally abandoned. Although no definite case is known, it is at least feasible that colour pigments might be produced as a consequence of either a new food plant detoxification process, or the novel production process of a defensive chemical. Moreover, the process may work in the reverse direction. If a new colour pigment mutation were advantageous for some reason other than defence (e.g. mate attraction), it is not impossible that a by-product of the pigment manufacture pathway or indeed the new pigment itself, could be unpalatable.

### **Characteristics associated with aposematic colour patterns**

If we are to fully understand the evolution of aposematism, the evolution of the traits that are often associated with this form of defence should also be considered.

#### ***Aggregative behaviour***

It is certainly true that many aposematic species tend to group together. Only has only to think of examples such as ladybirds that overwinter in large aggregations, the large groups of brightly coloured true bugs (sometimes called stink bugs), the spiky caterpillars of Peacock butterflies (*Inachis io*), or the toxic caterpillars of the Cinnabar moth (*Tyria jacobaeae*) to see that this is the case. Analysis of the correlation between larval grouping behaviour and aposematism showed that a much higher proportion of species with aposematic larvae lived in groups than did cryptic species that generally dispersed after hatching from their eggs and foraged alone. One problem here is that in some cases phylogenetic analysis has suggested that grouping behaviour evolved prior to the evolution of aposematism, not following it. Some commentators have seen this as a rationale for questioning the evolution of aposematism. However, there is no real problem here if one takes a pluralistic approach. I mentioned previously that the evolution of aposematism through kin selection may initially be facilitated by a local abundance of aposematic individuals. This is more likely to occur in species that, for example, lay eggs in large batches, for even if the larvae that result disperse, the majority will remain within the forage ranges of a rather small number of the same birds. This will be particularly the case in the spring and summer when many birds are nesting and rarely forage far from their nests. This means that aposematism is more likely to evolve in species



that have a tendency for grouping than in those that are widely dispersed. Once aposematism has evolved, selection will favour increased grouping. Thus, here we have a situation where grouping is both in part a facilitating precursor to aposematism and a beneficial consequence of aposematism. In some cases grouping will have preceded the evolution of aposematism, in others it will have evolved only as a consequence of aposematism, and in still others, it will have been both part cause and part consequence of the aposematism.

### ***Resistance to injury***

That aposematic species are more resistant to injury than cryptic species is not contentious. One has only to examine the integuments of, for example, aposematic species of the genera *Amauris* or *Danaus*, and the palatable *Papilio* species that resemble them, to see that the former is much thicker and tougher than the latter. The rationale for a species evolving resistance to injury is based on a cost-benefit analysis. The benefit of being resistant to injury has to be selectively weighed against the cost of putting developmental resources into strengthening the integument. For aposematic species, this cost benefit analysis often comes down on the benefit side because, when a naïve predator attacks an aposematic species, it may quickly discover its unpalatability and reject it before swallowing it. Resistance to injury may now allow the tested aposematic species to survive such a trial. In the case of a palatable insect, the predator will have no reason to reject the insect once caught, and so the insect will be eaten, even if it has some resistance to injury. Consequently, for a palatable species the cost benefit analysis comes down on the cost side because resistance to injury provides little or no benefit.

### ***Resting where one can be seen***

To illustrate that aposematic species have a tendency to rest in exposed positions, one has only to consider the number and type of beetles that one sees frequently. Perhaps the most commonly encountered beetles are the ladybirds, most of which are aposematic. This is not because ladybirds are the commonest beetles or the largest beetles. Rather it is because they are the most apparent beetles, partly because of their bright colours and partly because they do not hide away from predators. In fact, because of their aposematism, ladybirds gain from being out in the open where they can be clearly seen and their colour patterns can easily be recognised.



### ***Smelly adverts of chemical defence***

Finally, the secondary trait of releasing foul smelling volatile chemicals is also easy to understand. It allows predators to recognise quickly that a potential prey item is nothing of the sort and is unpalatable. The quicker that a predator realises this, the better it is for the potential prey. Thus, an early warning system will be beneficial to aposematic species. In some species the release of volatiles is obvious, as is the case when *Acraea* butterflies, tiger moths or ladybirds reflex bleed. In others, one just gets a nasty smell. Research has shown that release of these nasty smelling volatiles not only acts as an early warning system, it also increases the learning speed of predators. Thus, the rate of avoidance learning of unpalatable prey is more rapid when foul smell and bright colour pattern traits are combined than when either of these traits is present alone.

### **Conclusion**

The evolutionary battles between predators and prey are never-ending. Aposematism is just one strategy that prey may evolve to reduce predation. It is a very successful strategy. However, it is not perfect, and selection will continually act on predators to find ways around an aposematic prey-species's defences. Thus, for example, some birds have evolved strategies to rid bees and wasps of their stings before eating them, while other birds have evolved immunity to the toxins in ladybirds. As the co-evolutionary arms race between predators and prey will be never ending, and as the precise details of the selective factors involved will vary in every case, due to a huge number of variable factors, we should not be surprised that there is not one single pathway for the evolution of aposematism. Although scientists often wish the natural world to be tidy and to conform to general rules, naturalists know that this is rarely the case. So, although perhaps the most likely order of the evolution of aposematism is unpalatable first, then conspicuous, there is certainly a sizeable minority of cases in which the order of evolution of these traits was reversed. Nor is it impossible that in a few cases the two traits evolved together, while in a small number of others, the order of evolution of the traits may have varied between the sexes. Moreover, the finer details of aposematism in different species within each of these categories are also certain to vary. So, as an example, in the conspicuous first, then unpalatable class, the reasons for initial conspicuous colouration may be species recognition, or mate attraction, or for thermal reasons and so on.



I think that Charles Darwin would have approved of this multiple and never-ending pathways conclusion. In the closing paragraph of *The Origin of Species* Darwin contemplates 'an entangled bank,... ...with various insects flitting about'. He wrote, "There is grandeur in this view of life, with its several powers,... ...that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved".

### References

- Bates, H.W. 1862 Contributions to an Insect Fauna of the Amazon Valley. Lepidoptera: Heliconidae. *Transactions of the Linnean Society of London*, 23, 495-566.
- Darwin, C.R. 1859 *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. John Murray: London.
- Darwin, C. 1871 *The Descent of Man and Selection in Relation to Sex*. John Murray: London.
- Wallace, A.R. 1889 *Darwinism: An Exposition of the Theory of Natural Selection with some of its Applications*. Macmillan: London.

**Editor's Note:** Unfortunately Mike Majerus was unable to produce any further articles in this series.





## Reflections on an evolutionary paradigm: the case of the Peppered Moth (LEPIDOPTERA: *Biston betularia* Linn.)

by Catherine Scullion and AES President Michael E. N. Majerus

Department of Genetics, Downing Street, Cambridge, CB2 3EH

e-mails: CS: [catherine.scullion@cantab.net](mailto:catherine.scullion@cantab.net) MENM

The example of industrial melanism in the Peppered Moth as a paradigm of Darwinian evolution has been criticised due to flaws in the classic experiments that established the textbook details. Some creationists claim that if this classic case is unsound and must be discarded, then so too must Darwinian evolution.

The study of evolution is arguably the most significant of the many overlapping facets of biology. It answers the ultimate questions posed regarding the origins of the basic mechanisms of life and gives understanding of ecological and clinical outcomes; from cellular machinery to antibiotic resistance spread, virulence patterns and consequences of genetically modified organisms. It penetrates nearly every sphere of scientific pursuit that relates to living beings. Consequently, Darwin's synthesis of evolutionary progression with a driving mechanism, natural selection, in the seminal work '*On the Origin of Species*', published 150 years ago this year (Darwin, 1859), is often cited as the most influential work of the last millennium. Even from these few introductory sentences, it is clear that the claim carried in the first paragraph is a serious one, with profound repercussions; but does it have any basis in fact or scientific reason?

Here, the logical foundations of Darwin's evolutionary thesis will be outlined and used as a basis on which to assess critically evolutionist and creationist arguments with reference to the Peppered Moth as a specific example. The merit of each idea as a scientific theory and other relevant examples will be used to assess the validity of discarding Darwinian evolution as a result of qualms with the Peppered Moth case.

Biological evolution is defined as changes in the frequencies of alleles (forms of genes) in a population, over time. Darwinian evolution is a subset of biological evolution, requiring that the changes in allele frequencies that occur do so as a result of selection acting in favour of or against particular alleles as a consequence of the fitness that they confer on their carriers. The distinction is useful in maintaining stringent classifications for biological evolution. Changes



through processes such as random genetic drift are not adaptive. Conversely, by definition, changes dictated by Darwinian evolution are adaptive, at least in the short term.

Darwinian selection theory is based on four facts and three deductions that follow naturally from these. Organisms produce many more reproductive cells than they need to to replace themselves; yet population sizes remain relatively stable. Therefore, there must be high levels of mortality in natural populations. Additionally, there is wide phenotypic variation in the characteristics of individuals in a population. Logically, it follows that some individuals will have characteristics that make them better suited to life than others. As it has long been recognised that offspring have a tendency to resemble their parents, it follows that the favourable characteristics of successful parents will be propagated and maintained in populations. Conversely, unfavourable characteristics, which contribute to the lack of success of other individuals, will be naturally selected out of the population. Under this reasoning, Darwinian evolution cannot not happen. As Douglas Adams (2002) observed, Darwin's theory of evolution by natural selection is perhaps the ultimate tautology: that which survives, survives. No other input or explanation is required for this natural truth.

Special creationism is based on faith rather than logical deduction. A Creator is proposed to have designed and built the environment and all life inhabiting it. Intelligent Design is a variation of the creation idea, that allows for change in organisms following the time of their creation, but is much more limiting than Darwinian evolution insofar as explaining speciation and other phenomena.

The creationist/evolutionist debate has raged in various forms since the inception of the latter. The battle has been taken to courtrooms and parliamentary chambers, but in essence is one of winning minds. Creationist investment of time and funds is largely targeted at delivering their message to a mass audience. In contrast, research is the bedrock of evolutionary work, with many proponents reluctant to expend resources on debate. Thus, the controversy continues.

The most valuable weapons for the Darwinian evolutionist cause are simple, accessible, everyday examples of the theory in action that many can relate to and understand. It is these that prove most dangerous to creationist arguments. The example of industrial melanism in the Peppered Moth is the classic textbook case of evolution in action and as such has invited controversy.

Following the industrial revolution, the urban British landscape experienced numerous environmental and ecological changes. Among



the most interesting of these was the emergence of a melanic form of the Peppered Moth (*Biston betularia*) in the mid-19th century. By the end of the century, this variant, named *carbonaria*, almost replaced its paler, speckled counterpart, form *typica*, in urban areas. In 1950, Bernard Kettlewell ran a series of predation experiments and concluded that the level of predation of the pale form was greater than that of the melanic form in polluted woodland, the converse being the case in unpolluted woodland (Kettlewell, 1955, 1956). The results of these experiments, together with survey data showing a good correlation between melanic frequency and industrial pollution levels (Kettlewell, 1958) established melanism in the Peppered Moth as the premier textbook case of Darwinian evolution in action.

The two forms of the Peppered Moth are heritable, with the *carbonaria* form genetically dominant to the *typica* form. By day, Peppered Moths rest on the bark of trees, and, along with many other cryptic moth species, are hunted by birds. The melanic form benefited from better camouflage on trees blackened by pollution in urban areas and so was less likely to be eaten. The characteristic therefore spread through urban populations as a result of the selection pressure imposed by predation.

This basic story was simple and elegant, but incomplete. Over the 50 years since Kettlewell's experiments, numerous others have worked on, or commented on the Peppered Moth case. Some have elaborated on the details of the case; others have criticised some of the experimental approaches, while still others have made claims of fraud against the scientists who have worked on the Peppered Moth in the field. Attempts by scientists to unravel the fine detail of this paradigmatic case have been used by anti-evolutionary commentators to discredit the case as a whole. For example, the finding that Peppered Moths more commonly rest by day on the underside of lateral branches, rather than on tree trunks, has been used as a fundamental criticism to undermine Kettlewell's predation experiments, in which live Peppered Moths were placed on oak trunks. Superficially, this type of example may appear to represent a creationist victory. However, one should note that no experiments have been conducted by anti-evolutionary commentators to test whether the level of bird predation was affected by moth resting position.

Good science is conducted by a four-step process: observation, hypothesis formation, prediction and experimental test. Scientific theories are hypotheses that have been tested and verified. Darwin's hypothesis that organisms change as a result of natural selection has



been tested in a multitude of species, and reinforced by numerous observations. Moreover, elements of his hypotheses of evolution have been modified as science has advanced. Thus Mendel's discovery of the laws of inheritance led to major modifications of Darwinian evolution, to produce what has is often referred to as the neo-Darwinian synthesis. This provides an understanding of how heritable material is passed down the generations and modified by Darwin's mechanism of selection. Although Darwin died before Mendel's laws of inheritance became widely known, he would have approved of the manner in which his ideas on evolution were modified. He was a strong advocate of hypothesis testing and of 'listening' to results, writing in his autobiography, "I have steadily endeavoured to keep my mind free, so as to give up any hypothesis, however much beloved (and I cannot resist forming one on every subject), as soon as facts are shown to be opposed to it." (Darwin, 1887)

Adjudged by the criteria above, Special Creation is not a scientific theory, nor indeed a scientific hypothesis. Rather, it is an idea that is outside natural laws, and not open to the prediction testing that is inherent in scientific study. This is perhaps the biggest conceptual difference separating evolutionists from creationists. Intelligent Design represents some alteration of thought, but is thought by many commentators to be largely a pragmatic shift in emphasis to satisfy the established fact that populations of organisms are not immutable, unchanging and static. Creationism relies on the historical power of religious doctrine to discourage questioning or alteration of ideas, particularly those concerning human elevation.

Darwin, like Galileo before him, has provided a target for attack. As the first proponent of a mechanism of evolution, Darwin was and is seen as a focal figurehead for criticism by the creationists. It is Darwin who is singled out for attack, rather than the evolutionary geneticists of the twentieth century: Fisher, Wright, Maynard Smith, Hamilton, Dobzhansky, Mayr, Muller, Ford and many others. When creationists focus attack on specific cases, they follow a similar line, picking and assaulting targets selectively. Thus the Peppered Moth, and in particular the work of Kettlewell, has been targeted while the huge wealth of subsequent evidence (e.g. Lees, 1981; Majerus, 1998, 2005; Cook, 2003 for reviews) has been studiously ignored.

Moving forward from this debate, on the erroneous assumption that the Peppered Moth case is flawed, can Darwinian evolution still stand? One point made by creationists regarding the Peppered Moth case is that the selection involved is, in any case, not natural, as it is the result



of anthropogenic environmental changes (i.e., man-made pollution). However, other examples in support of natural selection theory can be drawn from totally natural environments. Rock pocket mice provide a similar case to that of the Peppered Moth, with melanic variants being common on dark volcanic rocks, and the paler form being prevalent on the paler rocky habitats between the laval flows (Nachman et al., 2003). This case is entirely natural in every sense.

Creationism provides a panacea explanation for all the 'whys' of the natural world. Whatever the conundrum, the explanation is the same: The Creator created it thus. This is like responding to the question 'why is that the way it is' with the answer, 'it just is'. In truth, this is no answer. In contrast, Darwinian evolution looks for unique explanations, and contends that organisms have been moulded by their environment and, through the processes of selection, have become adapted to their surroundings for survival and reproduction. The natural world abounds with examples that reveal the action and power of natural selection. One need only think of phasmids that look like sticks or leaves or moths that resemble bird-droppings so that they do not get eaten. There are the famous Galapagos finches that have beaks to help them feed on particular food, and gazelle that can run fast and so have a chance of out-pacing cheetah. All have the stamp of adaptive selection. At a more microscopic level, the evolution of pest resistance in many insects, antibiotic resistance in bacteria or the changes in virulence levels to maximise virus transmission rates all reveal how natural selection can cause directed changes over time in these rapid breeders.

Predator-prey and host-parasite co-evolutionary arms races have produced some extraordinary features and life-styles as the combatants in such relationships vie for adaptive supremacy. Even plants must compete; tapirs in the rainforest have learnt not to over-indulge on any single plant, as these will mean ingestion of a fatal dose of poison.

Selection theory also included sexual selection: the race to reproduce successfully, rather than the competition to survive. Darwin's (1871) 'battle of the sexes', stemming from asymmetric investment in pre- and post-natal care of offspring, is manifest in the impressive weaponry or elaborate ornaments of the males of many species, such as the horns of stag beetles, the extended tails of male comet moths, or from the vertebrate world, the antlers of red deer and the peacock's tail. These are the product of sexual selection when males compete for access to females or females choose their mating partners with care. A somewhat parasitic nature to the relationship between the sexes is revealed in



some insects that have evolved means of bypassing female sperm storage organs, and simply inject sperm directly into egg chambers; a selfish strategy that reduces lifespan of the female to facilitate transmission of the male's genes.

Arguably, these characteristics are simply what the Creator intended. But, if the life on Earth that we see today is a result of an omnipotent, supernatural Creator, we need to ask why so many organisms appear to have been designed very poorly, if the end product was known. The layout of the human urinogential system, with ducts following a convoluted, rather than a direct path within the body is a case in point. This pattern is easy to understand if bipedal humans evolved from quadrupedal ancestors, but seems contrary if humans were the product of a one-off job by a 'designer'. Or, in the insect world, one might wonder why a Creator would employ yellow and black scales on the underside of the wings of the Orange-tip Butterfly (*Anthocharis cardamines*) to give the impression of green, rather than simply using green scales.

These examples only touch the surface of the natural phenomena that can be explained by Darwinian evolution. That is not to say that all biological evolution is Darwinian. The effects of phenomena such as random genetic drift can be seen and understood through the study of species that occur on volcanic islands, having descended from a very small number of colonisers and experienced changes in allele frequencies as an isolated population. Moreover, such effects have been replicated experimentally in the laboratory, with similar results.

Finally, some anti-evolutionists have argued that the evolutionary changes that have been observed in cases such as the Peppered Moth are not important, as they do not lead to the origin of new species. However, since *The Origin of Species* was published, new species have been observed to arise through processes such as polyploidisation, hybridisation and cytoplasmic incompatibility, these processes all have a genetic basis and a selective rationale. Nor are they rare exceptions. Over two-thirds of the species of plant on Earth are polyploids.

Another area of controversy is the fossil record. The incompleteness of the fossil record is often cited to undermine Darwinism. Some even go so far as to assert that the Creator made fossils to test faith. However, again one should consider this issue from both perspectives. If fossils had been laid down by a Creator, would the Creator not have laid down a complete set? It is certainly true that the fossil record is not complete, but given the precise conditions that are needed for a dead organism to be fossilised, it would be extraordinary if the fossil record



were complete. Moreover, in the existence of 'living fossils', such as the Coelacanth, through advances in DNA sequencing and with the continuing discoveries of fossils, some of the gaps in the fossil record are slowly being filled. We may never know the precise transitions on every branch of the tree of life, but the mechanisms and broad principles are well established: here is no mystery inexplicable by science.

If it had been shown that the evidence in the Peppered Moth case had been, to borrow a legal term, 'found to be unsafe', this would not invalidate the theory of Darwinian evolution. It has been shown that Darwinian theory does not stand on a single example. There is no doubt that the Peppered Moth has changed over time: this has, and is, being observed. The scientific criticisms of the case have been related to the precise mechanism of this change. For evolutionary scientists, if a prediction is not fulfilled in test, then the hypothesis on which the prediction is based is discarded, and replaced, in time, with a new hypothesis that is also open to test. In the case of the Peppered Moth, it is notable that while anti-evolutionary lobbyists have sought to use flaws in some of the early experimental procedures to denigrate the case and the scientists who did the work, some of those scientists have simply used the scientific method to address the flaws, conducting new experiments that have produced results that have reaffirmed the theory. Through this rethinking and painstaking research undertaken to gain understanding of the intimate fine details of the moth's ecology and behaviour, they have strengthened the case of the Peppered Moth as an extraordinarily clear and understandable example of Darwinian evolution in action. The challenge for evolutionary biologists now is to establish further paradigms with the attractive, accessible, simple and understandable features of the Peppered Moth tale, to strengthen the understanding of Darwinian evolution in the public eye.

### References

- Adams, D. (2002). *The Salmon of Doubt*. Macmillan: London.
- Cook, L. M. (2003). The rise and fall of the carbonaria form of the Peppered Moth. *Quarterly Review of Biology* 78 399-417.
- Darwin, C. R. (1859). *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. John Murray: London.
- Darwin, C. R. (1871). *The Descent of Man, and Selection in Relation to Sex*. John Murray: London.
- Darwin, C. R. (1887). *The Autobiography of Charles Darwin 1809-1882*. 1958 edition (Ed. Barlow, N.). Collins: London.
- Kettlewell, H. B. D. (1955). Selection experiments on industrial melanism in the Lepidoptera. *Heredity* 9 323-342.



- Kettlewell, H. B. D. (1956). Further selection experiments on industrial melanism in the Lepidoptera. *Heredity* 10 287-301.
- Kettlewell, H. B. D. (1958). A survey of the frequencies of *Biston betularia* (L.) (Lepidoptera) and its melanic forms in Great Britain. *Heredity* 12 51-72.
- Lees, D. R. (1981). Industrial melanism: Genetic adaptation of animals to air pollution. In: *Genetic Consequences of Man Made Change* (eds. Bishop, J. A., Cook, L. M.). Academic Press: London 129-176.
- Majerus, M. E. N. (1998). *Melanism: Evolution in Action*. Oxford University Press: Oxford.
- Majerus, M. E. N. (2005). The Peppered Moth: Decline of a Darwinian Disciple. In *Insect Evolutionary Ecology* (eds. Fellowes, M. D. E., Holloway, G. J., Rolff, J.). CABI publishing: Wallingford, UK 367-391.
- Nachman, M. W., Hoekstra, H. E. and D'Agostino, S. L. (2003) The genetic basis of adaptive melanism in pocket mice. *Proceedings of the National Academy of Science* 100 5268-5273.



## **A Local Abundance of Angle Shades moths? (LEPIDOPTERA: *Phlogophora meticulosa* L.)**

by Jan Koryszko (6089)

3, Dudley Place, Keir, Stoke-on-Trent, Staffordshire, ST3 7AJ

The Angle Shades (*Phlogophora meticulosa* L.) is polyphagous, and adults can be found in every month of the year. It is common most years in my part of Staffordshire, mostly from July to September, and especially on sugar. But on 20th April 2007 I found 14 moths sitting on plants and on the wall of my garden, in warm sunshine. I have never seen so many in daylight hours before. Later that day neighbours and children also came to me with moths in jam jars and containers, having found them in gardens and at the roadside. Perhaps many larvae survived the mild winter, pupated and reached the adult stage simultaneously. Predation must have been low. Another possibility, of course, is that there could have been a large migration.

Moths continued to be seen in gardens, on walls and on footpaths etc. between 20th and 27th April. It would be interesting to know if there have been any similar observations at this time reported in other parts of the country, or was this just a local abundance?



# A primary gregarious egg parasitoid (HYMENOPTERA: Chalcidoidea, Trichogrammatidae) of the Small Skipper (*Thymelicus sylvestris*)

by Hewett A Ellis

16, Southlands, North Shields, NE30 2QS.

## Introduction

In previous articles in the *Bulletin* I have described and illustrated examples of ectoparasitoids, ectoparasitoids and pseudohyperparasitoids of the larvae of Lepidoptera (1966, 55(408): 199-202, Figs 1-4 1998, 57 57 (419): 145-149, Pl 98 N-P 1998, 57(421): 228-233, pl 98W; 1999 58(423) 43-46).

Less commonly encountered and described are parasitoids of the egg (Shaw and Fitton, 1989). An egg parasitoid is defined as a parasitoid species that oviposits in the host egg and completes its development therein, having killed the host (Shaw, 1990). Some braconids (Cheloninae) and some chalcids (Encyrtidae) oviposit in the host's egg but the parasitoid larva does not complete feeding and development until the host larva is mature or has pupated. Some species of two chalcid families (Mymaridae, "Fairy flies" and Trichogrammatidae) together with Scelionidae, are true egg parasitoids, completing development in the host's egg (Shaw and Askew, 1996). The present paper describes and illustrates the eggs of the Small Skipper butterfly (*Thymelicus sylvestris* Poda.) and their parasitism by one such Trichogramma species.

## Small Skipper eggs

From Mid-July to early August female Small Skipper butterflies can be seen alighting on the foodplant Yorkshire Fog Grass (*Holcus lanatus* L.) and walking up and down, or revolving round, the stems in characteristic fashion to locate the slit-like opening in the grass leaves for ovipositing. (Fig. 1) Examination of these sheaths afterwards usually reveals a row of three or four eggs, each measuring about 1.5mm x 0.6mm, which are pale cream coloured and oval with centrally flattened sides (Fig. 2). Occasionally I have found eight or more eggs, up to twenty six, in a single row. Numbers in excess of eight are thought to result from an accumulation of different batches of eggs (Emmet and Heath, 1989).



Figure 1. Small Skipper butterfly inserting eggs into a sheath of Yorkshire Fog Grass.



Figure 2. Grass sheath opened to show part of a row of developing Small Skipper eggs, one week after collection.

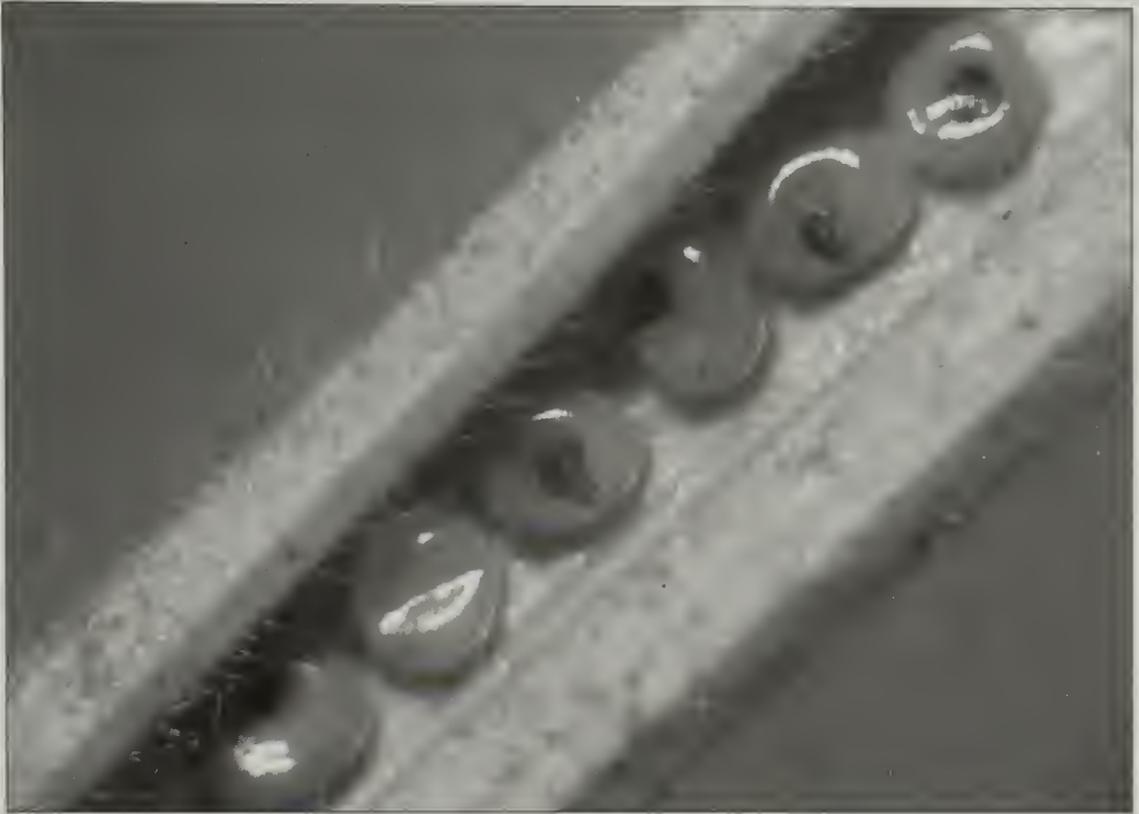


Figure 3. Eggs in grass sheath showing further development with black caterpillar head visible in each.



Figure 4. First instar caterpillars spinning cocoons in which they hibernate over winter within the grass sheath. One egg has not yet hatched.



Figure 5. Part of a row of developing eggs in grass sheath three days after collection. One is parasitized and diffusely dark grey with several tiny darker areas (gregarious parasitoid).



Figure 6. Adult *Trichogramma* species from Small Skipper egg. Note the squat body and broad forewings with reduced venation. Head detached to show anterior thorax. See text for details. Photomicrograph x20 on slide.

All photos by Hewett Ellis



### **Fate of collected eggs**

On 2nd August 1991 I collected two rows of eleven and eight eggs in two sheaths of Yorkshire Fog Grass from rough grassland near Spennymoor in Co. Durham (VC 66, Grid Reference: NZ 245 338). Initially all the eggs appeared to be normal and after a few days 11 darkened and the cream body and black head of the Small Skipper caterpillar could be seen within, though the translucent egg shell (chorion) (Fig. 3). These caterpillars began to emerge from the eggs (eclosion) on 13th August. They ate most of their egg shells, but nothing else, before spinning white silken cocoons within the grass sheath (Fig. 4), prior to hibernation over the coming winter. In contrast, the remaining eight eggs became darkened throughout over a few days after collection, and multiple discrete black areas became recognisable. (Fig. 5). About the same time as the Small Skipper caterpillars emerged from the normal eggs, tiny adult winged insects (having fully developed within the eggs) began to emerge through minute rounded holes in the attacked eggs. A total of 24 parasitoids was obtained from the eight attacked eggs.

The following season, on 28th July 1992, I made a further collection of three specimens of grass from the same site containing 26, 10 and 4 Small Skipper eggs, respectively. These later proved to include only one parasitized egg which became darkened throughout by 31st July and from which seven tiny parasitoids emerged through four separate holes, commencing 4th August.

### **The egg parasitoid**

#### **Description of parasitoid**

To the naked eye the tiny brown parasitoids appeared as specks of dust. In order to obtain a better idea of the morphology and dimensions, microscopy was necessary. In the following description measurements referred to were made at X200 magnification, using a calibrated eyepiece graticule.

Magnified, the parasitoid can be seen to have a squat body with a sessile gaster. The total length (head + thorax+ gaster) is only 0.38 mm to 0.61 mm (mean, 0.51 mm) and the gaster is 0.16 mm - 0.26 mm (mean, 0.2 mm) wide. The tarsus comprises three segments. The head is 0.24 mm wide on average and the compound eyes and three ocelli are reddish-brown. The short antennae terminate in a prominent club (clava) covered by long setae 70  $\mu$ m to 90  $\mu$ m long). The head is concave posteriorly and partially obscures the anterior thorax. The fully



developed wings have a reduced venation, with a submarginal vein, a swollen marginal vein bearing a few setae (averaging 44  $\mu\text{m}$  in length) and a stigmal vein but no post-marginal vein. The forewings are broadened (mean length 0.56 mm, mean maximum width 0.27 mm) and the overall wingspan is about 1.3 mm. Each wing is fringed by hairs and covered by numerous microtrichia arranged in longitudinal rows, leaving a bare area (speculum) beside the submarginal and marginal veins. By comparison, the hind wings are very narrow, fringed by hairs but with a single central row of microtrichia at the surface. Some of these features are shown in Fig. 6 which is a photomicrograph of a parasitoid on a slide, the head having been detached to expose the anterior thorax.

### Identity of parasitoid

The parasitoid appeared to be some form of tiny chalcid and the specimens were sent to the Department of Entomology, the Natural History Museum, London, for identification. Dr. UJ. Lasalle determined the parasitoid as *Trichogramma* species (Chalcidoidea: Trichogrammatida) but species level identification was not possible (pers. comm., Dr. M. G. Fitton, 1991). At Dr. Fitton's request further specimens were sent to Dr. M. Shaw at the Royal Museum of Scotland, Edinburgh. It seems that *Trichogramma* is a very difficult genus taxonomically. At the same time, Dr. Shaw informed me that he was unaware of any other published records of *Trichogramma* parasitizing Small Skipper eggs. However he had some *Trichogramma* which had been sent to him having been obtained from parasitized eggs of the Chequered Skipper (*Carterocephalus palaemon* Pallas), in Scotland.

### Discussion

The *Trichogramma* species obtained is a primary gregarious true egg parasitoid of the Small Skipper, having completed development within the egg. The frequency and distribution of the parasitoid are unknown. That I found several parasitized eggs in a small number of samples collected at random suggests that it cannot be too uncommon (at least at that particular location).

Regarding distribution, such a tiny insect must have limited control over its movements. As described by Imms (1956), all tiny insects, such as the present *Trichogramma* species, are able to control directional flight only when the air is very still. Commonly conditions are such that, resembling specks of dust, they are carried considerable distances



before returning to earth on cooling air currents. As a result it seems likely that the *Trichogramma* species is widely distributed throughout the country.

Theoretically, the tiny parasitoid may 'hitch a ride' on the female Small Skipper butterfly and be carried to the grass sheath at the time of ovipositing, a mechanism of spread known as phoresy. If this occurs then the distribution might be less widespread. However in the present instance phoresy would appear to be unlikely since, as pointed out by Dr. R. R. Askew (pers. comm., 1991) *Trichogramma* species are generally polyphagous, whereas those chalcids and scelionids known to engage in phoresy (Gauld and Bolton, 1998) are very host specific tending to attack large hosts such as orthopteroids.

The main problem in attempting to determine the frequency and distribution of the parasitoid is in finding fully representative samples of grass sheaths with eggs. Following ovipositing Small Skipper eggs take about 20 to 25 days before eclosion, but it is not known how soon after deposition that they are attacked by the parasitoid. The interval between deposition and the time of collecting will clearly influence the frequency of potential parasitism, but one has little control over this in the field. It is a simple matter to find eggs which have been recently deposited by observing an ovipositing female but these are unsuitable for the present purpose. Occasionally one is fortunate and finds a large number of eggs in such a grass sheath and some of these will have been deposited earlier by a different female. Then sufficient time may have elapsed for some of the eggs to have been parasitised.

Care is necessary when searching grass sheaths for eggs. Most other British butterflies – exceptions being the Marbled White (*Melanargia galathea* Linn.) and the Ringlet (*Aphantopus hyperantus* Linn.) – attach their eggs to the food plant with a sticky liquid which later hardens, fixing them in position. Eggs of the Small Skipper are unattached and are simply held in place in a row by the tightly closed grass sheath. If the sheath is opened and the eggs disturbed they readily fall to the ground.

The effect of the egg parasitoid on the Small Skipper population is uncertain. In general, it seems there has been a reluctance to accept that parasitism plays any significant role in controlling butterfly numbers, but it must have some effect (Shaw, 1990). The present *Trichogramma* egg parasitoid does not appear to have had any serious detrimental effect on the local Small Skipper population, which has continued to thrive in North-east England.



### Acknowledgements

I wish to thank Dr. J. Lasalle, Dr M. G. Fitton and Dr. M. R. Shaw for help with the identification of the parasitoid and Dr. R. R. Askew for providing me with information regarding its biology.

### References

- Ellis, H.A. The Small Skipper *Thymelicus sylvestris* Poda (LEPIDOPTERA: Hesperiiidae) in North-east England: History and current status *Entomologists' Record and Journal of Variation* **111**: 222-225.
- Emmett, A. M. And Heath, J. (1989) Hesperiiidae-Nymphalidae. *The Butterflies The Moths and Butterflies of Great Britain and Ireland* 7(1) Harley Books, Colchester.
- Gould, I and Bolton, B. (1988) *The Hymenoptera*. British Museum (Natural History), Oxford University Press, Oxford.
- Imms, A. D. (1956) *Insect Natural History*. 2nd edition. The New Naturalist. Collins London.
- Shaw, M. R. Parasitoids of European butterflies and their study. In: *Butterflies of Europe*, ed O Kudrna, Vol. 2: *Introduction to Lepidopterology*. AULA-Verlag, Wiesbaden
- Shaw, M. R., and Fitton, M. G. (1989) Survey of parasitoids of British butterflies *Entomologists' Record and Journal of Variation*, **101**: 69-71.



### Everyclick



In August we told members that they could help the society by selecting the AES as their charity of choice, at [www.everyclick.com](http://www.everyclick.com). This then enables you to search the Internet and raise money for the society. We have already received over £40 from this source – many thanks to those who have participated, and perhaps other members could consider this painless way of supporting us.



## Breeding the Deaths Head Hawk Moth in Captivity

by *Graham Best*

12 Hortham Lane, Almondsbury, Bristol, BS32 4JH.

e-mail: g.best@talk21.com

With a wingspan up to six inches the Deaths Head Hawk Moth (*Acherontia atropos*) is the largest hawk moth on the British list. With a skull and crossbones design in the hairs on the thorax and with a death premonition folklore association it has always commanded the attention of the public and especially of entomologists, for whom no Lepidoptera collection was considered complete without a specimen.

Specimens had always been obtainable from Europe, Africa and the Near East where three generations are common but the most prized were those with British data having been obtained as living specimens on British soil. Adult moths sometimes turned up but the main source was larvae and pupae found in potato fields before mechanization where enterprising agricultural workers soon learned their value from local entomologists. Other members of the Solanaceae were probably used before the potato was introduced to Europe. Mercury vapour traps now account for most captures, mostly autumn immigrants but it is considered that some are a second generation from early arrivals.

For many years breeding in captivity was unsuccessful, pairings were occasionally obtained but either no eggs were laid or those produced were infertile. Suddenly in the Seventies the breakthrough came but it is not clear why; one suggestion is that it was with South African livestock more suited to our conditions. I was fortunately able to obtain a few eggs at an Amateur Entomologists' Society Annual Exhibition in London and was successful in rearing a few through to adult, helped by the fact that they would feed on Privet, especially the evergreen variety. Further supplies of eggs became available spasmodically and grown men almost fought to get to the front at any dealer's table. Further supplies eventually became more freely available by post at exhibitions and from the Entomological Livestock Group and Worldwide Butterflies.

A further batch of 20 eggs was obtained one autumn and were hatched in tissue-lined plastic boxes. Torn strips of older Garden Privet leaves were added and eventually they were transferred to breeding cages with foodplant stems in jars of water plugged with nylon wool around the stems. Some breeders consider that livestock do not do well with cut plants in water. Other foodplants recorded are Deadly, Woody and Black Nightshades, Thorn Apple, Duke of Argyle's Tea Tree, Jasmine, Olive and Honeysuckle.



The netted cages were 18 x 18 x 24 inches high with a ply base and a six inch high base filled with Peat. These had previously been used for rearing Privet, Small and Large Elephant, Lime, Poplar, Oleander and Spurge Hawk moths. A minimum temperature of 25 degrees Centigrade was maintained by means of a judicious selection of light bulbs in a batten holder. Growth rate was prodigious and bunches of stems were stripped overnight by the five inch long larvae. Larvae showed readiness to pupate after only 15 days feeding by changing colour and marching restlessly around the peat surface, before disappearing into the peat and pupating. Care was taken not to have too many to a cage to avoid disturbance during pupation, and eventually after pupation for only about 20 days I was rewarded with a nearly 100% successful emergence of these magnificent moths.

Which was when the fun began! The moths have to be hand fed every other night by holding the moth gently but firmly in the fingers and dipping the short stiff proboscis into a teaspoon of 15% sugar or honey mixture. They objected to this at first and squirmed around and squeaked away like mice but eventually calmed down and consumed up to half a spoonful. Eventually I devised an ice cream cone shaped piece of paper with a small hole for the head which made life easier but, even so, much of an evening for two weeks was taken up; so breeding this species should not be undertaken lightly. The proboscis is ill-suited to flower feeding and the moth has been recorded as feeding on sap from wounded trees and robbing hives for honey, sometimes being found dead at the bottom of hives.

Pairing was attempted in the same cages with foodplant and flowers. Pairings were obtained and fertile eggs were laid mainly on the netting where they could be removed with a finger nail. Oviposition was rarely on the foodplant, flowers or wooden framework. Succeeding generations dwindled in number and by January after three generations they died out. Fluctuating and too low temperatures and possibly deteriorating food quality may have taken their toll. Inbreeding may be a possibility as many generations of a particular line may have been bred by the entomological fraternity although livestock from wild caught specimens are frequently available.

Like most hawk moth larvae they are susceptible to virus diseases and I also followed the technique of rearing larvae individually in plastic boxes where they will pupate in plentiful supplies of torn tissue regularly changed to absorb the moisture lost during preparation for pupation. Any very slow growers should be ruthlessly culled and some enthusiasts clean and dry their hands in hospital alcohol rub between handling individuals.



## Book reviews

### ***British Moths and Butterflies a Photographic Guide***

by Chris Manley, published by A & C Black, 352 pages, more than 2,300 photographs covering over 1,400 species. Dimensions: 234mm x 156mm. Softback with an RRP of £24.99. ISBN 978-0-7136-8636-4. Foreword by Alan Titchmarsh.

As you might expect from the title, this book is absolutely jam-packed with photographs. The book can be divided into six main sections. The first section covers an introduction to moths and butterflies and includes information on where to see them, how to photograph them and their life cycle. The main part of the book is then divided between three sections covering adult micro moths, butterflies and macro moths. A further section covers eggs, pupae and larvae.

The three sections covering adult Lepidopterans has a very broad coverage including some 800+ macros, 74 butterflies and 500 micros. Each species is represented by at least one photograph of the adult and a small amount of text. The species description is short, allowing the maximum amount of space to be used for photographs, but still provides a wealth of information for the reader. Species descriptions include vernacular name (where one exists), scientific name, wingspan, scarcity, flight period, distribution, habitat, descriptions of distinctive features if similar species cause confusion and larval food plant. Each species is depicted in numerical order based on the *Checklist of Lepidoptera Recorded from the British Isles* (Bradley).

Following on from the macro moths there is a section depicting the eggs, larvae and pupae of some 300 species of butterflies and macro moths. Not all species are covered and although each species covered has a least a photograph of the larvae not all have pictures of eggs and pupae as well. The descriptions accompanying these photographs are reduced simply to the Bradley number, vernacular name, scientific name, approximate maximum length of the larva and a page cross reference to the adult insect.

The final section includes a list of vagrant and accidental macro moths and butterflies, larval food plants for macros and butterflies, and a bibliography.

The book really is superb and the quality of the photographs is excellent. The author has obviously spent a considerable amount of time considering what would be most useful for the reader and this



fact comes through in the book. A good example of such consideration is the inclusion of photographs depicting the underside (photographs taken through a container with a clear base) of the Copper Underwing (*Amphipyra pyramidea*) and Svensson's Copper Underwing (*Amphipyra berbera svenssoni*) illustrating the distinguishing features of these two species. Although the text is kept to a minimum it remains informative, after all the main aim of this book is to aid identification rather than to provide a great deal of information on each species.

I initially questioned the decision to include butterflies and caterpillars in this book since each are already covered elsewhere. However, in the case of the butterflies the relatively few species means that this one work could easily be extended to include them and therefore increase its usefulness in the field. In the case of larvae then these are covered by *The Colour Identification Guide to Caterpillars of the British Isles* by Jim Porter but this work is sadly out of print and, moreover, a large and weighty publication that is difficult to use in the field.

There will be obvious comparisons between this book and the other great photographic work on moths, the *Colour Identification Guide to Moths of the British Isles* by Bernard Skinner. However, Skinner doesn't cover micro moths and the photographs are of set specimens whereas this work comprises photographs of moths in their resting positions which will make it invaluable in the field. The size and weight of this work also means that it's easy to use in the field.

I'd say that you should make room on your bookshelf for a *British Moths and Butterflies a Photographic Guide* by Chris Manley but the I suspect that you'll use it so frequently it will rarely be on the shelf!

Kieren Pitts (10563)

## ***Cockroach***

by Marion Copeland, published by Reaktion Books Ltd., 200 pages, 84 illustrations with 40 in colour. Dimensions: 190mm x 135mm. Softback with an RRP of £12.95. ISBN 1-86189-1920-X.

I'm sure there can be few readers who are not aware of the "Animal" series by Reaktion Books. The series takes a novel approach to looking at animals. That is, to explore the historical significance and impact on humans of the animal in question. The importance of mythology, religion and science are described as are the history of food, the trade in animals and their products, pets, exhibition, film and photography, and the animals' role in the artistic and literary imagination. The series



now comprises some 30 titles ranging from oysters to bears and tortoises to eels. Within the series, invertebrates are represented by the following titles: *Ant*, *Bee*, *Fly*, *Oyster* and *Cockroach*. This review will focus on *Cockroach* by Marion Copeland.

Cockroaches are arguably one of the most loathed and maligned groups of animals (a position possibly only challenged by sharks?) but they are utterly fascinating and it's only a handful of the 4,000 or so species that are actually considered pests. Cockroaches inhabited the earth long before the earliest humans and so references to them can be found in some of the earliest writings and roaches seem able to capture the imagination of everyone from a child to a research scientist or sculptor.

This excellent little book explores the role of cockroaches within art, writing, song and science. The lively style of the book is complemented by the many illustrations which range from cartoons to movie posters and book covers to electron micrographs. Although the book doesn't really focus on the biology of cockroaches (that not being its purpose) it covers enough to explain the themes and proposals put forward by the author. This book illustrates just how intertwined the relationship is between cockroaches and humans, and underlines the need for humans to have more empathy for less glamorous species.

In summary, *Cockroach* is a very enjoyable read and it's well worth exploring this and other books in the same series.

Kieren Pitts (10563)

### ***Water Bugs and Water Beetles of Surrey***

by Jonty Denton, published by Surrey Wildlife Trust, September 2007, 200 pp., 32 colour plates. Hard cover, 15.00 (plus, 2.40 postage & packing). ISBN 978 0 9556188 02. Available from Atlas Sales, Surrey Wildlife Trust, School Lane, Pirbright, Woking, Surrey, GU24 0JN, Tel: 01483 795451; website: [www.surreywildlifetrust.org](http://www.surreywildlifetrust.org)

This book is yet another addition to the acclaimed Surrey Wildlife Atlas series, which admirably continues the British tradition of publishing records and field information on particular taxa at a county level. By dealing with taxa such ladybirds, shieldbugs or ants, which have relatively few species in Surrey, some of the previous books in the series have provided ample space for detailed information on individual species. A more generalised approach has been necessary in the case of water bugs and water beetles, of which 59 and 283 species respectively have been recorded in Surrey. There is, however, concise



information on the occurrence of each species and many of them are illustrated in colour photos. The latter are mostly excellent, although the size of reproduction is rather small; understandably so, in view of the number of species illustrated.

Another feature of some of the earlier books in the series is that they deal with taxa in which nearly all the British species occur in the relatively small south-eastern English county of Surrey. The Surrey fauna of water bugs and water beetles does not include quite so high a proportion of British species as is the case – for example – with ladybirds, but it is sufficiently representative for this book to be of considerable value to readers who live in other parts of the country and overseas.

The Preface includes an enthusiastic account of the fascination that the author finds in water bugs and water beetles. He writes that perhaps his greatest joy is that the season starts early in the spring and lasts well into the following winter, when most sun-loving terrestrial invertebrates cannot be seen.

As in other books of the series, a wealth of general information precedes the accounts of individual species. The author points out that one of the most important differences between aquatic bugs and beetles is that the former do not have a pupal stage and thus do not require access to land in order to complete their development. This enables them to live in places such as cattle troughs, that water beetles can use only on a temporary basis. Another feature of water bugs is their great diversity of shape, which ranges from the rounded Saucer Bug, *Ilyocoris cimicoides*, to the extremely elongated Water Stick Insect, *Ranatra linearis*, and the Water Measurer, *Hydrometra stagnorum*. With the exception of various species that feed on floating water plants, water beetles generally have an ovoid, highly streamlined shape.

The Introduction includes various facts that, although well-known to freshwater biologists, are truly amazing. For example, the hind-legs of whirligig beetles (Gryinidae) have a fan-like mechanism, which opens and shuts sixty times per second during swimming. This variable geometry, by which there is a 94% percent reduction in surface area after each stroke, provides greater efficiency than any propeller built by humans. Also, the antennae of whirligigs are equipped with a superb echo-location system, which senses any object within the beetle's own bow-wave.

Elsewhere in the book, there is similarly fascinating information on the various families and genera of water bugs and water beetles. For example, the Water Stick Insect is not only bizarrely elongated (as its name suggests) but also has a spectacular method of catching its prey;



very like a mantid. It also has remarkable eggs, which are attached to floating, waterlogged vegetation and have periscope-like aeration tubes. With regard to the piercing mouthparts of water bugs, the author warns that certain species, such as Water Boatmen (*Notonecta* spp) and the Saucer Bug can inflict very painful wounds on humans. Perhaps the risk of being bitten is too obvious to require mention in the case of the large, carnivorous beetles of the genus *Dytiscus*.

Except in the case of extinct species and of a relatively small number of poorly recorded species, such as the aquatic weevils of the genus *Bagous*, the account of each species includes a county distribution map, showing the 2 x 2 km tetrads in which it has been recorded. The accompanying text briefly describes the habitats where the species is likely to be found and, in the case of the less widespread species, it also lists particular sites in Surrey where the species has been recorded. Notes about the wider British distribution are not, in most cases, included.

Of the species that have been recorded in Surrey, the book lists one water bug and 39 water beetles as probably extinct in the county, while a further four beetles have declined seriously since 1950. These figures seem to paint a less worrying picture of the conservation status of Surrey's aquatic invertebrates than emerges from the author's comments on aquatic habitats in the county. He mentions that well-meaning members of the public sustain inflated populations of ducks and geese by feeding them, with disastrous results for the invertebrate communities of many ponds in the county. Considerable harm is done also by the stocking of ponds with coarse fish and by the spread of invasive alien water plants, often aided by pet dogs. A more insidious problem is caused by the colonisation of damp heathland by Scots Pine, which affects the water table and acidifies the soil water. The author is concerned also about the effects of the increasing human population, especially with regard to the draining of floodplain wetlands for housing development.

The main text is followed by two appendices, comprising a list of literature references and a gazetteer of notable sites in Surrey. There are also indices of English and scientific names of species of water bugs and water beetles and of the plants with which they are associated but, as in other books of the series, there is no subject-index.

This book maintains the excellent standards of content and style that has been set by others in the series. Although it necessarily includes less detail on individual species than do some of its predecessors, it is a mine of fascinating and very useful information and is excellent value of money.

David Lonsdale (4137)



## Membership Matters

We know where you live! In order to fulfil the requirements of the Data Protection Act 1998 the Society hereby advises members of the information held about them by the Society and how it is used.

This includes name, address, periodicals subscribed to, payments made and in many cases other details such as email address, phone number, date of birth and entomological interests. If any member objects to any of these data being held on them please let us know.

The information is held on a computer database and is accessed mainly by the Registrar but may be accessed or sent to other elected council members if required for AES business purposes. Any personal data will be used solely for the purposes of managing AES membership subscriptions and administering the Society and will not be divulged to any third party without your permission except where the Society is legally obliged to do so.

The AES has from time to time in the past produced membership lists for circulation solely among its members but there is currently no such list and there are no immediate plans to generate one during the current subscription year.

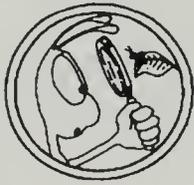
We don't know where you live! Unless you inform us promptly of any change of address (email registrar@amentsoc.org or write in using the change of address label on your *Bulletin* envelope) we will not be able to send your AES mailings to the right address!

Forgotten where you live?! Under the Freedom of Information Act 2000 we are obliged to let you have copies of all information we hold about you. If you would like this please write in to request it. There is no charge but a donation of £5 to the Society is suggested.

Is it best to renew my membership by post or via the online shop? If you have not yet renewed, the fact that you are reading this is surprising, as your details will not have been updated in the mailing database and consequently your first mailing will not have been generated!

For future reference, the cost of renewing is the same whether you do it by post or online. If renewing online you will receive an immediate emailed acknowledgement of your renewal request, followed by confirmation of your renewal when the AES database is updated, together with any end of year announcements. If renewing by post you will not receive any acknowledgement or receipt unless you specifically request one, in which case you should include a stamped, self-addressed envelope with your renewal cheque. Please note that postal renewals are subject to delays due to the misdirection of our PO Box mail and in some cases mail has inexplicably been returned to senders by Royal Mail (we are investigating this).

However you renew, please remember to complete the Gift Aid declaration each time, as that is worth extra money to the Society and helps to keep membership subscriptions as low as possible.



## AES Events Calendar 2009



Please see the AES website for full and up to date listings of AES and other events.

All AES events are free to members and their guests.

### **Saturday 21st February**

Oxford University Museum of Natural History  
Parks Road, Oxford OX1 3PW. 11:00 - 4:00.

'How to make an insect collection'

This will involve a talk by museum staff followed by practical work.

Specimens will be provided or you can bring your own specimens (of any invertebrate order) and the Museum staff will help you prepare and mount them and advise on curation.

It would help if you could please let the AES secretary know if you plan to attend.

### **Saturday 18th April**

AES Members' Day & AGM

Department of Zoology, University of Cambridge.

For more details please see next page.

### **Saturday 23rd May**

Visit to Horniman Museum and Gardens, London.

Full details will follow in the next issue of the *Record*.

### **Tuesday 16th June**

De La Beche Room, Natural History Museum, London SW7

6:00 - 8:00 pm but meet up at 5:30 to ensure access to the Museum.

'Entomology' - Introduced by Professor Maurice Moss.

This is a Joint 'Gossip' Meeting with our affiliate the Quekett Microscopical Club.

You can bring insects with you, live or dead. Various microscopes will be provided.

### **Saturday 27th June:**

Horsenden Hill, Perivale, Middlesex.

Meet at Horsenden Farm (TQ163840) 10.00 a.m.

A butterfly walk on Horsenden Hill including to see the White-letter hairstreak, and examination of moth trap contents from the previous night. Leaders: Andy Culshaw & David Howdon.



Contact: David Howdon (davidhowdon@yahoo.co.uk), 020 8426 6621

This is a joint event with Butterfly Conservation and the London Natural History Society. Please note that due to expected high numbers this event is restricted to AES members and our partner organisations only.

### **August events: (dates to be confirmed)**

AES & Bug Club visit to the World Museum Liverpool

William Brown Street, Liverpool, L3 8EN. 11:00 - 4:00

This visit will involve a tour of the museum's extensive insect collections and a guided visit to the Bughouse and the Clore Natural History Centre. This AES event is also open to members of local entomological and natural history societies and their guests.

Osterley Park BioBlitz

This will involve a survey of ancient grassland and woodland at Osterley Park.

### **September**

Oxford University Museum of Natural History

Parks Road, Oxford OX1 3PW. 11:00 - 4:00.

Bug Club event. Full details will follow closer to the time.

### **Saturday 17th October**

Annual Exhibition & Insect Fair, Kempton Park Middlesex

The UK's premier entomological fair

### **Mr. John L. Fenn (8089)**

We regret to report the death of AES member JOHN FENN (8089) on the 2nd December 2008, at the age of 75.

He lived most of his life in East Anglia, where he gained his unparalleled knowledge on the breeding and locating of the Lepidoptera occurring in the Brecks and Fenns. A knowledge that he was quite happy to share with any visiting Entomologist.

## British Butterflies throughout the year by Peter May

This new book from the AES describes the adults of different species of British butterflies, according to the time of year they appear on the wing. Nearly all the 60 British species are illustrated. Focussing on encouraging an interest in entomology among the young, and the young at heart, there is a helpful calendar of flight times and a useful checklist to help you keep track of your observations.

£ 5.00

Members price £ 3.80

## Preparing and maintaining a collection of Butterflies and Moths

by P. May and M. White. A practical manual detailing the various methods used to prepare specimens for a collection, from killing methods, setting the specimens and repairing damaged ones, to storage and preservation, including pest prevention and cure. 21 pages. 4 figures and 5 plates. (2006)

£4.85

Members price £3.65

## The Hymenopterist's Handbook by Dr. C. Betts et al.

2nd edition dealing with the history of their families, classification and structures; natural history; studying, collecting, breeding, attracting and preserving Hymenoptera. Appendices include keys to the families. 214 pages with numerous tables, keys and figures (1986)

£ 11.45

Members price £ 8.60

## Revised Flight Tables for the Hymenoptera

Revised flight tables for the Hymenoptera giving, wherever possible, times, location, flower visits and some indication of distribution and abundance. 24 pages (1988)

£ 3.10

Members price £ 2.35

## A Coleopterist's Handbook

Edited by J. Cooter & M.V.L. Barclay. The *Coleopterist's Handbook*, is now available as a fully revised and expanded fourth edition. Nomenclature has been brought inline with current use, collecting/curatorial methods reflect best practice and plant/beetle and beetle/plant lists are included together. Recent additions to the British fauna, modern and traditional techniques are included. All advice and comment given in the book is based upon collective years of practical experience of both curatorial methods and field craft; beetle family chapters have each been written by an internationally recognised authority. 496 pages including 32 colour plates.

£ 54.00

Members price £ 39.00

## Host plants of British Beetles: A List of Recorded Associations

A list of a wide range of plants, in alphabetical order, together with the beetle species that have been recorded as being associated with them. 24 pages (1992)

£ 3.10

Members price £ 2.35

## A Silkmother Rearer's Handbook by B.O.C. Gardiner

SPECIAL OFFER PRICE £ 7.70

No further discounted price available

## A Dipterist's Handbook by A.E. Stubbs, P.J. Chandler and others

A practical handbook for both the beginner and the initiated on collecting, breeding and studying the two-winged flies. Describes equipment, trapping, preservation, habitat, plant and animal associations and behaviour. Includes a detailed chapter on larval stages with an illustrated key to families. An essential hook for the keen Dipterist. 260 pages with drawings of larvae and equipment (1978, reprinted 1996)

£ 14.20

Members price £ 10.60

## Practical Hints for Collecting and Studying the Microlepidoptera

by P.A. Sokoloff. A practical manual for those interested in the smaller moths, describing techniques for collecting adult moths, collecting immature stages, breeding, killing, setting and mounting. A list of useful books and journals as well as details of societies and suppliers is included. 40 pages, 11 figures (1980)

£ 4.20

Members price £ 3.15

## Rearing and Studying Stick and Leaf-Insects by P. D. Brock

Specifically intended for beginners, although it is also suitable for experienced Phasmid enthusiasts, it is one of the few guides to rearing that features the majority of the culture stocks available, 22 species in detail. The informative text is complemented by 8 colour plates, 14 black and white plates and 29 figures. (New edition, 2003)

£ 11.20

Members price £ 8.20

## The Study of Stoneflies, Mayflies and Caddisflies by T.T. Macan

A comprehensive guide to collecting and studying the biology and ecology of these aquatic insects. 44 pages, 10 figures and bibliography (1982)

£ 4.20

Members price £ 3.15

## Breeding the British Butterflies by P.W. Cribb

A practical handbook covering all aspects of butterfly breeding, including general techniques, equipment and hints on how to breed each of the British species. 60 pages, 6 figures, 5 plates, Revised (2001)

£ 5.20

Members price £ 3.85

## Practical Hints for the Field Lepidopterist by J.W. Tutt

Written at the turn of the century, this book has been reprinted because of its scarcity and value to students of Lepidoptera. It gives a complete month by month guide to which species and stages of macros and micros to look for and how to find them. Also contains a biological account of the early stages and how to keep, rear, photograph and describe them. 422 pages. Hardback. (Reprinted 1994).

£ 24.00

Members price £ 18.30

## An index to the modern names for use with J.W. Tutt's Practical Hints for the Field Lepidopterist by B.O.C. Gardiner

A valuable cross-reference guide between the scientific and English names used in the early 1900s and the present time.

£ 4.70

Members price £3.50

## A Guide to Moth traps and their use by R. Fry and P. Waring

The first sections deal with the measurement and properties of light leading into the types of lamp available and the electrical circuits needed to operate them. The next sections give details of the construction of the most popular traps used in the UK. The last half deals with the practical use of traps in the field including where and when to trap, limitations of traps and their relative performance. 68 pages, 21 figures, 15 plates (1996)

£ 6.85

Members price £ 5.05

## The Amazing World of Stick and Leaf Insects by Paul D. Brock

A superb, comprehensive guide, for all those intrigued by these groups of insects. Topics covered include structure, fascinating facts, life history and development, defence behaviour, enemies, collecting, breeding (including trouble shooting), preserving, taxonomic studies, important collections in Museums etc. around the world and elaborate stories, beliefs and poems. Also outlines the major known species around the world on a regional basis. A section on Fossils is included. Includes a comprehensive glossary of the technical terms used in the description and classification of stick and leaf-insects. Hardback A5, 184 pages, 46 figures, 26 black and white plates and 40 pages of colour plates (containing 83 photographs and 4 drawings/paintings of insects and their habitats). (1999)

£ 18.90

Members price £ 14.10

## Rearing Parasitic Hymenoptera by M. Shaw

This booklet provides information on the parasitic Hymenoptera to enable successful studies to be made of this little understood group of the British insect fauna. Details are given on the general biology of parasitic wasps, rearing principles, efficient rearing practices and detailed methods of dealing with adult wasps. 52 pages, 4 colour plates (New edition - 2001)

£ 5.70

Members price £ 4.20

## Larval Foodplants of the British Butterflies by Peter May

A comprehensive compilation of the known larval foodplants of our native and immigrant butterflies. Also including "How to Encourage Butterflies to Live in Your Garden" by the late Peter Cribb 62 pages. (2003)

£ 7.40

Members price £ 5.45

## The larger water beetles of the British Isles by Peter Sutton

For those who love the spectacular larger water beetles of the British Isles, this is the publication that you have been waiting for! It is the only modern publication with colour illustrations of all of our aquatic coleopteran megafauna and it provides the most up-to-date distribution maps revealing their current distributions. Jam-packed with fascinating details of their life-histories, this book covers 11 species including the 6 native 'Great Diving Beetles' and the 'Silver Water Beetles'. It is also copiously illustrated with text figures and has much additional information including details of observed climate-induced range changes and the conservation measures required to ensure their continued survival.

£ 11.90

Members price £ 8.90

## Glossary for the Young Lepidopterist

6 pages, 2 figures. (1951)

£ 1.05

Members price £ 0.90

## A Label List of European Butterflies

20 pages. (Revised 1981)

£ 2.35

Members price £ 1.85

## Some British Moths Reviewed

Aid to the identification of some of the more difficult species. Reprinted from the *Amateur Entomologist* Vol. 5 (1941) and a *Guide to the Critical Species of Lepidoptera*, reprinted from *Entomologists' Gazette* 1969-72. 64 pages, 6 black and white plates, numerous figures (1985)

£ 4.45

Members price £ 3.35

## Butterflies of Cyprus 1998 (Records of a years sightings) by Eddie John

Observations of the 44 species of butterfly found on the island in 1998 including notes on each species and distribution maps. 46 pages (2000)

£ 4.30

Members price £ 3.25

## Collecting Het.Bugs (Hemiptera: Heteroptera)

12 pages (including 2 plates). (1946)

£ 1.20

Members price £ 1.00

## Collecting Clearwings

12 pages (including 2 plates), 4 figures. (1946)

£ 1.10

Members price £ 1.00

## Collecting Lacewings

9 pages, 8 figures, 5 plates. (2nd edition 1976)

£ 2.25

Members price £ 1.75

## An Amateur's Guide to the Study of the Genitalia of Lepidoptera

16 pages, 15 figures. (1973)

£ 3.10

Members price £ 2.35

## Rearing the Hymenoptera Parasitica

16 pages, 1 plate, 10 figures. (1974)

£ 2.55

Members price £ 2.00

## Rearing Crickets in the Classroom

12 pages, 2 plates. (1986) (Reprinted 1993)

£ 2.10

Members price £ 1.65

## Guidelines for Entomological Site Surveys

Published on behalf of the JCCBU. 7 pages (2000) (Reprinted 2003)

£ 3.10

Members price £ 2.35

## The Journal of the Entomological Exchange and Correspondence Club 1935-1936

An AES Jubilee Publication. Fascinating reprint of the very first volume of the AES journal. 100 pages.

£ 4.20

Members price £ 3.35



All the above publications sent post free to U.K. addresses. Outside U.K. please add 10% to order value for postage by surface mail. For postage by air-mail outside Europe please add 30% to order value. Please allow 28 days delivery.

Please make all cheques/postal orders payable to 'AES Publications' and send to:

AES Publications, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Telephone 01277 224610 • Fax: 01277 262815 • E-mail: aespublishings@btconnect.com

# AES AGM and Members' Day – 2009

“Evolution and the insect world”

**Saturday, 18th April, 2009**

Department of Zoology, University of Cambridge  
Downing Street, Cambridge, CB2 3EJ

Doors open 11:00 a.m. for a 12:00 noon start



## PROGRAMME

The opening address at this year's Members' Day will be delivered by **Professor David Bellamy**. A detailed programme will be provided on the day, and will include talks by Bug Club members **Samuel Baylis** and **Luke Andrews**. Talks will also be given by the Curator of the Cambridge Zoology Museum, **Dr William Foster**, and by **Cambridge entomologists** from the Departments of Zoology and Genetics.

In-between the talks there will be separate **tours of the Zoology Museum and the Insect Rooms**.

### Foyer displays will include:

Displays • AES Posters • Entomology at Cambridge  
Member exhibits & live insects

### Affiliates

Royal Entomological Society • Quekett Microscopical Club  
Conchological Society of Great Britain and Ireland

### Light refreshments

Sandwiches, wine and soft drinks will be available

## HOW TO GET THERE

The Museum is situated in Central Cambridge, on the University New Museum site.  
You can enter the Museum through the archway on Downing Street opposite Tennis Court Road.  
You will notice the Finback Whale skeleton above the entrance.

**By Rail:** There are services to Cambridge from King's Cross and Liverpool Street railway stations in London. There are one or two trains each hour from both stations, the faster of which takes just under an hour. Cambridge railway station is about 1 mile from the Department. Buses run regularly from the railway station to the centre of town.

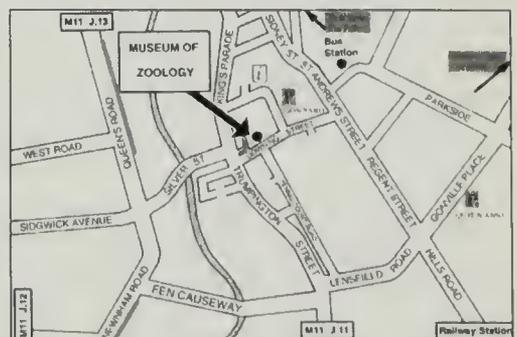
**By Coach:** Hourly services from London (Victoria) to Cambridge, arriving on Parkside, are provided by National Express (telephone: 08705 80 80 80). There are also services from Heathrow and Gatwick airports.

**By Road:** Cambridge is well served by several major roads, the M11, the A1(M) and the A14 making it easily accessible from all parts of the UK.

The simplest way into Cambridge is to join the M11: Leave the M11 at junction 12 and turn right onto Barton Road, following it to the City Centre. Turn right at first roundabout (Shell garage) where Barton Road meets Fen Causeway. Turn left onto Trumpington Street at the mini-roundabout, and continue past the Fitzwilliam Museum on your left. Turn right into Pembroke Street, which becomes Downing Street. The Zoology Department is on the left just before the junction with Corn Exchange Street and the Crowne Plaza Hotel.

**Car Parking:** There is no parking available on the New Museums Site where Zoology is located, but you can park in the Lion Yard car park adjacent to Zoology in Corn Exchange Street. If this is full, follow signs for St. Anne's Terrace car park, about half a kilometre away. Short term Pay and Display parking is available on streets. The car parks at the Grafton Centre and Park Street are both fairly central.

There is an excellent park and ride scheme located on the main routes into the city centre. See the Cambridge City Council website ([www.cambridge.gov.uk/services/carparks.htm](http://www.cambridge.gov.uk/services/carparks.htm)) for more details on locations and rates.



More detailed location and travel information is provided on the Zoology Department website:  
[www.zoo.cam.ac.uk/zooone/department/map.html](http://www.zoo.cam.ac.uk/zooone/department/map.html)



## AES Membership Rates 2009

Membership of the Society runs from 1st January to 31st December each year. New members will receive all publications published during the year of enrolment subject to availability, except for those joining on or after 1st October.

Members joining on or after 1st October will be deemed to have joined for the following year unless a specific request for membership of the current year is made. In such cases, the publications already published that year will be sent with the enrolment confirmation letter and the remaining ones received as they are published. A further membership subscription will be necessary for the following year.

If you have any queries about membership please contact us via the website, [www.amentsoc.org](http://www.amentsoc.org) or PO Box 8774, London SW7 5ZG

### Individual Adult Membership

Membership sub-category	UK	Overseas
<i>Bulletin only</i>	£20.00	£25.00
<i>Entomologist's Record only</i>	£25.00	£30.00
<i>Bug Club Magazine only</i>	£20.00	£25.00

### Individual Bug Club / Junior Membership

Membership sub-category	UK	Overseas
Junior under-18 ( <i>Bug Club Magazine only</i> )	£12.00	£17.00
Junior aged 13-17 ( <i>Bulletin only</i> )	£12.00	£17.00

### Family or Combined Membership

Membership sub-category	UK	Overseas
<i>Bulletin &amp; Entomologist's Record</i>	£40.00	£45.00
<i>Bulletin &amp; Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record &amp; Bug Club Magazine</i>	£35.00	£40.00
<i>Bulletin, Entomologist's Record &amp; Bug Club Magazine</i>	£48.00	£53.00

### Associate / Institutional Membership

Membership sub-category	UK	Overseas
<i>Bulletin only</i>	£20.00	£25.00
<i>Entomologist's Record only</i>	£50.00	£55.00
<i>Bug Club Magazine only</i>	£20.00	£25.00
<i>Bulletin &amp; Entomologist's Record</i>	£65.00	£70.00
<i>Bulletin &amp; Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record &amp; Bug Club Magazine</i>	£65.00	£70.00
<i>Bulletin, Entomologist's Record &amp; Bug Club Magazine</i>	£75.00	£80.00

**The Amateur Entomologists' Society**

PO Box 8774, London SW7 5ZG

[www.amentsoc.org](http://www.amentsoc.org)

The  
**Bulletin**  
*of the Amateur Entomologists' Society*

Volume 68 • Number 482

February 2009

CONTENTS

Editorial .....	1
Majerus, M.E.N. Bright defensive colour patterns of insects, Part 1: The conundrum of the evolution of true warning colouration .....	2
Scullion, C. and Majerus, M.E.N. Reflections on an evolutionary paradigm: the case of the Peppered moth (Lepidoptera: <i>Biston betularia</i> Linn.) .....	15
Koryszko, J. A Local Abundance of Angle Shades moths? (Lepidoptera: <i>Phlogophora meticulosa</i> L.) .....	22
Ellis, H.A. A primary gregarious egg parasitoid (Hymenoptera: Chalcidoidea, Trichogrammatidae) of the Small Skipper ( <i>Thymelicus sylvestris</i> ) .....	23
Best, G. Breeding the Deaths Head Hawk Moth in Captivity .....	31
Book Reviews .....	33
Membership Matters.....	38
AES Events Calendar 2009 .....	39

ES 36 A

# The Bulletin



*of the Amateur Entomologists' Society*

Volume 68 • Number 483

April 2009

THE NATURAL  
HISTORY MUSEUM  
28 MAY 2009  
PRESENTED  
ENTOMOLOGICAL



ISSN 0266-836X

Editors: Dr P. Wilkins & M. Hough



000174462



Founded in 1935

The AES • P.O. Box 8774 • London • SW7 5ZG

<http://www.amentsoc.org>

### Officers of the Society

<i>President:</i>	Robin Wootton
<i>Secretary:</i>	Dafydd Lewis
<i>Treasurer:</i>	Peter May
<i>Acting Registrar:</i>	Dafydd Lewis
<i>Bulletin Editors:</i>	Phil Wilkins & Martin Hough
<i>General Editor:</i>	Jacqueline Ruffle
<i>Advertising Secretary:</i>	Peter Hodge
<i>Exhibition Secretary:</i>	Wayne Jarvis
<i>Youth Secretary:</i>	Kieren Pitts
<i>Conservation Secretary:</i>	David Lonsdale
<i>Webmaster:</i>	Kieren Pitts
<i>ICN Editor:</i>	David Lonsdale
<i>Wants &amp; Exchange:</i>	Peter May

---

THE AES WORKS TO PROMOTE AND DISSEMINATE ENTOMOLOGICAL KNOWLEDGE AND TO ENCOURAGE AN INTEREST IN ENTOMOLOGY AMONG THE YOUNGER GENERATION.

---

#### **BULLETIN ADVERTISING RATES:**

Advertising in the AES *Bulletin* is a cost effective way of reaching all AES members and many others who benefit from institutional subscriptions.

Full page £75 for each advert or £375 for six adverts in the same year.

Half page £50 for each advert or £250 for six adverts in the same year.

Quarter page £30 for each advert or £150 for six adverts in the same year.

---

#### **NOTICE**

It is to be distinctly understood that all views, opinions, or theories, expressed in the pages of this Journal are solely those of the author(s) concerned. All announcements of meetings, financial grants offered or sought, requests for help or information, are accepted as bona fide. Neither the Editor, the Officers and Council of the Society, nor its Trustees, can be held responsible for any loss, embarrassment or injury that might be sustained by reliance thereon.

# Worldwide Butterflies [www.wwb.co.uk](http://www.wwb.co.uk)



Now available alone or with the Moonlander Moth Trap

## The new Goodden Light 12v for use in remote areas

By studying the light output from MV, Robert Goodden has developed this sophisticated portable unit with aspects in common with MV, using so little power that it runs all night on a 7.5Ah battery. It attracts insects much better than actinic lights, even powerful ones requiring heavy batteries. **Rainproof and safe.** An in-line photoswitch puts the light on and off automatically. With this switch the unit can be used vertically or horizontally in any moth trap.

See [www.wwb.co.uk](http://www.wwb.co.uk) for prices and more.

## Moonlander Moth trap

Folds totally flat and is contained in a convenient slim shoulder bag. Very lightweight.

**The Moonlander turns the principle of moth trapping upside down!** Moths enter from the bottom and cannot escape through the top. **Works as sheet and trap combined.**

Better than traditional egg boxes, moths prefer the new **reticulated foam moth shelters** and cone.

**The Moonlander** is now available **without electrics, or with Battery, Mains or BOTH.**

See the options on [www.wwb.co.uk](http://www.wwb.co.uk)



*No escape through the top*



**Both trap and light are total innovations by Robert Goodden**

They are tried and tested in Europe and the tropics.

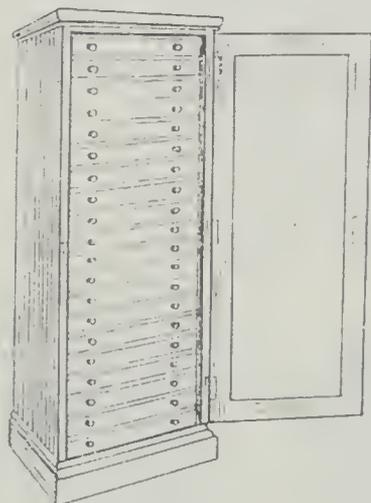
In good conditions the results are spectacular.

**Worldwide Butterflies** website offers **Livestock and Equipment for breeding and study. Specimens for specialist collectors will be added as available.** The system enables you to see exactly what is currently available as the season changes. From time to time there are special **Sale Offers** of equipment, books, livestock and specimens - an ever changing situation.

[www.wwb.co.uk](http://www.wwb.co.uk) Add it to your **Favorites** - check it regularly.

# ATROPOS ANTIQUES\*

## PURVEYORS OF FINE COLLECTOR'S CABINETS



*Many of you will have met us at the AES  
London Fair where we regularly show  
entomological cabinets for sale*

- We are specialist dealers in fine collector's cabinets.
- We can offer a choice of at least 30 cabinets, varying in purpose, construction, quality and price.
- We can supply both restored and un-restored cabinets and will undertake to restore and paper cabinets for clients.
- We are always interested in the purchase or exchange of cabinets, with or without a collection.
- Callers to our showrooms are always welcome by appointment.
- We offer a specialist collection and delivery service throughout the UK and have full expertise in the safe transportation of cabinets and collections.

**George Morgan**

**97, West Street, Hartland, N. Devon EX39 6BQ**

**T: 01237-441205/984 M: 07973 302190**

**E-mail: [george@atropos.wanadoo.co.uk](mailto:george@atropos.wanadoo.co.uk)**

\* We are an independent dealership of 30 years standing and have no association with any similarly named business.

# Discover our Fascinating Resources in Entomology

Browse, Buy and Save today!

## Ecology of Insects, 2nd Edition

Martin R. Speight, Mark D. Hunter, Allan D. Watt

ISBN: 978-1-4051-3114-8

Paperback • 640 pages • August 2008

RRP: £39.99 / €54.90 / \$89.95

AES discounted price:

£31.99\* / €43.92\* / \$71.96\*

## Statistics for Terrified Biologists

Helmut van Emden

ISBN: 978-1-4051-4956-3

Paperback • 360 pages • April 2008

RRP: £19.99 / €27.90 / \$39.95

AES discounted price:

£15.99\* / €22.32\* / \$31.96\*

## Control of Pests and Weeds by Natural Enemies

Roy Van Driesche, Mark Hoddle, Ted Center

ISBN: 978-1-4051-4571-8

Paperback • 484 pages • April 2008

RRP: £34.99 / €47.90 / \$69.95

AES discounted price:

£27.99\* / €38.32\* / \$55.96\*

## Behavioural Ecology of Insect Parasitoids: From theoretical approaches to field applications

Eric Wajnberg, Carlos Bernstein, Jacques van Alphen

ISBN: 978-1-4051-6347-7

Hardcover • 464 pages • December 2007

RRP: £45.00 / €62.90 / \$80.00

AES discounted price:

£36.00\* / €50.32\* / \$64.00\*

## Forensic Entomology: An Introduction

Dorothy Gennard

ISBN: 978-0-470-01479-0

Paperback • 244 pages • February 2007

RRP: £27.50 / €37.90 / \$55.00

AES discounted price:

£22.00\* / €30.32\* / \$44.00\*

## The Insects: An Outline of Entomology, 3rd Edition

P. J. Gullan, Peter Cranston

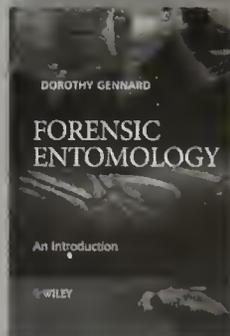
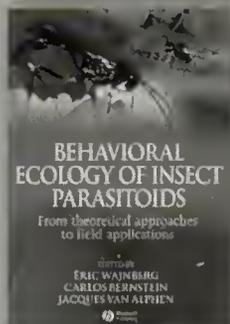
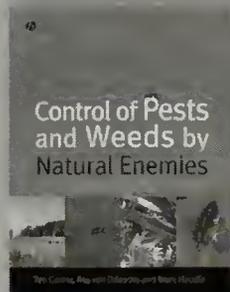
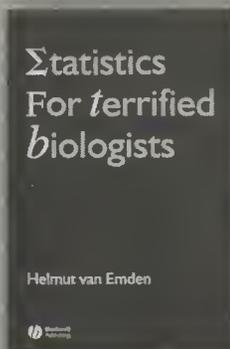
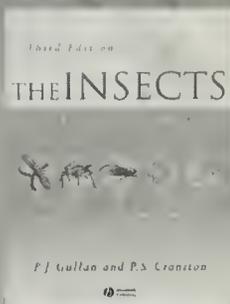
ISBN: 978-1-4051-1113-3

Hardcover • 528 pages • July 2004

RRP: £39.99 / €54.90 / \$100.00

AES discounted price:

£31.99\* / €43.92\* / \$80.00\*



**SIMPLY QUOTE AEntS WHEN ORDERING.\***

Visit [www.wiley.com](http://www.wiley.com) to order online

 **WILEY-  
BLACKWELL**

Discount valid until 30th November 2009

**£14.99 (inc. UK p&p)**

£16.99 (overseas)

## **Rearing Stick and Leaf Insects**

by Ronald N. Baxter

Fifty species described in detail: how to care for eggs prior to hatching, caring for small and large nymphs and adults. Including information on distribution,

descriptions, egg and egg laying, list of foodplants and general rearing requirements.



112 superb colour photographs and 12 stunning plates of 146 illustrations of Phasmid eggs, of a quality never before published.

**ORDER YOUR COPY NOW FROM**

Cravitz Printing Company Limited

1 Tower Hill, Brentwood, Essex CM14 4TA.

Tel: (01277) 224610 • Fax: (01277) 262815 • E-mail: [CravitzPrinting@btconnect.com](mailto:CravitzPrinting@btconnect.com)



## **Bulletin Cover**



This month's cover shows the Pale-lemon Sallow *Xanthia ocellaris* Borkhausen. More information can be found in the article on p61 of this issue. The moth is on the wing during September and October. It is a local species occurring sparsely in the southern counties of England, into East Anglia. It is distinguished from similar species by the hooked tips to its forewings. The larvae feed on the catkins of poplar (*Populus*) when young, later feeding on leaves of low plants.

Photograph: Keith Tailby

# The **Bulletin**

*of the Amateur Entomologists' Society*

Volume 68 • Number 483

April 2009

## **Editorial**

Welcome to another *Bulletin*. The insect season is well under way, so I hope you have been out there in the field. So far the weather seems to be good for insects – warm and sunny!

This month's *Bulletin* has an eclectic mix of articles, so I hope there is something in there to interest everyone. Amongst the more usual fare, I have included an article that was submitted to the AES website. It is not typical of *Bulletin* articles of the past. This is found on p70 and relates to the alfalfa fields of Egypt. I would be interested to hear what members think of this article's inclusion. Do you want more of the same, or is the *Bulletin* the wrong vehicle for such material? Either way, carry on sending in more of your own work for publication.



## **Acknowledgements**

We would like to sincerely thank AES members and others who have responded so generously to the kind appeal by Mrs Christina Majerus for donations in memory of our President, Michael Majerus, to be made to the Society. The total received to date is £1,000.

We would also like to thank Mrs Sonia Copeland Bloom, who has generously donated a portable digital microscope and stand to the Society for use during field trips and Bug Club events. The company selling the microscope, Absolute Data Services Ltd (9 Moorland Road, Hemel Hempstead, Herts HP1 1NQ. Tel: 0845 0560820; Email: [info@absolute-data-services.co.uk](mailto:info@absolute-data-services.co.uk); Web: [www.absolute-data-services.co.uk](http://www.absolute-data-services.co.uk)) enabled us to maximise the value of that donation by giving us a substantial discount as well as enabling us to buy a superior model of both microscope and stand.



## Orange Tip (*Autobocharis cardamines*) Gynandromorphs

by Peter Tebbutt (7941)

112 Broadway East, Abington, Northampton NN3 2PR.

During a bout of awful summer weather I was looking through some old AES *Bulletins* and stumbled upon a very interesting article by John Tennent entitled Two Bilateral Gynandromorphs in one lifetime-almost (AES *Bulletin* **53** No. 394, June 1994). It describes the fortunate capture of a true halved example of an Irish Common Blue (*Polyommatus icarus*) and an extreme mixed gynandromorph of a Chapman's Blue (*Agrodiaetus thersites*).

The only examples I have had the good luck to capture are two minor examples of Chalkhill Blue (*Lysandra coridon*), both females with a small patch or streak of male blue scaling, and a halved Poplar Hawk-moth (*Laotloe populi*) that came to a moth trap that I used to run in the back garden. I have had, however, the extreme good fortune to rear several specimens in five different species, and hope the following may be of some interest to fellow members.

The very first one, by strange coincidence, emerged on 12th October 1994, just four months after Mr Tennent's article appeared. I had captured a female Small White (*Pieris rapae*) with a light dusting of dark scales linking the two forewing spots together, ab. *fasciata*, and hoped to breed from it some specimens that were more boldly marked. About thirty pupae were reared from this female, some of which produced adults in the autumn. One of these had distinct white flashes on the left forewing of an otherwise perfect creamy coloured female, and proved to be a partial gynandromorph.

If I thought that was lucky, I had an even greater surprise when the imagines started to emerge from the overwintered pupae. On the 13th March 1995 I was checking over the latest ones to have emerged that morning when the one on the netting just in front of me caught my attention. Although I was only looking at it from the underside with its wings closed, I was immediately drawn to its noticeably curved abdomen. A closer examination revealed a bilateral gynandromorph, left side female and right side male. This sexual difference extended to the antennae and external genitalia, hence the deformed looking abdomen. The only problem was that some fluid remained between the wing membranes on the male hindwing and appeared as two bubbles. When these were later punctured they



unfortunately caused the wing to collapse slightly, but did not cause any other damage. I had high hopes of breeding further examples from the remaining offspring, but could not induce any pairings. I have since noticed a similar reluctance to pair in other species exhibiting this form of aberration, and assume that as some sort of chromosome abnormality has occurred it further complicates the attempted mating of siblings.

Now to the species mentioned in the title. I sometimes collect ova and larvae of the Orange Tip and rear them through to see what they produce. In 2002 I was looking over some pupae that were colouring up. As I rolled one over with a small paint brush I suddenly stopped. I was looking at a female, but I could have sworn I'd just checked a male. I rolled it back over and sure enough, a bright orange patch on the forewing. It seemed to be an eternity before the butterfly finally emerged, not helped by a spell of cold weather, but at last on the 3rd April there it was. The upperside had the left side totally male, the right side nearly all female, with just an orange streak along the costa. Curiously, the underside was almost entirely male, with just a poorly defined whitish streak along the costa of the right forewing.

In June 2005 I was visiting the site that produced this specimen, and was struck by how common the larvae were. The level ground on the top had a good growth of Garlic Mustard, whilst the bank was liberally scattered with Oil-seed Rape plants. It was the latter that had the most larvae, with up to nineteen present on a single plant. Although some were quite small, most were over half grown, and in a little over one and a half hours I found about 150 larvae. Some people may be shocked I collected so many, but my reasoning was threefold.

Incidentally, there is much debate at present about the scarcity of nettle dependant butterflies, particularly the Small Tortoiseshell (*Aglais urticae*), much of the blame going to a parasite recently discovered in Britain. This may be the case, but it cannot have been helped by some local councils obsession with "tidying up" the verges and river banks etc. Around here it occurred twice a year in most areas, late June and again during September. Both of these times were when thousands of Small Tortoiseshell and other larvae were still feeding and caused wholesale decimation at nearly all the sites. Despite my attempts to draw attention to this problem, I was fobbed off with the excuse that the cut was needed to help prevent flooding. I'm not too sure what nettles they have dealt with, as they are clearly much stronger than any



I have ever found, if they believe they can hold back flood-water. I failed to get any sort of reply to my final letters, and reluctantly gave up in despair.

I obviously hoped to rear another gynandromorph, the local council usually cut this area about this time, and finally I considered that as there were so many larvae then there was a good chance they had suffered heavy parasitic predation. The latter unfortunately proved true, and over 60 final instar larvae and pupae had tachinid flies emerge. These were sent to the National Museum of Scotland where they were passed to a specialist in that group, but I didn't get a list of identified species, very unusual for them as I always receive an excellent reply from Dr Mark Shaw on any parasitoid wasps that I send. However, I suspect more than one species was responsible.

From the surviving 95 pupae I had 94 adult butterflies successfully emerge. I failed to notice one which had a few strands of silk spun on it from another pupating larva. Three of these produced gynandromorphs. The first was seen in the pupal case as before, and emergence took place on 22nd April. This was the opposite of my previous example, being totally female on the left side and mainly male on the right side with just a streak of female along the forewing costa. It is worth noting that the larger size of the female apical black area is also reproduced. The underside in this case is perfectly halved.

The last two were at first thought to be ordinary females colouring up. There was a couple of odd streaks noticed, but I wrongly assumed these to be marks on the pupal cases. My initial glance on the morning of 25th April further complicated the matter, as I thought I had 11 males and five females in the emergence cage. After a cup of coffee I went back for a closer look. As I removed the last of the females, one of the "males" opened its wings to reveal a female with orange flashes on each forewing, from discal spot to the apical patch. A second, almost identical aberration, was found moments later. Both of these are almost totally male on the underside, with only a white female area along the costa from the discal point to the apex, on both forewings on one specimen and the right wing only on the other. What a fabulous four days, and surely one never to be repeated.

Forty pupae still remained, and it was with bated breath that I eagerly checked them over. No joy. Over the next ten days a total of 11 males and 26 females emerged, all normal. Three gynandromorphs in four days isn't bad going by anybody's standards, but one cannot



help wondering what was in the circa 60 "stung" larvae. On the basis of what emerged, i.e. 1:31, there may well have been another two, but I mustn't get too greedy must I?

As all the surviving stock were of unknown parentage I decided not to attempt further breeding. So as not to over populate the area, during a two week period I released fifty of the adults back at the point of origin, the remainder were put down at two other small sites, where I hope to one day see a wild gynandromorph basking in the sunshine.



## Events in Worcestershire

*Geoff Trevis (7049)*

Over the last two or three years a few events have taken place in Worcestershire which are either of direct interest to entomologists or provide the opportunity to publicise our interest and the AES. A few details of these appear on the AES website. However experience has shown that in order to attract the public, and especially children, to displays it is important, if possible, to have exhibits of live insects. We have tried collecting leaf litter locally and sieving out the invertebrates into trays and this has generated considerable interest from children. What occurred to me was that AES members locally might be willing and able to help by bringing displays e.g larvae, phasmids or anything else kept easily in a cage on a stand and shown to young people. The stands will be associated with displays from the Worcestershire Wildlife Trust, including WATCH, and the Worcestershire Biological Records Centre as well as having material to encourage membership of AES.

The two events at which I hope to have live displays are:

Droitwich Community Woods open day from 2.00 pm on Sunday 7th June. I am aiming to lead guided walks around the reserve and to have bug hunts if I can find sufficient volunteer entomologists.

Droitwich Salt Day on Saturday 12th September from about 10.30 am. This a major fair and cultural event in the town and provides the opportunity to engage a large number of people.

If you would like to help please contact me by telephone on 01905 774952 or by e-mail at [geoff.trevis@btinternet.com](mailto:geoff.trevis@btinternet.com)

The Entomology Day organised by the Wyre Forest Study Group may also be of interest and details appear on the website.



## A Day with the Emperor

by *Graham Best*

12 Hortham Lane Almondsbury Bristol BS32 4JH

E-mail [g.best@talk21.com](mailto:g.best@talk21.com)

After a lifetime of interest in Lepidoptera I finally decided to rectify the omission of not having seen the great prize of English entomology, the Purple Emperor (*Apatura iris*) in flight. Sunday July the 13th was selected as being mid-season which happened to be the only day so far in 2008 with favourable weather in what passes for summer these days.

Bentley Wood near Salisbury was selected as being my nearest venue and was approached on the A30 from Salisbury turning right after about five miles near the Pheasant Hotel and taking the minor road from East Winterslow to West Dean. The turning into the wood is easily missed as the sign is only easily spotted approaching from the opposite direction from the south. The rutted but hard surface track was followed for about two hundred yards to the Eastern Car Park at SU 258291 OS Map 184. There is a notebook in the notice board at the car park where sightings are recorded and a free leaflet and map of the woods. Sightings first appear on about the 28th of June and continue for about a month.

Arriving at the car park about noon on Saturday there were already about ten cars with the assemblage all craning their necks at the top of a large adjacent Oak tree where they feed on aphid secretions. I have not read of nectaring at flowers.

With infrequent sunny intervals the weather was not very conducive to flight and I had to wait until 5pm before one flew down and fluttered around my campervan roof edge but then quickly flew off. Mid to late morning is considered the optimum time for flight and I heard stories of them pitching on car radiators, car bonnet and peoples hats but no luck this time. I was told that once somebody with quick thinking wiped some perspiration off his brow and coaxed *A. iris* onto his finger off of a car bonnet. Perhaps too many persons and cars were there for them to descend much. Sap from wounded Oak trees has also been known to attract them and fruit and Banana skins had been scattered on the wooden benches. One visitor had even brought his own bucket of cattle droppings to which they have been known to be attracted. I was shown a photograph of a male *A. iris* taken the day before by someone with a 500 mm lens. About half a mile further on up the track which is barred to traffic there is a cross roads with Oaks



which is considered as another "hot spot" and where there is room to spread a white sheet which sometimes proves an attraction to inquisitive males.

Having camped nearby I arrived on the Sunday by 8.45a.m. just too late to see one which had pitched about twenty feet up and had been photographed. A previous sighting was recorded at about this time a few days before. About twenty cars arrived in all containing mostly butterfly watchers and the morning was passed watching Silver-washed and Dark Green Fritillaries, Purple Hairstreaks, Skippers and Ringlets but the expected White Admirals had not put in an appearance. Pearl and Small Pearl Bordered and Marsh Fritillaries are to be seen earlier in the season. As a bonus some Broad Leaved Helleborine Orchids were growing adjacent to the track but were not yet in flower. Much butterfly lore and localities were discussed including the tip of very lightly stroking the outside edge of the abdomen of butterflies with a grass stem to induce them to open their wings for upperside photographs when pitched and also using highly pungent Bellosan Prawn Paste from Chinese delicatessans to attract some species including *A. iris*. My cut out butterfly shapes of Blue and Purple foil failed to excite their curiosity

Finally at about 2.00 p.m. *A. iris* decided to tease us no longer and one condescended to put in an appearance flying down to flutter around a broad brimmed brown hat someone was wearing. The owner unfortunately quickly removed it and perhaps otherwise it might have settled where of course he would not have been able to see it. Some people have no thought for others!

Wall to wall sunshine all day (if we are ever to have it again) and weekdays with fewer visitors might be more productive. However, I am left with the memory of having spent two splendid days with true fellow butterfly enthusiasts some of whom had travelled some distance and would have been worth coming for alone.

I am indebted to *Discovering Butterflies in Britain* by D.E. Newland in the Wild Guides series for directions, information and site maps.





## Mantids found in this area – an up-date for 2008

by David Keen (3309L)

*Calle Casto Bancalero 11, 41650 El Saucejo, Sevilla, Spain.*

The year 2008 turned out to be a very disappointing one as far as the sighting of Mantids in and around the village of El Saucejo was concerned. No “new” species were recorded and I saw far fewer Mantids than I had seen in previous years. However, the following notes should be of interest when read in conjunction with my previous article on this group of insects – see under “Reference” below.

For the sake of good order I am listing species in the same order as before, starting with the largest, *Hierodnula bioculata*. The only specimen seen in 2008 was a male found at night sitting in the road by my car which was parked outside my house on 25 October. It was removed to the “safety” of my garden and released.

Records for *Mantis religiosa* were very limited in 2008. The living female mentioned in my previous article died during the early weeks of 2008. From two of the four batches of eggs she had laid, nymphs hatched during the spring and were released in the garden. No obvious sightings were made of these nymphs but a very small adult male was seen in the garden on 13 August. It was in the process of eating a Paper Wasp (*Polistes* sp.) whilst perched on our Mimosa bush. The only other record I have is of a female seen in the local countryside on 5th October.

Both the nymphs of *Empusa egea* (= *pennata*) died in March 2008 despite regularly eating the odd fly throughout the winter months. Only one nymph was seen in the garden during the year and that was sitting on a daisy flower during an afternoon in October. It was not seen again. The only adult that I saw was a fine male that was found dead by a student in the local school on 15th May. It then found its way to me via the local Librarian.

Three examples, all males, of the distinctive *Iris oratoria* came into the garden during the year. One came to my MV light on 7th August and this was followed a week by another one. The latter is very much larger than any of the others that I have come across. The final specimen, of normal size, was found dead on our sun terrace on 9th September.

The final species recorded in the year was *Ameles abjecta*. I had two batches of eggs that had been laid on 17th November 2007. From these, four nymphs hatched from one of the batches on 28th June. These were reared on aphids (taken from thistles on the verge at



the top of the road) and very small flies. However, one of the nymphs grew much more quickly than the other three and, after entering its second instar ahead of its siblings, duly devoured them as well. Despite a supply of aphids and flies it died on 9th July.

I will continue to make notes about the local Mantids and will write a further up-date in due course.

### Reference

Keen, David. 2008. Letter from Spain – 5th of a series – An Introduction to the Mantids found in this area. *The Bulletin of the Amateur Entomologists' Society*, 67 (478) 106-111.



## Sugaring for Red Underwings ( *Catocala napta* )

by *Graham Best*

12 Hortham Lane, Almondsbury, Bristol, BS32 4JH.  
e-mail: g.best@talk21.com

I was interested in reading the contribution by Bob Watts of Clevedon in the December 2007 *Bulletin* with regard to the population crash of the Red Underwing (*Catocala napta*) in his garden. I have been observing and U/V trapping moths for about 40 years and have never seen *C. napta* in my garden. This year for the first time I began regularly painting a large sugar patch on a fencing panel and was pleased to find two male Red Underwings had flown into my adjacent greenhouse although I had not seen any on the sugar amidst the plethora of Yellow and Copper Underwings, Spiders, Woodlice, Slugs and Earwigs.

It could be coincidence but as I live about 30 miles north of Bob it would perhaps be a flight of fancy that I have perhaps stolen his population with my sugar but as it would be against the prevailing wind this would seem unlikely. I have been in contact with him and he has recorded five this year (2008).

This is the first time I have consistently sugared and I am very pleased although I have yet to attract The Old Lady (*Mormo maura*) to my garden.

My sugar was the standard Brown Sugar and Black Treacle brew with an added dash of Rum. For transportation to new sites and economical use I paint the sugar on two pieces of Plywood stored face to face in a bin liner. It would be interesting to hear whether other members have had any notable successes with Sugaring.



## Further Notes on Gynandromorphs

by Peter Tebbutt (7941)

112 Broadway East, Abington, Northampton NN3 2PR.

This *Bulletin* contains my article about the extreme good luck I had whilst rearing Orange-tips (*Anthocharis cardamines*) and Small Whites (*Pieris rapae*), with a total of six gynandromorphs emerging. I stated that three examples in four days was surely something never to be repeated. Little did I know what was in store!

In late April 2007 a female Green-veined White (*Pieris napi*) with reduced discal spots caught my eye. I thought this would be interesting to breed, and set up a cage with cut Garlic Mustard leaves standing in water, and fed her on weak honey/water solution. She very kindly laid a few ova, and I duly reared these through to the pupal stage. Although it was now only July, I was amazed that most went straight into diapause, with about ten producing a typically marked summer brood, as expected in a F1 generation. These were paired up, and after laying enough ova were released. About fifty pupae resulted and entered immediate diapause, no third brood appearing as sometimes happens with this species. All the pupae were placed in my shed to overwinter, sorted into the F1 and F2 broods, and brought out in late March, by which time two males had already recently emerged.

In a very short time there was a rush of adults emerging, the F2 producing several examples that were very similarly marked to the original female. More pairings were obtained, and I also crossed several of the F1 stock with the F2 aberrations. This would hopefully produce approximately 50% aberrations if the strain was a simple recessive.

Due to the really good spring weather, these fed up extremely fast and a 'summer' brood started to emerge on the 19th May. Surprisingly none were marked with reduced spotting as expected, although one or two had the underside hindwing veining only very lightly dusted with black scales, so they were hardly noticeable. One was strangely asymmetrical, with the veining more prominent on one side, although broken up. I have to admit the reason for this eluded me at the time, and wasn't noticed until some days later. The penny really should have dropped that night, because as I looked over the pupae due to produce butterflies the next day, I could hardly believe my eyes. Two looked distinctly male on the left side, female on the right. They couldn't be surely!



Although the next day was a Saturday, I decided to forego my usual lie in and was up quite early for some reason. There in the emerging cage were the two butterflies, fully out and hardening off their wings. They were not quite bilateral gynandromorphs, one had some dark female scaling at the base of the male forewing, the other was male on the left side with a couple of whitish streaks going into the grey basal scaling on the otherwise female side. Not only that, but a third specimen proved to be a partial gynandromorph, being predominantly female with some whitish streaks greatly reducing the grey basal area on the right forewing.

Two days later, on the 26th May, a strangely marked bilateral example emerged. On this one the right side was male left side female. However, the female side had the top discal spot united with the apical patch with a black streak, and the black bar along the inner margin had a club like knob at the end just under the lower discal spot. The next day another halved example emerged together with a female having male areas of white at the bases of both forewings. On the 30th May the final example emerged and turned out to be a perfectly halved example, left side female, right side male.

A closer look at the underside aberration mentioned earlier showed this to be quite different at the apexes of the forewings, and this too proved to be a partial gynandromorph, but the least noticeable of the lot, at least on the upperside. It is interesting to note all the specimens show a difference, left to right, with the black spot along the costa of the hindwing. It therefore transpires that from 23rd to 30th May I had the unbelievable amount of eight gynandromorphs emerge. Attempts to breed from the other offspring proved unsuccessful, not helped by a prolonged period of cold unsettled weather. When the sun finally reappeared the females laid hundreds of ova, and I hoped that some unobserved pairings had occurred. However, the ova proved to be infertile and over a short period of time all collapsed. Even more amazing is that the original female was taken from exactly the same area as where I bred my four Orange-tip specimens from.

Is this purely a coincidence or are more sinister forces at work? As I understand it a gynandromorph is produced when a cell division goes wrong. Put simply, the male has two Z sex chromosomes, if one of these is lost the resultant cell with a single Z chromosome develops as a female. If this happens in the primary cell division then a bilateral gynandromorph is produced. The later on that this occurs then the smaller the area of female coloration. Conversely, in a female carrying a W and Z sex chromosome, if two cells fuse together the resultant cell



now has two Z chromosomes and therefore develops as male. (W and Z are now used to denote sex chromosomes in butterflies and moths (and birds), as ZZ produce a male whilst ZW results in a female. In humans etc it is XY that denotes male and XX female, hence the different use of letters to distinguish between the fact that two of the same sex chromosomes have totally different effects).

It appears to be uncertain as to what causes the cell division to go wrong. We know that radiation causes extreme deformities, as do various other chemicals. Is there something in the ground at this particular site that is being taken up by the plant life, ingested by the larvae, and therefore passed on to the butterflies to manifest itself at a later stage? There are no obvious sources of contamination such as treatment works, factories etc. Certain areas of Northamptonshire had a warning some time ago because the ground contained a high level of radon gas, but I don't think this area is affected, and I am unsure what damage it could cause. No other major aberration or deformity has been noted from this site, but I shall be breeding a few other species to see if it is a recurring event or just the biggest stroke of good luck!

I don't think the crossing of F1 with F2 generations is responsible either, as I am sure this must have occurred on many occasions with the likes of Head, Newman, Bowden etc and I cannot recall their mass breeding of this species producing similar results to mine. If anyone knows otherwise I should be very pleased to hear about it.

In the earlier article I mentioned breeding gynandromorphs in five species, so I feel I should mention the last two. These occurred in larvae that were given to me, and both were bilateral. To save any embarrassment I shall refrain from naming the people concerned, although both were informed at the time.

The first occurred on 14th July 1998. I had reared some Small Copper (*Lycaena phlaeas*) larvae that had been wild collected and kindly given to me as the person responsible had been more successful than they had originally thought. I usually knock out any emerging adults for a few minutes so that I can check them over without fear of damage or escape. This has absolutely no detrimental effect on them, and full recovery is reached after about ten minutes. This particular specimen seemed slightly deformed, one side being slightly larger than the other, and I was totally amazed when I spread its wings to see the left side was female and the right side male. Not only that, but the male side had a well marked series of blue spots on the hindwing, ab. *caeruleopunctata*. When I rang my friend to tell him and tentatively offer him the specimen, he very



generously replied that if I could spot a gynandromorph in this species then I should keep it. I am, however, reliably informed by his wife that that was definitely not what he muttered when he put the 'phone down. As there are possibly children and people of a nervous disposition reading this I shall decline from quoting him here!

My final example is possibly the best as I am lead to believe that may be only one other bilateral specimen exists. Another friend had been given some larvae that were feeding well and most likely to produce a second brood of what is normally a univoltine species. He very kindly asked if I would like a few, and hearing my acceptance, proceeded to take a leaf out of his rearing cage. On it were attached a few larvae, certainly enough for me. Although I later learned he lost all the remaining larvae due to a viral infection, mine fed straight through as expected. As they coloured up, I checked them over as usual, and rolled a female pupa over to be faced with a male on the other side. For four days or more it just lay there, and I was convinced it was not going to hatch. I had to pop out for about half an hour on the evening of 14th September 2000, and upon my return was surprised and delighted to find it successfully emerged and with its wings fully inflated. I can still remember the thrill when it finally opened its wings to reveal a perfect halved example. It was unfortunately slightly on the small side as it was a second brood example, had it been single brooded it would really have been a magnificent specimen. The species? None other than the Large Copper *Lycaena dispar batavus*.





## Breeding the Deaths Head Hawk Moth in Captivity

by Graham Best

12 Hortham Lane, Almondsbury, Bristol, BS32 4JH.

e-mail: g.best@talk21.com

With a wingspan up to six inches the Deaths Head Hawk Moth (*Acherontia atropos*) is the largest Hawk moth on the British list. With a skull and crossbones design in the hairs on the thorax and with a death premonition folklore association it has always commanded the attention of the public and especially of entomologists, without a specimen of which no Lepidoptera collection was considered complete.

Specimens had always been obtainable from Europe, Africa and the Near East where three generations are common but the most prized were those with British data having been obtained as a living specimen on British soil. Adult moths sometimes turned up but the main source was larvae and pupae found in Potato fields before mechanization where enterprising agricultural workers soon learned their value from local entomologists. Other members of the Solanaceae were probably used before the potato was introduced to Europe. Mercury Vapour traps now account for most captures, mostly autumn immigrants but it is considered that some are a second generation from early arrivals.

For many years breeding in captivity was unsuccessful, pairings were occasionally obtained but either no eggs were laid or were infertile. Suddenly in the Seventies the breakthrough came but it is not clear why, one suggestion is that it was with South African livestock more suited to our conditions. I was fortunately able to obtain a few eggs at an Amateur Entomologists Society Annual Exhibition in London and was successful in rearing a few through to adult helped by the fact that they would feed on Privet especially the evergreen variety. Further supplies of eggs became available spasmodically and grown men almost fought to get to the front at any dealer's table. Further supplies eventually became more freely available by post at exhibitions and from the Entomological Livestock Group and Worldwide Butterflies.

A further batch of 20 eggs was obtained one Autumn and were hatched in tissue lined boxes plastic boxes. Torn strips of older Garden Privet leaves were added and eventually they were transferred to breeding cages with foodplant stems in jars of water plugged with Nylon Wool around the stems. Some breeders consider that livestock do not do well with cut plants in water. Other foodplants recorded are Deadly, Woody and Black Nightshades, Thorn Apple, Duke of Argyle's Tea Tree, Jasmine, Olive and Honeysuckle.



The netted cages were 18 x 18 x 24 inches high with a ply base and a six inch high base filled with Peat. These had previously been used for rearing Privet, Small and Large Elephant, Lime, Poplar, Oleander and Spurge Hawk moths. A minimum temperature of 25 degrees Centigrade was maintained by means of a judicious selection of light bulbs in a batten holder. Growth rate was prodigious and bunches of stems were stripped overnight by the five inch long larvae. Larvae showed readiness to pupate after only 15 days feeding by changing colour and marching restlessly around the peat surface before disappearing into the peat and pupating. Care was taken not to have too many to a cage to avoid disturbance during pupation and eventually after pupation for only about 20 days I was rewarded with a nearly 100% successful emergence of these magnificent moths.

This was when the fun began! The moths have to be hand fed every other night by holding the moth gently but firmly in the fingers and dipping the short stiff proboscis in a teaspoon of 15% sugar or honey mixture. They objected to this at first and squirmed around and squeaked away like mice but eventually calmed down and consumed up to half a spoonful. Eventually I devised an ice cream cone shaped piece of paper with a small hole for the head which made life easier but even so much of an evening for two weeks was taken up so breeding this species should not be undertaken lightly. The proboscis is ill suited to flower feeding and the moth has been recorded as feeding on sap from wounded trees and robbing hives for honey sometimes being found dead at the bottom of hives.

Pairing was attempted in the same cages with foodplant and flowers, pairings were obtained and fertile eggs were laid mainly on the netting where they could be removed with a finger nail. Oviposition was rarely on the foodplant, flowers or wooden framework. Succeeding generations dwindled in number and by January after three generations they died out. Fluctuating and too low temperatures and possibly deteriorating food quality may have taken their toll. Inbreeding may be a possibility as many generations of a particular line may have been bred by the entomological fraternity although livestock from wild caught specimens are frequently available.

Like most Hawk moth larvae they are susceptible to virus diseases and I also followed the technique of rearing larvae individually in plastic boxes where they will pupate in plentiful supplies of torn tissue regularly changed to absorb the moisture lost during preparation for pupation. Any very slow growers should be ruthlessly culled and some enthusiasts clean and dry their hands in hospital alcohol rub between handling individuals.



## Moths Count event, 28-29 June 2008, Margrove, Tees Valley, Cleveland, North Yorkshire

by Paul Waring (AES 4220)

*Windmill View, 1366 Lincoln Road, Werrington, Peterborough PE4 6LS.*

The following is an account of one of the mothing events I led in 2008 for the Moths Count project, co-ordinated by Butterfly Conservation, to show the sorts of activities involved and report some of the moths recorded. A full programme of Moths Count events is also being organised to take place throughout 2009 (see [www.mothscount.org](http://www.mothscount.org)). This event was hosted by the Tees Valley Wildlife Trust at the former Margrove Heritage Centre (map. ref. NZ 65010 15490), Margrove Park, Boosbeck, near Saltburn by Sea, in the Tees Valley, Cleveland (vice-county North Yorkshire). It was co-ordinated by Wildlife Trust staff member Susan Antrobus. It was attended by 11 people (Figure 1), including the course leader Paul Waring, co-ordinator Susan, various members of the newly formed Tees Valley Moth Recording Group (which held its first meeting in January 2008), Countryside Rangers and Wildlife Trust members. The event involved an evening session on 28 June 2008 from 20.30hrs until 01.00hrs, including moth-trapping, and a day-time session on 29 June from 11.00hrs until 16.30hrs.



**Figure 1.** One of the caterpillar-hunting teams from the Moths Count event at Margrove, N. Yorks. on 28-29 June 2008, with a Bignell beating tray, a sweep-net, and a Boorman drop-disc for measuring the height of the grass sward.



**Figure 2.** Group photo for the Moths Count event at Margrove, in the Tees valley, Cleveland, North Yorkshire, 28-29 June 2008.

During the evening session we operated a 125W mercury vapour (m.v.) light on a tripod over a white ground-sheet from dusk until 01.00hrs in a sheltered grassy field corner by the wooded banks of a small stream about 300m along a footpath from the Margrove Centre (see view through window in Figure 2). We also set up a Robinson trap with a 125W m.v. bulb which was operated all night from the Margrove Centre on a 50m cable laid along the footpath. This trap was by a farm field only slightly sheltered by a hedgerow containing mainly Common Hawthorn *Crataegus monogyna*, Field Maple *Acer campestre* and Wild Rose *Rosa* spp.. In addition the leader also deployed an identical Robinson trap all night in Susan Antrobus's nearby garden in Fernie Road, Guisborough (at NZ 61275 14890), Paul Forster operated a Skinner-pattern 15W actinic trap in his Guisborough garden just up the road from Susan's, at 1 Middleton Drive (NZ 616 154), and Jamie Duffie operated an actinic trap at his home at 7 Jesmond Grove, Hartburn near Stockton (post code TS18 5ES). We recorded the moths to the lighted sheet as a group as they arrived. The catches in the other traps were all examined during the first session of the following morning, in which we looked at the characteristic features of the major



families of moths, the diagnostic features of the moths we had captured and the various types of light-traps and advantages and disadvantages of each.

The daytime session also included an hour spent hunting for caterpillars of moths in the fields, hedgerows and woodland immediately around the Margrove Centre (Figure 3), time examining and identifying them in the laboratory, and learning to distinguish them from the sawfly larvae which we found quite numerous when sweep-netting in the grassy fields and when beating the willows *Salix* spp. in the hedgerows. The remainder of the day-time session was spent indoors on various illustrated presentations from the leader. These concerned a selection of locally occurring moth species listed as priorities for conservation in the UK Biodiversity Action Plan, the local Biodiversity Action Plan and the Butterfly Conservation Regional Action, measures everyone can take to record and conserve moths more generally in their gardens or in other places in which they have influence and a crash course in the identification of caterpillars.

Some field observations made during the course were that more moths species were recorded at the light over the sheet in the wooded



**Figure 3.** Moth training session at the Margrove Centre, N. Yorks, at which light-traps were operated on 28-29 June 2008, in the habitats visible through the window.



field situation (21 species of macro-moth), than in any of the light-traps. This was partly because the habitat in which the light and sheet were operated contained the greatest number of species of native trees, shrubs, herbs and grasses within a few metres of the light, and also because it was a much more sheltered site than the Robinson trap operated 200m away on the more exposed and less species-rich habitat along the footpath (10 spp. of macromoth) despite the trap running all night. The small suburban gardens of Susan Antrobus and Paul Forster produced even smaller numbers both of species and individuals than this hedgerow site. The most noteworthy species recorded were the Peach Blossom *Thyatira batis* and Small Yellow Wave *Hydrelia flammeolaria*, seen only at the sheet and dependent as larvae on Bramble *Rubus fruticosus* agg. and Field Maple respectively, and the Figure of Eighty *Tethea ocularis*, seen only in Jamie's garden and dependent on poplars *Populus* spp. Jamie's garden was also the only site to produce a hawk-moth this night, a single Poplar Hawk-moth *Laotloe populi*, which thrilled all the less-experienced course members on account of its large size. The Beautiful Golden Y *Autographa pulchrina* was found in all but one of the sites, generally as 1-3 individuals per trap.

The number of caterpillars found was much smaller than the number of adult moths, mostly because of the time of the year and partly because of the smaller amount of search effort during the course. The spring peak of abundance of caterpillars found on woody plants such as oak *Quercus* spp., Common Hawthorn and Hazel *Corylus avellana* from mid-May to early June had evidently passed because the trees and shrubs were devoid of the larvae of abundant and widespread species such as the Winter moth *Operophtera brumata* and the Early moth *Theria primaria* and the oaks and hawthorns produced no larvae at all. The leader beat a single fully-grown caterpillar of the Common Quaker *Orthosia cerasi* from Grey Willow *Salix cinerea*. Three additional beating trays were in operation. A caterpillar of the Grey Pug *Eupithecia subfuscata* was beaten from Hazel and one of the Common Marbled Carpet *Chloroclysta truncata* from a willow. A single Buff Ermine *Spilosoma luteum* was also found. Sweeping by day amongst the tall grass and buttercups *Ranunculus* spp. produced no moth caterpillars at all, only a few sawfly larvae, but again, this result was not unexpected in from the experience of the leader in similar places at this time of year. Most of the moth species dependent on grasses or broad-leaved herbs are adults rather than in the larval stage at this time of year and night-time sweeping in the early spring is much more productive.



Various information sheets, Moths Count literature and a list of contacts and further reading were distributed at the end of the meeting.

The leader and author would like to thank the Moths Count project, co-ordinated by Butterfly Conservation, and the Heritage Lottery Fund for the financial support to hold this meeting and cover his expenses, Susan Antrobus and the Tees Valley Wildlife Trust and Tees Valley Biodiversity Partnership for co-ordinating, promoting and hosting this event, and all those who attended and supported the event and for their encouraging feedback. It was especially pleasing to address the membership of the new Tees Valley Moth Recording Group at such an early stage in their formation.

Readers may also be interested to know that after the training course the leader operated a Robinson light trap all night on 29 June 2008 at Hollins Lodge Guest House, in Institute Row, in the attractive village of Grosmont (postcode YO22 5PU, map. ref. NZ 835 055) before making the return journey back to his home in Peterborough. The grounds of Hollins Lodge back onto old iron-workings which have become overgrown with new woodland on what is actually a well-wooded valley-side. The main trees bordering the garden of Hollins Lodge were limes *Tilia* spp., Common Hawthorn and Blackthorn. The catch in the trap in the morning included 33 macro-moths of 15 species, including the Lilac Beauty *Apeira syringaria*. This species was formerly described as very local in Yorkshire (Sutton & Beaumont, 1989, Butterflies & Moths of Yorkshire). Though still a somewhat local and infrequent species in Yorkshire now, it has become much more well-distributed and frequent in recent decades.

The full lists of moths recorded from all the above sites on this visit have been forwarded to the County Moth Recorder for Yorkshire and to Butterfly Conservation for incorporation in the database of the National Moth Recording Scheme.





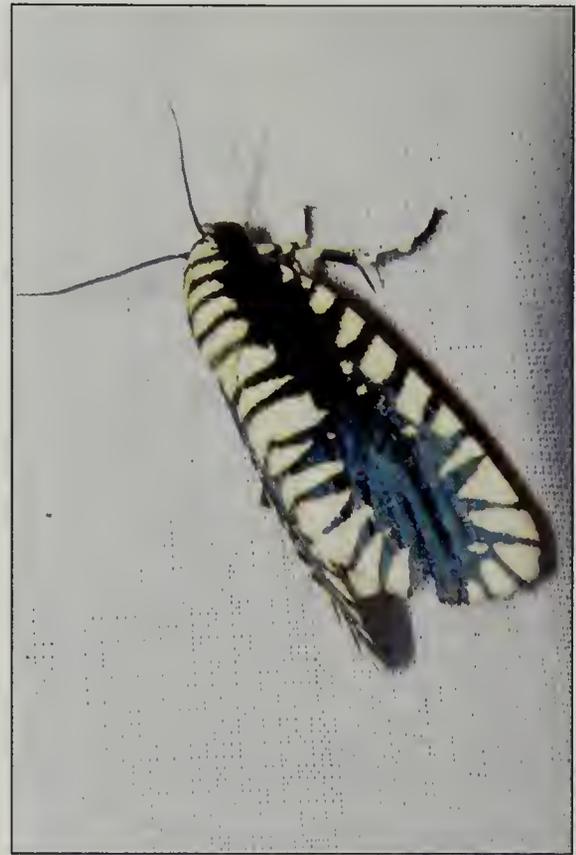
1) *Plutodes flavescens* (Butler)



2) *Attacus edwardsii* (White)



3) *Tarsolepis rufobrunnea* ((Nakamura)



4) *Apsarasa radians* (Westwood)\*



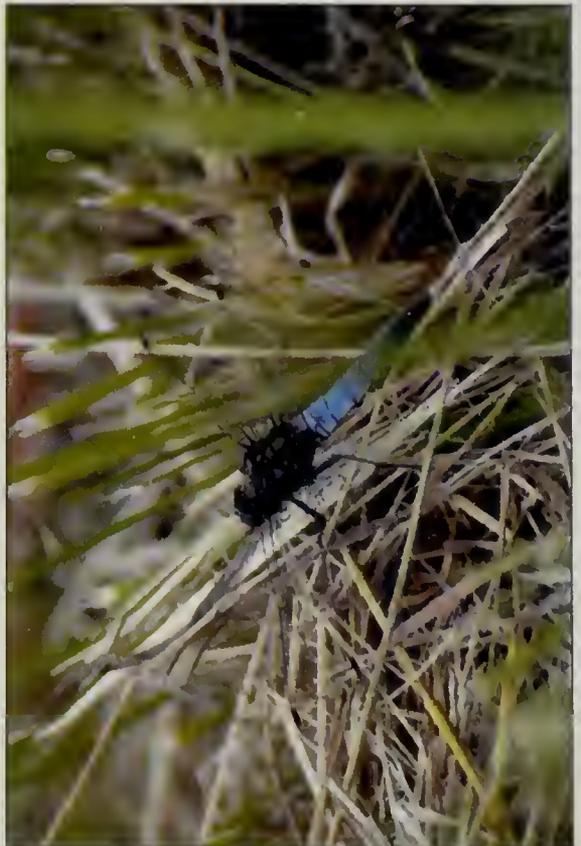
Male Common Blue Damselfly (*Enallagma cyathigerum*).  
(EXP00324)



Two Common Blue Damselflies. (EXP00326)



Common Blue Damselfly (*Enallagma cyathigerum*) in tandem.  
(EXP00322)



Black-tailed Skimmer (*Orthetrum cancellatum*). (DSC8813)



Orange-tip *Anthocharis cardamines* gynandromorphs underside.



Orange-tip *Anthocharis cardamines* gynandromorphs upperside.



Plate 4. Further Notes on Gynandromorphs by Peter Tebbutt



## Reflections on the Pale-lemon Sallow *Xanthia ocellaris* (Borkhausen, 1792)

by Philip Wilkins

*Thistledown, The Common, Little Blakenham, Suffolk, IP8 4JX.*

### Background

In October 2005 I set my Skinner Mercury Vapour moth trap as usual. It was a fairly typical autumn evening. However, as this was our first year in this part of Suffolk, there was always anticipation of something interesting to be found when emptying the trap in the morning.

Indeed, next morning was a moth that I could not initially identify. It superficially resembled the Brick *Agrochola circellaris*. However, it just did not look right. Searching through Skinner (1998) and Waring, Townsend and Lewington (2003), Pale-lemon Sallow *Xanthia ocellaris* seemed a better match. According to these books, the hooked wing tips of the fore-wings are crucial features to clinch identification. I looked again at my mystery moth. Sure enough, there were the hooked tips.

I thought I had identified my moth, but doubt lingered. The flight period was right, but the moth was described as scarce. In addition, the moth apparently 'comes sparingly to light' (Skinner, 1998). Although found in Suffolk, its stronghold is the Brecks (the opposite end of the county to my house). I thus took a photograph and posted this on the UKMoths internet forum. To my delight, several people confirmed my identification. I noted down a good record.

### Moth 'Twitching'

Having had the identification confirmed on the UK Moths internet discussion forum, I was unprepared for the subsequent drama. Amongst the emails confirming the identification, were some requesting that I keep the moth so it could be viewed. I had an email from a local 'mothing' acquaintance who wanted to photograph the moth for his website. This seemed fair enough to me. What surprised me more was the fact that the original request for viewing was mushrooming!

The moth was stored in the refrigerator. Next day a car full of five 'moth twitchers' arrived. They had a look at the moth in the pot from the fridge. I showed them round the habitat and they left. All were very pleasant, but some had travelled a considerable distance across the country for a brief glimpse of a small brown moth.



The following year, I caught another Pale-lemon Sallow. I was surprised to find that this generated almost as much interest as the first moth. My garden was potentially becoming recognised as a 'regular site' for an elusive moth. Further emails were received to set up moth trapping expeditions. After a few false starts, an event was organised. Over ten traps were set up in September 2008. I was apprehensive – what if the moth failed to turn up? My visitors had travelled some distance. I set up my trap the night before. Reassuringly, one Pale-lemon Sallow was caught. Thus bolstered, all the other traps were set at promising points.

Next day we searched the traps. The first four yielded none of the target species. We approached my own trap. Inside was a pristine *Xanthia ocellaris*! The next trap had an even better specimen. So two on the one night – not bad. One was duly photographed (see cover of this *Bulletin*).

So – why all this fuss? There are rarer moths in Britain. There are certainly more attractive moths. However, Pale-lemon Sallow seems to have developed a 'cult status'. It seems that it is the unpredictability that makes it so sought after. Known sites will rarely produce moths at light. Annual catches in my garden may mean there is a particularly large population nearby. There are certainly plenty of Poplar trees (the caterpillar food-plant). Alternatively, it may be just that the local population is more attracted to light than most of this species.

### The Moth

The Pale-lemon Sallow is not the most exciting of moths to look at. Keith Tailby's excellent photograph on the cover of this issue of the *Bulletin* reveals its subtle attractions. However, compared to other species, it cannot really be described as a beauty!

It has one generation a year. The adult is on the wing in September and October. Caterpillars feed on catkins of various trees of the genus *Populus*. Later they descend to the ground to feed on leaves of low-lying plants. Porter (1997) describes the caterpillars as feeding at night between April and early June. Apparently the larvae can be found by collecting fresh fallen poplar catkins and keeping these in ventilated containers, looking out for frass. The caterpillar is a purplish-brown, undistinguished beast.

### Status and Distribution

*X. ocellaris* is listed as Nationally Scarce A. This means that it has been recorded in 16-30 10km squares in Great Britain, as defined in Shirt



(1987). According to South (1961), the species was first recorded in Britain in 1893. Interestingly, one of the first records was from Ipswich – not far from here!

### The Local Population

As I have mentioned, there are numerous stands of poplars locally. Hence the future of the Blakenham Pale-lemon Sallow population is likely to be relatively secure. However, I am likely to be moving from the area, possibly even before the next season for this species. Hence, sadly, I cannot monitor the moths. My only regret is failing to locate the caterpillars!

### References

- Porter, J. 1997 *The Colour Identification Guide to Caterpillars of the British Isles*. Viking, London.
- Shirt, D. B. (Ed) 1987 *British Red Data Books 2 Insects*. Nature Conservancy Council, Peterborough.
- Skinner, B. 1998 *The Colour Identification Guide to Moths of the British Isles*. Viking, London.
- South, R. (1961) *The Moths of the British Isles Series 1 (4th Edition)*. Warne, London.
- Waring, P., Townsend, M. And Lewington, R. 2003 *Field Guide to Moths of Great Britain and Ireland*. British Wildlife Publishing, Hook, Hampshire.



## Butterfly Photography

by Graham Best

12 Hortham Lane, Almondsbury, Bristol, BS32 4JH.

e-mail: g.best@talk21.com

Photographing butterflies can be very frustrating when certain species such as Brimstones and Clouded Yellows will only pitch with their wings closed. Some years ago I supplied the BBC Natural History Unit in Bristol with some Brimstone butterflies which they wished to film through a quartz lens so that we could see the ultra violet patterns that other butterflies would see and we could not. Unfortunately they wanted to see the patterns on the upperside and I informed them quite categorically that in many years of butterfly watching I had never seen one with its wings open when pitched except briefly during mating display. They then shone a 500 Watt light through a heat filter and to my amazement the Brimstone opened its wings wide and sat there while filming took place. I have tried to replicate this with Clouded Yellows using a beam of light from a slide projector but with no success but have yet to try it with Brimstones.



## Light and Sheet in the Mountains of Thailand

by Martin Hough (3354)

7. Post Mill Orchard, Grundisburgh, Woodbridge, Suffolk IP13 6UT.

While on holiday in Chiang Mai, Northern Thailand in September 2009, I was able to meet up with my good friend John Moore of "Thaibugs" fame. (Visit his website at [www.thaibugs.com](http://www.thaibugs.com), if you do not already know it.) It was he who had insisted that I visit Thailand in the Rainy Season (best for moth trapping). He was also kind enough to take me on a moth hunting expedition to prove the value of his advice. I met him at Chiang Mai's Arcade bus station, and we drove thirty miles out into the hills, in the mountainous region of Doi Saket. A turn-off from the main road took us winding steeply up the hill. At one point we narrowly avoided running over a four-and-a-half foot long black and yellow snake, which had presumably stretched itself out to enjoy the residual day's heat on the bitumen road surface. We piled out, frantically fiddling with settings on our cameras in order to preserve the moment, but the snake was obviously shy of publicity and slid off into the undergrowth.

There is no such thing as silence in Thailand. Before climbing back into the car we paused to listen: cicadas (John has recently had the honour of getting one named after him) chirred; frogs croaked with a volume totally disproportionate to their size; and above us a species of owl was repeatedly sending out a morse "Q". There is a Thai tradition that owls know when a death is about to occur, and a year or so ago John and his wife were awakened by one screeching frantically at his window. The next morning they found that their trusty old dog had died in the night. They have never had such an owl visitation before or since.

We parked at a lofty viewpoint and set up our light – a 30 watt actinic tube, powered by a small motorbike battery and an inverter. It was mounted on a photographer's tripod, and behind it, we simply draped a sheet over the vehicle (a Toyota Carryboy, equal to the most treacherous of Thailand's roads). The Thai authorities are becoming protective over their local wildlife, and I was advised diplomatically to keep my net out of sight, even though our expedition was exclusively photographic. John's good reputation as a local naturalist and ability to speak excellent Thai – he has written a textbook on the language – were further assurances that our activities would not be unwelcome.

I am sure that you will not believe this, but moths started arriving even before we switched the light on. (There was the usual hair-raising



moment when a bad battery contact made it seem as if the equipment had failed.) Presumably the spread of white cloth was an attraction on its own. The actinic light is, of course, less effective than a full 125w mercury vapour, but it is far more comfortable to work with and we quickly had more moths than we could handle. The biggest crowd pleasers were a magnificent Edwards' Atlas moth (sadly, but not surprisingly, their enormous wings get battered fairly quickly), and a pair of Eastern Death's Head Hawk Moths. There were at least five other species of Hawk moth, too. But one quickly gets to push past these giants in order to peer at the smaller fry – some obvious and usually larger relatives of European species, but some totally (to my eyes at least) weird and exotic. I was busy with my camera throughout, unable to pause to review shots taken because of John's constant cries of "Hey, come and look at this!" and "this one here is stunning".

But of course light does not only attract moths. Bats quickly became aware that a new restaurant had opened up, and were constantly wheeling overhead. In the trees above us, some noctilucous flying insect was hovering, but mysteriously the light appeared to be red, not green. Enormous wasps arrived, and had to be contained quickly, in case they should be forgotten, abused and obliged to deliver a painful sting. Praying mantids and cicadas paid visits to us – one mantis a delicate silky white creature. But most intrusive were the enormous beetles, including four-inch long rhino beetles. These clowns were a delight on their arrival, but the pleasure quickly wore off because they failed to settle and insisted on buzzing against everything sitting on the sheet, creating turmoil.

I had learnt by my mistakes on previous occasions and donned dark clothing for the evening – a white shirt will of course attract as many moths as the sheet – but even so it was not long before indeterminate insects were exploring the inside of my trouser legs, my shirt and every orifice within reach. John displayed true friendship and trust by standing dead still and thinking of England while I removed a fine large leopard moth that had decided to perch on his rear end.

It is an observable phenomenon that when an entomologist decides "Right, that's it – it's time to go home" all the good stuff suddenly decides to put in an appearance. A huge silk moth arrived as we started packing away, and a couple more hawk moths delayed us by at least half an hour. But it was a long drive back to Chiang Mai, and we had finally had to place our lens caps firmly back on our cameras, switch the light off and stow the equipment.



My friends have been bored mightily by all the photos that I took on this splendid expedition, so I show here just some of the highlights. . I remain extremely grateful to John for all his kindness on my sporadic trips to this part of the world, and only wish that there were ways in which I could reciprocate. I have offered to take him into the Suffolk wilderness and to show him a few Square Spot Rustics, but it's not the same. At least, though, I could provide him with some good, dark, strong Suffolk Ale.



1) *Eupatoris gracillicornis*.



2) *Diamesus osculans* (Vigors)



3) *Acherontia lachesis* (Fabr) (Linn.)



4) *Meganoton nyctiphanes* (Walker)



5) *Acronycta maxima* (Moore)



(6) *Bastilla joviana* (Stoll)

### Notes on illustrations

The moth identifications are my own, and highly fallible. Colin Johnson very kindly identified the beetles for me.

- 1) *Eupatoris gracillicornis*. This giant Rhinoceros beetle tends to be caught, mounted in various ways and sold to tourists in street markets. So much nicer to see in the wild- until it lands on your sheet and disturbs all the settled moths
- 2) *Diamesus osculans* (Vigors) Colin Johnson tells me that he was once sent a specimen of this carrion- eating beetle from Malaysia- inside a dead monkey!
- 3) *Acherontia lachesis* (Fabr) (Linn.) This close relative of our own Death's Head Hawk Moth (*Acherontia atropos*) is to be found almost all the year round in Thailand. It feeds on solanum species
- 4) *Meganoton nyctiphanes* (Walker) The band of yellow spots on the hindwing make this hawkmoth easily identifiable. It is widespread on the hills of Northern Thailand, and feeds on species of Verbenaceae
- 5) *Acronycta maxima* (Moore) Recognisably one of the Dagger family, this moth's range extends across much of South East Asia and the Indian subcontinent.



- 6) *Bastilla joviana* (Stoll) The adults of this Noctuid common in South East Asia- attack tropical fruits by piercing them.

Plate 1, Fig. 1. *Plutodes flavescens* (Butler) An Oecophorid, widespread in South East Asia.

Plate 1, Fig. 2. *Attacus edwardsii* (White) It's a real delight when one of these giants arrives. Unfortunately its huge wingspan seems monstrously impractical and in the wild the wings quickly become battered, as in this specimen. It occurs from NW India to China, Taiwan, Thailand, Myanmar and Malaysia.

Plate 1, Fig. 3. *Tarsolepis rufobrunnea* ((Nakamura) No, they aren't holes in the wings. This Notodontid has silver-white patches on the forewing and a striking tuft at the base of the abdomen.

Plate 1, Fig. 4. *Apsarasa radians* (Westwood) This very striking little Noctuid is to be found across South East Asia and Northern India

### References

- Barlow, Henry Introduction to the Moths of South East Asia Kuala Lumpur: Malayan Nature Society, 1982.
- Pinratana, Bro. Amnuay and Lampe, R. Moths of Thailand Vol. One: Saturniidae Bangkok: Brothers of St. Gabriel, 1990.
- Inoue, H., Kennett, R. and Kitching, I Moths of Thailand Vol. Two: Sphingidae Bangkok: Brothers of St. Gabriel, 1990.
- Kononenko, V. and Pinratana, Bro. Amnuay Moths of Thailand Vol. Three: Noctuidae Bangkok: Brothers of St. Gabriel, 2005.



### Belted Beauty (*Lycia zonaria*)

There is a colony of this rare moth at Meols, the Wirral, Cheshire. The colony is really struggling and there have not been any organised counts for a while. The Lancashire & Cheshire Entomological Society (LCES) are hoping that local recorders can spend some time at the Wirral to search for adults, and they may organise larval searches later in the year.

If anyone could spend time there over the next few weeks to search for the adults it would be greatly appreciated by the LCES. For details of where to look please contact Shane Farrell at the Lancs & Cheshire Ent Soc (shane.farrell@ntlworld.com).



## The most common insect species in Alfalfa field in Egypt

by <sup>1,2</sup>Mohamed A. Shebl, <sup>1</sup>Soliman M. Kamel, <sup>1</sup>Talaat A. Abu Hashesh,

<sup>1</sup>Mohamed A. Osman

<sup>1</sup>Dept. of Plant Protection, Faculty of Agriculture, Suez Canal University, Ismailia, EGYPT.

<sup>2</sup>Graduate School of Bioresource and Bioenvironmental Science, Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, 812-8581 Japan.

Alfalfa is a superb forage, but it can shelter a complex of insect pests, natural enemies and pollinators. Alfalfa insect populations can vary greatly from field to field. Therefore, it is essential to check each alfalfa field frequently for the presence of insects. The survey of the insect fauna of alfalfa *Medicago sativa* L. was carried out in different areas of Egypt like Ismailia, Suez, Swia Oasis, and The New Valley. A high number of insects were collected from alfalfa fields. Different samples were collected during the season 2003, the insect faunal composition could be categorized to the following groups; pests, natural enemies, and pollinators.

KEY WORDS: alfalfa, pests, natural enemies, IPM, pollinators, ecosystem

### Introduction

Alfalfa is a perennial plant that is native to Southwest Asia. It has been cultivated for forage longer than any other crop. Not only does alfalfa have very high yield potential, but it is also one of the most palatable and nutritious forage crops. Because of its high protein and vitamin content, alfalfa is a primary component in the diet of dairy cattle as well as beef cattle and horses. Alfalfa, *Medicago sativa* L., is among the most prized of forage and is grown worldwide (Summers 1998). Alfalfa, *Medicago sativa* L. is a high quality forage and green manure crop; varieties are available and are being bred that are well-adapted to reclaimed agricultural lands in Egypt. Currently there are 200-300,000 acres of alfalfa planted in Egypt, and acreage is rising each year (Shebl et al. 2008).

Alfalfa provide a large number of arthropods; some of them are pests but many have no effect on the crop (Alsuhaibani 1996). Alfalfa supports a diverse arthropod fauna; at least 1,000 species have reported from alfalfa in the US, with perhaps 100-150 of these causing some degree of injury. Few of these, however, can be described as key pest species, the rest are of only local or sporadic importance, or are incidental herbivores, entomophagous (parasites and predators), or pollinators (Flanders and Radcliffe 2000).



Alfalfa fields, as a short-term perennial agroecosystem, support a wide range of arthropods, most of which have neither positive nor negative effects on the crop. In fact, alfalfa fields are important contributors to the biodiversity of agricultural systems (Putnam et al. 2001). The contribution of alfalfa to biological diversity and for the nurturing of beneficial insects for other species often goes unrecognized. This should be considered an important environmental benefit of incorporating alfalfa into a cropping system. While it is true that alfalfa production fields often represents a significant change from the naturally occurring flora and fauna of a region, it is not true that wildlife are automatically losers in this tradeoff. Agricultural activities interact significantly with wildlife on several different levels, and many forms of wildlife adapt, adjust, or even thrive within and alongside agriculture (Putnam 1998). In extensive surveys conducted in the Sacramento Valley, California and in subsequent analysis by wildlife biologists, many species of wildlife were found to be present in alfalfa fields. Of the 643 regularly-occurring resident and migratory terrestrial wildlife (amphibians birds, mammals, and reptiles), 162 species or 25% were considered regular users of a alfalfa fields to varying degrees (Kuhn et al. 1996). Correct identification and efficient sampling methods for beneficial and pest insects are two critical steps toward implementation of integrated pest management (IPM) programs. IPM includes the use of all feasible control tactics (e.g., crop rotation, resistant hybrids and chemical control) to manage pests within a profitable, yet environmentally sound production system. Current integrated pest management (IPM) programmes sue cultural, biological and chemical tactics for managing alfalfa pests; however instances, IPM is not practiced by alfalfa growers because of the cost and time involved in implementing these tactics (DeGooyer, et al. 1999). Efficient sampling methods are necessary for making accurate and timely evaluations of insect population (infestation) levels. These estimates can then be used for comparison with economic thresholds and consideration of appropriate management tactics. For production of high yielding, high quality alfalfa, the crop should be checked weekly. In cooler weather, sampling can be done less frequently. In hot weather, however, sampling frequency should be increased (insects develop, feed and reproduce faster under warmer conditions). Shorter sampling intervals are also necessary as insect populations and/or damage approach economically damaging levels. Therefore, it was very important to check the insect fauna of alfalfa agroecosystem in Egypt for improving IPM programmes and for improving alfalfa cultivation in Egypt.



## Material and Methods

The survey of the insect fauna of alfalfa *Medicago sativa*, L. was carried out in different areas of Egypt in western and eastern desert; Ismailia, Suez, Swia Oasis, and The New Valley. In Suez, Swia Oasis, and The New Valley samples have been collected from different fields during summer season. Samples have been collected from the university farm, Ismailia during the whole season of 2003 (Fig. 1). An area of one feddan was cultivated with alfalfa in early October. This area received usual agriculture practices but no chemical control application was practised. During the season 2003, the sampling technique was based on using sweep net; 50 full length double net-strokes were practised, the samples were taken by cross distribution of the field every two weeks. Catch was killed in an ordinary cyanide jar, then spread on a sheet of white paper for identification. Sweep Net Sampling — This is currently the most convenient method of estimating many of the pest and beneficial insect populations in alfalfa. Although it provides only a *relative* estimate of insect density, it is sufficient and cost effective for most above ground insect pests of alfalfa. Sweep net sampling *is not* recommended for determining absolute estimates of alfalfa weevil, cutworm, armyworm, grasshopper, or aphid populations. However, the sweep net is often useful for detecting initial low-density populations of alfalfa weevil larvae and pea aphids.

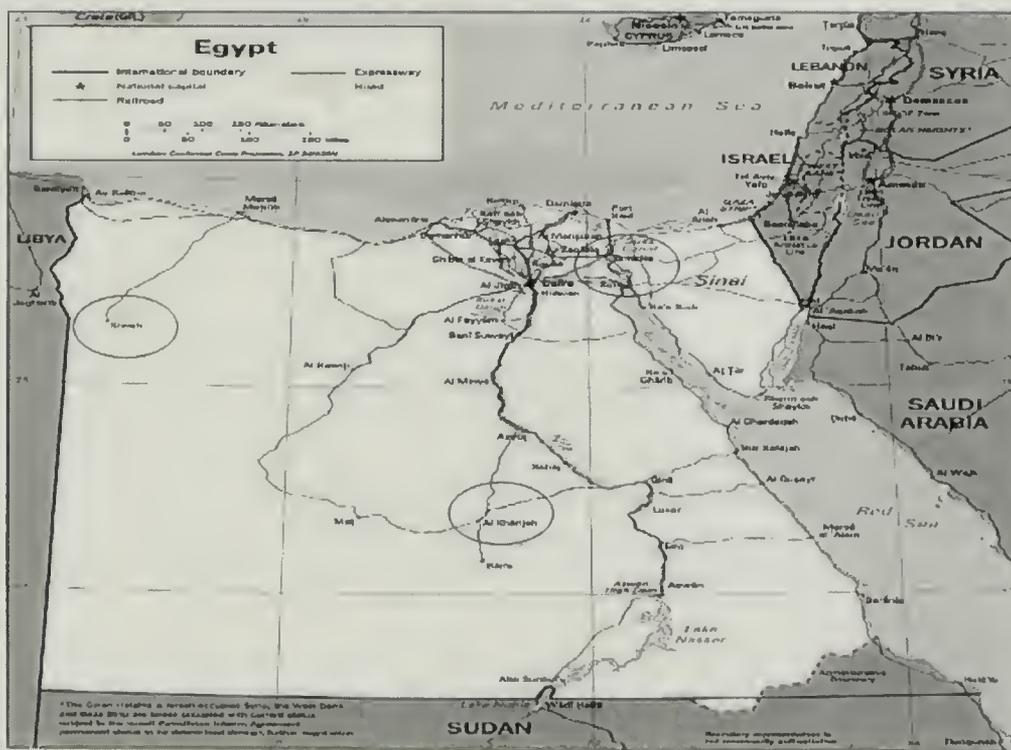


Figure 1. Egypt map with collecting areas.



## Results and Discussion

A high number of insects were collected from alfalfa fields. About 10 different orders were found Coleoptera, Diptera, Hemiptera, Homoptera, Orthoptera, Lepidoptera, Dictyoptera, Neuroptera, Odonata and Hymenoptera. Different species could be categorized depending on economic value into the following group:

1 – Pests, Table 1

2 – Natural Enemies, Table 2

3 – Pollinators, Table 3

Table 1. The most common pests in alfalfa fields:

Order	Family	Species
Coleoptera	Fam: Curculionidae	<i>Hypera brunneipennis</i> <i>Sitona lividipes</i>
	Fam: Scarabidae	<i>Tropinota squalida</i> <i>Scarabus sacer</i>
Diptera	Fam: Agromyzidae	<i>Leromyza trifolii</i>
	Fam: Muscidae	<i>Musca domestica</i>
	Fam: Calliphoridae	<i>Lucilia spp.</i>
Hemiptera	Fam: Pentatomidae	<i>Nexara viridula</i>
	Fam: Lygaeidae	
Homoptera	Fam: Jassidae	<i>Empoasca decipiens</i>
	Fam: Aphididae	<i>Acyrtosiphon pisum</i>
	<i>Therioaphis pisum</i>	
Orthoptera	Fam: Acrididae	<i>Eutropocentris plorans</i>
	Fam: Tettigonidae	<i>Homorocbryphus nitidulus</i>
Lepidoptera	Fam: Elachistidae	<i>Colias eurytheme</i>
	Fam: Lycaenidae	<i>Cosmlyce baeticus</i>
	Fam: Pieridae	<i>Pieris rapae</i>
	Fam: Noctuidae	<i>Spodoptera littoralis</i> <i>Spodoptera exigua</i>

The most abundant pest species in alfalfa field were *Cosmlyce baeticus* and *Hypera brunneipennis* and Aphids. Alfalfa weevil (*Hypera postica* Gyllenhal) and Egyptian alfalfa weevil (*H. brunneipennis* Boheman) are the most important insect pests of alfalfa. Pea aphid (*Acyrtosiphon pisum* Harris), blue alfalfa aphid (*Acyrtosiphon kondoi* Shinji), spotted alfalfa aphid (*Therioaphis maculata* Buckton), and cowpea aphid (*Aphis craccivora* Koch) are the principal aphids associated with alfalfa (Summer et al. 2007).



Table 2 the most common natural enemies associated with pests in alfalfa fields:

Order	Family	Species
<i>Coleoptera</i>	<i>Fam: Coccinellidae</i>	<i>Coccinella septempunctata</i> <i>Coccinella undecimpunctata</i> <i>Scymnus spp.</i>
	<i>Fam: Staphylinidae</i>	<i>Paederus alfieri</i>
<i>Diptera</i>	<i>Fam: Syrphidae</i>	<i>Syrphus spp.</i>
<i>Hemiptera</i>	<i>Fam: Anthocoridae</i>	<i>Orius spp.</i>
	<i>Fam: Nabidae</i>	<i>Nabis capsiformis</i>
<i>Dictyoptera</i>	<i>Fam: Mantidae</i>	<i>Sphodromatis bioculata</i>
		<i>Mantis savignyi</i>
		<i>Mantis religiosa</i>
<i>Neuroptera</i>	<i>Fam: Chrysopidae</i>	<i>Chrysopa carnea</i>
	<i>Fam: Myrmeleontidae</i>	<i>Cneta variegata</i>
<i>Odonata</i>	<i>Fam: Agrionidae</i>	<i>Ischnura senegalensis</i>
	<i>Fam: Libellulida</i>	<i>Crocothemis erythraea</i>
<i>Hymenoptera</i>	<i>Fam: Aphididae</i>	<i>Syrphus spp.</i>

Different natural enemies (parasitoids and predators) have been found in alfalfa agroecosystem associated with their hosts. Ladybird beetles, *Orius* bugs, aphid lion and some hymenoptera parasitoids were the most abundant natural enemies species in alfalfa. The most abundant natural enemies are *Bathyplectes curculionis*, *Aphidius* spp., *Trichogramma* spp., *Coccinella septempunctata*, *Coccinella* spp., *Orius* spp., *Nabis* spp., *Chrysoperla* sp. (Summer et al. 2007).

Table 3 the most common pollinators in alfalfa fields:

Order	Family	Species
<i>Hymenoptera</i>	<i>Fam: Andriidae</i>	<i>Andrina oratula</i>
	<i>Fam: Anthophoridae</i>	<i>Anthophora spp.</i>
	<i>Fam: Xylocopidae</i>	<i>Xylocopa spp.</i>
		<i>Ceratina spp.</i>
		<i>Halictus spp.</i>
	<i>Fam: Halictidae</i>	<i>Halictus spp.</i>
	<i>Fam: Apidae</i>	<i>Apis mellifera</i>
	<i>Fam: Megachilidae</i>	<i>Chalcidoma siculum</i>
		<i>Osmia spp.</i>
		<i>Megachile submucida</i>
<i>Megachile uniformis</i> <i>Megachile mintusemina</i>		

Different bee species have been collected from alfalfa ecosystem belonging to six different families. The most common and abundant



bee species was leafcutting bees. the most abundant bees visiting alfalfa flowers were Megachilid bees followed by Halictids, Anthophorids and colletids, respectively. It was clear that the most abundant species visiting alfalfa flowers was the leaf-cutting bees *Megachile patellimana* Spin (El-Badawy 1975). Total of 545 Hymenoptera, belonging to 13 genera, were obtained at the 20 alfalfa sites. *Megachile*, a genus of solitary bees, was the most frequently collected, representing almost half of all collected bees. The social *Bombus* was second in frequency, and represented 20% of the collections (Brookes et al. 1994).

Insect fauna of alfalfa in Saudi Arabia have studied using standard 15-inch sweeping net. The identification of insects revealed the prevalence of 103 insect species belonging to 94 genera, 49 families and 10 orders of class insecta. Of these insects, 18 species were recorded for the first time in Saudi Arabia. The insect fauna of alfalfa was divided, according to their importance to alfalfa grower, to the following categories of insects expressed in percentages; 48% phytophagous insects, 25.6% entomophagous insects, 21.6% pollinating insects and 4.8% for other insects (saprophagous, scavengers – etc.). Studying entomofauna of alfalfa is important for developing integrated pest management programs for alfalfa and neighboring (Alsuhaibani 1996). A fieldside view of an alfalfa field may show little apparent activity – simply a mass of green. However, each successive regrowth of alfalfa creates an environment which teems with insect life. The numbers and kind of insects that inhabit alfalfa have been described as “incredible” (Manglitz and Ratcliffe 1988). A count of 591 species was recorded in a field near Ithaca, NY (Pimental and Wheeler 1973). Insects are so abundant in alfalfa fields that university entomology classes can often be found sweeping in alfalfa fields to study the diversity of insects to be found there. Some of these insects, of course feed on alfalfa as a primary source of food, but there are many beneficial insects as well. These ‘beneficials’ prey on herbivorous or sucking insect pests of alfalfa. Dozens of predacious and parasitic insects occur in alfalfa, and several “work horses” of biological control are especially abundant (Leigh 1991). The role of beneficial insect pests in helping to reduce crop damage in an alfalfa integrated pest management (IPM) program has been understood for some time. However, several of the species present in alfalfa also effect a number of other neighbouring crops where they may greatly reduce the threat of pest damage. Due to its reservoir of insects, planting alfalfa in strips with other crops has been proposed to help distribute and nurture beneficial insects (Leigh 1991).



Nearly 1000 species of arthropods are associated with alfalfa agro-ecosystem and play an integral role in various arthropod-plant community complexes associated with the intensified agriculture (Summers 1976). More studies should be carried out in the future to study the fauna and flora structure of alfalfa and other crops, plants, trees as well. However, we should investigate the effect of climate change and global warming on the fauna and flora structure of different plants, crops, trees . . . etc. Global warming and climate change is the biggest challenge for agriculture production in the world right now so we need more answers to be ready for any change in the agriculture ecosystem.

### References

- Alsuhaibani, A. M. 1996. Entomofauna of Alfalfa in Riyadh, Saudi Arabia, Journal of King Saud University, Agricultural Sciences. *J. King Saud Univ.*, Vol. 8, Agric. Sci. (2): 269-277.
- Brookes, B., Small, E., Lefkovitch, L.P., Dammon, H. and D.T. Faurey 1994 Attractiveness of alfalfa (*Medicago sativa* L.) to wild pollinators in relation to wild flowers. *Can. J. Plant. Sci.* **74**: 779-783.
- Degooyer, T. A., Pedigo, L. P. and M. E. Rice. 1999. Effect of alfalfa grass intercrops on insect population. *Enviro. Entomo.* **28(4)**: 703-710
- El-Badawy, A. 1975. Studies on family Megachilidae in the New valley with special reference to active pollinator. Ph. D. Thesis, Fac. of Agric., Cairo University.
- Flanders, K. L., and E. B., Radcliffe. 2000. IPM world textbook, Alfalfa IPM, University of Minnesota
- Kuhn, J., T. Ellis, and L. Fitzhugh. 1996. Alfalfa helps wildlife on your farm. *In* Proceedings, 27th National Alfalfa Symposium and 26th California Alfalfa Symposium, 9-10 December, 1996, San Diego, CA. Certified Alfalfa Seed Council, Davis, CA and Univ. of California, Davis.
- Leigh, T.F. 1991. Alfalfa as an Insectary for Beneficial Insects. *In* Proceedings, 21st Alfalfa Symposium, 9-10 December, 1991, Sacramento, CA. Department of Agronomy and Range Science, University of California, Davis, CA.
- Manglitz, G.R. and R.H. Ratcliffe. 1988. Insects and Mites. pp. 671-695. *In* A.A. Hanson, D.K. Barnes, and R.R. Hill, Jr., (eds) *Alfalfa and Alfalfa Improvement*. Monograph No. 29. American Society of Agronomy. Madison, WI.
- Pimental, D. and A.G. Jr. Wheeler. 1973. Species and diversity of arthropods in the alfalfa community. *Environ. Entomol.* **2**: 659-668
- Putnam, D.H., Russelle, M., Orloff, S., Kuhn, J., Fitzhugh, L., Godfrey, L., Kiess, A. and Long, R.F. 2001. *Alfalfa, Wildlife, and the Environment. The importance and benefits of alfalfa in the 21st century. A friendly and informative guide to alfalfa, the "queen of forages"*. California Alfalfa and Forage Association. 24 pp.
- Putnam, D.H. 1998. Contributions of alfalfa to wildlife and the environment Proceedings of the 28th National Alfalfa Symposium, Bowling Green, KY, February 26-27, 1998.
- Shebl, M.A., Kamel, S.M., Abu Hashesh, T.A. and Osman, M.A. 2008. The impact of leafcutting bees (*Megachile minutissima*, Megachilidae, Hymenoptera) (Radoszkowski, 1876) artificial nest sites on seed production of alfalfa, Ismailia, Egypt. *Agricultura Journal* Volume **5** 33-35.
- Summers, C. G., Godfrey, L. D. and Natwick, T.E. 2007. *Managing Insects in Alfalfa*. University of California, Division of Agriculture and Natural Resources, Publication 8295; 12, 2007. USA.
- Summers, C. G. 1998. Integrated pest management in forage alfalfa. *Integ. Pest Manag. Rev.* **3**: 127-151.
- Summers, C. G. 1976. Population fluctuations of selected arthropods in alfalfa: influence of two harvesting practice. *Enviro. Entomo.* **5** (1): 103-110.



## Photographing Damselfies

by Matthew Renwick

*Ashtree Cottage, Goosey Green, Near Faringdon, OXON, SN78PD.*

Last June I was staying with my daughter who lives in a small village in the Vale of the Whitehorse near Faringdon in Oxfordshire. The weather was fine. Hence, one morning I set off with my camera to see if I could find something worth photographing. The swallows in flight were particularly challenging and attractive to me.

After a certain amount of success I sat on the bank of large pond to see if I could get a decent photograph of the swallows as they skimmed the water. A disused slurry pit on the adjoining, ex-dairy farm, had been transformed by nature into a rather pretty area of water. With my camera set at 2,000th of a second, F 5.6, ISO 400, I settled down by the waters edge. After a while I noticed what looked like small blue dragonflies hovering above the water just in front of me. As it turned out, the settings on the camera which were right for the swallows were also right for damselfies.

Being something of a novice as far as insects are concerned, I didn't know exactly what they were. I saw Phil Wilkins on *Born to be Wild* on the television. I thought that he might be able to help me. I looked him up on the web and sent him the photos.

He was most helpful and kind and told me exactly what they were and then asked me if he could use them in the *Bulletin*.

This is what he wrote:

The photos you have sent are all Damselfies and dragonflies (order Odonata). They are showing some interesting behaviour.

The photo labelled EXP00322 copy.jpg shows a pair 'in tandem'. The species is the Common Blue Damselfly (*Enallagma cyathigerum* to give it its proper name!). The blue one is the male and the yellow one the female. They have probably just mated and are flying to look for egg-laying sites. They form an attractive heart shape when mating. The male keeps hold of the female to stop other males grabbing her and mating (if another male succeeds – he scrapes out the first male's sperm from the female, but that's another story!).

The photo labelled EXP00324.jpg is very interesting. It shows egg-laying. It is the same species, but is clearly a male. Males, as I am sure you know cannot lay eggs. The explanation lies in the male keeping hold of the female (see above). The female sometimes



submerges while egg laying, to find a suitable plant for the eggs. Hence, the female will be under water with the male holding her. Was there a female under water?

The photo labelled EmailDSC8813.jpg shows an adult male Dragonfly of the species Black-tailed Skimmer (*Orthetrum cancellatum*). Is this the mummy you mention – I am afraid it is a male. The females are yellow. This species likes open muddy areas to bask / display. It likes larger water bodies with bare margins – like ex-gravel pits.

The final photo EXP00326.jpg shows two male Common Blue Damselflies.

A good range and interesting behaviour to photograph. There are several similar species to look out for.

The best book is by British Wildlife Publishing. It is called *Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland* by Steve Brooks.

Searching the Web I also found out that the Common Blue Damselfly *Enallagma cyathigerum* is found in lakes and ponds, streams, canals and gravel pits as long as there is adequate bank-side vegetation.

This species is very similar to the *Coenagrion* damselflies, including the Variable Damselfly, the Azure Damselfly and the Irish Damselfly. However, *Enallagma* can be distinguished by the presence of a single black stripe on the side of the thorax, as opposed to two stripes in the other species. Damselflies have retained both pairs of wings, which they use in flight. They are very strong fliers. When dragonflies rest, both pairs of wings are held perpendicular to the body whereas damselflies hold them almost parallel to the body.

The Common Blue Damselfly is well named, and is in fact very common. The markings on this species are rather variable. It is found in the UK, Europe and America. In this country, the adults can be found from May to September.

Mating can take 20 minutes. The eggs are then laid above and below the water line in plant tissue and the females are capable of remaining submerged for some time. The male will remain on guard at the point where the female entered into the water.

Damselflies spend most of their life as larvae – sometimes up to three years. The larvae are predators and feed on other creatures that live among the water weeds.



## Late developing Ichneumon

by David Keen (3309L)

*Calle Casto Bancalero 11, 41650 El Saucejo, Sevilla, Spain.*

Over many years I have managed to rear, by accident, many parasites from the larvae and pupae of Lepidoptera found in the field. My records show that most of these parasites, either flies or wasps, have emerged quite soon after the butterfly or moth caterpillar has pupated, if not before. Those that have not emerged so soon, have emerged to coincide with the next brood of larvae from the host within a period of eleven months at the most. However, I have now reared an Ichneumon and I feel that the details ought to be recorded.

On 23rd March 2007 I was returned from a walk in the local countryside when I came across a moth caterpillar walking across the track in front of me. I picked it up and brought it home where I decided that it was a Noctuid larva that was more or less full grown. It was duly transferred to a plastic box with peaty soil in the base. The soil was covered with a paper tissue and the larva was released on the top of the tissue. The next day a cocoon had been spun within the tissue and on further investigation on 13th April a pupa was present within the cocoon.

As nothing emerged from the pupa during the summer of 2007 I assumed that the moth would emerge in the following February or early March – but it did not. Regular checks showed that the pupa was still alive right through 2008 and the winter of 2008/2009. The last such check was made on 12th March 2009 when the pupa was still soft to the touch and also very active.

When I made my daily visual check of livestock on the morning of 16th March 2009 I found that a parasite had emerged. This was of the typical “Ichneumon” group of Hymenoptera with a black head and body and reddish legs and antennae. The length from head to tail is 16mm and the wingspan 26mm. At the present time I do not have any keys to the identification of the Spanish Ichneumonidae so I doubt if I will be able to name this specimen – the English species have given me quite enough problems in the past without the added complication of translating Spanish literature!

I would be interested, however, to hear from any members who have encountered a similar “late” emergence of such a parasite.



## Charles Darwin's Beetles

In Darwin's Bicentenary year, Max Barclay has provided the AES Bulletin with photographs from the extensive collection of the Natural History Museum in London. The first photograph is featured here.



*Nyctelia fitzroyi* Waterhouse, Captain FitzRoy's darkling beetle (Tenebrionidae).

Captain Fitzroy's darkling beetle specimen collected by Darwin at Port Desire, 1834. Port Desire is a fishing port (now known as Puerto Deseado) in Patagonia in the Santa Cruz Province of Argentina, on the estuary of the Deseado River. Darwin visited the area on his voyages on the Beagle, which, of course, was commanded by Captain FitzRoy.



## Jordan's Cereals' Big Buzz

As you may have heard in the news recently, bee numbers have been in sharp decline over the last couple of years, with 30% of hives wiped out in the last year alone. Sad as that sounds, it is only when you consider bees' contribution to the country that things get really worrying. A third of the food we eat requires bees for pollination and bees add over £200m to the UK economy.

To help combat this issue and raise awareness for the plight of bees, Jordans Cereals have just launched their 'Big Buzz' campaign and they need YOU to get involved. The Big Buzz campaign allows you to help Britain's bees thrive by filling your garden with free, bee-friendly plants, and that's just for starters...

To help them to spread the word about the plight of the humble bumble, Jordans have created a fun message system, the Bee-Line. Jordans' Bee-Line allows you to send your friends a message by bee, giving you a fun new way to stay in touch whilst spreading the news of the Big Buzz.

You can send a Bee-Line to your friends by visiting <http://www.jordansbigbuzz.co.uk/funny-honey-stuff/bee-line>

With your help Britain's gardens can be turned back in to the happy hives of activity they used to be. To keep up to date with all the happenings in the Big Buzz make sure you follow the Big Buzz on Twitter [www.twitter.com/jordansbigbuzz](http://www.twitter.com/jordansbigbuzz) where all the news as it happens will be posted.

To find out more about how to get involved with Jordans Big Buzz please click here [www.jordansbigbuzz.co.uk](http://www.jordansbigbuzz.co.uk)

Here's to getting Britain buzzing!

## British Butterflies throughout the year by Peter May

This new book from the AES describes the adults of different species of British butterflies, according to the time of year they appear on the wing. Nearly all the 60 British species are illustrated. Focussing on encouraging an interest in entomology among the young, and the young at heart, there is a helpful calendar of flight times and a useful checklist to help you keep track of your observations.

£ 5.00

Members price £ 3.80

## Preparing and maintaining a collection of Butterflies and Moths

by P. May and M. White. A practical manual detailing the various methods used to prepare specimens for a collection, from killing methods, setting the specimens and repairing damaged ones, to storage and preservation, including pest prevention and cure.

£4.85

Members price £3.65

## The Hymenopterist's Handbook by Dr. C. Betts et al.

2nd edition dealing with the history of their families, classification and structures, natural history, studying, collecting, breeding, attracting and preserving Hymenoptera. Appendices include keys to the families. 214 pages with numerous tables, keys and figures (1986)

£ 11.45

Members price £ 8.60

## Revised Flight Tables for the Hymenoptera

Revised flight tables for the Hymenoptera giving, wherever possible, times, location, flower visits and some indication of distribution and abundance. 24 pages (1988)

£ 3.10

Members price £ 2.35

## A Coleopterist's Handbook

Edited by J. Cooter & M.V.L. Barclay. The *Coleopterist's Handbook*, is now available as a fully revised and expanded fourth edition. Nomenclature has been brought inline with current use, collecting/curatorial methods reflect best practice and plant/beetle and beetle/plant lists are included together. Recent additions to the British fauna, modern and traditional techniques are included. All advice and comment given in the book is based upon collective years of practical experience of both curatorial methods and field craft. beetle family chapters have each been written by an internationally recognised authority.

£ 54.00

Members price £ 39.00

## Host plants of British Beetles: A List of Recorded Associations

A list of a wide range of plants, in alphabetical order, together with the beetle species that have been recorded as being associated with them. 24 pages (1992)

£ 3.10

Members price £ 2.35

## A Silkmoth Rearer's Handbook by B.O.C. Gardner

SPECIAL OFFER PRICE £ 7.70

No further discounted price available

## A Dipterist's Handbook by A.F. Stubbs, P.J. Chandler and others.

A practical handbook for both the beginner and the initiated on collecting, breeding and studying the two-winged flies. Describes equipment, trapping, preservation, habitat, plant and animal associations and behaviour. Includes a detailed chapter on larval stages with an illustrated key to families. An essential book for the keen Dipterist. 260 pages with drawings of larvae and equipment (1978, reprinted 1996)

£ 14.20

Members price £ 10.20

## Practical Hints for Collecting and Studying the Microlepidoptera

by P.A. Sokoloff. A practical manual for those interested in the smaller moths, describing techniques for collecting adult moths, collecting immature stages, breeding, killing, setting and mounting. A list of useful books and journals as well as details of societies and suppliers is included. 40 pages, 11 figures (1980)

£ 4.20

Members price £ 3.15

## Rearing and Studying Stick and Leaf-Insects by P.D. Brock

Specifically intended for beginners, although it is also suitable for experienced Phasmid enthusiasts, it is one of the few guides to rearing that features the majority of the culture stocks available, 22 species in detail. The informative text is complemented by 8 colour plates, 14 black and white plates and 29 figures. (New edition, 2003)

£ 11.20

Members price £ 8.20

## The Study of Stoneflies, Mayflies and Caddisflies by T.L. Macan

A comprehensive guide to collecting and studying the biology and ecology of these aquatic insects. 44 pages, 10 figures and bibliography (1982)

£ 4.20

Members price £ 3.15

## Breeding the British Butterflies by P.W. Cribb

A practical handbook covering all aspects of butterfly breeding, including general techniques, equipment and hints on how to breed each of the British species. 60 pages, 6 figures, 5 plates. Revised (2001)

£ 5.20

Members price £ 3.85

## Practical Hints for the Field Lepidopterist by J.W. Tutt

Written at the turn of the century, this book has been reprinted because of its scarcity and value to students of Lepidoptera. It gives a complete month by month guide to which species and stages of macro and micro to look for and how to find them. Also contains a biological account of the early stages and how to keep, rear, photograph and describe them. 422 pages. Hardback (Reprinted 1994)

£ 24.00

Members price £ 18.30

## An index to the modern names for use with J.W. Tutt's Practical Hints for the Field Lepidopterist by B.O.C. Gardner

A valuable cross-reference guide between the scientific and English names used in the early 1900s and the present time

£ 4.70

Members price £3.50

## A Guide to Muth traps and their use by R. Fry and P. Waring

The first sections deal with the measurement and properties of light leading into the types of lamp available and the electrical circuits needed to operate them. The next sections give details of the construction of the most popular traps used in the UK. The last half deals with the practical use of traps in the field including where and when to trap, limitations of traps and their relative performance. 68 pages, 21 figures, 15 plates (1996)

£ 6.85

Members price £ 5.05

## The Amazing World of Stick and Leaf Insects by Paul D. Brock

A superb, comprehensive guide, for all those intrigued by these groups of insects. Topics covered include structure, fascinating facts, life history and development, defence behaviour, enemies, collecting, breeding (including trouble shooting), preserving, taxonomic studies, important collections in Museums etc. around the world and elaborate stories, heliols and poems. Also outlines the major known species around the world on a regional basis. A section on fossils is included. Includes a comprehensive glossary of the technical terms used in the description and classification of stick and leaf insects. Hardback A5, 184 pages, 46 figures, 26 black and white plates and 40 pages of colour plates (containing 83 photographs and 4 drawings/paintings of insects and their habitats). (1999)

£ 18.90

Members price £ 14.10

## Rearing Parasitic Hymenoptera by M. Shaw

This booklet provides information on the parasitic Hymenoptera to enable successful studies to be made of this little understood group of the British insect fauna. Details are given on the general biology of parasitic wasps, rearing principles, efficient rearing practices and detailed methods of dealing with adult wasps. 52 pages, 4 colour plates (New edition 2001)

£ 5.70

Members price £ 4.20

## Larval Foodplants of the British Butterflies by Peter May

A comprehensive compilation of the known larval foodplants of our native and immigrant butterflies. Also including "How to Encourage Butterflies to Live in Your Garden" by the late Peter Cribb. 62 pages. (2003)

£ 7.40

Members price £ 5.45

## The larger water beetles of the British Isles by Peter Sutton

For those who love the spectacular larger water beetles of the British Isles, this is the publication that you have been waiting for! It is the only modern publication with colour illustrations of all of our aquatic coleopteran megalana and it provides the most up-to-date distribution maps revealing their current distributions. Jam-packed with fascinating details of their life-histories, this book covers 11 species including the 6 native 'Great Diving Beetles' and the 'Silver Water Beetles'. It is also copiously illustrated with text figures and has much additional information including details of observed climate-induced range changes and the conservation measures required to ensure their continued survival.

£ 11.90

Members price £ 8.90

## Glossary for the Young Lepidopterist

6 pages, 2 figures. (1951)

£ 1.05

Members price £ 0.90

## A Label List of European Butterflies

20 pages. (Revised 1981)

£ 2.35

Members price £ 1.85

## Some British Moths Reviewed

Aid to the identification of some of the more difficult species. Reprinted from the *Amateur Entomologist* Vol. 5 (1941) and a *Guide to the Critical Species of Lepidoptera*, reprinted from *Entomologist's Gazette* 1969-72. 64 pages, 6 black and white plates, numerous figures (1985)

£ 4.45

Members price £ 3.35

## Butterflies of Cyprus 1998 (Records of a years sightings) by Eddie John

Observations of the 44 species of butterfly found on the island in 1998 including notes on each species and distribution maps. 46 pages (2000)

£ 4.30

Members price £ 3.25

## Collecting Hel-Bugs (Hemiptera: Heteroptera)

12 pages (including 2 plates) (1946)

£ 1.20

Members price £ 1.00

## Collecting Clearwings

12 pages (including 2 plates), 4 figures. (1946)

£ 1.10

Members price £ 1.00

## Collecting Lacewings

9 pages, 8 figures, 5 plates. (2nd edition 1976)

£ 2.25

Members price £ 1.75

## An Amateur's Guide to the Study of the Genitalia of Lepidoptera

16 pages, 15 figures. (1973)

£ 3.10

Members price £ 2.35

## Rearing the Hymenoptera Parasitica

16 pages, 1 plate, 10 figures. (1974)

£ 2.55

Members price £ 2.00

## Rearing Crickets in the Classroom

12 pages, 2 plates. (1986) (Reprinted 1993)

£ 2.10

Members price £ 1.65

## Guidelines for Entomological Site Surveys

Published on behalf of the JCCBI. 7 pages (2000) (Reprinted 2003)

£ 3.10

Members price £ 2.35

## The Journal of the Entomological Exchange and Correspondence Club 1935-1936

An AES Jubilee Publication. Fascinating reprint of the very first volume of the AES journal. 100 pages

£ 4.20

Members price £ 3.35



All the above publications sent post free to U.K. addresses. Outside U.K. please add 10% to order value for postage by surface mail.

For postage by air-mail outside Europe please add 30% to order value. Please allow 28 days delivery.

Please make all cheques/postal orders payable to 'AES Publications' and send to:

AES Publications, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Telephone 01277 224610 • Fax: 01277 262815 • E-mail: aespublications@btconnect.com

## Specialist in Argentinian Butterflies and Collecting Tours

*Rhopalocera*  
*Saturnidae*  
*Sphingidae*  
*Carabus etc.*

Details on collecting trips and complete price list on all Argentinian species to:

Nigel South, Mis Montanas,  
Los Robles 1818, Villa Los Altos,  
Rio Ceballos 5111, Cordoba,  
Argentina

Email:  
butterflyconnections@hotmail.co.uk

Tel: 00 54 3543 454627



[www.amentsoc.org](http://www.amentsoc.org)

Visit the AES shop to renew your membership, order from AES Publications or order other AES merchandise!

*And don't forget to visit the News page for the latest entomological news!*

[www.amentsoc.org](http://www.amentsoc.org)



## Ian Johnson Natural History Books

*(Pemberley Books)*

Specialist in *Entomology* and related subjects  
Also *Zoology, Ornithology, Botany* etc.

- CATALOGUES – Second-hand, Antiquarian and New books – free catalogues available on request.
- SPECIALIST BOOKSHOP at Richings Park, Iver, just to the West of London – easy to reach by car or train. Visitors are welcome to visit and view our stock, but please telephone first to confirm opening times.
  - \* *By car*: only 10 minutes drive from the M25 via the M4 (Junction 5), or M40 (Junction 1). 15 minutes from Heathrow Airport.
  - \* *By train*: 20 minutes from London Paddington to Iver Station on the Paddington-Slough Thames Trains service (2 trains every hour). We are 1 minute's walk from Iver Station.
- WEBSITE – view our stock on our website: [www.pemberleybooks.com](http://www.pemberleybooks.com).
- BOOKS BOUGHT – We are always interested in purchasing books in our specialist field, particularly antiquarian, academic and scholarly works on insects and other invertebrates.

18 BATHURST WALK, RICHINGS PARK, IVER, BUCKS SL0 9AZ  
Tel: 01753 631114/Fax: 01753 631115 • e-mail: [ian.johnson@pemberleybooks.com](mailto:ian.johnson@pemberleybooks.com)



**Do you have an interest in butterflies  
or natural history, and are you confident  
interacting with the general public?**

**We are looking for volunteers  
for the newly opened Butterfly House  
at Golders Hill Park, on Hampstead Heath.**

**Tasks include monitoring the welfare of  
the butterflies, maintaining the Butterfly  
House environment, welcoming visitors  
and helping them to understand conservation  
issues surrounding butterflies and their  
habitats in the wild.**

**The Butterfly House is open everyday  
between April and October  
from 2pm to 4pm**

**Contact 020 8458 9102 for more information  
or download an application form online at  
[www.heath-hands.org.uk/volunteer](http://www.heath-hands.org.uk/volunteer)**



Heath  
Hands



CITY  
LONDON



## AES Membership Rates 2009

Membership of the Society runs from 1st January to 31st December each year. New members will receive all publications published during the year of enrolment subject to availability, except for those joining on or after 1st October.

Members joining on or after 1st October will be deemed to have joined for the following year unless a specific request for membership of the current year is made. In such cases, the publications already published that year will be sent with the enrolment confirmation letter and the remaining ones received as they are published. A further membership subscription will be necessary for the following year.

If you have any queries about membership please contact us via the website, [www.amentsoc.org](http://www.amentsoc.org) or PO Box 8774, London SW7 5ZG

### Individual Adult Membership

Membership sub-category	UK	Overseas
<i>Bulletin only</i>	£20.00	£25.00
<i>Entomologist's Record only</i>	£25.00	£30.00
<i>Bug Club Magazine only</i>	£20.00	£25.00

### Individual Bug Club / Junior Membership

Membership sub-category	UK	Overseas
Junior under-18 ( <i>Bug Club Magazine only</i> )	£12.00	£17.00
Junior aged 13-17 ( <i>Bulletin only</i> )	£12.00	£17.00

### Family or Combined Membership

Membership sub-category	UK	Overseas
<i>Bulletin &amp; Entomologist's Record</i>	£40.00	£45.00
<i>Bulletin &amp; Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record &amp; Bug Club Magazine</i>	£35.00	£40.00
<i>Bulletin, Entomologist's Record &amp; Bug Club Magazine</i>	£48.00	£53.00

### Associate / Institutional Membership

Membership sub-category	UK	Overseas
<i>Bulletin only</i>	£20.00	£25.00
<i>Entomologist's Record only</i>	£50.00	£55.00
<i>Bug Club Magazine only</i>	£20.00	£25.00
<i>Bulletin &amp; Entomologist's Record</i>	£65.00	£70.00
<i>Bulletin &amp; Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record &amp; Bug Club Magazine</i>	£65.00	£70.00
<i>Bulletin, Entomologist's Record &amp; Bug Club Magazine</i>	£75.00	£80.00

**The Amateur Entomologists' Society**

PO Box 8774, London SW7 5ZG

[www.amentsoc.org](http://www.amentsoc.org)

The  
**Bulletin**  
*of the Amateur Entomologists' Society*

Volume 68 • Number 483

April 2009

CONTENTS

Editorial .....	41
Tebbutt, P. Orange Tip ( <i>Authocharis cardamines</i> ) Gynandromorphs.....	42
Trevis, G. Events in Worcestershire .....	45
Best, G. A Day with the Emperor.....	46
Keen, D. Mantids found in this area – an up-date for 2008.....	48
Best, G. Sugaring for Red Underwings ( <i>Catocala nupta</i> ) .....	49
Tebbutt, P. Further Notes on Gynandromorphs .....	50
Best, G. Breeding the Deaths Head Hawk Moth in Captivity .....	54
Waring, P. Moths Count event, 28-29 June 2008, Margrove, Tees Valley, Cleveland, North Yorksire.....	56
Wilkins, P. Reflections on the Pale-lemon Sallow <i>Xanthia ocellaris</i> (Borkhausen, 1792) ..	61
Best, G. Butterfly Photography.....	63
Hough, M. Light and Sheet in the Mountains of Thailand .....	64
Belted Beauty ( <i>Lycia zonaria</i> ).....	69
Shebl, M.A., Kamel, S.M., Hashesh, T.A.A. and Osman, M.A. The most common insect species in Alfalfa field in Egypt.....	70
Renwick, M. Photographing Damselflies.....	77
Keen, D. Late developing Ichneumon .....	79
Charles Darwin's Beetles .....	80
Jordan's Cereals' Big Buzz .....	81

ES 36 A

# The Bulletin



*of the Amateur Entomologists' Society*

Volume 68 • Number 484

June 2009

THE NATIONAL  
HISTORY MUSEUM  
- 7 JUL 2009  
PRESENTED  
ENTOMOLOGY LIBRARY



ISSN 0266-836X

Editors: Dr P. Wilkins & M. Hough



000174463



Founded in 1935

The AES • P.O. Box 8774 • London • SW7 5ZG

<http://www.amentsoc.org>

### Officers of the Society

<i>President:</i>	Robin Wootton
<i>Secretary:</i>	Dafydd Lewis
<i>Treasurer:</i>	Peter May
<i>Acting Registrar:</i>	Dafydd Lewis
<i>Bulletin Editors:</i>	Phil Wilkins & Martin Hough
<i>General Editor:</i>	Jacqueline Ruffle
<i>Advertising Secretary:</i>	Peter Hodge
<i>Exhibition Secretary:</i>	Wayne Jarvis
<i>Youth Secretary:</i>	Kieren Pitts
<i>Conservation Secretary:</i>	David Lonsdale
<i>Webmaster:</i>	Kieren Pitts
<i>ICN Editor:</i>	David Lonsdale
<i>Wants &amp; Exchange:</i>	Peter May

---

THE AES WORKS TO PROMOTE AND DISSEMINATE ENTOMOLOGICAL KNOWLEDGE AND TO ENCOURAGE AN INTEREST IN ENTOMOLOGY AMONG THE YOUNGER GENERATION.

---

#### **BULLETIN ADVERTISING RATES:**

Advertising in the AES *Bulletin* is a cost effective way of reaching all AES members and many others who benefit from institutional subscriptions.

Full page £75 for each advert or £375 for six adverts in the same year.

Half page £50 for each advert or £250 for six adverts in the same year.

Quarter page £30 for each advert or £150 for six adverts in the same year.

---

#### **NOTICE**

It is to be distinctly understood that all views, opinions, or theories, expressed in the pages of this Journal are solely those of the author(s) concerned. All announcements of meetings, financial grants offered or sought, requests for help or information, are accepted as bona fide. Neither the Editor, the Officers and Council of the Society, nor its Trustees, can be held responsible for any loss, embarrassment or injury that might be sustained by reliance thereon.

# Worldwide Butterflies [www.wwb.co.uk](http://www.wwb.co.uk)



## The new Goodden Light 12v for use in remote areas

Now  
available  
alone or  
with the  
**Moonlander  
Moth Trap**

By studying the light output from MV, Robert Goodden has developed this sophisticated portable unit with aspects in common with MV, using so little power that it runs all night on a 7.5Ah battery. It attracts insects much better than actinic lights, even powerful ones requiring heavy batteries. **Rainproof and safe.** An in-line photoswitch puts the light on and off automatically. With this switch the unit can be used vertically or horizontally in any moth trap.

See [www.wwb.co.uk](http://www.wwb.co.uk) for prices and more.

## Moonlander Moth trap

Folds totally flat and is contained in a convenient slim shoulder bag. Very lightweight.

**The Moonlander turns the principle of moth trapping upside down!** Moths enter from the bottom and cannot escape through the top. **Works as sheet and trap combined.**

Better than traditional egg boxes, moths prefer the new **reticulated foam moth shelters** and cone.

**The Moonlander** is now available **without electrics, or with Battery, Mains or BOTH.**

See the options on [www.wwb.co.uk](http://www.wwb.co.uk)



*No escape through the top*



**Both trap and light are total innovations by Robert Goodden.**

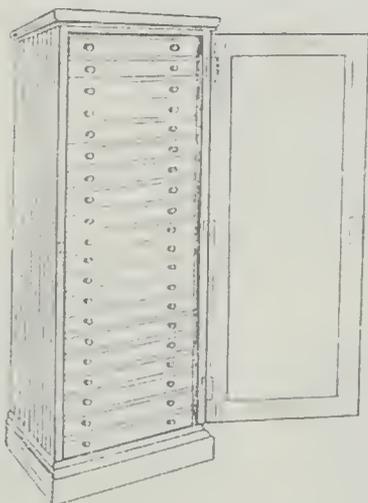
They are tried and tested in Europe and the tropics. In good conditions the results are spectacular.

**Worldwide Butterflies** website offers **Livestock and Equipment for breeding and study. Specimens for specialist collectors will be added as available.** The system enables you to see exactly what is currently available as the season changes. From time to time there are special **Sale Offers** of equipment, books, livestock and specimens - an ever changing situation.

[www.wwb.co.uk](http://www.wwb.co.uk) Add it to your **Favorites** - check it regularly.

# ATROPOS ANTIQUES\*

## PURVEYORS OF FINE COLLECTOR'S CABINETS



*Many of you will have met us at the AES  
London Fair where we regularly show  
entomological cabinets for sale*

- We are specialist dealers in fine collector's cabinets.
- We can offer a choice of at least 30 cabinets, varying in purpose, construction, quality and price.
- We can supply both restored and un-restored cabinets and will undertake to restore and paper cabinets for clients.
- We are always interested in the purchase or exchange of cabinets, with or without a collection.
- Callers to our showrooms are always welcome by appointment.
- We offer a specialist collection and delivery service throughout the UK and have full expertise in the safe transportation of cabinets and collections.

**George Morgan**

**97, West Street, Hartland, N. Devon EX39 6BQ**

**T: 01237-441205/984 M: 07973 302190**

**E-mail: [george@atropos.wanadoo.co.uk](mailto:george@atropos.wanadoo.co.uk)**

\*We are an independent dealership of 30 years standing and have no association with any similarly named business.

# NAP NEW PUBLICATION

Volume 2 of a collection of 4 volumes which cover most of the moths of Europe.

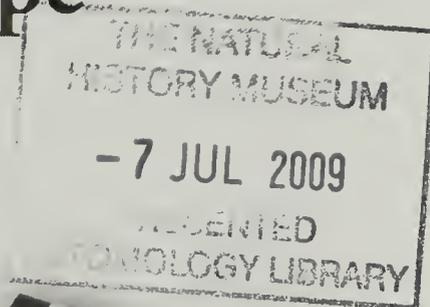
Author : Patrice LERAUT

## Moths of Europe

Geometrid Moths

Volume 2

Published in English



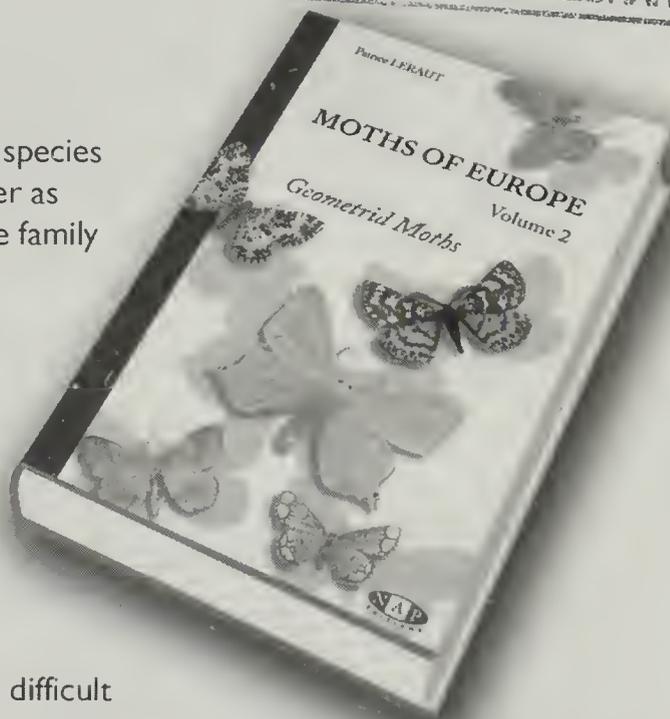
### 2800 illustrations of Geometrid moths of Europe

This guide book deals with more than 1000 species of Lepidoptera traditionally grouped together as geometers and classified in the Geometridae family (plus a single species from the Uraniidae): illustrations are displayed in the form of 158 colour plates showing 1116 species in 2800 photos.

Four new genera, seven species and 17 subspecies are described.

The precise description of each species is given with details on their biology, and distribution maps are provided.

200 line drawings clarify certain anatomical characters and illustrate the genitalia of taxa difficult to distinguish.



### A concise virtually complete field guide.

Hardback cover

Bound book

Format 13 x 20,5 cm

808 pages

**85€ - (£82)**

For bulk orders please contact us

(+7 € postage for one book

+2 € by additional book)

Payment accepted by international money order, international visa card, bank transfer,  
For more than one copy and grouped orders, contact us by email, fax, or post at the address below.

© N.A.P Editions : 3 chemin des hauts gravières - 91370 Verrières-Le-Buisson - France

Tel. (+33).1.60.13.59.52 - fax (+33).1.60.13.01.33

napedit@wanadoo.fr

For further information consult [www.napeditions.com](http://www.napeditions.com)

**£14.99 (inc. UK p&p)**

£16.99 (overseas)

## **Rearing Stick and Leaf Insects**

by Ronald N. Baxter

Fifty species described in detail: how to care for eggs prior to hatching, caring for small and large nymphs and adults. Including information on distribution,

descriptions, egg and egg laying, list of foodplants and general rearing requirements.



112 superb colour photographs and 12 stunning plates of 146 illustrations of Phasmid eggs, of a quality never before published.

**ORDER YOUR COPY NOW FROM**

Cravitz Printing Company Limited

1 Tower Hill, Brentwood, Essex CM14 4TA.

Tel: (01277) 224610 • Fax: (01277) 262815 • E-mail: [CravitzPrinting@btconnect.com](mailto:CravitzPrinting@btconnect.com)



## **Bulletin Cover**



This month's cover features a mantid on the Greek island of Corfu. An article on the insect fauna on Corfu by Peter Sutton will appear in a future *Bulletin*.

Photograph: Peter Sutton

# The Bulletin

*of the Amateur Entomologists' Society*

Volume 68 • Number 484

June 2009

## Editorial

It is not often that insects make the national news. Usually when they do, it is because of some perceived threat – “Colorado Beetle found in Warehouse”, or because the presence of rare species impedes some planning monolith – “Buglife fights development plans in West Thurrock”. But headlines have been made this month by a spectacular natural event – the massive migration by Painted Lady butterflies (*Vanessa cardui*). Suddenly thousands of ordinary members of the public went out to look for butterflies, and were delighted with what they saw. The visitors were seen up and down Europe – we even received a short note from our Spanish correspondent, David Keen, who had witnessed it even in the Iberian Peninsula.

It is to be hoped that we may yet be delighted by an abundant second generation of these butterflies, and many insect recorders are on the watch in case there is an influx of other species. We will, of course, be very happy to publish observations in the *Bulletin* – send them in to AES *Bulletin*, P.O. Box 8774, London SW7 5ZG or email them to [bulletin-submission@amentsoc.org](mailto:bulletin-submission@amentsoc.org)

**Martin Hough**



## Announcement

The British Ladybird Research Group will have a stand at the Royal Society Summer Exhibition (30th June - 4th July) entitled: ‘Ladybird, ladybird: unravelling the story of an alien invader’. We hope to see some AES members there!



## Corrections

Several typographical errors slipped into Hewett Ellis's article on parasitoids in the Small Skipper in the February 2009 *Bulletin* (Vol 68 no 482 pp 23-30). The most important ones were in the references, which are corrected below, with apologies to the author.

Page 23 and 30

Shaw, M. R. And Askew, R. R. (1976). *Parasitoids*.

In: *Moths and Butterflies of Great Britain and Ireland*, ed. J. Heath, I: 24-56.

Page 28 for Dr. UJ. Lasalle read Dr. J. Lasalle.

Page 29 and 30

Gauld, I and Bolton, B (1988). *The Hymenoptera* British Museum (Natural History), Oxford University Press, Oxford.

Page 30

Ellis, H.A. (1999). *The Small Skipper Thymelicus sylvestris* Poda (Lepidoptera: HesperIIDae) in North-east England: history and current status. In *Entomologist's Record and Journal of Variation* **111**: 222-225.

Shaw, M. R. (1990). Parasitoids of European butterflies and their study. In: *Butterflies of Europe*, ed O. Kudrna, Vol. 2: *Introduction to Lepidopterology*. AULA-Verlag, Wiesbaden.

**Martin Hough**





## AES Events Calendar 2009



Please see the AES website for full and up to date listings of AES and other events.

All AES events are free to members and their guests.

For further details please contact the AES Secretary via the PO Box or via email ([secretary@amentsoc.org](mailto:secretary@amentsoc.org))

### **Thursday 27th August:**

AES & Bug Club visit to the World Museum Liverpool

William Brown Street, Liverpool, L3 8EN. 11:00 - 4:00

This exciting visit will involve a tour of the museum's extensive insect collections and a guided visit to the Bughouse and the Clore Natural History Centre. This AES event is also open to members of local entomological and natural history societies and their guests. Please let the AES secretary (or Guy Knight at the Museum) know if you plan to attend – [secretary@amentsoc.org](mailto:secretary@amentsoc.org).

### **Friday/Saturday or Saturday/Sunday 21st - 23rd August:**

Osterley Park, Middlesex, BioBlitz

This will involve a weekend survey of ancient grassland and woodland at Osterley Park, including examining the contents of moth traps during the evening and the following morning. Includes talks by the warden on invertebrate conservation at Osterley Park by the National Trust. Contact Osterley Park to reserve a place. 020 8232 5069

### **Saturday 12th September:**

Oxford University Museum of Natural History

Parks Road, Oxford OX1 3PW. 11:00 - 4:00.

Meet up at the Museum's entomology department (upstairs) at 11:00 am.

This event will involve bug hunting in the nearby University Parks, followed by lunch and examining and handling insects and other invertebrates in the Museum. Led by Darren Mann.

Please let the AES secretary know if you plan to attend - [secretary@amentsoc.org](mailto:secretary@amentsoc.org).

**Friday 18th September:**

National Moth Night at Perivale Wood

From 7:15pm until late.

Entrance from Sunley Gardens: <http://tinyurl.com/pgggad>

Moth trapping etc. Free to members and their guests and others but booking essential please – contact David Howdon ([david.howdon@virgin.net](mailto:david.howdon@virgin.net)) if you plan to attend.

**Sunday 27th September:**

AES survey of a Surrey garden.

Joint meeting with the Holmesdale Museum Club, Reigate.

Led by Jacqueline Ruffle.

**Saturday 17th October:**

Annual Exhibition & Insect Fair,

Kempton Park Middlesex



*The UK's premier entomological fair.*

**Saturday 7th November:**

Worcestershire Entomology Day

A day of talks and displays organised by Wyre Forest Study Group. This year the event will focus on changes in the insect fauna of the county, resulting mainly from climate change. Prebooking is advised – please note there is a charge of £8 for this event! The meeting will be held at Heightington village hall at SO764711. If you would like to attend please contact Geoff Trevis (AES Conservation Representative for Worcestershire) on 01905 774952 or by e-mail at [geoff.trevis@btinternet.com](mailto:geoff.trevis@btinternet.com)



## AES Outreach Calendar 2009

The AES will have a presence at the following events in 2009.

Help from members to man the stand at these events would be much appreciated.

Please let the AES secretary know if you can help – [secretary@amentsoc.org](mailto:secretary@amentsoc.org).

**4th July:** Royal Entomological Society Insect day, York Museum

**5th July:** 'Go green at Gatton'. Gatton Park, Reigate, Surrey

**19th July:** Stroud Festival of Nature, Stratford Park, Stroud, Glos.

**20th August:** Osterley Park Insect Day, Osterley, Middlesex

**12th September (Saturday):** Droitwich Spa Salt Day, Worcestershire  
From 10:30 am

**13th September (Sunday):** Banstead Countryside Day. 10 am - 4 pm





## Amateur Entomologists' Society Grants and Awards

### AES Grant Scheme:

No new applications under the AES Grant Scheme will be considered this year. The Scheme is under review by the AES Council and it is intended that the launch of a new grant scheme be announced before the end of this year.

### Cribb Award

The Cribb Award is a recognition of work done by UK residents in the field of Conservation, and is presented at the Society's AGM. For more details see [www.amentsoc.org/publications/icn/articles/cribb-award/html](http://www.amentsoc.org/publications/icn/articles/cribb-award/html)

### Awards for Exhibits at the Annual Exhibition

The Bradford Award (currently £100) is made for the best exhibit by an adult member. The judging is done at the exhibition by the AES President and two council members, and the prize is presented at the exhibition.

The Anson Award is made for the best exhibit by a junior member. The prize is £60 but this can be divided among more than one winner if the judges – the President, the *Bug Club Magazine* Editor and the Youth Secretary – decide that this is merited. The prize is presented at the exhibition.



## Exciting opportunity to carry out survey work on Headley Heath!

*by Jacqueline Ruffle*

*5 Monks Walk, Reigate, Surrey, RH2 0SS. Jmr0204@yahoo.co.uk*

The Headley Heath Trust have selected eight geologically different areas which they want surveyed. This has arisen because the grazing of the land has changed to Banded Galloway Cattle and they want to assess how this will impact on the plants in the area.



Then they felt that whilst looking at plants, they should also study insects as everything is inter-related. The area is an SSSI and an AONB so collecting is not allowed and it suffers from dual use as a public access area and a conservation area.

They are hoping to start the plant survey in June/July and



obviously from an insect point of view it would be good to take advantage of the Summer months, so if you would be interested in helping, please contact me asap. They anticipate that the survey could last for several years in order to give time for trends to develop and to gain a large data set.

A few of us have been to some areas of the site which is comprised of grassland, chalk heath, acid heath, a heather and gorse area and woodland. Some areas are relatively level, others are on fairly steep slopes. Within each area, a plot of land approx. 35m<sup>2</sup> has been marked out and it is proposed to record the plants and insects within that plot.

On one area the top soil has been mechanically removed and piled up to form a bank on one side. The aim is to remove any tenacious plants and give dormant seeds underground a chance to germinate. This area was covered in chalk rubble as the work has been carried out too recently to allow for any re-growth. The trust have plotted out a 'W' shaped series of transects which they hope to walk along on a regular basis, recording the plant species which are growing within about one metre either side of the line.

The second site that we visited was a hillside with an acid chalk substrate, where an acidic soil lies on top of a chalky substrate so that calcifuges and calcicoles can be found side by side. Because of the rarity of this combination of pHs it is known to have a large number of orchids and other plants of interest.

There are a further four sites that we have not yet visited.

It is a very interesting piece of land that would merit further investigation but to make a valid contribution we need help from other members of the society. So, if you live within reach of Headley (Surrey), you are competent at identifying a group of insects and you have the time and inclination, please get in touch.



## AES Annual Report for the Year ended 31 December 2008

**Membership.** Total membership of the Society at 31st December 2008 was 1274, an increase of 38 over the previous year.

**Conservation.** The Society continues to work with appropriate conservation bodies including Invertebrate Link and Buglife, the Invertebrate Conservation Trust. *Invertebrate Conservation News* was published three times during 2008 and conservation-related articles have continued to appear in each issue of the *AES Bug Club Magazine*. In September an AES poster was presented at the Royal Entomological Society's annual meeting showing how our efforts to encourage the younger generation to take an interest in entomology have a strong conservation dimension, and this engendered much interest, including some in the national press. Copies of the poster are available on our website, or as hard copy on request to the Secretary.

**Publications.** Two excellent new books were published during the year under the AES Publications imprint: *A year in the life of British ladybirds* authored by Professor Mike Majerus and colleagues, and *The larger water beetles of the British Isles* by Dr Peter Sutton.

The bimonthly *AES Bulletin* and *AES Bug Club Magazine* were published as usual. During the year we reached agreement to take over the publication of the *Entomologist's Record and Journal of Variation*, commencing in January 2009.

**Events.** Events held during 2008 included the Members' Day and AGM held at the Natural History Museum, London, in April and the Annual Exhibition at Kempton Park in October. Outreach events included those at Wildlife Aid, in Leatherhead, at Gatton Park near Reigate, and at two events at Osterley Park in Middlesex, together with Bug Club outings to Wisley (RHS) during National Insect Week, and to the Oxford University Museum in September.

**Development, Publicity and Affiliations.** During 2008 we established three new affiliations. Firstly, our affiliation with the Royal Entomological Society was extended to include a partnership effective from 1st January 2009, involving the management of the AES Bug Club, which will be renamed 'The Bug Club'. We also established affiliations with the Quekett Microscopical Club and the Conchological Society of



Great Britain and Ireland. These affiliations will extend the opportunities open to members to engage with invertebrates; they also provide new perspectives for the membership of all affiliates.

**Awards.** The Hammond Award [Best article in the AES *Bulletin*] was awarded to David Keen.

The Gardiner Award [Best *Bug Club Magazine* article] was awarded as follows:

9-13 age group: Equal First Prize Winners: Calum Lyle and Rachel McLeod. Highly Commended: Samuel Baylis; Luke Andrews; Freya Carter; Harry Poore; Ella Wilkins; Bethany Wildash.

Under 9 age group: First Prize Winner: Magnus McLeod. Highly Commended: Jodie Brown; Sophie Brown; Ben Newman; Ella Roy.

The Bradford Award [Best exhibit from an adult member at the Kempton exhibition] It was decided not to award this in 2008, although the following were Highly Commended for their exhibit: Andrew Halstead; Roy McCormick; David Oram.

The Anson Bequest [Best exhibit by younger members at the Kempton Exhibition]: Equal First Prize Winners were Luke Andrews and Theo Tamblyn; Highly Commended were Samuel Baylis; David May; Daniel Osmond.

Cribb Award: There were no nominations for the Cribb Award during 2008.

Entomological Grant Scheme: There were two successful applicants for the AES Grant Scheme in 2008. These assisted the Rose Green Junior School, Bognor Regis, to build a pond and conservation area; and Mohamed Shebl, a young professional entomologist, to attend and present at the Ninth International Conference on Dryland Development, in Egypt.

**Governance.** The AES Council met on four occasions in 2008 at the rooms of the South Place Ethical Society in Conway Hall, Bloomsbury. Our Registrar, Nick Holford, retired after over 12 years in that role, and Peter Sutton resigned from Council after many years as Habitat Conservation Officer. Our thanks go to both of these, whose different contributions and lasting legacies to the Society over the years have been truly substantial.

In December, we learnt the terrible news that our President, Michael Majerus, had been diagnosed with terminal cancer. Although this



report covers the calendar year 2008, it would be incomplete if I did not mention that Mike died on 27th January 2009, at the age of 54. I think it is true to say that the AES and Cambridge University were among the institutions closest to Mike's heart, and there will be a tribute to him at the AES Members' Day in Cambridge, which he helped to organise.

The AES Council nominee for AES President, 2009-10 is Dr Robin Wootton, Hon. FRES, Exeter.

The following retire from Council by rotation at this meeting and have expressed their willingness to remain on Council if nominated and duly elected: Peter Hodge; John Howells; Wayne Jarvis; David Lonsdale; Kieren Pitts.

Mr David Tatham was co-opted to serve on Council in December 2008 and stands for nomination and election at this meeting.

During the year we instituted a three-year Governance Review of how the Society operates, with the aim of making continuous improvements and efficiencies in how we run the Society.

**Deaths.** Finally, it was with great regret that we received notice of the deaths during 2008 of the following members of the Society:

Mr E W Classey (41)

Mr John Fenn (8089)

Mr K C Lewis (3680)

Mr R T Lowe (8022)

Mr K H Poole (133)

Dr N A Robinson (10002)

Mr D H Walker (5998)

**Dafydd Lewis**

Hon Secretary

### **Treasurer's Report for the Year Ending 31st December 2008**

I am pleased to report that the General Fund made a slight gain of £381 in 2008, taking the value of the fund up to £1814. The drop in income for the Annual Exhibition in 2007 has proven to be a one-year event, and 2008 saw matters return to pre-2007 levels. The Bug Club is now being jointly funded by the RES and this, together with our taking over production of *The Entomologist's Record*, may cause financial matters in the next couple of years to be unpredictable, but once these



two items are fully integrated, they will hopefully be of great benefit to the society and entomology in general.

As a result of the continuing downturn in worldwide investment markets, the Crow and Hammond Fund has seen a loss in capital investment value. I am hopeful that these investments will return to their former level within the reasonably near future. Monies from the fund were also used for promotional purposes and awards.

As a result of the investment losses in financial markets, the Ansonge Fund, used to make awards to juniors, also made a loss in 2008; being only the second time in many years. Again, it is hoped that these losses in capital value will only be temporary. Awards totalling £150 were made to juniors.

The Publications Fund has once again made a good profit, which as usual will be used to fund future publications. A new publication, *A year in the lives of British ladybirds*, was produced, aimed at juniors and those new to entomology, and a new book on the larger water beetles was also published. It is hoped that at least one new publication will also be produced in 2009.

Overall, despite the losses to some of our funds caused by the continuing financial uncertainty in investment markets, the Society remains on a reasonably stable footing which will hopefully continue in the foreseeable future.

**Peter May**  
Hon Treasurer

### **Conservation Report for 2008**

**AES Conservation Committee.** Dr Peter Sutton, one of the Society's most stalwart supporters of conservation and the author of the recently published AES book on water beetles, stepped down from the AES Council and thus also from the post of Habitat Conservation Officer (HCO), which remained vacant for the rest of 2008. His work in that role over recent years is greatly appreciated.

**National and international representation.** In response to a letter from an AES member, we made enquiries about the practice of feeding wild-caught moths to captive orphaned or injured bats that are undergoing rehabilitation. Together with other Invertebrate Link (InvLink) member organisations, we were very pleased to find that the Bat Conservation Trust was developing an appropriate guidance note. This was published later in the year and should help avoid the



exploitation of wild-caught invertebrates in ways that would flout the InvLink code of conduct for collectors.

The Society's representatives on InvLink continued reporting to Council on the greatly delayed fourth quinquennial review of Schedule 5 of the Wildlife & Countryside Act 1981. This was eventually completed, with the addition of the Roman Snail, *Helix pomatia*. The government agency JNCC then began consultation over the fifth quinquennial Review, with a proposal to de-list the Essex Emerald Moth *Thetidea smaragdaria* – now evidently extinct in Britain. There was insufficient time for the AES or InvLink to respond at that stage, but InvLink intends to set up a working group to liaise with JNCC and to help ensure that InvLink members are given a proper opportunity to comment on any proposals that are made later in the review.

In the first phase of the review, Buglife, the Invertebrate Conservation Trust proposed the de-listing of two species in addition to the Essex Emerald: i.e. the Lagoon Snail *Paludinella littorina* and the Northern Hatchet Shell *Thyasira gouldi*. Buglife also proposed to add (with full protection) the Bedstraw Hawkmoth, *Hyles gallii* and the Streaked Bombardier beetle, *Brachinus sclopeta*, together with two Burnet moths; the Talisker *Zygaena lonicerae jocelynae*, and the Slender Scotch *Zygaena loti scotica* (with protection from sale only). Buglife's most radical proposal was to apply the provisions for protecting the places that scheduled invertebrates use for shelter and protection, but not to criminalise their collection *per se*. To this end, Buglife listed thirteen species that are not currently scheduled and a further twelve that are already scheduled for full protection.

InvLink has considered arguments that an increasingly anti-collecting culture is deterring the study of invertebrates, especially among future generations. There has been some discussion about the merits of trying to redress the balance by promoting essential aspects of collecting, such as the retention of voucher specimens. InvLink has already published a document setting out a rational basis for laws designed to protect species whose populations are demonstrably threatened by collecting. This is broadly consistent with existing UK laws which, although far from ideal, have been guided by wise advice from specialist staff-members of the government conservation agencies. InvLink has, however, expressed concern that these agencies are reducing their employment of invertebrate specialists. InvLink does not have a remit to seek to influence legislation beyond the UK, but has noted concern about the negative effects of indiscriminate anti-collecting laws in many other countries.



Another InvLink initiative is the review of its Code for Re-establishment, under the charge of AES representative David Lonsdale. The scope of the new draft has been widened to include novel introductions beyond the existing species-ranges. This reflects the potential need to overcome obstacles to the natural shift of species distributions in response to climate change.

The UK Biodiversity Action Plan remains a major topic at InvLink meetings. After the Priority Species Review, further discussion focused on the implementation of species-plans. This will involve Natural England and other national agencies, including those that run the Higher Level Scheme of Countryside Stewardship.

**Displays and events.** At the Royal Entomological Society's annual meeting in Plymouth, in September, we presented a poster entitled "Joined-up Entomology – working together for insect conservation and the next generation of entomologists". This focussed on some of the above-mentioned activities for young people and on the society's relationships with other organisations. These include two with which we have formed affiliations: most recently the Quekett Microscopical Club, and the RES, which sponsored a double-length edition of the *Bug Club Magazine*.

As reported elsewhere, the Society held a number of field and indoor events, some of which contributed to National Insect Week. The encouragement of young entomologists, especially with conservation in mind, has been of key importance at these events. Also, our programme of events at Osterley Park, in the London Borough of Hounslow, has led to a plan to undertake some survey work, which is planned for the summer of 2009.

**Publications.** The many articles in Invertebrate Conservation News covered topics as wide-ranging as the threats to corals in relation to 'climate engineering', an alert about the Citrus longhorn beetle *Anoplophora chinensis* in the UK, the new guidelines on the feeding of invertebrates to captive bats, the principles for legal protection of invertebrate species by law, captive breeding of the Pearl mussel *Margaritifera margaritifera* in Wales, an endangered snail in Iowa USA, Australian butterflies threatened by climate change and a possible new threat from the use of veterinary drugs based on avermectins.

**David Lonsdale**  
Hon Conservation Secretary



## Letter from Spain – 7th in a series – Spanish winter butterflies: a further update

by David Keen (3309L)

*Calle casto Bancalero 11, 41650 El Saucejo, Sevilla, Spain.*

I must begin this article by mentioning the weather, which has been the main cause for the reduced number of recording trips that I was able to make during last winter. It was not only the UK that experienced a cold winter, as local average temperatures in the months of November and December 2008 and January and February 2009 were the lowest on record. Not only that, we had a lot more rain than in the previous ten or more winters and this caused problems with the olive harvest, which was completed much later than normal.

As a direct result of the wet and cold weather, I was only able to take a walk in the local countryside on three days during the four month period. This compares with ten in the previous winter and thirteen in the one before that.

I will now review my sightings of species in the same order as in the earlier articles on this topic.

I did not see the Swallowtail, *Papilio machaon*, at all during the four months, either locally or whilst on sightseeing trips to other areas. As for the Pieridae, the Small White, *Artogeia (Pieris) rapae*, was seen in small numbers on all my local trips – i.e. on 19 November, 21 December and 18 February. It was also seen on 10 November during a trip to see the historic castle in the village of Constantina which is north east of Sevilla. The Large White, *Pieris brassicae*, was present on all three local trips and was frequently seen in the village during the first half of November and at the castle in Constantina. I only saw the Bath White, *Pontia daplidice*, once during the winter and that was a solitary specimen on rough ground by the Rio Corbones (Corbones River) on the road between the local villages of La Puebla de Cazalla and Villanueva de San Juan. The only record over the winter for the Green-striped White, *Euchloe belemia*, is of one specimen seen in the countryside on 18 February. However, the Clouded Yellow, *Colias crocea*, was common enough on all three local trips and was also present by the Rio Corbones and by the castle in Constantina.

Passing on to the Nymphalidae, we did not manage to visit Sevilla this winter so have no records for the Two-tailed Pasha, *Charaxes jasius*. The Red Admiral, *Vanessa atalanta*, made its first and only appearance of the year in my garden on 15 November. Several were



seen at the castle in Constantina but it was not seen in January or February. The only sighting of the Painted Lady, *Cynthia cardui*, was on 18 February when a battered example was seen sitting on one of the paths in the local countryside.

None of the Satyridae were seen during the four winter months.

Of the Lycaenidae, the most interesting record is of the Geranium Bronze, *Cacyreus marshalli*, that I saw visiting the flowers of its food plant in the centre of the town on Jerez de la Frontera on 7 November. This is my first record of this species from the Province of Cadiz. Other records for this family are also of individuals. A Long-tailed Blue, *Lampides boeticus*, was seen in the countryside on 19 November and in the same location on the same date I saw a male Common Blue, *Polyommatus icarus*. In this location on 18 February I saw a Small Copper, *Lycaena phlaeas*, and a Provence Hairstreak, *Tomares ballas*. Another Small Copper was flying and sunning itself by the castle in Constantina.

The only Skipper that came to my notice was an individual Mallow Skipper, *Carcharodus alceae*, in the local countryside on 19 November.

It is also worth mentioning that the lowest species-count for any trip to the local countryside in the last four years was set on 21 December 2008 when only *crocea*, *brassicae* and *rapae* were seen. The previous lowest was for seven species on 5 February 2008. It is unusual for me to see fewer than ten during a trip in the winter months in this area.

### References

- Keen, David. 2007. Letter from Spain - 4th of a series - Some Spanish winter butterflies. *The Bulletin of the Amateur Entomologists' Society*, **66** (474) 176-179.
- Keen, David. 2008. Some Spanish winter butterflies - an update. *The Bulletin of the Amateur Entomologists' Society*, **67** (477) 70-74.





## Long-tailed Blue in Northumberland (Lepidoptera: *Lampides boeticus*)

by Steven J. Ellis and Hewett A. Ellis (9940)

16, Southlands, South Shields, Tyne and Wear, NE30 2QS.

On the twelfth of March 2009 one of us (S. J. E.) discovered a small butterfly with brown wings resting on his kitchen wall in New Hartley, South Northumberland (VC 67; Grid Reference NZ306 765). The butterfly was released into the garden where it was found again the following day, resting on an outside window frame. It was identified as a female Long-tailed Blue (*Lampides boeticus* L.) The wings were somewhat faded and worn, but the characteristic pale brown underside with white lines, the metallic-ringed black spots and the 'tails' were still clearly recognizable (Figure 1). There was a little blue colouration on the upperside wing bases.



Figure 1. Underside of Long-tailed Blue butterfly found at New Hartley, Northumberland, in March 2009.

The butterfly was placed in a netted cage with *Hebe* flowers, where it fed avidly on the sugar solution provided. Ova were not deposited and, restored, the butterfly was returned to the wild a week later.



Sightings of the Long-tailed Blue are rare in Britain. The first records seem to have been in Brighton and Christchurch in 1859 (Emmet and Heath 1989; Thomas and Lewington 1991). Subsequently to 1991 there were about 120 records, mostly in the southern counties of England and in the Channel Islands. The present sighting is distinctly unusual in that it was made so far north and very early in the year. Most records of migrant Long-tailed Blue have been from late June to September (Asher *et al.*, 2001). The species breeds all year round in its warm habitat around the Mediterranean and although it has been known to breed during August and September in Southern England (Fox *et al.*, 2006), colonies are not established since it cannot survive our winters.

All this makes it difficult to explain the presence of a Long-tailed Blue butterfly in Northumberland in March! Theoretical possibilities include – (1) it was a migrant, (2) it had been accidentally or intentionally introduced (3) it had emerged from an immature stage contained in some imported food such as beans or mange-tout peas. Long-tailed blue larvae feed on a wide range of leguminous plants, entering the pods to devour the lining and contained seeds, and it is known that adults can emerge from immature stages contained in such imported foodstuffs (Asher *et al.*, 2001).

Much as we would like to romanticize about the possibility that this particular Long-tailed Blue was a migrant, having survived all the odds against it, we have to accept that this is extremely unlikely. Also it seems unlikely that it had been intentionally introduced. The most acceptable explanation is that it had emerged from an immature stage contained in an imported foodstuff unknowingly purchased by someone in the New Hartley district. Whatever the mechanism, we count ourselves fortunate in having had this rare opportunity to see this delightful little butterfly.

### References

- Asher, J., Warren, M., Fox, R., Harding, P., Jeffcoate, G. and Jeffcoate, S. 2001. *The millennium atlas of butterflies in Britain and Ireland*. Oxford University Press, Oxford.
- Emmett, A. M., and Heath, J. 1989. Hesperiiidae-Nymphalidae. The butterflies. *The moths and butterflies of Great Britain and Ireland* 7(1) Harley Books, Colchester.
- Fox, R., Asher, J., Brereton, T., Roy, D. and Warren, M. 2006. *The state of butterflies in Britain and Ireland* Information Press, Oxford.
- Thomas, J. and Lewington, R. 1991. *The butterflies of Great Britain and Ireland*. Dorling Kindersley, London.





## An unusual occurrence in Latvia

by *Graham Stevens* 13068

*Kalna iela 5-11, Priekuli, Cesis, LV-4126, Latvia.*

My wife and I moved to the small village of Priekuli, Latvia in March 2008. Priekuli is situated three kilometres east of the regional capital Cesis and some 85 kilometres north-east of the Latvian capital Riga. The area is surrounded by pine and spruce forests, which are intermingled with a large number of other tree species, including, oak, birch, willow and sallow to name but a few.

Like many other locals we have a large allotment, which contains three apple, two pear and two plum trees. On the 7th September 2008 my wife and I walked down to the allotment, to collect vegetables and fruit. I wanted to collect the pears as I had noticed that they had started to rot. As I approached the pear tree I noticed a large number of Red Admiral (*Vanessa atalanta*) lying dead on the ground around the base of the tree. On closer inspection I saw that, as the Red Admiral approached the rotting fruit, Hornets (*Vespa crabro*) attacked and killed it. What was even stranger to me was the fact that in and around the tree were some 20 or more Camberwell Beauty (*Nymphalis antiopa*) which also approached the rotting pears, but were left alone by the Hornets.

Latvia has many pagan traditions and sayings. One of these involves ones' first sighting of the year. If the butterfly is yellow then the summer will be sunny and beautiful. A coloured butterfly represents a colourful and interesting summer.



## Herald Moth (*Scoliopteryx libatrix*) on dog dung

by *Richard Dickson* (3674)

*39 Serpentine Road, Fareham, Hampshire PO16 7ED.*

On 17th April 2009 the members of my local moth group encountered a Herald Moth on dog dung. We were in local woodland at night in moist conditions when we found the moth sitting on a succulent dog stool in the middle of a forest track. It was actively probing with its proboscis. It was certainly not forced to this extreme by dehydration, since all surfaces were wet with fine rain.

We have observed butterflies to do this occasionally, and the habit is enshrined in the lore of the Purple Emperor (*Apatura iris*), but we have neither seen nor heard of moths on dung before.



## The Great Green Bush-cricket *Tettigonia viridissima* in 'old' Cambridgeshire

by Rob Partridge 8956

11 New Road, Mepal, Ely, Cambridgeshire CB6 2AP. Rpartridge3@aol.com

The Great Green Bush-cricket, *Tettigonia viridissima*, is one of Britain's largest and most spectacular insects. Adult males can measure up to 50mm and the females up to 54 mm; add in the long legs, wings and ovipositors and they can look enormous. They are bright green with some reddish-brown markings, and they are wonderfully camouflaged amongst the tall herbage that they favour; it is quite possible to have one's nose a matter of a few inches from one that is calling at full volume and to still not be able to see it until it moves. The song is most distinctive and far-carrying; it has been compared to all sorts of things but those of you who have ever fixed a card into your cycle wheel for sound effects have some idea of the noise! The ability to hear the song does decline with age. I am in my mid-fifties and could hear it easily last year but friends in their late sixties and seventies could not – fortunately, a bat detector set at about 20 khz will enable you to hear them at considerable distances.

Like many of our Orthoptera, the Great Green Bush-cricket has a relatively short season as an adult insect. I have recorded them singing between late June and early October, with the peak month usually being August. The nymphs, of course, appear much earlier in the year with April being the usually stated month of emergence but I have not studied the insect at this stage yet. Like most of us, they enjoy long, warm summers, and numbers probably increase if we have a succession of these. Similarly, hard winters may reduce the size of a colony, presumably because only the eggs laid in optimum sites are able to survive prolonged low temperatures. As I write, we are in the middle of the coldest winter spell for several years, with lows of  $-6^{\circ}\text{C}$  in my garden; this may well affect the two colonies that I have been recording for the past few years.

From the above, it will not be surprising to learn that this bush-cricket has always been considered to have a rather southerly distribution within the British Isles. In view of the locations of the two colonies that I know of in 'old' Cambridgeshire, it is worth reviewing what some publications have to say about the distribution. In 1965 Ragge wrote "this species is most common in coastal districts and especially along the south coast. Warmth and sunshine are of great importance to it." He then mentions particularly the counties of Dorset,



Devon and Cornwall. In 1988 Marshall and Haes published *Grasshoppers and Allied Insects of Great Britain and Ireland* which is, as far as I know, still the most authoritative book available on the British Orthoptera. Their map shows the species to be present in 1961 or later in VCs 29 and 31. These are the two most northerly vice-counties with 1961 or later records apart from East Norfolk, VC 27, but the text then suggests that "it is probably extinct on the Norfolk coast." The writers also add that "it may persist by the main railway line near Huntingdon, but has probably gone from all its other once-numerous fenland sites." One further and for me very interesting comment is this – "Inland it is now a distinctly local species." In 1997, Haes and Harding published the *Atlas of grasshoppers, crickets and allied insects in Britain and Ireland*. This appears to confirm more or less the distribution suggested in the previous text but what is striking is how few colonies, now plotted as 10km squares, actually existed as 1970 onwards records; in the 100km square that includes VC 29, 'old' Cambridgeshire, there are just six 1970 or later dots – two in Essex, one in the Peterborough area, one on the Norfolk/Suffolk border, one close to Huntingdon and one which must represent the colonies with which I am familiar today. It is indeed clear from this map that at the time the records were compiled the Great Green Bush-cricket was predominantly a coastal insect, with extensive areas of some southern counties devoid of records apart from their coastal fringes. Finally, a recent publication, *A Photographic Guide to the Grasshoppers and Crickets of Britain and Ireland* (Evans and Edmondson, 2007) confirms that the species is "quite scarce inland" with colonies "as far north as Westbury-on-Severn in Gloucestershire and inland in Suffolk." Curiously, alongside this text is printed a map which seems to show a widespread distribution across all of southern England, all of East Anglia and even a presence up through the Midlands and into the southern edges of Lancashire and Yorkshire.

### **The historical situation in Cambridgeshire**

Marshall and Haes, as already quoted above, suggested that the Great Green Bush-cricket was once numerous in the fens but they give no indication of the data upon which that assertion is made. The Orthoptera have never been as widely or as systematically recorded as some other insect groups, such as the Lepidoptera, and at any one time it seems likely that only a few naturalists would have been interested in making records – in some eras perhaps only a single individual was taking any notice of them. The NBN Gateway offers a fascinating insight into the past history of our fauna – with the proviso,



of course, that it only shows which records have been submitted to it; other records may still exist in the notebooks and memories of older naturalists. A recent search of the Gateway turned up 20 records for Cambridgeshire and 17 for Huntingdonshire. The Cambridgeshire records fall approximately into two groups: those made in the 1920s and 1930s, and those made from the 1970s onwards. Only two records appear for the new century and these relate to the two colonies that I personally know about.

These two colonies are, I believe, responsible for 13 of the 20 Cambridgeshire records on the database. Of the remaining seven records, only one is in what I would call modern times – near Stapleford in the Gog Magog Hills in August 1989. This is in the far south-east of the county. The other six records are much older; for example, Coveney near Ely in 1924. It would appear from the records held on the database at present that the Great Green Bush-cricket has had a rather limited distribution in Cambridgeshire for a considerable period of time; whilst it may be a difficult insect to locate and to catch, it is by no means difficult to hear for most younger people, and its habit of singing on into darkness on still summer evenings certainly attracts the attention of non-naturalists. The agricultural intensification which began in the 1960s may not be to blame in this case – this was my original assumption but, again on the basis only of the published records, this bush-cricket does not seem to have been widely reported in the county at any time in the twentieth century. If it ever was “numerous”, it may only have been so at the time before the drainage of the fens began in the seventeenth century; between then and the twentieth century it may well have been more widespread than now because even after drainage it is likely that plenty of damp, overgrown areas remained where wildlife in general must have flourished. However, it seems that by the beginning of the twentieth century the Great Green Bush-cricket was a very local insect in ‘old’ Cambridgeshire.

As a check on the above, I then searched the Gateway for records of two species that are common today in Cambridgeshire and which I have no reason to suspect have not always been relatively common; these are the Common Field Grasshopper, *Chorthippus brunneus*, and the Dark Bush-cricket, *Pholidoptera griseoptera*. The former species has only three records pre 1970 and the latter has none at all! This suggests either that the Orthoptera really were all rather scarce in Cambridgeshire in the early twentieth century – and I think that is unlikely – or that very few people were bothering to record them,



perhaps because they were so common. It is interesting that records of the Great Green Bush-cricket outnumber those of what were probably more common species; I would put this down to features identified earlier – its large size and its loud, far-carrying song. It is among the most likely of our Orthoptera to be noticed by non-specialist observers, and I still think that the paucity of records indicates that has not been numerous in Cambridgeshire for a long time.

### **The 1990s**

The publication of the *Atlas of Grasshoppers, Crickets and Allied Insects in Britain and Ireland* by Haes and Harding in 1997 led to an increase in recording in many areas. In Cambridgeshire the baton was taken up by Adrian Colston who rapidly organised recording within the county as well as making many new contributions himself over the next few years. His results were published in three editions of the annual publication *Nature in Cambridgeshire*, and in the first of these, no. 40, 1998, Colston reviews the situation regarding the Great Green Bush-cricket: after 1980 two 10-km squares have records; five 10-km squares have the species not recorded. I have not seen the data that Colston was using but this fits pretty well with my own rather less professional conclusions based on the NBN Gateway. Colston states “Since 1980 it has been recorded in four separate sites.” His map shows these sites; three are clearly related to my own two colonies, and the fourth is in the far south of the county, representing a record with which I am unfamiliar. For the sake of completeness, it is worth pointing out that Colston refers to two authors who also claim that the insect was “very common” – Burr (1904) – or “formerly abundant in VC 29” – Worthington (1938).

### **The present situation**

I first took an active interest in the Great Green Bush-cricket in 2005, partly as a result of Adrian Colston's articles in *Nature in Cambridgeshire*. On the 21st of August I visited a site near the village of Aldreth which I knew was one of the last places to have records of *viridissima* in Cambridgeshire. I was not optimistic – I rarely am – but a friend had told me that a man who cuts the grass along some of the riverside paths had reported seeing huge grasshoppers while he worked. It was a hot, humid afternoon with only intermittent sunshine. I began recording at 2.00pm and had soon found plenty of Orthoptera; it may be worth listing them, in fact, as both sites for the Great Green Bush-cricket have a relatively high number of other species: present



were Dark Bush-cricket, *Pholidoptera griseoptera*, Roesel's Bush-cricket, *Metrioptera roeselii*, Long-winged Cone-head, *Conocephalus discolor*, Speckled Bush-cricket, *Leptophyes punctatissima*, Field Grasshopper, *Chorthippus brunneus*, Meadow Grasshopper, *Chorthippus parallelus*, and Lesser Marsh Grasshopper, *Chorthippus albomarginatus*.

It was not until almost 4 pm that I first heard an unfamiliar song. I see from my field notebook that it took me another ten minutes to locate this first Great Green Bush-cricket, first because it appeared to be something of a ventriloquist, and second because it can be so difficult to see even when you are close by. I was amazed by the size of the beast – in this country we generally seem to deal with rather small insects but this looked at least as long as my forefinger! It was most definitely aware of my presence even when I was several feet away – it would stop singing if I moved carelessly and if I continued to approach, it would move around the stem so that it was more difficult to see. This behaviour I have seen many times in the Short-winged Cone-head, *Conocephalus dorsalis*, but it is also common in *T. viridissima*. By 4.30 pm other males had begun to sing in the area, and that afternoon I located a total of fifteen by song; whilst the Great Green Bush-cricket can be found singing earlier in the day, I have proved several times on the two sites near me that often they will not begin to sing until late afternoon, even when conditions seem ideal. Surveys taking place earlier in the day could miss this species.

I have visited the Aldreth site annually since 2005. The Great Green Bush-cricket seems to be well established over quite a wide area, with at least a mile and a half sometimes recorded between the most distant males. The most that I have found in a single visit is thirty three singing males – that was on the 28th of July, 2007. The area is predominantly intensively-farmed arable land and the crickets are concentrated along field margins and the sides of tracks. The Old West River runs through the area but the banks are heavily grazed and the short vegetation does not appeal to the crickets – they are invariably found in thicker, taller herbage up to a metre in height, and I suspect that this is a requirement if the males are to establish some kind of territory.

Much encouraged by this early success, I decided to visit the second site at which the species might still be present on 23rd of August 2005. As I opened the car door not far from the village of Sutton and close to the banks of the Ouse Washes nature reserve, I could hear the by now familiar song, again from the thicker vegetation that edges most



fenland droves. A slow walk of no more than 300 yards located at least 30 singing males. On the 3rd of September I returned, hoping to discover how far along the wash banks the colony extended. It was a hot afternoon and the insects were in full song; I estimated that there were at least 100 over a three quarter mile stretch. This was most exciting and I think that it was exceptional for an inland colony. I have also monitored this site annually since and since 2005 I have not recorded more than 14 singing males on any one visit. The reasons for this 'decline' may include the following: 2005 was a good summer locally for the Orthoptera with the numbers of most species being relatively high; the colony area seems to be smaller than at Aldreth; the area includes some drain-side flood washes which in the past remained relatively dry – they are now more often flooded even in the spring; finally, much of the area occupied by the crickets in 2005 has since been more intensively grazed and the vegetation structure no longer suits them. In 2008 I found several males singing well away from the original point of discovery on field and ditch margins, much as at Aldreth. At my suggestion, the Environment Agency has fenced off a small section to prevent close grazing - they deserve credit for that and I hope it will be of some benefit to the insect.

Over the four years I have seen some fascinating behaviour in the Great Green Bush-cricket but this article is perhaps not the place to discuss that. As regards the present distribution in the parts of Cambridgeshire with which I am familiar, I am left with more questions than answers. Here are some of the questions:

- Are these the last two colonies left in the whole of fenland – the last two of a species that historically was considered by some to have been abundant? Over the last two years I have visited a number of possible sites, including some of the old recorded ones, but without further success.
- Why have they managed to survive on these two sites? The sites have some similarities in that they are both on the margins of arable land and close to waterways but in all other respects, including their vegetation, they are entirely unremarkable – there are hundreds of acres of apparently identical habitat in the fens.
- The soil types are slightly different, with that near Sutton being more typically the soft black fen soil, but at neither site are there exposed areas of warm dry soil that some texts suggest they need for successful oviposition.
- In Cambridgeshire, what will be the consequence for the Great Green Bush-cricket of the climatic amelioration that seems to be



taking place? Adrian Colston's work in the late 1990s showed that Roesel's Bush-cricket was spreading rapidly across the county, and he also successfully predicted the arrival of the Long-winged Conehead. The latter species has since spread, I believe, at a remarkable rate and occupies suitable sites in huge numbers. The Short-winged Cone-head also seems to have spread further west and north in the county since 2000. Will their much larger cousin respond in the same way?

I rather hope so. If these are the only survivors from the times when the county of Cambridgeshire was a wilderness of wetlands, then it is time that they had some luck, and there would be some sort of irony in it if they were in the end to benefit from our mismanagement of their environment - mismanagement which, some might say, began here with the wholesale drainage of the fens in the first place.

Although I have focused attention on the status of the Great Green Bush-cricket in 'old' Cambridgeshire, I would be most interested to hear of any records, ancient or modern, within the new administrative county area. If any members would like to share information or thoughts about such abstruse matters as population cycles, colony structures and habitat preferences in other parts of the country, I would be most grateful; it seems that surprisingly little is known about one of our most impressive insects.

### References

- Burr, M. (1904). *The Orthoptera of Cambridgeshire*. In: *Handbook to the Natural History of Cambridgeshire*, ed. by J.E. Marr & A.E. Shipley, 142-144. Cambridge University Press, Cambridge.
- Colston, Adrian. (1998). *A provisional atlas of bush-crickets, grasshoppers and allied insects in 'old' Cambridgeshire*. *Nature in Cambridgeshire* No. 40 1988. Cambridge, England.
- Colston, Adrian. (1999). *Orthopteroid records*. *Nature in Cambridgeshire* No. 41 1999. Cambridge, England.
- Colston, Adrian. (2000). *Orthopteroid records*. *Nature in Cambridgeshire* No. 42 2000. Cambridge, England.
- Evans, Martin and Edmondson, Roger, (2007). *A Photographic Guide to the Grasshoppers and Crickets of Britain and Ireland*. WGUK
- Haes, E.C.M. and Harding, P.T. (1997). *Atlas of grasshoppers, crickets and allied insects in Britain and Ireland*. ITE research publication no. 11. NERC.
- Marshall, Judith A. and Haes E.C.M. (1988). *Grasshoppers and Allied Insects of Great Britain and Ireland*. Harley Books: Colchester, England.
- Ragge, David R. (1965). *Grasshoppers, Crickets and Cockroaches of the British Isles*. Frederick Warne and Co Ltd: London.
- Worthington, E.B. (1938). *Orthoptera and Dermaptera*. In: *The Victoria History of the Counties of England. Cambridgeshire and the Isle of Ely*, 1: 91-92. Oxford University Press, Oxford.

The NBN Gateway can be found on the website of the National Biodiversity Network at [www.nbn.org.uk](http://www.nbn.org.uk)



## Insects in Malta, Summer 2007

by Stuart Cole (10159)

21 Wensleydale Gardens, Hampton, Middlesex TW12 2JL

stuart.cole@blueyonder.co.uk

My stay on Malta for two and a half weeks in August and September 2007 was primarily to visit my wife's numerous relations on the island. Although it was my fourth visit, it was the first where I had some time to explore its natural history. Small, densely populated and largely denuded of natural vegetation, Malta is not an obvious entomological destination. Also, this was not a good time of the year to look for insects. Nevertheless, I found much of interest in the way of native and introduced insects, the latter forming a large proportion of the species identified.

By August the countryside is desiccated. In a normal year there will have been little or no rain for months; but across the eastern half of the Mediterranean this summer had been hotter and drier than usual. In Malta temperatures had reached 106°F in July; consequently terrestrial life was fairly scarce. Of vertebrates, birds, apart from House Sparrows and feral Rock Doves, were almost completely absent and the endemic lizard *Podarcis filfolensis* and the introduced Mediterranean Chameleon were the only reptiles seen other than a gecko on the wall of our rented flat. However, this dearth on land was more than compensated for by the variety of fish and other marine animals seen on our snorkelling excursions at various points around the coast of both Malta and neighbouring Gozo.

Although insects generally were sparse, the Hymenoptera were abundant, especially the social wasps of the genus *Polistes* which were numerous everywhere. There are two common species in Malta: *P. gallicus* and the slightly smaller *P. omisus*. The flowers of two umbellifers in bloom at this time, fennel on waste ground and the semi-succulent Rock Samphire on walls and cliffs beside the sea, were guaranteed to attract these wasps in numbers. An unusually big *Polistes* nest was found on a stone wall at the Ghammieri agricultural research facility. It was five inches across with a couple of smaller subsidiary nests adjacent. Also, instead of hanging upside down so that the cells opened beneath the protective umbrella of the base, the nest was constructed on the side of the wall so that the cells were lying horizontally. A particularly handsome solitary wasp, the black and yellow sphecid *Sceliphron spirifex*, was often seen. Of bees, the big carpenter bee *Xylocopa violacea* frequented lantana flowers in the Buskett gardens along with other solitary bees.



Orthoptera were represented by a small selection of grasshoppers. *Euprecocnemis plorans* is essentially an African species occurring southwards through that continent to the Cape, but also found in some parts of southern Europe. It is rather plain brown or grey in colour but distinctive for its banded eyes. Two were found in the St Anton Gardens. *Sphingonotus coeruleans*, grey with pale bluish hindwings, inhabited open rocky ground by the sea. *Anacridium aegyptium* is a very big grey grasshopper of a mostly African genus that was seen just once along a country road. In Malta I have found it to be more numerous in winter. In fact grasshoppers generally were more numerous during my one winter visit to the islands in 1976/77.

Of the very few butterflies seen, the Swallowtail (*Papilio machaon*) was the species most often encountered, as it had been on previous summer visits to Malta, where it is represented by the sub-species *melitensis*. The Painted Lady (*Vanessa cardui*) and the African lycaenid Geranium Bronze (*Cacyreus marshalli*), which is now established in gardens and parks, were just about the only other species around at this time. *Vanessa cardui* seems to be on the wing all year round in Malta; it was the most frequent butterfly in the winter of 1976/77 (when other species seen were Red Admiral (*Vanessa atalanta*) and Wall Brown (*Lasiommata megera*)). As for moths, some small unidentified micros came to light; the Humming Bird Hawkmoth (*Macroglossum stellatarum*) was common and a migrant Striped Hawkmoth (*Hyles lineata livornica*) was seen once.

There were some Odonata about especially in the gardens of San Anton where pools attracted the Emperor Dragonfly and the red-bodied *Sympetrum fouscolombii* and *Crocothemis erythrea*. The Emperor Dragonfly (*Anax imperator*), conspicuous for its size and the bright blue abdomen of the male, was the most widespread of the Odonata and was seen hawking along town streets as well as in the countryside.

The numerous cicadas calling from trees and bushes in many parts were probably all *Cicada orni*. *Graphisoma lineatum* var. *italicum* is a striking red and black striped pentatomid bug that was very common, especially on fennel and another bug noted was the introduced Green Vegetable Bug (*Nezara viridula*), nymphs of which were present in a field of tomatoes. The original home of this species is north-east Africa; it now occurs in all the warmer regions of the world (and was first recorded breeding in Britain in 2004).

Two kinds of fly particularly attracted notice; both were introduced species: the Mediterranean Fruit Fly (*Caratitia capitata*) of the



Tephritidae, actually native to sub-Saharan Africa, and the Black Soldier Fly (*Hermetia illucens*) of the Stratiomyidae, an introduction from tropical America. The Mediterranean Fruit Fly, which is unrelated to the *Drosophila* fruit flies that are a favorite subject for genetic research, is a cosmopolitan pest of fruit crops. In Malta I often found the adult flies clustered on flower buds of caper (*Capparis spiuosa*). The Black Soldier Fly on the other hand has been widely introduced in warmer parts of the world because it is useful in several ways in factory farming: e.g. in reducing the bulk and moisture content in manure accumulations and the harvesting of the prepupae for animal feedstuff.

Local entomologist Dr David Mifsud, at the time employed at the Ghammieri agricultural research station, told me that two large tropical beetles have become established in Malta in recent years: the longhorn *Phryneta leprosa* (Cerambycidae: Lamiinae) from tropical Africa, first recorded in 2000, the host plant in Malta being the Black Mulberry, and a weevil of the genus *Rhynchophorus* which Richard Thompson at the Natural History Museum, London, confirmed as *R. ferrugineus* from south Asia. This species, which feeds on palm trees, has apparently spread to a number of Mediterranean countries via the Middle East.

Our accommodation during this visit to Malta was a rented flat in Birzebuggia on the south coast. This had a light on the balcony that attracted quite a few insects: moths, bugs and beetles and provided a regular meal for a resident Moorish Gecko (*Tarentola mauritanica*) that lived above the lamp. From among these insects I identified the following beetles:

*Lasioderma serricornis* (Anobiidae). A cosmopolitan species associated with various human products especially tobacco and its common name in English is Tobacco Beetle.

*Scobicia chevrieri* (Bostrichidae). One of these turned up. A small beetle with a prominent crest of golden hair around its head. It appears to be an east Mediterranean insect. The genus *Scobicia* consists of 11 species of which six are North American mostly from the west and south-west states (one is notorious for its habit of boring into lead sheathed telephone cables), two are Mediterranean, two are from the Canary Islands and one from the Azores.

*Hirticomus hispidus* (Anthicidae)

*Alphitobius diaperinus* (Tenebrionidae). A minor pest of stored food products. It is one of several cosmopolitan species in a pan-tropical but mostly African genus.



*Aderus populneus* (Aderidae)

*Phyllognathus excavatus* (Scarabaeidae: Dynastinae). This is a common beetle in Malta and I found it at light in several localities. It is a relatively small member of the subfamily, none of the specimens being more than three cm in length; the male has a small horn on the head. The species occurs from southern Europe through the Middle East to Saudi Arabia.

In addition dead adults of the anobiid beetle, *Oligomerus ptilinoides*, were found in a chest of drawers in the flat, and the species was probably responsible for the exit holes in this item of furniture.

Out in the parched countryside, Tenebrionidae were the most often encountered Coleoptera; in fact the only beetles in any number. The big cellar beetle *Blaps gigas* could be found wandering over tracks near the sea in early morning (and was also encountered in the basement of an isolated medieval fort where several were crawling about the walls), *Opatroides punctulatus* was common under rocks and *Scaurus striatus* less often so. Beetles of other families sheltering under rocks were *Hirticomus quadriguttatus* and the little grey longhorn *Parmenia pubescens*. The latter congregated in small groups and appeared to be aestivating.

I will mention one other beetle: *Exochomus nigripennis* (Coccinellidae) found on fennel only because it was the only ladybird found and a new species for me. It has shiny black elytra and a brown pronotum. Its distribution is northern Africa (including the Canary Islands) through the Middle East to India. It has also been recorded in southernmost Europe.

We spent a couple of days on Gozo, smaller and much less developed than the main island. Our first stop was Dwejra at the west end of the island where low ridges of sharp white limestone slope steeply down to the sea. In the bay here is the so-called Fungus Rock, a sea stack, which is protected as a site for the rare and peculiar root parasite *Cynomorium coccineum*, a flowering plant of the Balanophoraceae. In this dry and treeless area the most conspicuous plants at this time were the tall white flower spikes of Sea Squill (*Urginea maritima*) in an unusually dense sward. This very poisonous plant has huge bulbs of up to six inches in diameter which allows it to thrive in almost arid conditions. A couple of Painted Lady butterflies and a Humming Bird Hawkmoth along with a few grasshoppers were the most obvious of the sparse animal life.

Ramla Bay on the north coast of Gozo still retains some sand dunes, the only ones I know of in Malta. The sand here is renowned for its



red colour. Sea Holly (*Eryngium maritimum*) and the Sea-lily (*Pancreatum maritimum*), the latter bearing large white flowers and clumps of heavy green pods, were among plants decorating the dunes. Another bushy plant with white flowers that I was unable to identify attracted a multitude of Hymenoptera, mostly *Polistes* and the parasitic wasp *Leucospis gigas* (Leucospidae). The latter is black and yellow and notable for the swollen hind femora. It is a parasite in the nest cells of *Chalicodoma* bees.

Very few arachnids were encountered in Malta but a particularly fine orb-web spider was *Argiope lobata*. I came upon just one, a mature female in her web in a prickly-pear cactus at Delimara Point. She had a head and body length of about 2½ cm, each segment of her abdomen was prominently lobed at the sides. This is the first of this species I have found anywhere, although it is very widespread in the Mediterranean region, Africa and Asia. The genus *Argiope* is cosmopolitan.

### Acknowledgement

My thanks to Richard Thompson of the Natural History Museum, London for confirming the identification of, and for information on, *Rhynchophorus ferrugineus*.

### References

- Mifsud, D. (2000). Present Knowledge of the Entomofauna of the Maltese Islands, *Entomologica Basiliensia*.
- Tomberlin, J. K. and Sheppard, D. C. (1999). Lekking Behaviour of the Black Soldier Fly, *Florida Entomologist* **84**(4).





## The 'Queen of Entomologists' Part 1: Mrs Hutchinson and the Pinion-spotted Pug

by Peter Holland (6700)

[peter.holland57@ntlworld.com](mailto:peter.holland57@ntlworld.com)

Like most entomologists, I will readily travel many miles to catch a glimpse of a rare or unusual insect. I never expected a rarity to turn up in my own back garden. About once a month I run a 100W blended bulb moth trap, just out of curiosity to see what is on the wing. Checking the contents of the trap on the morning of 27 April 2008 revealed a few common moths – Hebrew Character (*Orthosia gothica*), Brimstone (*Opisthograptis luteolata*), Purple Bar (*Cosmorhoe ocellata*) and Brindled Pug (*Eupithecia abbreviata*) – plus a small delicately patterned Pug that I had never seen before. Consulting the excellent field guide by Waring, Townsend and Lewington (2003) revealed it was a Pinion-Spotted Pug (*Eupithecia insigniata*), a moth on the Nationally Scarce B list. Not only was this a new record for me, but it had also never been seen by the local county moth recorder for Oxfordshire. My house actually falls within the Watsonian vice-county of Berkshire for recording purposes, reflecting an older county boundary, and this was just the third record of the species in vice-county 22 over the past 19 years.



Pinion-spotted Pug *Eupithecia insigniata*, Wallingford, 2008.

The larval food plants of the Pinion-spotted Pug are recorded as hawthorn and apple, so the moth's scarcity is certainly not a reflection of food plant distribution. Presumably some other ecological factors limit its distribution, but these remain a mystery at present. I can only





evidence that Emma had been breeding the species for even longer. Her son Thomas recalled that Emma first caught a Pinion-spotted Pug in 1864, when she found a specimen struggling with a spider close to the roots of an apple tree. It is likely that Emma started breeding the species very soon afterwards, since she provided eggs to Reverend Henry Harpur Crewe of Drayton Beauchamp, Bucks, and to Reverend Joseph Greene of Cubley Rectory, Derbyshire, around 1867. She also gave examples to the former President of the Entomological Society of London, Raphael Meldola, as described in a small hand-written note pinned alongside a series of specimens in the Hope Entomological Collections, Oxford (confusingly, the note says the series is descended from a pair collected in 1872, with an additional male being introduced in 1874). Whatever the exact dates, Emma Hutchinson bred this unusual moth continuously for over thirty years, and provided livestock and specimens to many of the well-known entomologists of the day.

The numerous accounts of Emma providing livestock to other entomologists, who often subsequently published on their own account, suggest she was not only highly skilled, but also remarkably generous. Eustace Bankes (1906) summed her up well, writing 'By her kindness, liberality, and enthusiasm, Mrs Hutchinson endeared herself to many personal friends, and to a still wider circle of correspondents, amongst whom were numbered, of a past generation, Doubleday, Newman, Stainton, Buckler, Hellins, and other noted Entomologists.' The poet William Wordsworth was also a family friend, and would often stay at her house, Grantsfield, near Kimbolton. (Emma's husband was the nephew of William Wordsworth's wife Mary).

Despite Emma's contributions to natural history and her wide renown amongst entomologists of the day, she was not permitted to join her local Natural History Society, the Woolhope Club, simply because she was a woman. Nevertheless, Emma (and her children) were not deterred and contributed many of their findings to the society via her husband, the Reverend Thomas Hutchinson, vicar of Kimbolton, as well as publishing occasional notes in the national literature. In one of these, entitled '*Entomology and Botany as pursuits for Ladies*', she encouraged others to study the 'habits' of insects, rather than simply collecting (quoted in Salmon, 2000). She was not a scientist, however, and perhaps in keeping with the ecclesiastical circles in which she moved, very scathing of the new ideas of evolutionary biology, dismissing them as 'vague theories' (Hutchinson 1881). Fittingly, there is a lasting tribute to Emma Sarah Hutchinson, but it does not relate to her work on the rarer pug moths. It was



Emma's breeding experiments that revealed the Comma butterfly to be bivoltine: many butterflies emerging in the summer brood have a golden ground colour, while the second or autumn brood emerges as a darker over-wintering form (Hutchinson, 1892; Thomas and Lewington 1991). Emma Sarah Hutchinson is remembered today in the scientific name of the golden form of the Comma butterfly (*Polygonia c-album f. hutchinsoni*).

### Acknowledgements

I thank Darren Mann for tracking down specimens in the Hope Entomological Collections, David Rogers for permission to reproduce the photograph of the Meldola series, Stella Brecknell for assistance in the Hope Library, Martin Honey for information on the collections in London, and Martin Harvey and Martin Townsend for comments on the 2008 record.

### References

- Banks, E. (1906). *Entomologist's Monthly Magazine* **17**: 13 & 274-275.  
Harpur Crewe, H. (1868). *Entomologist's Monthly Magazine* **5**: 72.  
Hutchinson, E. S. (1881). *The Entomologist* **14**: 250-252.  
Hutchinson, T. (1892). *Herefordshire Lepidoptera*. Woolhope Club Transactions.  
Greene, J. (1868). *Entomologist's Monthly Magazine* **5**: 72.  
Pierce, F.N. (1909). *The genitalia of the group Noctuidae of the Lepidoptera of the British Isles*. Liverpool: Duncan.  
Salmon, M.A. (2000). *The Aurelian Legacy*. Colchester: Harley Books.  
South, R. (1908). *The Moths of the British Isles*. Series 2. London: Frederick Warne.  
Thomas, J. and Lewington, R. (1991). *The Butterflies of Britain and Ireland*. London: Dorling Kindersley.  
Waring, P., Townsend, M. and Lewington, R. (2003). *Field Guide to the Moths of Great Britain and Ireland*. Hook: British Wildlife Publishing.





## Food plant preference in Privet Hawk (*Lepidoptera: Sphinx ligustri*) larvae

by *Graham Best*

*12 Northam Lane Almondsbury Bristol BS32 4JH.*

*E-mail g.best@talk21.com*

With a large number of Privet Hawkmoth larvae available, I decided to conduct a simple food plant preference experiment. Although this species will feed on a surprisingly large number of food plants, the plants selected were growing in my garden and so a plentiful supply of cut fresh plant material was available on a daily basis. All rearing was done in plastic food boxes lined with kitchen roll to absorb condensation, using larger boxes containing fewer larvae as they grew.

**Lilac** was selected as I had once read that larvae did better on this plant than on privet.

**Holly** is listed as a foodplant and as the leaves appear tough especially for young larvae I wanted to see how they coped.

**Ash** was also selected.

Newly hatched larvae were all reared to the beginning of the second instar on stems of privet at which point 30 larvae were placed in each box containing their respective food plant all of which they transferred to without any problems. Numbers in each box were reduced by random selection as the experiment proceeded and space considerations were experienced. Although different growth rates between individual larvae were experienced with each plant, no overall differences were found between them half way through the final instar at which point the experiment was terminated, as a holiday was due and I considered them unlikely to show any differences although it is possible that eventual pupation, emergence and fertility might conceivably be affected.

A previous report suggested that variations in growth may possibly be explained by variation in food plant presentation, including factors such as wilting. The Pine Hawkmoth, for example, is reported as not thriving on cut food plant in water. Even the spines on holly were consumed.

Although the experiment was relatively simple and not conducted with strict scientific method I am satisfied that, with the three food plants chosen, there were no practical differences for those breeding this species except a tendency for cut holly to remain fresher for longer which might be a practical consideration.



## Detection rates of adult male and larval Glow-worms *Lampyris noctiluca* from transect sampling

by Tim Gardiner (11826)

2 Beech Road, Rivenhall, Witham, Essex, CM8 3PF, tg@writtle.ac.uk

Traditional survey methods for the Glow-worm *Lampyris noctiluca* (Coleoptera: Lampyridae) have focussed on counting adult females on summer evenings (June-August). The Essex Glow-worm Survey was initiated in 2001 and standardised transect counts of adult females have been undertaken (see Gardiner *et al.* (2003) for a detailed description of the method) at a number of sites throughout the county on an annual basis. Although participants were not specifically asked to count adult male and larval Glow-worms that they encountered on their transect walks, most recorders sent in any records which they had of both life stages, in addition to their observations of glowing females. Males were observed by an inspection of glowing females with a torch, or if the light of the female appeared to be going 'on and off' due to the male crawling over the female's light producing organ. Larvae were seen as they glow faintly at night, and they were often spotted when there were no glowing females to distract the attention of the transect walker (e.g. many larvae were observed in August when females had finished displaying for the season).

A total of 23 males and 46 larvae were recorded from eight transect sites (Table 1), which is a ratio of approximately two males and four larvae for every 100 females counted, indicating that both life stages were infrequently seen whilst transect walking. However, I believe it is useful to keep a record of males and larvae seen whilst transect sampling as they may be a useful indicator of the breeding success of a colony.

If a more detailed study of a colony is required then I would suggest that regular transect counting of females is supplemented with sampling for males using a Light Emitting Diode (LED) device (Clements 2002; Tyler 2002). Studies at known colonies in Essex using LEDs have shown that they are often more effective in attracting flying males than nearby females, therefore their use for standardised counts of males is to be recommended (Mark Iley *pers. comm.*). Larvae can be found under reptile refugia placed over winter; materials that they congregate under include felt tiles (carpet and roof tiles have been successfully used) and corrugated metal tins (Cranfield 2003). The number of larvae found

**Table 1:** Total number of adult female, adult male and larval Glow-worms *Lampyris noctiluca* recorded from transect walks at eight sites (data combined for 2001-2006)

Site	Life stage		Larvae
	Adult female	Adult male	
One Tree Hill	661	5	30
Danbury Woods	73	0	1
Finches Nature Area	209	16	1
Saffron Walden	60	0	0
Shut Heath Wood	29	0	0
Hatfield Forest	24	2	5
Iron Latch	106	0	5
Grays Chalk Quarry	30	0	4
Total	1192	23	46

**Table 2.** Total number of adult female, adult male and larval Glow-worms *Lampyris noctiluca* recorded from 2001-2006 on standardised transect walks.

Life stage	Year						Total
	2001	2002	2003	2004	2005	2006	
Adult female	336	255	188	190	144	79	1192
Adult male	16	1	1	5	0	0	23
Larvae	32	5	0	9	0	0	46

under individual felt tiles (size of felt commonly used is 50 x 50 cm) is usually < 10 with no records, to my knowledge, of large aggregations of larvae as yet.

Although the numbers of males and larvae seen in the Essex Glow-worm Survey were small in comparison to female counts (Table 1), there appears to have been a decline in the numbers of both life stages, which is concomitant to that of the females (Table 2). Does the decrease in the number of males and larvae since 2001 constitute a decline in the breeding success of the Essex colonies or does the inefficiency of the sampling method make it difficult to compare numbers between years?

### Acknowledgements

I would like to thank all survey participants who walked transects at the different sites and Essex Wildlife Trust for allowing surveys on their nature reserves. My gratitude is also extended to Writtle College for providing finance and resources for the duration of the survey.



## References

- Clements, D. (2002). An artificial lure for Glow-worms. *British Wildlife* **14**: 74.
- Cranfield, J. (2003). *Reptile refugia* – a new survey method for Glow-worm! *Essex Field Club Newsletter* **42**: 17-19.
- Gardiner, T., Pye, M. & Field, R. (2003). The influence of soil pH on the abundance of the Glow-worm *Lampyrus noctiluca* (Linnaeus) (Lampyridae) in Essex. *The Coleopterist* **12**: 121-123.
- Tyler, J. (2002). *The Glow-worm*. Sevenoaks; Lakeside Printing Ltd.



## Is this a Glow-worm, which I see before me?

by Tim Gardiner (11826)

2 Beech Road, Rivenhall, Witham, Essex, CM8 3PF. tg@writtle.ac.uk

For many centuries the Glow-worm *Lampyrus noctiluca* (in fact a beetle) has inspired naturalists and poets due to the pale green glow which is emitted by the adult female on warm summer evenings. Alfred Leutscher (former Chairman of the British Naturalists' Association; BNA), writing in his 1974 book '*Epping Forest – its history and wildlife*' fondly recalls his camping days in Epping Forest when specimens were collected and hung in jam jars inside tents, with the light emitted apparently strong enough to read by. The female's glow is produced via a complex series of chemical reactions and is used to attract the flying adult male.

Due to its inspiring qualities, the Glow-worm has appeared in many works of literature. Glow-worms are mentioned in William Shakespeare's *Hamlet*, when the Ghost in Act 1, Scene V, says 'The glow-worm shows the matin to be near, And 'gins to pale his uneffectual fire', – a reference to the cold light they generate and the fact that their dimming lights herald the coming of dawn. William Wordsworth was similarly inspired by Glow-worms; his reference was to the 'earth-born star' in '*The Pilgrim's Dream*' (c. 1820). Gilbert White, the famous naturalist of Selborne, referred to the 'amorous fire' of the Glow-worm, whilst Samuel Taylor Coleridge in '*The Nightingale*' refers rather dubiously to the 'love torch' of the female. It seems there is no end of references to the Glow-worm in literature. Winston Churchill rather amusingly stated 'We are all worms. But I believe that I am a glow-worm.' I couldn't agree more!

Perhaps my favourite piece of Glow-worm literature is by Andrew Marvell (1621-1678) in his poem '*The Mower to the Glow-worms*'. The opening two lines are the stuff of literary legend: 'Ye living lamps, by



whose dear light, The nightingale does sit so late'. This is my favourite piece because it evocatively links the appearance of the Glow-worm with the marvellous song of the Nightingale which can last long into the night after other birds have stopped singing.

Sadly, the Glow-worm appears to be becoming rarer in the British countryside; the days of collecting Glow-worms in Epping Forest appear to be over, as it is now very rare in the area. This beetle seems to have suffered from the destruction of its unimproved grassland habitats since World War II; many other sites have been lost due to scrub encroachment and succession to woodland. However, it is still a relatively widespread, but localised insect, and it is hoped that increased awareness and long-term monitoring can detect any decline before it is too late to do anything about it. It really would be a shame if future naturalists couldn't be inspired as many writers have been through the ages. It is certainly my favourite insect and it was good to hear at a recent BNA conference that I share this preference for Glow-worms with the popular naturalist, Chris Packham. It seems we also share an interest in the band, The Smiths. Perhaps their lead singer Morrissey was referring to the plight of Glow-worms when he sang 'There is a light that never goes out' in the 1980s. We can only hope this sentiment is true.



## The beetles I found on holiday...

by Isobel Ruffle

When I was on holiday in Berwick St. James (Wiltshire) this Easter I found quite a lot of beetles called 'Oil beetles' (*Meloe violaceus*). The males were about 4.5 cm and the females were about 3 cm long. They were metallic navy blue underneath and we found about eighteen of them digging holes in the sand on the side of the path.

There were also lots running around in the grass. When we returned home my Mum looked up the beetle and we found out that they are parasites that attach themselves to pollen-collecting insects, in the hope that they will be transported to a bees' nest, where they will feed on the developing larvae. A large number of the beetles die, however because they become attached to the wrong type of insect and are not carried to an appropriate nest.

### Reference

Cooter, J. and Barclay, M.V.L. *The Coleopterist's handbook* - 4th ed., The Amateur Entomologists' Society, 2006.



## Another importation of the Great Capricorn Beetle (Coleoptera: *Cerambyx cerdo*)

by Richard Dickson (3674)

.39 Serpentine Road, Fareham, Hampshire PO16 7ED.

In May 2008 a Hampshire sawyer who had been working on oak obtained from France found an impressive longhorn beetle in the building. He passed it to a friend who identified it as a female of this species, *Cerambyx cerdo* L. They also found a larva in a piece of the oak. The beetle was much photographed and eventually passed to me. It lived for several weeks, and fed upon (or at least imbibed juices from) strawberries. The larva was retained by my friend, and this year a male duly emerged.



The original beetle was widely admired, including by those attending my retirement party (at which she enabled me to speak about invertebrate conservation).

The beetle's range extended to this country, but only subfossil remains have been found. It has lost ground in the north of its range, but still exists in isolated populations in much of Europe. It is regarded as endangered and is listed in the EU's Habitats Directive and protected by law in some countries. Occasional records in this country all refer to importations. One such is reported from Sherfield-on-Loddon near Basingstoke in June 2008 (Hampshire Biodiversity Information Centre Newsletter Issue 12, Winter 2008-2009).

She raised an ethical dilemma for me. What should I do with her? There would seem little point in releasing her locally since suitable habitat would be hard to find, and *ad hoc* releases such as this are generally regarded as unhelpful. I could think of no way of returning her to the country of origin, at least within her expected life-span. In the end she lived out her days in my care. She is preserved, currently in my collection and for all I know possibly illegally!

Thanks to Trevor Codlin for passing her to me, and providing details of her discovery and the photograph.



## *Book Review*

### ***Colour identification guide to moths of the British Isles (Macrolepidoptera): 3rd revised and updated edition***

by Bernard Skinner, illustrated by David Wilson. Hardback 25 x 20cm. 325 pages, 51 colour plates and line drawings in text. ISBN 978-97-88757-90-3 Apollo Books. Available from the publisher at Kirkeby Send 19, DK-5771, Stenstrup, Denmark, DKK 480. GBP 48, EUR 69, USD 99 excluding postage.

As a twelve year old boy I was rewarded for four hours' endurance in a dentist's chair by being presented with my very own copy of Richard South's *Moths of the British Isles*. This was the moth chaser's Bible at the time- the only comprehensive illustrated work on the British moths then available. It was the last of many editions – the earlier ones had been illustrated by colour photographs the plates for which had become worn over the years until the quality became inadequate for publication, and in my new edition they were replaced by paintings by an anonymous artist.

When this appeared, a controversy raged as to whether illustrations for identification guides should be by photographs or paintings. The first were viewed as true representations – the second had the advantage that the artist could position them and emphasise the diagnostic points. I later acquired a secondhand copy of an older edition, and thus had the best of both worlds.

We are now fortunate enough to be in a position to choose the style of illustration which suits us best. Richard Lewington's paintings in Paul Waring and Martin Townsend's *Field Guide to the Moths of Great Britain and Ireland* are extremely fine, and show each species in a natural sitting position. It also has many photos of larvae. But Bernard Skinner's *Colour Identification Guide to the Moths of the British Isles* has excellent photographs of every moth in the standard "set" position. Beginner lepidopterists have difficulty in transferring their image of a living specimen in front of them into the traditional position – more experienced people usually prefer the "unnatural" pose because it displays every feature of the insect's forewings and hindwings.

The latest edition of Skinner's work shows several great improvements. The colour plates have lost a slight yellowish tinge which was evident in the earlier edition, and seem much clearer and



sharper. Extra plates have been included: two pages of new species which have appeared in Britain in the twelve years since the last edition, and also a further six enlarged colour plates show wings of easily confused species side by side, for comparison purposes. Although the book remains a textbook on macrolepidoptera, it does now picture one or two micro species that could be mistaken for similar macro species – for instance the micro Green Oak Tortrix (*Tortrix viridana*) is displayed because it could be confused with macro Cream Bordered Green Pea (*Earias clorana*), and the Thistle Ermine is shown (*Myelois circumvoluta*) because of its similarity to the Speckled Footman (*Coscinia cribraria bivittata*.)

One small carp – updating plates is obviously an undertaking both expensive and fraught with difficulty, so it is understandable that additions should only appear in the new plates at the end. But this does mean that the later material is not illustrated at the right place in the taxonomic sequence. So Langmaid's Yellow Underwing (*Noctua jantbina*) is not with the other Yellow Underwings, but appears in the new comparison plates at the back alongside the Lesser Broad Bordered Yellow Underwing (*Noctua jantbe*). It appears in the correct place in the text, of course, with appropriate references, so this is only a minor inconvenience.

As before, the text is arranged taxonomically with information for each species given under headings of similar species,; variation, imago and larva. There are indexes under English names and Scientific names. The information has been updated where necessary although can never totally keep pace with a dynamic population – for instance there is no mention of the recent strong increase of the range of the Least Carpet (*Idaea rusticata atrosignaria*) – Waring and Townsend in the *Field Guide* op. cit. score a point here. The real strong point of the book, however, is in the text illustrations – very clear drawings illustrating features which can separate similar species. There is a danger here that this can lead to over confidence. It is a brave – and perhaps unwise – person who will pronounce upon a specimen being a Marbled Minor (*Oligia strigilis*) or a Tawny Marbled Minor (*Oligia latruncula*) without confirming it by genitalia dissection. But there is no other guide available which gives such clear aid in distinguishing species.

So the beginning student of moths will find Waring and Townsend easier to work with and just as up to date, if not more so, than Skinner; but for the serious Lepidopterist Skinner's work remains the standard reference work and completely indispensable. Of course, it is



best to own both books and take advantage of the strong points of each: and furthermore the true fanatic will also use them in conjunction with Chris Manley's *British Moths and Butterflies: a photographic guide*, which provides splendid photos of every macro species (and quite a few micros) taken in natural position and background, but confusingly has them without any consistent scale.

Skinner's book is now published by Apollo Books. The cover is laminated cloth, and the binding is sewn. It is beautifully produced, and the price of £48 is not unreasonable in the context of its value and durability. It is an indispensable tool for the serious lepidopterist.

**Martin Hough**



## ARE YOU MISSING OUT? THE ENTOMOLOGIST'S RECORD and Journal of Variation

Publishes notes, observations, articles and reviews, mainly on the Lepidoptera and Coleoptera of the British Isles and Europe.

Founded in 1890 by J. W. Tutt, and still going strong, we publish six issues a year – alternating with the AES *Bulletin*. This means there is now a first class entomological journal available every month of the year!

Our subscription price is £25 per year. If you would like to see a specimen copy, please send your name and address, and a couple of second class stamps to cover postage to:

**The Editor, 14 West Road, Bishops Stortford, Hertfordshire CM23 2QP.**

*Write now! You never know what you could be missing.*

The Entomologist's Record is a publication of the Amateur Entomologists' Society.  
To ensure high standards of production we use Cravitz Printing Company.



## Ian Johnson Natural History Books

*(Pemberley Books)*

Specialist in *Entomology* and related subjects  
Also *Zoology, Ornithology, Botany* etc.

- CATALOGUES – Second-hand, Antiquarian and New books – free catalogues available on request.
- SPECIALIST BOOKSHOP at Richings Park, Iver, just to the West of London – easy to reach by car or train. Visitors are welcome to visit and view our stock, but please telephone first to confirm opening times.
  - \* *By car:* only 10 minutes drive from the M25 via the M4 (Junction 5), or M40 (Junction 1). 15 minutes from Heathrow Airport.
  - \* *By train:* 20 minutes from London Paddington to Iver Station on the Paddington-Slough Thames Trains service (2 trains every hour). We are 1 minute's walk from Iver Station.
- WEBSITE – view our stock on our website: [www.pemberleybooks.com](http://www.pemberleybooks.com).
- BOOKS BOUGHT – We are always interested in purchasing books in our specialist field, particularly antiquarian, academic and scholarly works on insects and other invertebrates.

18 BATHURST WALK, RICHINGS PARK, IVER, BUCKS SL0 9AZ  
Tel: 01753 631114/Fax: 01753 631115 • e-mail: [ian.johnson@pemberleybooks.com](mailto:ian.johnson@pemberleybooks.com)

## British Butterflies throughout the year by Peter May

This new book from the AES describes the adults of different species of British butterflies, according to the time of year they appear on the wing. Nearly all the 60 British species are illustrated. Focussing on encouraging an interest in entomology among the young, and the young at heart, there is a helpful calendar of flight times and a useful checklist to help you keep track of your observations. £ 5.00

Members price £ 3.80

## Preparing and maintaining a collection of Butterflies and Moths

by P. May and M. White. A practical manual detailing the various methods used to prepare specimens for a collection, from killing methods, setting the specimens and repairing damaged ones, to storage and preservation, including pest prevention and cure. 21 pages, 4 figures and 5 plates. (2006) £4.85

Members price £3.65

## The Hymenopterist's Handbook by Dr. C. Betts et al.

2nd edition dealing with the history of their families, classification and structures; natural history; studying, collecting, breeding, attracting and preserving Hymenoptera. Appendices include keys to the families. 214 pages with numerous tables, keys and figures (1986) £ 11.45

Members price £ 8.60

## Revised Flight Tables for the Hymenoptera

Revised flight tables for the Hymenoptera giving, wherever possible, times, location, flower visits and some indication of distribution and abundance. 24 pages (1988) £ 3.10

Members price £ 2.35

## A Coleopterist's Handbook

Edited by J. Cooter & M.V.L. Barclay. The *Coleopterist's Handbook*, is now available as a fully revised and expanded fourth edition. Nomenclature has been brought inline with current use, collecting/curatorial methods reflect best practice and plant/beetle and beetle/plant lists are included together. Recent additions to the British fauna, modern and traditional techniques are included. All advice and comment given in the book is based upon collective years of practical experience of both curatorial methods and field craft; beetle family chapters have each been written by an internationally recognised authority. 496 pages including 32 colour plates. £ 54.00

Members price £ 39.00

## Host plants of British Beetles: A List of Recorded Associations

A list of a wide range of plants, in alphabetical order, together with the beetle species that have been recorded as being associated with them. 24 pages (1992) £ 3.10

Members price £ 2.35

## A Silkmother Rearer's Handbook by B.O.C. Gardiner

SPECIAL OFFER PRICE £ 7.70  
No further discounted price available

## A Dipterist's Handbook by A.E. Stubb, P.J. Chandler and others

A practical handbook for both the beginner and the initiated on collecting, breeding and studying the two-winged flies. Describes equipment, trapping, preservation, habitat, plant and animal associations and behaviour. Includes a detailed chapter on larval stages with an illustrated key to families. An essential hook for the keen Dipterist. 260 pages with drawings of larvae and equipment (1978, reprinted 1996) £ 14.20

Members price £ 10.60

## Practical Hints for Collecting and Studying the Microlepidoptera

by P.A. Sokoloff. A practical manual for those interested in the smaller moths, describing techniques for collecting adult moths, collecting immature stages, breeding, killing, setting and mounting. A list of useful books and journals as well as details of societies and suppliers is included. 40 pages, 11 figures (1980) £ 4.20

Members price £ 3.15

## Rearing and Studying Stick and Leaf-Insects by P. D. Brock

Specifically intended for beginners, although it is also suitable for experienced Phasmid enthusiasts, it is one of the few guides to rearing that features the majority of the culture stocks available, 22 species in detail. The informative text is complemented by 8 colour plates, 14 black and white plates and 29 figures. (New edition, 2003) £ 11.20

Members price £ 8.20

## The Study of Stoneflies, Mayflies and Caddisflies by T.T. Maean

A comprehensive guide to collecting and studying the biology and ecology of these aquatic insects. 44 pages, 10 figures and bibliography (1982) £ 4.20

Members price £ 3.15

## Breeding the British Butterflies by P.W. Cribb

A practical handbook covering all aspects of butterfly breeding, including general techniques, equipment and hints on how to breed each of the British species. 60 pages, 6 figures, 5 plates, Revised (2001) £ 5.20

Members price £ 3.85

## Practical Hints for the Field Lepidopterist by J.W. Tutt

Written at the turn of the century, this book has been reprinted because of its scarcity and value to students of Lepidoptera. It gives a complete month by month guide to which species and stages of macros and micros to look for and how to find them. Also contains a biological account of the early stages and how to keep, rear, photograph and describe them. 422 pages. Hardback. (Reprinted 1994). £ 24.00

Members price £ 18.30

## An index to the modern names for use with J.W. Tutt's

### Practical Hints for the Field Lepidopterist by B.O.C. Gardiner

A valuable cross-reference guide between the scientific and English names used in the early 1900s and the present time. £ 4.70

Members price £3.50

## A Guide to Moth traps and their use by R. Fry and P. Waring

The first sections deal with the measurement and properties of light leading into the types of lamp available and the electrical circuits needed to operate them. The next sections give details of the construction of the most popular traps used in the UK. The last half deals with the practical use of traps in the field including where and when to trap, limitations of traps and their relative performance. 68 pages, 21 figures, 15 plates (1996) £ 6.85

Members price £ 5.05

## The Amazing World of Stick and Leaf Insects by Paul D. Brock

A superb, comprehensive guide, for all those intrigued by these groups of insects. Topics covered include structure, fascinating facts, life history and development, defence behaviour, enemies, collecting, breeding (including trouble shooting), preserving, taxonomic studies, important collections in Museums etc. around the world and elaborate stories, beliefs and poems. Also outlines the major known species around the world on a regional basis. A section on Fossils is included. Includes a comprehensive glossary of the technical terms used in the description and classification of stick and leaf-insects. Hardback A5, 184 pages, 46 figures, 26 black and white plates and 40 pages of colour plates (containing 83 photographs and 4 drawings/paintings of insects and their habitats). (1999) £ 18.90

Members price £ 14.10

## Rearing Parasitic Hymenoptera by M. Shaw

This booklet provides information on the parasitic Hymenoptera to enable successful studies to be made of this little understood group of the British insect fauna. Details are given on the general biology of parasitic wasps, rearing principles, efficient rearing practices and detailed methods of dealing with adult wasps. 52 pages, 4 colour plates (New edition - 2001) £ 5.70

Members price £ 4.20

## Larval Foodplants of the British Butterflies by Peter May

A comprehensive compilation of the known larval foodplants of our native and immigrant butterflies. Also including "How to Encourage Butterflies to Live in Your Garden" by the late Peter Cribb 62 pages. (2003) £ 7.40

Members price £ 5.45

## The larger water beetles of the British Isles by Peter Sutton

For those who love the spectacular larger water beetles of the British Isles, this is the publication that you have been waiting for! It is the only modern publication with colour illustrations of all of our aquatic coleopteran megafauna and it provides the most up-to-date distribution maps revealing their current distributions. Jam-packed with fascinating details of their life-histories, this book covers 11 species including the 6 native 'Great Diving Beetles' and the 'Silver Water Beetles'. It is also copiously illustrated with text figures and has much additional information including details of observed climate-induced range changes and the conservation measures required to ensure their continued survival. £ 11.90

Members price £ 8.90

## Glossary for the Young Lepidopterist

6 pages, 2 figures. (1951)

£ 1.05

Members price £ 0.90

## A Label List of European Butterflies

20 pages. (Revised 1981)

£ 2.35

Members price £ 1.85

## Some British Moths Reviewed

Aid to the identification of some of the more difficult species. Reprinted from the *Amateur Entomologist* Vol. 5 (1941) and a *Guide to the Critical Species of Lepidoptera*, reprinted from *Entomologists' Gazette* 1969-72. 64 pages, 6 black and white plates, numerous figures (1985) £ 4.45

Members price £ 3.35

## Butterflies of Cyprus 1998 (Records of a years sightings) by Eddie John

Observations of the 44 species of butterfly found on the island in 1998 including notes on each species and distribution maps. 46 pages (2000) £ 4.30

Members price £ 3.25

## Collecting Het.Bugs (Hemiptera: Heteroptera)

12 pages (including 2 plates). (1946)

£ 1.20

Members price £ 1.00

## Collecting Clearwings

12 pages (including 2 plates), 4 figures. (1946)

£ 1.10

Members price £ 1.00

## Collecting Lacewings

9 pages, 8 figures, 5 plates. (2nd edition 1976)

£ 2.25

Members price £ 1.75

## An Amateur's Guide to the Study of the Genitalia of Lepidoptera

16 pages, 15 figures. (1973)

£ 3.10

Members price £ 2.35

## Rearing the Hymenoptera Parasitica

16 pages, 1 plate, 10 figures. (1974)

£ 2.55

Members price £ 2.00

## Rearing Crickets in the Classroom

12 pages, 2 plates. (1986) (Reprinted 1993)

£ 2.10

Members price £ 1.65

## Guidelines for Entomological Site Surveys

Published on behalf of the JCCBI. 7 pages (2000) (Reprinted 2003) £ 3.10

Members price £ 2.35

## The Journal of the Entomological Exchange and Correspondence Club 1935-1936

An AES Jubilee Publication. Fascinating reprint of the very first volume of the AES journal. 100 pages. £ 4.20

Members price £ 3.35



All the above publications sent post free to U.K. addresses. Outside U.K. please add 10% to order value for postage by surface mail. For postage by air-mail outside Europe please add 30% to order value. Please allow 28 days delivery.

Please make all cheques/postal orders payable to 'AES Publications' and send to:

AES Publications, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Telephone 01277 224610 • Fax: 01277 262815 • E-mail: aespublishings@btconnect.com

The  
**Bulletin**  
*of the Amateur Entomologists' Society*

Volume 68 • Number 484

June 2009

CONTENTS

Editorial.....	83
Corrections .....	84
AES Events Calendar 2009 .....	85
Amateur Entomologists' Society Grants and Awards .....	88
Ruffle, J. Exciting opportunity to carry out survey work in Headley Heath!.....	88
AES Annual Report for the Year ended 31 December 2008 .....	90
Keen, D. Letter from Spain – 7th in a series – Spanish winter butterflies: a further update	96
Ellis, S. J. and Ellis, H. A. Long-tailed Blue in Northumberland (Lepidoptera: <i>Lampides boeticus</i> ) .....	98
Stevens, G. An unusual occurrence in Latvia .....	100
Partridge, R. The Great Green Bush-cricket <i>Tettigonia viridissima</i> in 'old' Cambridgeshire .	101
Cole, S. Insects in Malta, Summer 2007 .....	108
Holland, P. The 'Queen of Entomologists' Part 1: Mrs Hutchinson and the Pinion-spotted Pug.....	113
Best, G. Food plant preference in Privet Hawk (Lepidoptera: <i>Sphinx ligustri</i> ) larvae.....	117
Gardiner, T. Detection rates of adult male and larval Glow-worms <i>Lampyrus noctiluca</i> from transect sampling .....	118
Gardiner, T. Is this a Glow-worm, which I see before me? .....	120
Ruffle, I. The beetles I found on holiday... ..	121
Dickson, R. Another importation of the Great Capricorn Beetle (Coleoptera: <i>Cerambyx cerdo</i> ).....	122
Book Review <i>Colour identification guide to the moths of the British Isles (Macrolepidoptera): 3rd revised and updated edition</i> by Bernard Skinner .....	123

ES 36 a

# The **Bulletin**



*of the Amateur Entomologists' Society*

Volume 68 • Number 485

August 2009

THE NATURAL  
HISTORY MUSEUM  
03 SEP 2009  
PRESENTED  
ENTOMOLOGY LIBRARY



ISSN 0266-836X

Editors: Dr P. Wilkins & M. Hough



000174464



Founded in 1935

The AES • P.O. Box 8774 • London • SW7 5ZG

<http://www.amentsoc.org>

### Officers of the Society

<i>President:</i>	Robin Wootton
<i>Secretary:</i>	Dafydd Lewis
<i>Treasurer:</i>	Peter May
<i>Acting Registrar:</i>	Dafydd Lewis
<i>Bulletin Editors:</i>	Phil Wilkins & Martin Hough
<i>General Editor:</i>	Jacqueline Ruffle
<i>Advertising Secretary:</i>	Peter Hodge
<i>Exhibition Secretary:</i>	Wayne Jarvis
<i>Youth Secretary:</i>	Kieren Pitts
<i>Conservation Secretary:</i>	David Lonsdale
<i>Webmaster:</i>	Kieren Pitts
<i>ICN Editor:</i>	David Lonsdale
<i>Wants &amp; Exchange:</i>	Peter May

---

THE AES WORKS TO PROMOTE AND DISSEMINATE ENTOMOLOGICAL KNOWLEDGE AND TO ENCOURAGE AN INTEREST IN ENTOMOLOGY AMONG THE YOUNGER GENERATION.

---

#### **BULLETIN ADVERTISING RATES:**

Advertising in the AES *Bulletin* is a cost effective way of reaching all AES members and many others who benefit from institutional subscriptions.

Full page £75 for each advert or £375 for six adverts in the same year.

Half page £50 for each advert or £250 for six adverts in the same year.

Quarter page £30 for each advert or £150 for six adverts in the same year.

---

#### **NOTICE**

It is to be distinctly understood that all views, opinions, or theories, expressed in the pages of this Journal are solely those of the author(s) concerned. All announcements of meetings, financial grants offered or sought, requests for help or information, are accepted as bona fide. Neither the Editor, the Officers and Council of the Society, nor its Trustees, can be held responsible for any loss, embarrassment or injury that might be sustained by reliance thereon.

# Worldwide Butterflies [www.wwb.co.uk](http://www.wwb.co.uk)



## The new Goodden Light 12v for use in remote areas

Now  
available  
alone or  
with the  
**Moonlander  
Moth Trap**

By studying the light output from MV, Robert Goodden has developed this sophisticated portable unit with aspects in common with MV, using so little power that it runs all night on a 7.5Ah battery. It attracts insects much better than actinic lights, even powerful ones requiring heavy batteries. **Rainproof and safe.** An in-line photoswitch puts the light on and off automatically. With this switch the unit can be used vertically or horizontally in any moth trap.

See [www.wwb.co.uk](http://www.wwb.co.uk) for prices and more.

## Moonlander Moth trap

Folds totally flat and is contained in a convenient slim shoulder bag. Very lightweight.

**The Moonlander turns the principle of moth trapping upside down!** Moths enter from the bottom and cannot escape through the top. **Works as sheet and trap combined.**

Better than traditional egg boxes, moths prefer the new **reticulated foam moth shelters** and cone.

**The Moonlander** is now available **without electrics, or with Battery, Mains or BOTH.**

See the options on [www.wwb.co.uk](http://www.wwb.co.uk)



*No escape through the top*



**Both trap and light are total innovations by Robert Goodden.**

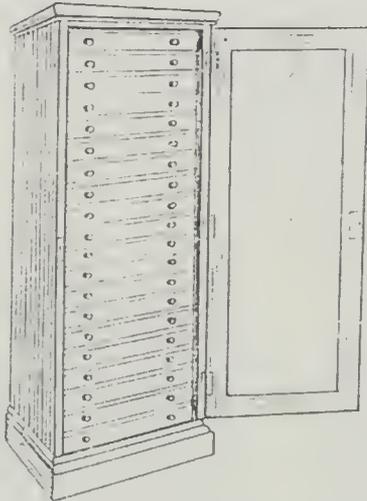
They are tried and tested in Europe and the tropics. In good conditions the results are spectacular.

**Worldwide Butterflies** website offers **Livestock and Equipment for breeding and study. Specimens for specialist collectors will be added as available.** The system enables you to see exactly what is currently available as the season changes. From time to time there are special **Sale Offers** of equipment, books, livestock and specimens - an ever changing situation.

[www.wwb.co.uk](http://www.wwb.co.uk) Add it to your **Favorites** - check it regularly.

# ATROPOS ANTIQUES\*

## PURVEYORS OF FINE COLLECTOR'S CABINETS



*Many of you will have met us at the AES  
London Fair where we regularly show  
entomological cabinets for sale*

- We are specialist dealers in fine collector's cabinets.
- We can offer a choice of at least 30 cabinets, varying in purpose, construction, quality and price.
- We can supply both restored and un-restored cabinets and will undertake to restore and paper cabinets for clients.
- We are always interested in the purchase or exchange of cabinets, with or without a collection.
- Callers to our showrooms are always welcome by appointment.
- We offer a specialist collection and delivery service throughout the UK and have full expertise in the safe transportation of cabinets and collections.

**George Morgan**

**97, West Street, Hartland, N. Devon EX39 6BQ**

**T: 01237-441205/984 M: 07973 302190**

**E-mail: [george@atropos.wanadoo.co.uk](mailto:george@atropos.wanadoo.co.uk)**

\* We are an independent dealership of 30 years standing and have no association with any similarly named business.



## ARE YOU MISSING OUT? THE ENTOMOLOGIST'S RECORD and Journal of Variation

Publishes notes, observations, articles and reviews, mainly on the Lepidoptera and Coleoptera of the British Isles and Europe.

Founded in 1890 by J. W. Tutt, and still going strong, we publish six issues a year – alternating with the AES *Bulletin*. This means there is now a first class entomological journal available every month of the year!

Our subscription price is £25 per year. If you would like to see a specimen copy, please send your name and address, and a couple of second class stamps to cover postage to:

**The Editor, 14 West Road, Bishops Stortford, Hertfordshire CM23 2QP.**

***Write now! You never know what you could be missing.***

The Entomologist's Record is a publication of the Amateur Entomologists' Society.  
To ensure high standards of production we use Cravitz Printing Company.



## Ian Johnson Natural History Books

*(Pemberley Books)*

Specialist in *Entomology* and related subjects  
Also *Zoology, Ornithology, Botany* etc.

- CATALOGUES – Second-hand, Antiquarian and New books – free catalogues available on request.
- SPECIALIST BOOKSHOP at Richings Park, Iver, just to the West of London – easy to reach by car or train. Visitors are welcome to visit and view our stock, but please telephone first to confirm opening times.
  - \* *By car:* only 10 minutes drive from the M25 via the M4 (Junction 5), or M40 (Junction 1). 15 minutes from Heathrow Airport.
  - \* *By train:* 20 minutes from London Paddington to Iver Station on the Paddington-Slough *Thames Trains* service (2 trains every hour). We are 1 minute's walk from Iver Station.
- WEBSITE – view our stock on our website: [www.pemberleybooks.com](http://www.pemberleybooks.com).
- BOOKS BOUGHT – We are always interested in purchasing books in our specialist field, particularly antiquarian, academic and scholarly works on insects and other invertebrates.

18 BATHURST WALK, RICHINGS PARK, IVER, BUCKS SL0 9AZ

Tel: 01753 631114/Fax: 01753 631115 • e-mail: [ian.johnson@pemberleybooks.com](mailto:ian.johnson@pemberleybooks.com)

**£14.99 (inc. UK p&p)**

£16.99 (overseas)

## **Rearing Stick and Leaf Insects**

by Ronald N. Baxter

Fifty species described in detail: how to care for eggs prior to hatching, caring for small and large nymphs and adults. Including information on distribution, descriptions, egg and egg laying, list of foodplants and general rearing requirements.



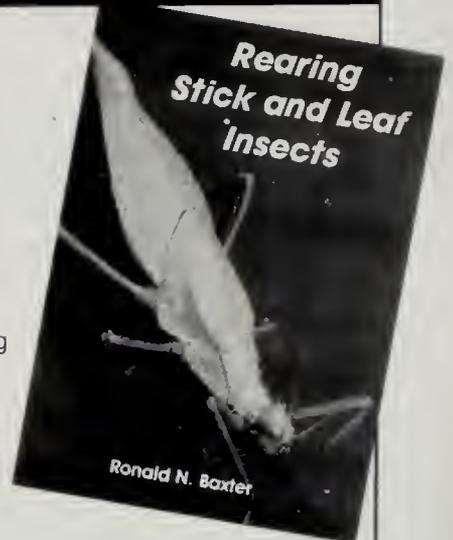
112 superb colour photographs and 12 stunning plates of 146 illustrations of Phasmid eggs, of a quality never before published.

**ORDER YOUR COPY NOW FROM**

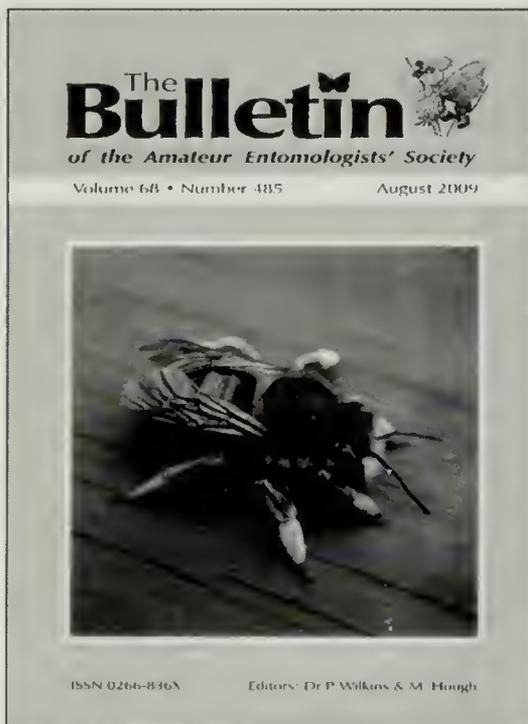
Cravitz Printing Company Limited

1 Tower Hill, Brentwood, Essex CM14 4TA.

Tel: (01277) 224610 • Fax: (01277) 262815 • E-mail: [CravitzPrinting@btconnect.com](mailto:CravitzPrinting@btconnect.com)



## **Bulletin Cover**



The cover shows a Wool Carder Bee *Anthidium manicatum* (Linnaeus 1758) photographed at Welney Wildfowl and Wetlands Trust Reserve, Norfolk. This species is noteworthy for several reasons. Unusually for bees, the male is larger than the female (a male is shown here). The male is very aggressive and will attack other species. He will also abduct the female for mating. The female collects woolly hairs from flowers. It forms these into a ball, or tomentum. This is used to line a tube – usually an unoccupied beetle larval burrow in wood. She constructs several cells and provides the egg with pollen and honey.

Photo: Phil Wilkins

# The Bulletin

of the Amateur Entomologists' Society

Volume 68 • Number 485

August 2009

## Editorial

It is a privilege to be given a blank canvas for writing, and a colour section to fill with photographs, for the purpose of spreading the thoroughly enjoyable word of entomology. However, it is unfortunate that for some time now, that generous request has come as a result of necessity because, in spite of a fairly substantial membership, the editors have had considerable difficulty finding enough copy to fill the *Bulletin*. I am often puzzled by the fact that the majority of members make no contribution to the *Bulletin* when it provides such a wonderful opportunity to see articles and colour photographs in print. Is it that we are all so ridiculously busy that we rarely get a chance to get into the field and make those noteworthy observations? Could we be overlooking the benevolence of support, where generosity of subscription through loyalty, to ensure the ongoing prosperity of the Society is the order of the day, rather than involving oneself with the occasionally timely business of research for paper writing? (I have always argued strongly that members should not be harangued for copy when they are actively supporting the Society through their generous subscription.) Or is it simply (and this may be close to the mark), with the continuous fragmentation of the individual interests that make up the entomological scene, together with their respective journals about beetles, bees, wasps, butterflies, dragonflies, best days, new discoveries, aberrations, *etc.*, that all of the possible articles of interest that would once have found their way into the *Bulletin* have gone elsewhere? If this is the case, does it mean that this constant erosion of the Society will inevitably lead it to what Darwin might have referred to as an 'evolutionary cul-de-sac'? I believe that the answer is no. The AES has, and has always had, a critical role to play in both the nurturing of young entomological talent and the development of entomologists of all ages, many of whom have gone on to play pivotal roles in their respective fields. Mike Majerus knew this. It was our sad loss to have had such a dynamic and inspirational President, who had significantly raised the profile of the Society, tragically taken through illness before he had time to bring his plans for the Society to fruition. Mike's unerring ability, as a pro-active ambassador for entomology, to make things happen by enthusing and inspiring all those who came



into contact with him, was a gift that will be greatly missed by all who had the privilege of knowing and working with him. Our heartfelt thoughts continue to remain with Mike's family at this time.

Regarding the reasons for the lack of *Bulletin* contributions, I do not purport to know the answer to this conundrum. What I do know, as mentioned above, is that the *Bulletin* provides a marvellous opportunity for amateur entomologists to make a contribution to entomological literature, and, as I sit writing this at Mansion House, among the fantastic ancient volumes of work that grace the bookshelves in the study at the RES library, it is good to see our journal shining like a beacon among the topical journals of the day in the display rack. I would like to take this opportunity to sincerely thank those contributors who regularly put their work forward and also thank several newcomers for their excellent articles. I particularly enjoyed the recent article on the Carabidae of Kouklia Dam by Emma Small and Kevin Austin, with superb photos by Christodoulos Makris. I sincerely hope that those who do find (or can make) the time to prepare the enjoyable contributions that we would all like to see, will continue do so. Good luck!

**Peter Sutton**

## **AES Member receives major Insect Conservation Award**

The Society is pleased to congratulate Dr David Lonsdale, AES Conservation Secretary, who has been awarded the Marsh Award for Insect Conservation by the Royal Entomological Society.

The Marsh Award is given only for outstanding contributions to insect conservation, on the basis of 'lifetime achievement' or 'considerable and exemplary contribution'.

David currently represents the AES on Invertebrate Link (the Joint Committee for the Conservation of British Invertebrates) and has, among many other activities, edited our journal *Invertebrate Conservation News* for the past 40 years.





## Corfu, an introduction to its invertebrate fauna

by Dr Peter G. Sutton (7388)

2 Fir Tree Close, Flitwick, Beds. MK45 1NZ.

Corfu is a passion of mine. It is the greenest and lushest of the Ionian Islands and its jewelled scimitar rises from the turquoise sunlit waters off the coast of Albania and Greece, taunting the barren ruggedness of those brown mountainous lands with its emerald beauty.

As has been the case for many other naturalists, it was the Durrells, Gerald and Lawrence, who introduced me to this island with their evocative descriptions of its people, its landscapes, and its wildlife. It was Gerald Durrell in particular, with his descriptions of praying mantises, rose beetles and scorpions that convinced me that I should spend some quality time searching for these and other species on the island. Little did I realise that my own explorations of Corfu would allow me to add to the knowledge of species on the island, which, for some reason, I had assumed would have been very well-studied and documented. In fact, if this selection of articles reveals anything, it is that there is still so much to discover, and enjoy, on the island of Corfu. During my own studies, I have had the good fortune to find a new species of dragonfly for the island, document observations regarding the formerly unrecorded Mole Cricket *Gryllotalpa* sp., record new species of butterfly and the cockroach *Phyllodromica marginata*, and provide an introduction to the Cerambycidae and other beetles to be found on Corfu.

I have attempted to provide accurate modern checklists for the Rhopalocera, Odonata and Orthoptera, and as mentioned above, details of a sample of the coleopteran fauna of Corfu, as well as several other species of note from other Orders.

However, this work would not have been possible without the foundations laid by previous entomologists, and the generous help and advice from a number of experts from across Europe. It has been my great privilege to correspond with the following entomologists, who have been instrumental in ensuring the accuracy of the papers in this special issue: Luc Willemse and Vladimir Vrabec (Orthoptera); Wolfgang Lopau, Vincent Kalkman and K-D Dijkstra (Odonata); Martin Rejzek and Garth Foster (Coleoptera); Vladimir Vrabec, Matt Rowlings, David Baldock (Lepidoptera: Rhopalocera). My sincere thanks also go to the following for taking the time to help with the identification of several species: Colin Plant, Peter Hodge, Max Barclay, Conrad Gillett and Alex Ramsay, and again to David Baldock for his kind provision of



the small collection of Corfu butterflies exhibited by the late R.F. Bretherton at the BENHS exhibition some thirty years ago. Any errors to be found in the following papers are mine alone.

Returning to the beginning, all of this work, in its entirety, has grown from a seed planted by Gerald Durrell. It was his ability to directly transport you to the island of Corfu and experience its riches through the magic of his writing, that provided the spark for myself and so many other naturalists to visit the island. It is hoped that this special issue will provide an insight into the rich invertebrate fauna of Corfu and show that it is still possible, in the 21st century, to add to both the knowledge of the fauna and the species list of this remarkable, and in places, still breathtakingly beautiful Ionian island.



## A checklist of the butterflies (Rhopalocera) of Corfu (Kérkira)

by Dr Peter G. Sutton (7388)

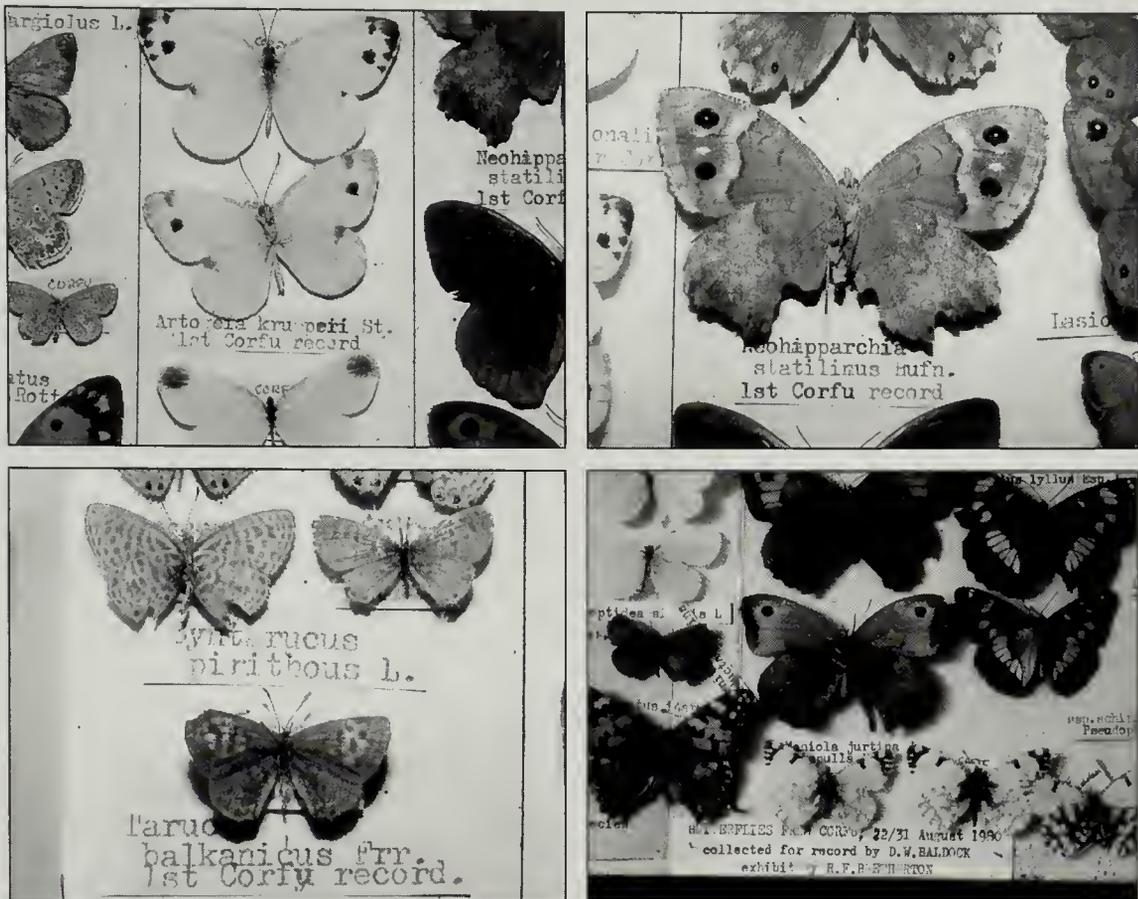
2 Fir Tree Close, Flitwick, Beds. MK45 1NZ.

### Introduction

In 1980, David Baldock visited Corfu and observed a total of 34 species of butterfly in a short period of time between the 18th and 31st August, including, at the time, six species for which no previous records could be traced. Baldock concluded that, "In all this is more than half of all the butterflies previously certainly known to occur there. It gives some idea of the richness of the butterfly fauna of the island and suggests that further discoveries remain to be made" (Baldock and Bretherton, 1981).

Subsequently, Baldock and Bretherton (*loc. cit.*) compiled a provisional list of the butterflies of Corfu, drawing on available historical records. This list included 79 species of butterflies, including 16 species which required additional information to confirm their presence on Corfu, and nine which had not been recorded since the previous century. The paper concluded that, "The list is unlikely to be complete; but even so, probably more species of Rhopalocera are to be found on Corfu than any other Mediterranean island, except Sicily.

In 1995, a visit to Corfu by Rob Parker, which added to the known fauna of the island, inspired a further revision of its Rhopaloceran



**Figure 1.** Some new butterfly species for Corfu collected by David Baldock, August 1980.

fauna (Parker, 1996). Parker worked closely with Alain Olivier, who has an in-depth knowledge of the butterflies of the Greek islands, to produce a checklist confirming the presence of 75 species. A list of those species considered to be doubtful was also provided, along with justification for the inclusion of certain species e.g. *Hipparchia semele*. However, the possibility of previously recorded absentees still being present on the island always remains and, to exemplify this, the presence of one of the species considered doubtful, the Mountain Small White *Pieris ergane*, was later confirmed by Peter Taylor in 1996 (Parker, *loc. cit.*), who also added the Lesser Fiery Copper *Lycaena thersamon* and Purple Hairstreak *Quercusia quercus* to the species list.

In May (14th-28th) 2001, the author visited Corfu as part of an ongoing study of its fauna and noted the presence of a large number of species, including the Great Banded Grayling *Kanetisa (Brintesia) circe* (Plate 4) and the Sloe Hairstreak *Satyrium acaciae* (Plate 8) for which there appeared to be no previous records. A later communication with Vladimir Vrabec (pers. comm., 28.vi.2007) revealed that he too had recorded both species during a survey conducted between 2001-2, and that he had also added the Marbled



Skipper *Carcharodus lavatherae* to the list. A later visit by the author (May 26th-June 2nd 2007) also confirmed the continued presence of the migratory Plain Tiger *Danaus chrysippus* (at Ermones and Agios Georgios). This species was first reported on Corfu by Vanholder (1993) and has, since 1988, seen a remarkable increase in its distribution range in Italy, which has been linked to the warm climatic conditions experienced in the late 1980s. In 1992 this species was recorded for the first time in Serbia and Montenegro and appeared in Croatia in 2004 (Perkovic, 2006).

In the light of these recent additions, an updated list of the butterflies of Corfu has been compiled:

### A checklist of the butterflies of Corfu (Kérkira)

#### Papilionidae

Swallowtail *Papilio machaon* (Linnaeus, 1758)

Southern Swallowtail *Papilio alexanor* (Esper [1800])

Scarce Swallowtail *Iphiclides podalirius* (Linnaeus, 1758) (Plate 2)

Southern Festoon *Zerynthia polyxena* ([Denis and Schiffelmüller], 1775)

#### Pieridae

Large White *Pieris brassicae* (Linnaeus, 1758)

Small White *Artogeia rapae* (Linnaeus, 1758)

Southern Small White *Artogeia mami* (Mayer, 1851)

Mountain Small White *Artogeia ergane* (Gayer, 1828)

Green-veined White *Artogeia napi* (Linnaeus, 1758)

Krueper's Small White *Artogeia krueperi* (Staudinger, 1860)

Eastern Bath White *Pontia edusa* (Fabricius, 1777)

Bath White *Pontia daplidice* (Linnaeus, 1758)



**Figure 2.** Clouded Yellow *Colias crocea*, Vátos.



**Figure 3.** Wood White *Leptidea sinapis*, Agios Górdis.



Eastern Dappled White *Euchloe ausonia* (Hübner, [1804])  
Orange Tip *Anthocharis cardamines* (Linnaeus, 1758)  
Eastern Orange Tip *Anthocharis damone* (Boisduval, 1836)  
Clouded Yellow *Colias crocea* (Geoffroy in Fourcroy, 1785)  
Brimstone *Gonepteryx rhamni* (Linnaeus, 1758)  
Cleopatra *Gonepteryx cleopatra* (Linnaeus, 1767) (Plate 6)  
Wood White *Leptidea sinapis* (Linnaeus, 1758)

### Lycaenidae

Purple Hairstreak *Quercusia quercus* (Linnaeus, 1758)  
Sloe Hairstreak *Satyrium acaciae* (Fabricius, 1787) (Plate 8)  
Ilex Hairstreak *Satyrium ilicis* (Esper, 1779) (Plate 7)  
Blue-spot Hairstreak *Satyrium spini* ([Denis and Schiffelmüller], 1775)  
Green Hairstreak *Callophrys rubi* (Linnaeus, 1758)  
Small Copper *Lycaena phlaeas* (Linnaeus, 1761)  
Grecian Copper *Lycaena ottomana* (Lefebvre, 1830)  
Purple-shot Copper *Lycaena alciphron* (Rottemburg, 1775)  
Lesser Fiery Copper *Lycaena thersamon* (Esper, 1784)  
Long-tailed Blue *Lampides boeticus* (Linnaeus, 1767)  
Lang's Short-tailed Blue *Leptotes pirithous* (Linnaeus, 1767)  
Little Tiger Blue *Tarucus balkanicus* (Freyer, [1844])  
Small Blue *Cupido minimus* (Fuessly, 1775)  
Holly Blue *Celastrina argiolus* (Linnaeus, 1758)  
Green-underside Blue *Glaucopsyche alexis* (Poda, 1761)  
Baton Blue *Pseudophilotes baton* (Bergstrasser, 1779)  
Eastern Baton Blue *Pseudophilotes vicrama* (Moore, 1865)  
Silver-studded Blue *Plebejus argus* (Linnaeus, 1758)  
Brown Argus *Aricia agestis* ([Denis and Schiffelmüller], 1775)  
Chapman's Blue *Agrodiaetus thersites* (Cantener, 1835)  
Common Blue *Polyommatus icarus* (Rottemburg, 1775)

### Libytheidae

Nettle-tree Butterfly *Libythea celtis* (Laicharting, 1782)

### Danaidae

Plain Tiger *Danaus chrysippus* (Linnaeus, 1758)

### Nymphalidae

Two-tailed Pasha *Charaxes jasius* (Linnaeus, 1767) (Plate 1)  
Southern White Admiral *Limenitis reducta* (Staudinger, 1901) (Plate 5)  
Camberwell Beauty *Nymphalis antiopa* (Linnaeus, 1758)



- Large Tortoiseshell *Nymphalis polychloros* (Linnaeus, 1758)  
 Peacock Butterfly *Inachis io* (Linnaeus, 1758)  
 Red Admiral *Vanessa atalanta* (Linnaeus, 1758)  
 Painted Lady *Vanessa cardui* (Linnaeus, 1758)  
 Small Tortoiseshell *Aglais urticae* (Linnaeus, 1758)  
 Comma Butterfly *Polygonum c-album* (Linnaeus, 1758)  
 Southern Comma *Polygonum egea* (Cramer, [1775])  
 Cardinal *Argynnis pandora* ([Denis and Schiffelmüller], 1775)  
 Silver-washed Fritillary *Argynnis paphia* (Linnaeus, 1758)  
 Queen of Spain Fritillary *Issoria lathonia* (Linnaeus, 1758)  
 Glanville Fritillary *Melitaea cinxia* (Linnaeus, 1758)  
 Knapweed Fritillary *Melitaea phoebe* ([Denis and Schiffelmüller], 1775)  
 Spotted Fritillary *Melitaea didyma* (Esper, 1778) (Plate 3)

### Satyridae

- Balkan Marbled White *Melanargia larissa* (Geyer, [1828])  
 Eastern Rock Grayling *Hipparchia syriaca* (Staudinger, 1871)  
 Delattin's Grayling *Hipparchia volgensis* (Mazochin-Porshnjakov, 1952)  
 Grayling *Hipparchia semele* (Linnaeus, 1758)  
 Tree Grayling *Neohipparchia statilinus* (Hufnagel, 1766)  
 Great Banded Grayling *Kanetisa (Brintesia) circe* (Fabricius, 1775) (Plate 4)  
 Meadow Brown *Maniola jurtina* (Linnaeus, 1758)  
 Oriental Meadow Brown *Hyponphele lupina* (Costa, 1836)  
 Southern Gatekeeper *Pyronia cecilia* (Vallantin, 1894)  
 Small Heath *Coenonympha pamphilus* (Linnaeus, 1758)  
 Speckled Wood *Pararge aegeria* (Linnaeus, 1758)  
 Wall Brown *Lasionmuata megera* (Linnaeus, 1767)  
 Large Wall Brown *Lasionmuata maera* (Linnaeus, 1758)  
 Lattice Brown *Kirinia roxelana* (Cramer, [1777])

### Hesperiidae

- Grizzled Skipper *Pyrgus malvae* (Linnaeus, 1758)  
 Orbed Red-underwing Skipper *Spialia orbifer* (Hübner, [1823])  
 Sage Skipper *Muschaupia proto* (Ochsenheimer, 1808)  
 Mallow Skipper *Carcharodus alceae* (Esper, 1780)  
 Marbled Skipper *Carcharodus lavatberae* (Esper, 1783)  
 Oriental Marbled Skipper *Carcharodus orientalis* (Reverdin, 1913)  
 Inky Skipper *Erynnis marloyi* (Boisduval, [1834])  
 Lulworth Skipper *Thymelicus acteon* (Rottemburg, 1775)  
 Small Skipper *Thymelicus sylvestris* (Poda, 1761)  
 Large Skipper *Ochlodes venatus* (Bremer & Grey, 1853)  
 Pigmy Skipper *Gegenes puuilio* (Hoffmannsegg, 1804)



**Figure 4.** Mallow Skipper *Carcharodus alceae*, Agios Górdis.

### Conclusion

The checklist of butterflies for Corfu now comprises 83 species and it may be that further recording effort could yet increase that number. It is clear that Corfu provides an extraordinarily rich island fauna for the lepidopterist to observe and that any visit to the island is likely to be a wholly rewarding experience.

### Acknowledgements

The compilation of an updated checklist would have been an impossible task without the extensive and painstaking efforts of previous workers, and I am sincerely indebted to the following: David Baldock, (the late) R. Bretherton, Rob Parker, Alain Olivier, Vladimir Vrabec; and all those who have contributed records from which the previous respective checklists have been compiled. Sincere thanks also to Matt Rowlings for confirming the identification of the Ilex and Sloe Hairstreaks.

### References

- Baldock, D.W. and Bretherton, R. (1981), Butterflies in Corfu (Kerkyra) in late August with a provisional list of all species known from it. *Trans. Br. Ent. Nat. Soc.*, **14**: 8-10 & 101-107.
- Parker, R. (1996), *Pieris mannii* and other animals on Corfu in May 1995, *Bull. Amat. Ent. Soc.*, **55** (407): 175-183 & 254-255.
- Perkovic, D. (2006), *Danaus chrysippus* (Linnaeus, 1758) (Lepidoptera, Nymphalidae, Danainae), a new species in the fauna of Croatia. *Nat. Croat.*, **15** (1-2): 61-64.
- Vanholder, B. (1993), *Danaus chrysippus* (Linnaeus, 1758) en andere trekvinders op Kerkira (Corfu), *Phegea*, **21** (2): 44.



# A checklist of the dragonflies (Odonata) of Corfu (Kérkira) including a new record for the Ionian Islands, the Black Pennant *Selysiothemis nigra* (Vander Linden, 1825)

by Dr Peter G. Sutton (7388)

2 Fir Tree Close, Flitwick, Beds. MK45 1NZ.

## Introduction

If it is the case that a central theme to this collection of articles has been the fact that it is still possible, in the 21st century, to discover new species on the island of Corfu, then it is also the case that the process of confirming those discoveries has only been possible because of the considerable time and effort of previous workers who have established a degree of certainty regarding the lists of fauna produced for each respective invertebrate group. In each case it has been possible to observe how the initial provisional checklists have been put together and built upon, with later additions and omissions based on an identification process which has been subject to increasing scrutiny. Indeed, the ongoing processes of modern taxonomic determination have themselves been subject to a seemingly continual state of flux, particularly with regard to a more rigorous approach to the identification of formerly imperceptible anatomical differences, and also with the advent of techniques such as DNA fingerprinting, which help to identify species and their origins at a molecular level.

In the case of the Odonata, a suitable baseline was provided by Hämäläinen (1983), who, through the study of 58 specimens, was able to build a list of 23 species for the island of Corfu, including the following new species: Blue-eyed Hawker *Aeshna affinis*; Yellow-spotted Emerald *Somatochlora flavomaculata* (which at the time was a new record for Greece); Ruddy Darter *Sympetrum sanguineum*; and the Broad Scarlet (Scarlet Darter) *Crocothemis erythraea* (Plate 13). However, it should also be noted that some of the original information that helped to build the knowledge of the odonatan fauna of Corfu came from Gerald Durrell's mentor, Theodore Stephanides (Stephanides, 1939), who surveyed the "freshwater biology of Corfu and certain other regions of Greece". Stephanides recorded an impressive list of 20 species (detailed in Lopau, 2006).

Hämäläinen's list was subsequently updated by Butler (1999), who published his contemporary observations of the island's dragonfly



fauna and proposed the following new species for the island: *Lestes viridis* (an explanation of why this species has been split, and why the species found on Corfu is now regarded to be *Lestes parvidens* (Plate 14), is provided below); Lesser Emperor *Anax parthenope*; Green-eyed Hawker (Norfolk Hawker) *Aesbna isocetes* (Plate 12); Hairy Hawker *Brachytron pratense*; and Southern Darter *Sympetrum meridionale*. However, unbeknown to Butler, all but *Brachytron pratense* had been discovered previously, and it is unfortunate that the large body of data collated by Lopau (1999, 2000) which revealed previous records of the above 'new' species by a number of workers, did not appear in print until the same year that Butler published his observations. Butler's proposed list, as is often the case, also precipitated the appearance of useful historical literature; in this case, the above-mentioned work of Stephanides (*loc. cit.*), who had previously reported the presence of *Anax parthenope* and *Sympetrum meridionale* from Corfu.

Lopau's studies of the Odonata of Greece were published in two separate supplements of the German journal, *Libellula* (Lopau, 1999, 2000) and provided details of the species found in Greece, including specific locality details for sites on Corfu. They also provided details of new species, including the recent and spectacular arrival, the Violet Dropwing *Trithemis annulata*, (Plate 11), which was first recorded on Corfu in 1994. Lopau later went on to summarise the data for Corfu, providing a list of 39 species for the island (Lopau, 2006). To place this figure into context, Corfu has, by far, the richest odonatan fauna of all the Ionian Islands, which collectively, at that time, had 40 species. Only the Dainty Bluet *Coenagrion scitulum*, is missing from the Corfu list. In comparison, Kefalloniá and Lefkáda have 20 species of Odonata, and Zákynthos has 14 species.

In May 2007, the author, whilst surveying an area near Spartera on the southern cape of Corfu (28.v.2007), photographed a species of dragonfly which was not immediately recognisable. Subsequent research revealed it to be the Black Pennant *Selysiothemis nigra* (Plate 9), a species that had not previously been recorded from the island, and was hitherto known from only three Greek islands: Crete, Lesbos and Euboea (W. Lopau, *pers. comm.*, 13.vii.2007). Elsewhere, this species has an extremely patchy distribution and is: "Found mainly in central Asia and the Middle East. Scarce in the eastern Mediterranean, rare further west. Principally coastal in our area, but in Africa confined to oases in the Sahara" (Kalkman in: Dijkstra & Lewington, 2006).

Significant developments in recent years have concerned the appearance of species e.g. *Trithemis annulata*, on Corfu that have



probably arrived as a result of climate-induced range expansions, and the recognition of new species and subspecies resulting from taxonomic redetermination, albeit with the significant blurring of boundaries in some areas. In one case a species that was formerly recognised as being distinct, *Orthetrum ramburi* (Sélys) (e.g. in Askew, 1988) is now considered to be *Orthetrum coerulescens* spp. *anceps* because of the large areas of Europe over which indeterminate individuals can be found. The recognised subspecies of the *Calopteryx* damselflies e.g. *Calopteryx splendens* spp. *balcanica*, which are essentially defined according to their phenotypic characteristics also exhibit significant areas of introgression where their respective ranges coalesce. Taxonomic discrepancies still arise through a non-uniform approach to the assignment of subspecies status. *Aeshna isoceles* for example, in the southern Balkans, tends to have broader yellow antehumeral stripes and is recognised by some workers as *Aeshna isoceles* ssp. *antehumeralis*, while others feel that this status is unjustified. For example, this subspecies has not been recognised in the recent work of Boudot *et al.*, (2009). The currently recognised subspecies for species found on Corfu are provided in the checklist below.

Species that have increased their ranges in response to climate change continue to be found at new localities at their respective range boundaries. The work of Boudot *et al.* (2009) is particularly useful in this respect, and provides brief details of observed changes and current distribution maps for each species. The maps for *Crocothemis erythraea* and *Trithemis annulata*, for example, show that both species appear to have had strong northward and westward expansions in response to climate change, with the entry for the latter species reading: "...has expanded its range rapidly in southwestern Europe in recent decades. It crossed the whole of the Iberian Peninsula from 1978 onwards and was found for the first time in western France in 1994. It is now regularly recorded from the Garonne estuary to the Rhône delta."

Species that have been added to the Corfu list since the 1990s are: *Aeshna affinis*, *Aeshna isoceles*, *Anax ephippiger*, *Brachytron pratense*, *Trithemis annulata*, and *Selysiobemis nigra*. (*Ceriagrion georgifreyi*, *Lestes parvidens* and *Pyrrhosoma elisabethae* have also been added to the list as a result of taxonomic changes, as described below.)

The Turkish Red Damselfly *Ceriagrion georgifreyi* Schmidt, 1953 was formerly regarded to be a subspecies of the Small Red Damselfly *C. tenellum* (de Villers, 1789) spp. *georgifreyi* Schmidt, 1953 (where



*georgfreyi* has apparently now changed to *georgifreyi*) and is now recognised as a distinct species (Kalkman, 2005). It is found on the Greek islands of Thásos, Zákynthos and Corfu, and along a narrow coastal fringe that extends from Israel to south-west Turkey.

Two other significant taxonomic changes concern the species formerly known as *Lestes viridis* and *Pyrrhosoma nymphula*. The Balkan form of *Lestes viridis* was originally assigned a subspecies status, *parvidens* Artobolevskii, but this has since been revised and the Eastern Willow Spreadwing *Lestes parvidens* is now regarded to be a distinct species, as is *Lestes viridis*, the Western Willow Spreadwing (previously known as the Willow Emerald Damselfly). Interestingly, these are the only two species of European Odonata that lay their eggs in live wood. Jödicke (in: Dijkstra & Lewington, 2006) states that *L. v. parvidens* “in the 1980’s and 1990’s, was found to overlap with *Lestes viridis* in Italy and the Balkans.” Limits of ranges have still not been accurately assessed, and hybridisation can also occur between the two species, although apparently, this is rare. It is interesting to note that, in addition to the morphological differences between the two species, which can reliably be determined only with the aid of magnification, differences in emergence times and activity have also been noted. The Eastern Willow Spreadwing is recorded on the wing from early May onwards (the specimen shown in Plate 14 was recorded on Ropa River at Ermones 31.v.2005), whereas the Western Willow Spreadwing is “the latest *Lestes*; in central Europe seldom emerges before mid-July. . . abundant in August and September, persisting into November.” (Jödicke in: Dijkstra & Lewington, 2006, *loc. cit.*)

The species formerly recorded as *Pyrrhosoma nymphula* has since been recognised as the distinct species, the Greek Red Damselfly *Pyrrhosoma elisabethae* Schmidt, 1948. This rare and vulnerable species is found in richly vegetated streams and currently known only from a small number of localities in Greece and Albania. Consequently, it is of significant conservation value on the island of Corfu. Boudot *et al.* (2009) state that: “No more than 14 localities have yet been identified, at several of which it has subsequently become extinct. Hence, *P. elisabethae* is one of the most threatened Odonata species in the Mediterranean region. It is classified as VU (vulnerable) in the Global Red List but has been upgraded to EN (endangered) in the subsequent Mediterranean Red List.”

The last record of *P. elisabethae* was by Fons Peels in 2008, and *C. georgifreyi* has only been recorded once from the island (Vincent Kalkman, pers. comm. 24.vi.2009). It is clear that the current status and



vulnerability of both species on the island requires accurate assessment.

The following checklist for the dragonflies of Corfu now includes *Selysiothemis nigra*, bringing the total number of species recorded from the island to 40, and the current total for the Ionian Islands to 41:

### **A checklist of the dragonflies (Odonata) of Corfu (Kérkira)**

(Nomenclature follows Dijkstra, (*loc. cit.*) with older 'common' names in brackets.)

#### **Zygoptera Damselflies**

##### **Calopterygidae**

*Calopteryx* Leach, 1815, Demoiselles

Banded Demoiselle *Calopteryx splendens* ssp. *balcanica* (Harris, 1782)

Beautiful Demoiselle *Calopteryx virgo* ssp. *festiva* (Linnaeus, 1758)

*Lestes* Leach, 1815, Spreadwings (Emerald Damselflies)

Migrant Spreadwing (Southern Emerald Damselfly) *Lestes barbarus* (Fabricius, 1798)

Small Spreadwing (Small Emerald Damselfly) *Lestes virens* (Charpentier 1825)

Dark Spreadwing *Lestes macrostigma* (Eversmann, 1836)

Eastern Willow Spreadwing *Lestes parvideus* Artobolevskii, 1929

*Sympecma* Burmeister, 1839, Winter Damsels

Common Winter Damsel *Sympecma fusca* (Vander Linden, 1820)

##### **Coenagrionidae**

*Ischnura* Charpentier, 1840, Bluetails (Blue-tailed Damselflies)

Common Bluetail *Ischnura elegans* (Vander Linden, 1820)

*Enallagma* Charpentier, 1840, 'American' Bluets

Common Bluet *Euallagma cyathigerum* (Charpentier, 1840)

*Coenagrion* Kirby, 1890, 'Eurasian' Bluets

Variable Bluet *Coenagrion pulchellum* (Vander Linden, 1825)

Azure Bluet *Coenagrion puella* (Linnaeus, 1758)

*Erythromma* Charpentier, 1840, Brighteyes (Red-eyed Damselflies)

Small Redeye *Erythromma viridulum* (Charpentier, 1840)

*Pyrrhosoma* Charpentier, 1840, Large Red Damsels

Greek Red Damsel *Pyrrhosoma elisabethae* Schmidt, 1948

*Ceriagrion* Selys, 1876, Small Red Damsels

Turkish Red Damsel *Ceriagrion georgifreyi* Schmidt, 1953



## Platycnemididae

*Platycnemis* Burmeister, 1839, Featherlegs (White-legged Damselflies)

Blue Featherleg (White-legged Damselfly) *Platycnemis pennipes* ssp. *nitidula* (Pallas, 1771)

## Anisoptera True Dragonflies

### Aeshnidae

*Aeshna* Fabricius, 1775, Mosaic Hawkets

Migrant Hawker *Aeshna mixta* (Latreille, 1805)

Blue-eyed Hawker *Aeshna affinis* Vander Linden, 1820

Green-eyed Hawker (Norfolk Hawker) *Aeshna isoceles* (Müller, 1767)

*Anax* Leach, 1815, Emperors

Blue Emperor *Anax imperator* Leach 1815

Lesser Emperor *Anax parthenope* (Selys, 1839)

Vagrant Emperor *Anax ephippiger* (Burmeister, 1839)

*Brachytron* Evans, 1845, Hairy Hawkets

Hairy Hawker *Brachytron pratense* (Müller, 1764)

*Caliaeschna* Selys, 1883, Eastern Spectres

Eastern Spectre *Caliaeschna microstigma* (Schneider, 1845)

### Gomphidae

*Gomphus* Leach, 1815, Clubtails

Turkish Clubtail *Gomphus schneiderii* Selys, 1850

*Onychogomphus* Selys, 1854, Pincertails

Small Pincertail *Onychogomphus forcipatus* spp. *forcipatus* (Linnaeus, 1758)

*Somatochlora* Selys, 1871, Striped Emeralds

Balkan Emerald *Somatochlora meridionalis* Nielsen, 1835

Yellow-spotted Emerald *Somatochlora flavomaculata* (Vander Linden, 1825)

### Libellulidae

*Libellula* Linnaeus, 1758, Chasers

Broad-bodied Chaser *Libellula depressa* Linnaeus, 1758

Blue Chaser (Scarce Chaser) *Libellula fulva* Müller, 1764

*Orthetrum* Newman, 1833, Skimmers

Black-tailed Skimmer *Orthetrum cancellatum* (Linnaeus, 1758)

Keeled Skimmer *Orthetrum coerulescens* ssp. *anceps* (Fabricius, 1798)

Southern Skimmer *Orthetrum brunneum* (Fonscolombe, 1837)

*Sympetrum* Newman, 1833, DartersRuddy Darter *Sympetrum sanguineum* (Müller, 1764)Yellow-winged Darter *Sympetrum flaveolum* (Linnaeus, 1758)Red-veined Darter *Sympetrum fonscolombii* (Selys, 1840)Common Darter *Sympetrum striolatum* (Charpentier, 1840)Southern Darter *Sympetrum meridionale* (Selys, 1841)*Crocothemis* Brauer, 1868, ScarletsBroad Scarlet (Scarlet Darter) *Crocothemis erythraea* (Brullé, 1832)*Trithemis* Brauer, 1868, DropwingsViolet Dropwing *Trithemis annulata* (Palisot de Beauvois, 1807)*Selysiobemis* Ris, 1897, Black PennantsBlack Pennant *Selysiobemis nigra* (Vander Linden, 1825)

### The future

Any discussion regarding the freshwater fauna of Corfu, particularly with regard to its species of conservation concern, must recognise the fact that it is a fauna under threat. The situation has changed considerably since Stephanides published his survey of the freshwater biology of Corfu in 1939, and, doubtless, many formerly suitable habitats have been lost as the island has evolved from the rural idyll described by the Durrell brothers, to the popular tourist destination that it has become today. Moreover, the problems faced by the freshwater fauna of Corfu are mirrored (perhaps even more dramatically) on the Greek mainland and generally across the Mediterranean region. These factors have been discussed in more detail elsewhere (Sutton, 2008, and references therein) and can be effectively summarised as follows: pollution of freshwater habitats (with a significant threat coming from pesticides and other chemicals); degradation and loss of freshwater habitats through excessive water abstraction (with the corresponding threat of desertification); disturbance and habitat destruction through building development; and the inappropriate management of aquatic resources through lack of strategic planning, including unsustainable agricultural practices which have led to the loss of the majority (75 %) of Greek wetlands since 1900 (OECD, 2000).

It is often the case that progress with regard to the protection of biodiversity in certain countries can be a painfully slow process. It is also the case that where positive steps have been taken to protect biodiversity through legislation, an inability to enforce that legislation, coupled with what appears to be a general carelessness regarding what



happens to areas that are supposed to be protected, has led to some disastrous conservation calamities. It is a great pity that a vital custodian of such an important part of the world's biodiversity has recently been prosecuted for its failure to comply with legislation that attempts to retain these natural riches for future generations. Nevertheless, in some areas, incremental progress is being made, and it is through recognition of the fact that Greece, including Corfu, has something very special to protect, that will hopefully provide the energy for its decision makers to move forward and lead in a manner reminiscent of its ancient scholars.



**Figure 1.** Black-tailed Skimmer *Ortbetrum cancellatum*, Corfu Town.



**Figure 2.** Teneral male Keeled Skimmer *Ortbetrum coerulescens* ssp. *anceps*, Lake Korission.

### Recommended publications

For anyone interested in the Odonata of the Mediterranean and North Africa, the following publication is an essential text:

Boudot, J.-P. *et al.*, (2009), Atlas of the Odonata of the Mediterranean and North Africa, *Libellula Supplement 9*: 1-256.

This publication is illustrated with superb colour photographs and distribution maps throughout, and is a valuable source of information regarding the current changes that are occurring in the status and distribution of Odonata species across this region, with research underpinned by a weighty body of references.

The cost of this publication is 25 Euros and it can be obtained directly by e-mailing Gabi Peitzner: [gdo.peitzner@gmx.de](mailto:gdo.peitzner@gmx.de) or, I understand, it can also be purchased (perhaps more easily) through the British Dragonfly Society.

Similarly, the *Field Guide to the Dragonflies of Britain and Europe*, by K-D Dijkstra and Richard Lewington represents yet another standard work from British Wildlife Publishing, and is an indispensable companion to the study of odonatan fauna abroad. Lavishly illustrated



throughout by the hand of one of the world's most accomplished entomological artists, it also contains colour photographs and distribution maps, with the comprehensive and up-to-date text for each species being provided by the relevant expert.

This book is available from British Wildlife Publishing ([www.britishwildlife.com](http://www.britishwildlife.com)) at a price of £21.95 paperback, £30-hardback (p&p free, UK only).

### Acknowledgements

My sincere thanks and gratitude, for their generous provision information, advice and valuable comments must go to Wolfgang Lopau, Vincent Kalkman and K-D. Dijkstra. Again, I must make the point that the compilation of this checklist has only been possible because of the painstaking efforts of previous workers, and I am indebted to all those, from Theodore Stephanides (1939) to Boudot *et al.* (2009), whose contributions have allowed me to provide this latest update.

### References

- Askew, R.R. (1988). *The Dragonflies of Europe*. Harley Books, Colchester.
- Boudot, J.-P., Kalkman, V.J., Azpilicueta Amorín, M., Bogdanovic, T., Cordero Rivera, A., Degabriele, G., Dommanget, J.-L., Ferreira, S., Garrigós, B., Jovic, M., Kotarac, M., Lopau, W., Marinov, M., Mihokovic, N., Riservato, E., Samraoui, B., & Schneider, W. (2009), Atlas of the Odonata of the Mediterranean and North Africa, *Libellula Supplement 9*: 1-256.
- Butler, S.G. (1999). Further additions to the knowledge of the Odonate fauna of the island of Corfu, Greece. *Notul. Odonatol.* **5**: 25-27.
- Dijkstra, K-D. B. (2006), *Lestes parvidens* Eastern Willow Spreadwing, in: Dijkstra, K-D. B. and Lewington, R. (2006), *Field Guide to the Dragonflies of Britain and Europe*, British Wildlife Publishing, Gillingham (Dorset).
- Hämäläinen, M. (1983), Additions to the knowledge of the Odonate fauna of the island of Corfu, Greece. *Notul. Odonatol.* **2**: 25-26.
- Kalkman, V.J. (2005), On the distribution of the genus *Ceriagrion* Selys in the Balkans with *C. georgfreyi* Schmidt new for Europe. *Libellula, Supplement 4*: 25-32.
- Kalkman, V.J. (2006), *Selysiothemis nigra* Black Pennant, in: Dijkstra, K-D. B. and Lewington, R., (2006), *Field Guide to the Dragonflies of Britain and Europe*, British Wildlife Publishing, Gillingham (Dorset).
- Lopau, W. (1999), Bisher unveröffentlichte Libellenbeobachtungen aus Griechenland. *Libellula, Supplement 2*: 43-61.
- Lopau, W. (2000), Bisher unveröffentlichte Libellenbeobachtungen aus Griechenland II. *Libellula, Supplement 3*: 81-112.
- Lopau, W. (2006), Die Libellenfauna der Jonischen Inseln/Griechenland – Kefalloniá, Kérkira (Korfu), Lefkáda und Zákynthos, Libellen. *Naturkundliche Reiseberichte*, **32**: 3-37.
- OECD. 2000. Environmental Performance Reviews: Greece. Greek Ministry of Environment and Public Works. Athens.
- Stephanides, T. (1939), *A survey of the freshwater biology of Corfu and of certain other regions of Greece*. Christou, Athens.
- Sutton, P.G. (2008), The occurrence of the freshwater crab *Potamon fluviatile* (Herbst, 1785) (Decapoda: Brachyura) in Corfu, *JMBA2 (Journal of the Marine Biological Association 2: Online Biodiversity Records* <http://www.mba.ac.uk/jmba/pdf/6296.pdf>).



## A selection of beetles (Coleoptera) from the island of Corfu (Kérkira)

by Dr Peter G. Sutton (7388)

2 Fir Tree Close, Flitwick, Beds. MK45 1NZ.

### Introduction

When I first decided to put together a series of observations regarding the beetle fauna of Corfu, I had little idea that it would turn out to be such a frustrating business! That frustration was borne of the general lack of a coherent body of information regarding the Mediterranean fauna, bringing to mind a quote from Fer Willemsse regarding what was formerly the case for the Greek Orthoptera: “. . . identification of the Greek species . . . has been a problem to people not experienced in identifying representatives of this group of insects. Helpful literature is scattered, often unavailable and more often than not written by specialists for other specialists.”

Populist literature, with all due respect to the authors, is barely worth talking about.

The best guide that I found was a French book, *Guide des mille-pattes, arachnides et insectes de la région Méditerranéenne* published by Delachaux et Niestlé. While this is a worthy and useful book for many of the species found in this region, it exemplifies the problems associated with the accurate identification of Coleoptera, and lists only 41 species, some of which are only identified to genus level. As for the British literature, a question must be asked regarding what purpose, if any, it really serves. The Collins *Complete Mediterranean Wildlife Photoguide* provides details of only 13 species, including: the Green Tiger Beetle *Cicindela campestris*; a ‘tenebrionid beetle’ which apparently “walks with a purposeful but awkward gait”; and the 7-Spot Ladybird *Coccinella 7-punctata*. The Pelham Books illustrated work, *The Natural History of the Mediterranean*, fares only slightly better and lists 16 species, again including that stalwart of the Mediterranean scene, the 7-Spot Ladybird and another garden friend, the 14-Spot Ladybird *Propylea (Coccinella) quatordecimpustulata*.

The Internet is a better resource, and there are some useful websites available, ranging from the vaguely useful, *i.e.* those that point you in the right direction regarding the identification of a species, to the extremely useful, like the Longhorn Beetles (Cerambycidae) of the Palaearctic Region website by Martin Rejzek and Michal Hoskovic, the details of which are provided below.



There are, of course, some very useful books for the specialist, all of which are (occasionally very) costly, and many of which are in a different language. The *Coléoptères Phytophages D'Europe* series of books, for instance, has good coverage with useful illustrations and maps (details can be found at [www.coleoptere.com](http://www.coleoptere.com)). Those books that provide keys, including the illustrated key to the Cicindelidae and Carabidae of Europe by Trautner and Geigenmüller, are similarly useful, although this particular book, again frustratingly, could not tell me that the Corfu tiger beetle was *Calomera littoralis* ssp. *nemoralis*.

This leads on to that other point of frustration, the fact that identification from photographs is not satisfactory, and in the absence of an expert in the field, the collection of voucher specimens provides the only realistic method of obtaining viable scientific records for conservation purposes. Consequently, I found that some very distinctive species that I thought I would have no problem identifying from a photograph, e.g. *Cerocoma* and *Trichodes* sp., cannot accurately be identified past genus level, and so have not been. Nevertheless, some interesting species have been identified.

It is hoped that this article provides a stepping stone for those who wish to study the coleopteran fauna of Corfu in a more detailed manner, and gives an indication of the remarkable diversity of the beetle fauna to be found on the island.

### The beetles

Corfu is a coleopterist's paradise and, since I have more than a passing interest in this vast and diverse group of insects, its Coleoptera have provided me with a constant stream of interesting and occasionally spectacular interludes while studying other aspects of the island's fauna. One species that immediately springs to mind is the huge buprestid, *Capnodis cariosa* (Plate 18), which, at a size of up to 40 mm, competes only with *Capnodis miliaris* for the title of largest European jewel beetle. (An account of the capture of this species is provided in the *Diary notes* for the island.)

The island of Corfu has been drastically altered by tourism in many areas, and yet there are still areas that remain secluded and untouched, even in the vicinity of popular tourist destinations. Agios Gordis, for example, on the west coast of the island, has been a source of many noteworthy observations, and the place where a very beautiful species of jewel beetle was discovered. At the southern end of the beach at Agios Gordis is a pathway that leads directly to the cliff tops. The path is very difficult to negotiate and has some awkwardly steep sections to



climb but, at the end of the trek, the cliff-top flowers provide some fine species to observe. Colourful species such as the Rose Chafer *Cetonia aurata* and Bee beetles *Trichodes* sp. (Plate 19) can be seen across the island, but other specialities exist in these small oases of habitat away from the beaten track. On this occasion the highlight was one of the showy *Anthaxia* species, which (again, in the absence of a voucher specimen) I believe to be *Anthaxia salicis* (Plate 20). The chafer, *Oxythrea funesta* (Plate 21) was also present in good numbers.

Occasionally the island flowers will produce cerambycids, members of the longhorn beetle family such as *Stenurella septempunctata* (Plate 22), and the wasp beetle, *Clytus rhamni* (Plate 23). Other cerambycids are much harder to find, and, as ever, are found more by luck than judgement. *Parmena pubescens* (Plate 24) for example, a nocturnal Mediterranean species, and the rare and impressive *Herophila (Dorcatypus) tristis* (Plate 25), were both chance finds. The former species was found at Agios Gordis, together with *Neodorcadian bilineatum* (Plate 26), and the latter species was found wandering the dune scrub at dusk to the south of Lake Korission.

As far as the Cerambycidae are concerned, probably the most special species is *Agapanthia schurmanni*, which is found only on Corfu and, in a part of northern Greece and Macedonia. This species was found by Michal Hoskovec on *Asphodelus* in the peak area of Mount Pantokrator in Corfu, the photograph of which is on the very useful European Longhorn site: <http://www.cerambyx.uochb.cz>. Initially, it was thought that I had found this species near Agios Gordis, but it was subsequently decided, with the aid of Martin Rejzek's considerable expertise, that the structure of the antennae appeared to be wrong for this species.... again highlighting the fact that photographs are no substitute for voucher specimens! It was decided that the specimen (Figure 1) was probably *Agapanthia cardui*, a species that I had found previously near Kalami (Plate 27). Martin's expertise was again required regarding the identification of what turned out to be the rarer of the two black *Ropalopus* species, *Ropalopus macropus* (Plate 28), which was separated from *R. clavipes* (which had also been recorded from Corfu by Michal Hoskovec) on the basis of its lack of antennal spines. A final species was the Musk Beetle *Aromia moschata* (Plate 29), whose metallic blue and red colouration suggested that it might have been something other than the nominotypical *moschata*, but it wasn't. It did not have the red pronotum that would have immediately distinguished it as the eastern subspecies, *ambrosiaca*.



**Figure 1.** Originally suspected to be *Agapanthia schurmanni*, this specimen is probably *Agapanthia cardui*.

The latter two species were again found at Agios Gordis, which, in 2002, turned out to be something of a hotspot for Coleoptera and other insects. In one particular field near the sea, some of the plants were bejeweled with considerable numbers of Rose Chafers (Figure 2), one of which had a distinctly purple metallic hue. In the evening, the same field would be illuminated by Fireflies *Lamprobiza splendidula* which flashed their green beacons rhythmically as they attempted to locate a matching signal. In the olive grove on the hillside above the field, the large carabid, *Carabus coriaceus* (Plate 30), was also found. I returned to the same field



**Figure 2.** A cluster of Rose Beetles *Cetonia aurata*.

at the same time of year in 2005 hoping to see a similar display, but depressingly, the area had clearly been sprayed with pesticide, and was now almost completely devoid of life . . . a great pity since in addition to the extraordinary abundance of insect life that I had observed, I had also found and photographed the highly specialized myrmecophilous snake, *Typhlops vermicularis* at this site (Figure 3).



### Butterflies of Corfu



Plate 1. Two-tailed Pasha *Charaxes jasius*.



Plate 2. Scarce Swallowtail *Iphiclides podalirius*.



Plate 3. Spotted Fritillary *Melitaea didyma*.

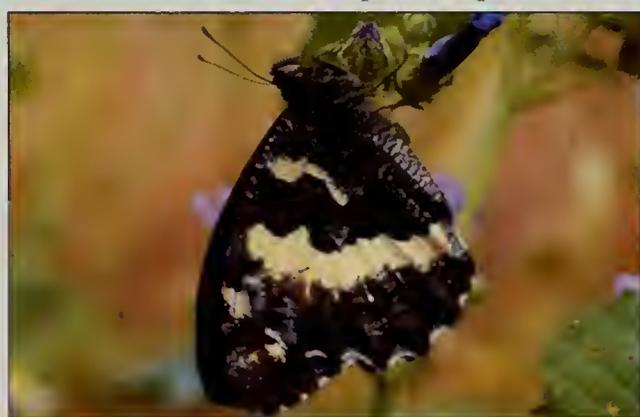


Plate 4. Great Banded Grayling *Kanetisa circe*



Plate 5. Southern White Admiral *Limenitis reducta*



Plate 6. Cleopatra *Gonepteryx cleopatra*.



Plate 7. Ilex Hairstreak *Satyrium ilicis*.

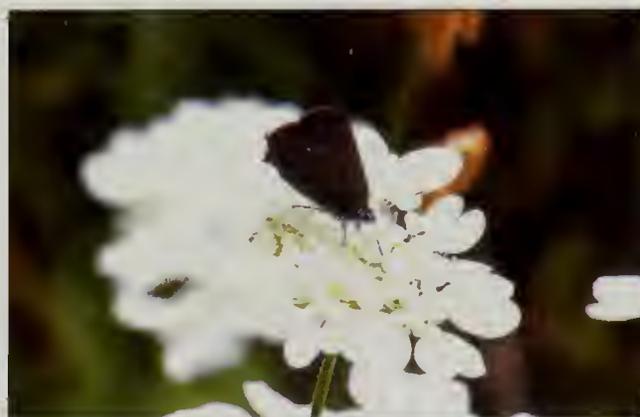
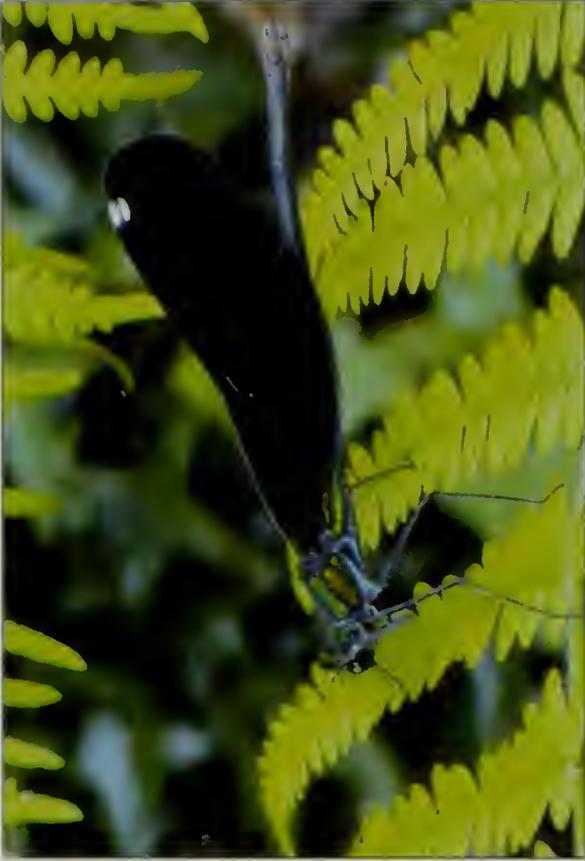


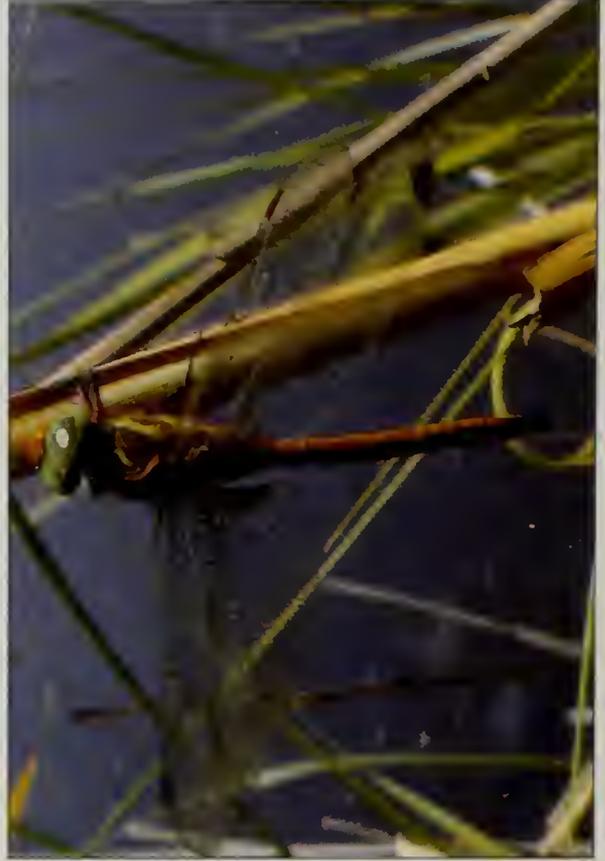
Plate 8. Sloe Hairstreak *Satyrium acaciae*.



**Plate 10.** Beautiful Demoiselle *Calopteryx virgo* ssp. *festiva* (androchrome female). Near Spartera.



**Plate 9.** Black Pennant *Selysiothemis nigra*. Near Spartera.



**Plate 12.** Green-eyed Hawker (Norfolk Hawker) *Aeschna isoceles* Aviaki and Ermones.



**Plate 11.** Violet Dropwing *Tritibemis annulata*. Ermones.



**Plate 13.** Broad Scarlet *Crocothemis erythraea*.



**Plate 14.** Eastern Willow Spreadwing *Lestes parvidens*.



**Plate 15.** Blue Featherleg (White-legged Damselfly)  
*Platynemis pennipes* ssp. *nitidula*.



**Plate 16.** Southern Skimmer *Ortbetrum brunneum*.



**Plate 17.** The Mammoth or Giant Dagger Wasp *Megascolia maculata* is the largest solitary wasp in Europe and parasitizes the larvae of the European Rhinoceros Beetle *Oryctes nasicornis*.



### Beetles of Corfu



Plate 18. Jewel Beetle *Capnodis cariosa*.



Plate 19. Bee Beetle *Trichodes* sp. and prey (*Oedemerita* sp.)



Plate 20. Jewel Beetle *Anthaxia salicis*.



Plate 21. The Chafer, *Oxytrea fumesta*.



Plate 22. Longhorn Beetle *Stenurella septempunctata*.



Plate 23. Wasp Beetle *Clytus rhamni*.



Plate 24. Longhorn Beetle *Parmena pubescens*



Plate 25. Longhorn Beetle *Herophila (Dorcatypus) tristis*



Beetles of Corfu



Plate 26. Longhorn Beetle *Neodorcadian bilineatum*.



Plate 27. Longhorn Beetle *Agapanthia cardui*.



Plate 28. Longhorn Beetle *Ropalopus macropus*.



Plate 29. Musk Beetle *Aromia moschata*.



Plate 30. Ground Beetle *Carabus coriaceus*.



Plate 31. Carabid Beetle *Scarites buparius*.



Plate 32. The Meloid Beetle *Cerocoma* sp.



Plate 33. Tiger Beetle *Calomera littoralis* ssp. *nemoralis*



**Plate 34.** Golf course ponds at Vatos. Clockwise from top left: two views of the King Diving Beetle *Dytiscus dimidiatus*; Great Silver Water Beetle *Hydrophilus piceus*; Blue Chaser (Scarce Chaser) *Libellula fulva* and the Ground Beetle *Cblaenius spoliatus*.



**Plate 35.** The yellow form of the Great Green Bush-cricket *Tettigonia viridissima*, Agios Georgios.



**Plate 36.** The Greek Magician *Saga bellica* and inset, its prey, the White-faced Bush-cricket *Decticus albifrons*.



**Plate 37.** The Mole Cricket *Gryllotalpa* sp. (probably *krimbasi*) burrowing in stream sediment near Kavos. Inset left: Mole Cricket eggs, inset right: Mole Cricket nymph.



**Plate 38.** Clockwise from top left: the Cockroaches *Phyllodromica marginata* and *Loboptera decipiens*, Chabrier's Bush-cricket *Eupholidoptera chabrieri garganica*, and the Ionian Bush-cricket *Poecilmon jonicus jonicus*.



**Figure 3.** The highly specialized myrmecophilous snake, *Typhlops vermicularis* was lost, together with virtually all insect life, after the site at Agios Gordis had been treated with agrochemicals.

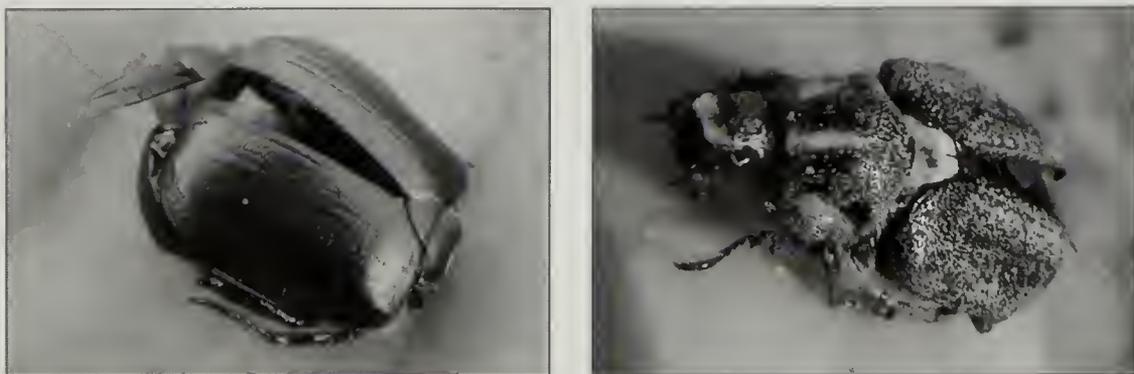
There are some nice carabids to be found on the island, with arguably, the most spectacular being a large *Scarites* species that inhabits the dunes of Lake Korission to the south. Available literature suggests that the species (Plate 31, Figure 4) is *Scarites buparius*. With its huge mandibles it must be a formidable opponent for any small creature and I found one large specimen devouring a newly metamorphosed Green Toad *Bufo viridis* that it had captured.



**Figure 4.** The impressive carabid, *Scarites buparius*.



Lake Korission, like Lake Antiniotissa, Gerald Durrell's 'Lake of Lilies', on the north-east of the island, is an area of special conservation interest and harbours many species for the coleopterist to observe. Certainly, a trip in early May would yield great rewards for those interested in the chafers, a statement made on the basis of the dried remains of body parts found in late May (Figure 5).



**Figure 5.** The remains of early season chafers litter the dunes at Lake Korission in late May.

It was at this site that the *Cerocoma* sp., with its bizarre antennae, was found (Plate 32). This species develops in the nests of the large sphecoid sand wasps (*Tachytes* and *Tachysphex* spp.) where it feeds on the large paralyzed grasshoppers and locusts that they bring as food for their larvae. Another species, a member of the Clytrinae, that on first appearances might be thought to have a strong hymenopteran association, but in fact feeds in soil litter is *Lachnaia sexpunctata* (Figure 6), which is not uncommon across the island. The tiger beetle that is commonly found on the shores of this lake is *Calomera littoralis* ssp. *nemoralis*. (Plate 33), and it is assumed that this is the same species that is found on the sandy beaches at San Stefano on the north west coast. Figure 7 shows a specimen of this variable species where the elytral spots have not coalesced.



**Figure 6.** *Lachnaia sexpunctata*.



**Figure 7.** A variation of *Calomera littoralis* ssp. *nemoralis*.



Many carabids are found in the vicinity of the Ropa River, and a particularly nice species that can be found close to the water's edge is *Chlaenius spoliatus* (Plate 34).

In the river resides the largest of the water beetle fauna, the Great Silver Water Beetles. All three *Hydrophilus* species have been recorded from the island, together with an impressive complement of other aquatic species. I have found a *Hydrophilus* sp. in the deep weedy stretches of the river at Ermones, and close by, on the golf course ponds, have found *Hydrophilus piceus* in the company of the King Diving Beetle *Dytiscus dimidiatus* (Plate 34), *Hygrobia* sp. and many other smaller species of water beetle.

It is clear that Corfu offers considerable opportunities for the coleopterist. Certainly, in my own experience, I have only seen a fraction of what the island has to offer, primarily because so many species have eluded me by taking to the air as soon as they are approached. Among these have been some mouthwatering examples of saproxylic species observed in the foothills near Acharavi. The fact that the largest European solitary wasp, *Megascolia maculata* (Plate 17), is present in such numbers also suggests the widespread presence of its host, the European Rhinoceros Beetle *Oryctes nasicornis*, just one more reason to add to a considerable number of excuses to return and investigate the island more thoroughly!

### Acknowledgements

Sincere thanks to Martin Rejzek, Garth Foster, Max Barclay, Conrad Gillett and Peter Hodge for their help with the identification of species.





## A checklist of the Orthoptera and allied insects of Corfu (Kérkira)

by Dr Peter G. Sutton (7388)

2 Fir Tree Close, Flitwick, Beds. MK45 1NZ.

### Introduction

There can be no discussion about the Orthoptera of Greece without acknowledging the fact that two outstanding entomologists, Fer and Luc Willemse, have been largely responsible for coordinating the main body of work which currently facilitates the regional study of this group of insects. The results of the first surveys, which included about 330 species (of which 57<sup>1</sup> species were recorded from Corfu), were published a quarter of a century ago (F. Willemse, 1984, 1985) and research has been ongoing since then.

In 2008, Fer and Luc Willemse produced *An annotated checklist of the Orthoptera-Saltatoria from Greece including an updated bibliography* (Willemse & Willemse, 2008), which reveals that since the first studies were published, over 60 species of Orthoptera-Saltatoria new to the Greek fauna have been discovered, and that about 40 of these species proved to be new to science, bringing the "currently recognised number of species and subspecies recorded from Greece to about 395." The 2008 paper effectively collates the information from almost 150 papers published in various periodicals and books since the first surveys, and is presented with "an up-to-date checklist, systematic and faunistic annotations for a considerable number of species and an updated bibliography." It is primarily from this work that the current checklist for the Orthoptera of Corfu has been revised, particularly with regard to the majority of taxonomic considerations<sup>2</sup>, which are discussed below.

A recent contribution to the knowledge of the orthopteroid insects of Corfu has also been made by Vrabec and Kőcárek (2005), who recorded seven new species of Orthoptera from the island: *Platycleis affinis affinis* Fieber, 1853, *Yersinella raymondii* (Yersin, 1860), *Tetrix subnata* (Linnaeus, 1758), *Sphingonotus caeruleus* (Linnaeus, 1776), *Acrotylus insubricus* (Scopoli, 1786), *Chorthippus brunneus brunneus*

<sup>1</sup> *Eupholidoptera epirotica* has since been removed from this list.

<sup>2</sup> The taxonomic revisions of Willemse and Willemse (2008) have been followed with the exception of Raymond's Bush-cricket *Yersinella raymondii*. As Ragge and Reynolds explain, in accordance with *The International Code of Zoological Nomenclature*, "...scientific names are often spelt with a single '-i', but the original spellings were with the ending '-ii' in every case and must stand under Article 32 (b) of the Code."

<sup>3</sup> This was the first record of Raymond's Bush-cricket *Yersinella raymondii* from Greece. It was later found on the Greek mainland in two localities in the lowlands of Ipiros (Willemse & Willemse, 2008).



(Thunberg, 1815) and *Chorthippus lesinensis* (Krauss, 1888). These species were included as part of a list of 37 species of Orthoptera recorded from the northern part of Corfu from surveys conducted in 2001, 2002 and 2003. These surveys included useful records of six allied species from the Mantodea, Dermaptera, Blattaria and Isoptera. Vrabec and Křocárek also produced a very useful paper describing their faunistic observations regarding the ecology of *Saga bellenica* on the island (Vrabec and Křocárek, 2005). Their work gives a clear indication of the species richness to be found on Corfu, with one locality surrounding the village of Almyros on the northern coast yielding 33 species of Orthoptera.

Since the work of Vrabec and Křocárek, the status of two species on the above list, *Chorthippus brunneus brunneus* and *Chorthippus lesinensis*, has been revised and they have been replaced on the Corfu checklist accordingly. Willemse and Willemse (2008) state that the range of *Chorthippus brunneus brunneus* "most probably does not extend into Greece", where this species is replaced by *Chorthippus bornbalmi* Harz, 1971. In the same work, *Chorthippus lesinensis* has also been omitted from the Greek list and has been replaced by *Chorthippus mollis mollis* (Charpentier, 1825). An extensive review of the *Chorthippus* species with angled pronotal keels (F. Willemse *et al.*), which discusses the reasons for these revisions, has just been published (L. Willemse, pers. comm., 08.vi.2009).

The orthopteran fauna of Corfu was studied by the author during several trips to the island between 1994 and 2007. A variety of species were observed, with notable highlights including the beautiful lemon-yellow form of the Great Green Bush-cricket *Tettigonia viridissima* (Plate 35), the spectacular Greek Magician *Saga bellenica* (Plate 36), and more familiar species such as the impressively large White-faced Bush Cricket *Decticus albifrons* (Plate 36), the Slender Bush-cricket *Tylopsis lilifolia* (Figure 1), the Ionian Bush-cricket *Poecilimon jonicus jonicus* (Plate 38), the Long-legged Bush-cricket *Acrometopa servillea macropoda* (Figure 2), the Mediterranean Bush-cricket *Rbacocleis germanica* (Figure 3), the Egyptian Grasshopper *Anacridium aegyptium* (Figure 4), and the Long-headed Grasshopper *Acrida ungarica* (Figure 5).

On 28.v.2007, a new addition to the orthopteran fauna of Corfu, the Mole Cricket *Gryllotalpa* sp. was recorded from a stream between Spartera and Kavos. An adult was observed together with a well-developed nymph and a number of eggs (Plate 37) in an area of wet silt at the edge of the stream. This species was not previously



**Figure 1.** Slender Bush-cricket *Tylopsis lilifolia*, Lake Antiniotissa.



**Figure 2.** Long-legged Bush-cricket *Acrometopa servillea macropoda*, Gardiki Point.



**Figure 3.** Mediterranean Bush-cricket *Rbacocleis germanica*, Agios Stefanos.



**Figure 4.** Egyptian Grasshopper *Anacridium aegyptium*, Agios Georgios.



**Figure 5.** Long-headed Grasshopper *Acrida ungarica*, Agios Stefanos.



**Figure 6.** The remains of a *Gryllotalpa* sp., at Lake Korission.



from Corfu according to the data provided by Willemse (1984, 1985), Vrabec and Křocárek, (2005a), and by Willemse & Willemse (2008), or, to my knowledge, in any previous literature for the island. Nevertheless, this distinctive but elusive species is likely to have had a continuing presence on the island; the remains of a dead adult on a path at the northern edge of Lake Korission (Figure 6), and another freshly dead adult at Messonghí, were also found by the author on the same visit. The known distribution of this species suggests that the Corfu specimens are likely to be Krimbasi's Mole Cricket *Gryllotalpa kimbasi* Baccetti, 1992. There are two *Gryllotalpa* spp. currently recorded from Greece, the other being *Gryllotalpa stepposa* Zhantiev, 1991. *Gryllotalpa kimbasi* has 19 chromosomes and according to the map provided by Willemse (1984) has been found widely across the Greek mainland. Conversely, *Gryllotalpa stepposa*, which has 14 chromosomes, has only been recorded from Crete, some East Aegean islands and Thraki, a phalanx of northern Greece between Bulgaria and Turkey. While this would appear to secure an identification of *G. kimbasi*, it should be noted that an isolated occurrence of *G. kimbasi* also occurs on the Eastern Aegean island of Kos within the archipelago of *G. stepposa* records, and that *G. stepposa* is additionally recorded from Bulgaria (Willemse & Willemse, 2008), and thus, nothing should be assumed regarding the distribution of each species until the appropriate DNA investigations have been conducted. Nor should the possibility of the presence of an introduced species be ruled out. We are familiar with the ease with which the Mole Cricket can be transported across Europe in plant material, particularly the root boles of imported trees. There are 8 species of Mole Cricket in Italy and, since the Venetians occupied the island for four centuries (1386-1797), the possibility of a successful translocation should not be ruled out.

A new species of cockroach for the island, *Phyllodromica (Hololampra) marginata*, was also found at Lake Korission on 27.v.2009.

The following checklist provides a summary of the orthopteroid species that have been recorded from the island of Corfu:



## A checklist of the orthopteroid insects of Corfu (Kérkira)

**Order:** *Orthoptera (Saltatoria)*

**Suborder:** *Ensifera*

**Superfamily:** *Tettigonioidea*

**Family:** *Tettigoniidae*

**Subfamily:** *Phaneropterinae*

Long-legged Bush-cricket *Acrometopa servillea macropoda*<sup>1</sup> (Burmeister, 1838)

Speckled Bush-cricket *Leptophyes punctatissima* (Bosc, 1792)

Southern Sickle-bearing Bush-cricket *Phaneroptera nana* Fieber, 1853

Ionian Bush-cricket *Poecilimon jonicus jonicus* (Fieber, 1853)

*Poecilimon thoracicus* (Fieber, 1853)

Slender Bush-cricket *Tylopsis lilifolia* (Fabricius, 1793)

**Subfamily:** *Conocephalinae*

Southern Cone-head *Conocephalus conocephalus* (Linnaeus, 1767)

Long-winged Cone-head *Conocephalus discolor* Thunberg, 1815

*Conocephalus bastatus bastatus* (Charpentier, 1825)

Large Cone-head *Ruspolia nitidula* (Scopoli, 1786)

**Subfamily:** *Tettigoniinae*

White-faced Bush-cricket *Decticus albifrons* (Fabricius, 1775)

Chabrier's Bush-cricket *Eupholidoptera chabrieri garganica*<sup>2</sup> La Greca, 1959

Roesel's Bush-cricket *Metrioptera roeselii ambitiosa*<sup>3</sup> Uvarov, 1924

Large Dark Bush-cricket *Pholidoptera femorata* (Fieber, 1853)

*Platycleis (Incertana) incerta* Brunner von Wattenwyl, 1882

Tuberous Bush-cricket *Platycleis affinis affinis* Fieber, 1853

Intermediate Bush-cricket *Platycleis intermedia intermedia* (Serville, 1839)

Sepia Bush-cricket *Platycleis (Sepiana) sepium*<sup>4</sup> (Yersin, 1854)

*Platycleis orina* Burr, 1899

Mediterranean Bush-cricket *Rhacocleis germanica* (Herrich-Schaeffer, 1840)

Great Green Bush-cricket *Tettigonia viridissima* (Linnaeus, 1758)

Raymond's Bush-cricket *Yersinella raymondii* (Yersin, 1860)

<sup>1</sup> *Acrometopa servillea macropoda* (Burmeister, 1838) has replaced *Acrometopa macropoda* (Burmeister, 1838), which is currently considered as a subspecies of *Acrometopa servillea* (Brullé, 1832), (Willemse & Willemse, 2008).

<sup>2</sup> Chabrier's Bush-cricket *Eupholidoptera chabrieri garganica* La Greca, 1959 is currently assumed to be the sole species of *Eupholidoptera* occurring on the island of Corfu. There is no current evidence to suggest that the Epirus Bush-cricket *Eupholidoptera epirotica* (Ramme, 1927) was ever present on the island (L. Willemse, pers. comm., 08.vi.2009).

<sup>3</sup> *Metrioptera (Metrioptera) roeselii ambitiosa* Uvarov, 1924 replaces *Metrioptera (Roeseliaua) fedtschenkoi ambitiosa* Uvarov, 1924, (Heller, 1988).

<sup>4</sup> *Platycleis (Sepiana) sepium* (Yersin, 1854) and other species formerly belonging to distinct genera (e.g. *Incertana*) are now treated as subgenera of *Platycleis* in accordance with the work of Ragge (1990).

**Subfamily:** SaginaeGreek Magician *Saga bellenica* (Kaltenbach, 1965)**Superfamily:** Grylloidea**Family:** Gryllidae**Subfamily:** GryllinaeTwo-spotted Cricket *Gryllus bimaculatus* De Geer, 1773Desert Cricket *Melanogryllus desertus* (Pallas, 1771)Bordeaux Cricket *Modicogryllus (Eumodicogryllus) bordigalensis bordigalensis*<sup>8</sup> (Latreille, 1804)**Subfamily:** NemobiinaeMarsh Cricket *Pteronemobius beydenii beydenii* (Fischer, 1853)*Stenonemobius (Stenonemobius) gracilis*<sup>9</sup> (Jakovleff, 1871)**Subfamily:** Trigonidiinae*Trigonidium cicindeloides* Rambur, 1839**Subfamily:** OecanthinaeItalian or Tree Cricket *Oecanthus pellucens pellucens* (Scopoli, 1763)**Subfamily:** Mogoplistinae*Arachnocephalus vestitus* Costa, 1855*Mogoplistes brunneus* Serville, 1839*Pseudomogoplistes squamiger* (Fischer, 1853)**Subfamily:** Myrmecophilinae*Myrmecophilus (Myrmophilina) ochraceus* Fischer, 1853**Superfamily:** Grylloidea**Family:** Gryllotalpidae**Subfamily:** GryllotalpinaeMole Cricket *Gryllotalpa* sp. (?*krimbasi* Baccetti, 1992?)**Superfamily:** Gryllacridoidea**Family:** Rhaphidophoridae**Subfamily:** Dolichopodainae*Dolichopoda steriotisi*<sup>10</sup> Boudou-Saltet 1972**Suborder:** Caelifera**Superfamily:** Tetrigoidea**Family:** Tetrigidae

<sup>8</sup> Bordeaux Cricket *Modicogryllus (Eumodicogryllus) bordigalensis bordigalensis* (Latreille, 1804) replaces *Tartarogryllus bordigalensis* (Latreille, 1804), (Willemse & Willemse, 2008).

<sup>9</sup> *Stenonemobius (Stenonemobius) gracilis* replaces *Pteronemobius gracilis* (Jakovlev, 1871), (Willemse & Willemse, 2008).

<sup>10</sup> This important species is the only endemic species of Orthoptera on Corfu.

**Subfamily:** Tetriginae

*Depressotettix depressus*<sup>11</sup> (Brisout, 1848)

*Paratettix meridionalis* (Rambur, 1838)

Bolivar's Groundhopper *Tetrix bolivari* (Saulcy, 1901)

Cepero's Groundhopper *Tetrix ceperoi* (I. Bolivar, 1887)

Slender Groundhopper *Tetrix subulata* (Linnaeus, 1758)

**Superfamily:** Acridoidea**Family:** Pyrgomorphidae**Subfamily:** Pyrgomorphinae

*Pyrgomorpha conica conica* (Olivier, 1791)

**Family:** Acrididae**Subfamily:** Cantantopinae

*Pezotettix giornae* (Rossi, 1794)

**Subfamily:** Calliptaminae

*Calliptamus barbarus barbarus* (Costa, 1836)

Italian Locust *Calliptamus italicus* (Linnaeus, 1758)

*Paracaloptenus caloptenoides caloptenoides* (Brunner von Wattenwyl, 1861)

**Subfamily:** Cyrtacanthacridinae

Egyptian Grasshopper *Anacridium aegyptium* (Linnaeus, 1764)

**Subfamily:** Acridinae

Long-headed Grasshopper *Acrida ungarica* (Herbst, 1786)

**Subfamily:** Oedipodinae

*Acrotylus insubricus* (Scopoli, 1786)

*Acrotylus longipes* (Charpentier, 1843)

*Acrotylus patruelis* (Herrich-Schaeffer, 1838)

Autumnal Grasshopper *Aiolopus strepens* (Latreille, 1804)

Long-winged Grasshopper *Aiolopus thalissinus thalissinus* (Fabricius, 1781)

Migratory Locust *Locusta migratoria cinerascens* (Fabricius, 1781)

Blue-winged Grasshopper *Oedipoda caerulescens* (Linnaeus, 1758)

Red-winged Grasshopper *Oedipoda germanica* (Latreille, 1804)

Slender Blue-winged Grasshopper *Sphingonotus caeruleans* (Linnaeus, 1767)

*Sphingonotus candidus personatus*<sup>12</sup> Zanon, 1926

**Subfamily:** Gomphocerinae

*Cborthippus bornubalmi*<sup>13</sup> Harz, 1971

*Cborthippus mollis mollis*<sup>14</sup> (Charpentier, 1825)

Meadow Grasshopper *Cborthippus parallelus tenuis* (Brulle, 1832)

Sharp-tailed Grasshopper *Eucborthippus declivus* (Brisout de Bern 1848)

<sup>11</sup> *Depressotettix depressus* (Brisout, 1848) has replaced *Dasyleurotettix depressus* (Brisout, 1848), (Willemse & Willemse, 2008).

<sup>12</sup> *Sphingonotus candidus personatus* Zanon, 1926, replaces *Leptoternis candidus personatus* Zanon, 1926, (Willemse & Willemse, 2008).

<sup>13</sup> Has replaced *Cborthippus brunneus brunneus* per (Willemse & Willemse, 2008).

<sup>14</sup> Has replaced *Cborthippus lesinensis* per (Willemse & Willemse, 2008).



*Omocestus minutus* (Brulle, 1832)

Woodland Grasshopper *Omocestus rufipes* (Zetterstedt, 1821)

**Order:** Mantodea

**Family:** Mantidae

Praying Mantis *Mantis religiosa* (Linnaeus, 1758)

*Ameles decolor* (Charpentier, 1825)

**Order:** Blattaria

**Family:** Ectobiidae

*Phyllodromica marginata* (Schreber, 1781)

**Family:** Blattellidae

*Loboptera decipiens* (Germar, 1817)

**Order:** Dermaptera

**Family:** Labiduridae

Giant or Tawny Earwig *Labidura riparia* (Pallas, 1773)

**Family:** Forficulidae

Common Earwig *Forficula auricularia* Linnaeus, 1758

**Order:** Isoptera

**Family:** Rhinotermitidae

*Reticulitermes lucifugus* (Rossi, 1792)

### Conclusion

64 species of Orthoptera-Saltatoria have been recorded from the island, together with seven allied species from the Mantodea (two species), Blattaria (two species), Dermaptera (two species) and Isoptera (one species). It is clear that the island merits further investigation by orthopterists, particularly with regard to establishing the identity of the *Gryllotalpa* sp. that resides in suitable wetland habitat on the southern parts of the island near Spartera, Lake Korission and Messongí.

### Acknowledgements

I am indebted to Luc Willemse and Vladimir Vrabec, for their kind provision of data and discussions regarding the orthopteran fauna of Corfu. My sincere thanks must also go to those workers, named and un-named, whose contributions to knowledge through field work and research have allowed this current picture of the island's orthopteran fauna to be compiled.



## References

- Heller, K.-G. 1988. Bioakustik der Europäischen Laubheuschrecken. – In: Knuth, D. [Ed.] *Ökologie in Forschung und Anwendung* **1**: 1-358. Weikersheim (J. Magraf).
- Kočárek, P. and Vrabec, V. 2005. Contribution to the knowledge of orthopteroid insects of Corfu Island, Greece (Orthoptera, Mantodea, Dermaptera, Blattaria, Isoptera), *Entomofauna carpathica*, **17**: 8-10.
- Ragge, D.R. 1990. The songs of the western European bush-crickets of the genus *Playcleis* in relation to their taxonomy (Orthoptera: Tettigoniidae). *Bulletin of the British Museum (Natural History)* (Entomology) **59**: 1-35.
- Ragge, D.R. and Reynolds, W.J. 1998. *The Songs of the Grasshoppers and Crickets of Western Europe*. Harley Books, Colchester: 1-591.
- Vrabec, V. and Kočárek, P. 2005. The observation of *Saga belenica* Kaltenbach, 1967 (Orthoptera) on Corfu Island, *Entomofauna carpathica*, **17**: 11-13.
- Willemse, F. 1979. A review of the species of *Acrometopa* Fieber, 1853 (Orthoptera, Tettigonioidea, Phaneropterinae) with special reference to the Greek fauna. *Bijdragen tot de Dierkunde*, **49**: 135-152.
- Willemse, F. 1984. Fauna Graeciae I. *Catalogue of the Orthoptera of Greece*. Athens: 1-275.
- Willemse, F. 1985a. Fauna Graeciae II. *A key to the Orthoptera species of Greece*. Athens: 1-288.
- Willemse, F. 1985b. Fauna Graeciae Ia. *Supplementary notes on the Orthoptera of Greece*. Athens: 1-47.
- Willemse, F. and Heller, K.-G. 1992. Notes on the systematics of Greek species of *Poecilimon* Fischer, 1853 (Orthoptera: Phaneropterinae). *Tijdschrift voor Entomologie* **135**: 299-315.
- Willemse, F., and Willemse, L. 2008. An annotated checklist of the Orthoptera-Saltatoria from Greece including an updated bibliography. *Articulata Beibest*, **13**: 1-91.



**Antlion moonscape.** The rare Juniper scrub habitat on the extensive dune system at Lake Korission has an extraordinary invertebrate fauna, including this metropolis of larval antlion pits.



## Diary notes from the island of Corfu, 1994 - 2007

by Dr Peter G. Sutton (7388)

2 Fir Tree Close, Flitwick, Beds. MK45 1NZ.

### Introduction

Corfu has changed, dramatically in some areas, since Gerald Durrell wrote the first of three magical accounts about his time on the island (*My Family and Other Animals*, 1956). In spite of the considerable tourist-driven changes that have occurred since that time, Corfu is still an island of hidden delights for the naturalist, and for those who are prepared to leave the beaten track in pursuit of its rich fauna and flora, a fantastic journey of discovery awaits them. Indeed, in the words of Hilary Whitton Paipeti (1998), “. . . the reality is that, much of the Corfu that the Durrells knew endures, and can be enjoyed by those who look for it.”

There are many places to visit, from the mountains in the north (Figure 1) and the gradation of different habitats that lead down through the foothills and lowlands to the sea, to the rare and ancient juniper forest that can be found on the extensive dune system around Lake Korission at the southern end of the island. All of these habitats are capable of producing a rich variety of species to observe, and it would seem that there is always the possibility of finding something special. Several of these habitats, and the species that inhabit them, are described below.



**Figure 1.** A view of the highlands from Mount Pantokrator. In the far distance is Durrell's Lake of Lilies – Lake Antiniotissa.



### The Stream of Plenty (Kavos – Spartera)

As a naturalist, I have a wide range of interests, but there are two main foci within that sphere: entomology and herpetology. It was the latter that was being studied on my trip to Kavos on 28.v.07, and I was after some pictures of two species that had eluded me: the Aesculapian Snake and the Greek form of the Smooth Newt. I had been directed to Kavos by a friend who had found the snake, and who also spoke of a flooded dam between Kavos and Spartera which held Stripe-necked Terrapins, and a good population of water snakes which I assumed must be feeding on newts and frogs. For those who have never visited Kavos, it may provide an example of how a Greek island can be ruined by the excesses of tourism, although for those who specifically go to the island to engage in drink-fuelled revelry, it may equally be a perfect holiday destination! However, the activities of the clubbing set essentially remain within the confines of the Kavos strip, and within a few minutes, you can be a world apart, and in the flower-filled meadows and woodlands behind Kavos surrounded by fritillaries and other wildlife.

I found the beginning of the stream I was looking for at an establishment called Ulla's Pool, and began to follow it up a long and winding tree-lined track. Immediately I saw the colourful Dalmation *Algyroides* lizards sunning themselves on the trees and the first damselflies. As the darkening clouds above were threatening an imminent downpour, I photographed an androchrome female of the Beautiful Demoiselle *Calopteryx virgo* ssp. *festiva* (Plate 10).

Further up the road I was investigating a huge example of the Common Toad *Bufo bufo* ssp. *spinus*, and as I was doing so, I noticed a dark dragonfly land on the chalky path some distance ahead. I walked slowly towards it, and after several take-offs and landings, it gradually allowed me to get close enough to take a picture. I hadn't a clue about its identity and could not recall seeing a specimen like it in any of my dragonfly books. It turned out to be a specimen of the Black Pennant *Selysiothemis nigra* (Plate 9), which I was reliably informed was the first record for Corfu and the Ionian Islands.

I was unable to locate the flooded dam that my friend had spoken of but came across a stream which had collected into a pool before it ran through a pipe beneath a path (Figure 2). As I walked past the pool I immediately saw a movement at the side of a silt bed and knew that it was the newt that I had been searching for, and so began what was to be an incredible half an hour. As I stepped down to the side of the pool, I instinctively lifted a bucket that lay on the silt, and could



**Figure 2.** The Kavos stream, the perfect habitat for newts, freshwater crabs and Mole Crickets! The Mole Cricket burrows were found in the wet silt in the foreground.

not believe what I saw. It was a large Mole Cricket *Gryllotalpa* sp. tending its eggs in a burrow that it had built beneath the bucket. There was also a large nymph that scurried to the water's edge, and undeterred, launched itself into the water. I was amazed at both the buoyancy of the nymph, whose water-repellent hairs held it high in the water, and its proficiency as a swimmer, as it rapidly completed a semicircle of about one metre in the slow flowing current, returning to the vegetation at the side of the pool. I was also intrigued by the fact that the burrow had been made in the waterlogged silt, a virtually aquatic habitat and, with the thunderstorms that had occurred in recent days, the egg chamber must surely have been flooded regularly.

Then came the next surprise. After I had photographed the Mole Crickets (Plate 37), I turned my attention to the newts, and saw something fairly large move under some vegetation on the other side of the pool. After some tricky manoeuvring and a couple of wet feet later, I had captured the specimen, which was a fine example of the



**Figure 3.** The freshwater crab *Potamon fluviatile*, a second record for Corfu.

freshwater crab *Potamon fluviatile* (Figure 3), only the second record of this species from the island. I managed to photograph the newt, an extraordinary subspecies with three small crests and a tail filament, and had just managed to finish before another heavy thunderstorm brought proceedings to a complete halt. The bright sunshine after the rain brought out a number of species who used the warm path to

recuperate after the deluge and, as I walked back, I got good views of the dragonflies and damselflies that lifted into the air only when I was virtually on top of them.

### Lake Antiniotissa – the Lake of Lilies

Lake Antiniotissa is on the north-west of the island and is an important conservation area. It contains a small population of Otters *Lutra lutra* and many other species of conservation interest. It was at this site that I discovered my first Greek Magician *Saga hellenica* (Plate 36) in the scrubland above the lake. There is a path leading from the bridge over the channel where the spring-fed lake meets the sea, and after a fair walk up this dusty white track you reach the edge of some woodland. In the clearing before this woodland is an area brimming with Orthoptera, from the impressively large White-faced Bush-cricket *Decticus albifrons* to the Slender Bush-cricket *Tylopsis lilifolia*, and also a variety of butterflies and other insects.

After a brief foray into the woodland, where I had seen Swallowtails and Cleopatras nectaring at flowers in the woodland clearings, I spent some time watching the nymphs of the Praying Mantis *Ameles decolor* jumping from grass stem to grass stem. The meadow was alive with Spotted Fritillaries *Melitaea didyma* (Plate 3) and blue and red winged grasshoppers. Occasionally, a step forward into longer grass would bring a clatter of wings as either the bulky White-faced Bush-cricket took a low straight flight into nearby cover, or the more proficient Egyptian Grasshoppers would fly skyward, banking and diving back down to the scrub where they quickly disappeared from view. I found the *Saga* while trying to spot the brown form of the Slender Bush-cricket, and



had no idea that I was practically breathing on it as I learnt over the bush. Well it had clearly had enough of that and when it moved I nearly jumped out of my skin! This species is a true giant of the orthopteran world. I carefully extracted it from the bush and let it climb onto my hand (Figure 4). However, having forgotten to bring the spare battery for my camera, I then had to walk all the way back to the beach with this parthenogenetic Amazon hitching a ride in my net. When I reached the beach, I found my wife sunbathing among the famous white dune lilies that inspired Durrell to christen the lake in his book, and I was absolutely bursting with delight. “Look what I’ve found!”, I beamed as I thrust the Greek Magician towards her face. She screamed and shouted at me, “Take that thing back to where you found it!” Not quite the reaction that I was after, and it cannot go down in the annals of marriage as a ‘shared moment of pleasure’, but I now had my battery, and it was time to capture this spectacular insect on film. A perfect end to a hot summer afternoon.



**Figure 4.** The formidable Greek Magician *Saga hellenica*.

### **Agios Gordis – beetle paradise**

The beetle fauna of Agios Gordis has already been described in some detail and, in spite of the damage that was done to one particular area, it remains a likely source of interesting species for the coleopterist, particularly those who are able to negotiate the path to the cliff tops.



I was surprised to see how many species could be routinely found in some numbers, notably the colourful buzzing Rose Beetles, immediately bringing to mind another of Durrell's famous characters. Contrary to my wife's dissatisfaction above, she has occasionally been a great help; for example, expertly catching a Tree Frog *Hyla arborea* from a swimming pool drain for me to photograph. I also have my wife to thank for the picture of the Musk Beetle (Plate 29), which she found while I had been out getting groceries from the village shop. Impressively, she had shepherded the large specimen into a carrier bag with a stick and, although looking slightly pasty and somewhat perturbed by the experience, she had persevered and managed to get the beetle into a jam jar and into the fridge. The metallic blue and red colouration of the beetle suggested that it might be something other than the subspecies *moschata*, but it wasn't. (The eastern subspecies, *ambrosiaca*, is instantly recognized by its red pronotum.)

Walking down the steep winding path through the sunlit woodland to the beach every day was always a pleasure. The delicacy of the Wood Whites, the colourful grace of the Swallowtails, and the rustle of lizards disappearing in a blue and red flash as you approached were regular features of the morning routine. In the evening, after a Greek meal and perhaps a carafe or two of local red wine, we would walk back along the beach to our favourite shortcut to end the day in the perfect manner, with a midnight stroll through a meadow lit up with fireflies.

### The capture of *Capnodis cariosa* near Avlaki



There are certain beetles that are capable of temporarily deleting the cerebral files that are responsible for maintaining personal well-being, and *Capnodis cariosa*, one of the two largest European jewel beetles, is one of them. On Wednesday 1st June 2005, I was lucky enough to encounter this species in the foothills above Avlaki on the north-eastern side of Corfu. After spending a very pleasant morning photographing dragonflies at some tepid reed-fringed pools on the north-eastern side of the island (Figure 5), I drove up into the

**Figure 5.** The tepid pools at Avlaki.



foothills to get some shade and a vantage point to view any other potential glinting areas of freshwater to survey. As I enjoyed the languid tranquility of the panoramic view before me, with the searing heat of the day tempered beneath the welcome shade of a large fig tree, it took but a brief whirring excerpt to jolt me into an electrified state of anticipation. Many coleopterists are familiar with the sound that I heard... the characteristic drone of a very large beetle in flight. They are also familiar with the rarity of such events, and the excitement that they can cause, particularly when the identity of the species remains unknown. All you know is that the specimen producing the noise is likely to be a pretty spectacular beast. On that day, luck was with me as I observed something that looked like a small winged rowing boat fly past, glinting in the midday sun. I began my pursuit, leaping like a lunatic through the undergrowth in my bid to curtail its tantalizingly laboured flight, and was now completely oblivious to the growing number of lacerations produced by the obstacles that blocked my path. Then disaster, as my progress was halted abruptly by a well-hidden bough from a fallen tree that brought me crashing to the ground. Amazingly, my luck held out, and as I lay there, prostrate in the undergrowth, I saw the shining black jewel land on the underside of a tree branch. Once again I leapt into action. I would tend my cuts and bruises, and remove the mud from my face at a later date. For now, I was focused on an entomological prize. As I approached, the specimen did not move, clearly assured of its ability to blend into the shaded mosaic of bark on which it was fixed, and possibly aware that it had positioned itself on a branch that was well out of my reach. However, necessity is the mother of invention and, after rolling a large stump into position, and in a move that might well only be surpassed by Magic Johnson, I took a running leap, via the stump, and at full stretch, managed to pluck the magnificent specimen carefully from its perch. It was a mighty beast and clearly at the upper size limit for this species (Plate 18). I spent quite a while admiring and photographing the jewel beetle before holding it up to the sun to fly off. It climbed to the end of my finger, flicked open its glossy wing cases, and buzzed loudly until its wings took its body weight and lifted it into the air. It then flew slowly and noisily at full throttle towards the sanctuary of the same tree from which it had been caught.

### **The future**

Greece has been described as a small country with a big biodiversity that is poorly understood. It is remarkable that this statement even applies to Corfu, an island that has been much studied by naturalists.



Greece and its islands have an extraordinary, and in many cases, unique biodiversity and, for the naturalist, this hotbed of endemism provides not only an exciting place to study the natural world, but also a great challenge to identify and document the species to be found in its varied habitats. What happens to the big biodiversity of Greece and Corfu in the future very much depends on the ability of Greece to preserve that biodiversity with the same passion and pride that it routinely attributes to its great archaeological heritage.

### References

- Durrell, G. 1956. *My Family and Other Animals*, Penguin Books.  
Paipeti, H.W. 1998. *In the footsteps of Lawrence Durrell and Gerald Durrell in Corfu (1935-1939). A Modern Guidebook*, Pedestrian Publications, Corfu: 1-64.



The Praying Mantis *Mantis religiosa*, Lake Korission, Corfu.



## AES Events Calendar

### September – November 2009



Please see the AES website for full and up to date listings of AES and other events.

All AES events are free to members and their guests.

#### **Saturday 12th September:**

##### **INSECTS AT THE OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY**

Parks Road, Oxford OX1 3PW. 11:00 – 4:00.

Meet up at the Museum's entomology department (upstairs) at 11:00 am.

This event will start with an insect walk in the nearby University Parks, including using a vacuum sampler, followed by lunch and examining insects in the Museum. Microscopes will be provided. There will also be a tour of the Hope Entomological Collections and for younger (or young at heart) members there will be opportunities to handle live insects and tarantulas etc. This event will be led by Darren Mann. It would help with the arrangements if you could please let the AES secretary know if you plan to attend – secretary@amentsoc.org or at PO Box 8774, London SW7 5ZG.

#### **Friday 18th September:**

##### **NATIONAL MOTH NIGHT AT PERIVALE WOOD NATURE RESERVE**

From 7:15pm until late. Entrance from Sunley Gardens: <http://tinyurl.com/pgggad>.

This joint event is free to members and their guests but booking is essential - please let David Howdon (Email: david.howdon@virgin.net; Tel 020 8426 6621) know if you plan to attend.

#### **Sunday 27th September:**

##### **INSECT SURVEY OF A SURREY GARDEN**

Joint event with the Holmesdale Museum Club, Reigate.

Led by Jacqueline Ruffle. Further details: secretary@amentsoc.org.

#### **Saturday 17th October:**

##### **ANNUAL AES EXHIBITION AND INSECT FAIR**

Kempton Park Racecourse, Middlesex

The UK's premier entomological fair – see separate announcement.

#### **Saturday 7th November:**

##### **WORCESTERSHIRE ENTOMOLOGY DAY**

A day of talks and displays organised by the Wyre Forest Study Group. This year the event will focus on changes in the insect fauna of the county resulting mainly from climate change. Prebooking is advised – **please note there is a charge of £8 for this event!** The meeting will be held at Heightington village hall at SO764711. If you would like to attend please contact Geoff Trevis (AES Conservation Representative for Worcestershire) on 01905 774952 or by e-mail at [geoff.trevis@btinternet.com](mailto:geoff.trevis@btinternet.com)



## Society Matters

**UPDATING STANDING ORDERS:** A number of members have omitted to update their standing orders following recent subscription changes, as a result of which some are paying too little – and some are paying too much!! PLEASE could you check your standing order arrangements and update them if necessary. The current subscription rates follow on from this announcement. Any shortfalls can be paid to the Society by post, via PayPal (use the donation form on our website <http://www.amentsoc.org/about/make-a-donation.html> and email [registrar@amentsoc.org](mailto:registrar@amentsoc.org) to tell us what it is for) or you can make up the shortfall in person at the Annual Exhibition on 17th October. Your help in sorting this out will save us some of the costs associated with chasing up these matters later in the year. Thank you.

**ARE YOU MAKING THE MOST OF YOUR MEMBERSHIP?!** Did you know that all AES and Bug Club members with access to the internet are eligible to use the **AES Online Forum**? It's true!! You can use the Forum to post messages, spark discussions and get specimens identified by the AES Insect Advisory Panel: <http://groups.yahoo.com/group/aes/>.

We also have a **Members Only Area** on the AES website: [www.amentsoc.org/members/](http://www.amentsoc.org/members/). This contains various electronic publications, discount coupons to use when buying AES publications via the AES Online Shop etc. If you also subscribe to the Entomologist's Record, there is another, separate members' area you can explore! ([www.entrecord.com/members.html](http://www.entrecord.com/members.html))

Other electronic resources set up by the Society include the Bug Club Open Forum (<http://groups.yahoo.com/group/bugclub>) which is on open access to the public, and the Lepidopterist Study Group ([http://tech.groups.yahoo.com/group/Breeding\\_UK-Leps/](http://tech.groups.yahoo.com/group/Breeding_UK-Leps/)) moderated by AES member Reg Fry. This is linked to the website [www.ukleps.org](http://www.ukleps.org) where there is a growing wealth of photos of the early stages of the British Lepidoptera.

Other AES member benefits include discounts, awards and member and affiliate events, not to mention the fact we all, through our membership of the AES, support the study and conservation of insects. You can check out all AES benefits on our website [www.amentsoc.org](http://www.amentsoc.org) or you can write for a list of current benefits to the Hon. Secretary.



## AES Membership Rates 2009

Membership of the Society runs from 1st January to 31st December each year. New members will receive all publications published during the year of enrolment subject to availability, except for those joining on or after 1st October.

Any member joining on or after 1st October will be deemed to have joined for the following year unless he or she specifically requests membership for the current year. If such a request is made, the publications already published that year will be sent with the enrolment confirmation letter and the remaining ones will be sent when they are published. A further membership subscription will be necessary for the following year.

If you have any queries about membership please contact us via the website, [www.amentsoc.org](http://www.amentsoc.org) or PO Box 8774, London SW7 5ZG

### Individual Adult Membership

Membership sub-category	UK	Overseas
<i>Bulletin only</i>	£20.00	£25.00
<i>Entomologist's Record only</i>	£25.00	£30.00
<i>Bug Club Magazine only</i>	£20.00	£25.00

### Individual Bug Club / Junior Membership

Membership sub-category	UK	Overseas
Junior under-18 ( <i>Bug Club Magazine only</i> )	£12.00	£17.00
Junior aged 13-17 ( <i>Bulletin only</i> )	£12.00	£17.00

### Family or Combined Membership

Membership sub-category	UK	Overseas
<i>Bulletin &amp; Entomologist's Record</i>	£40.00	£45.00
<i>Bulletin &amp; Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record &amp; Bug Club Magazine</i>	£35.00	£40.00
<i>Bulletin, Entomologist's Record &amp; Bug Club Magazine</i>	£48.00	£53.00

### Associate / Institutional Membership

Membership sub-category	UK	Overseas
<i>Bulletin only</i>	£20.00	£25.00
<i>Entomologist's Record only</i>	£50.00	£55.00
<i>Bug Club Magazine only</i>	£20.00	£25.00
<i>Bulletin &amp; Entomologist's Record</i>	£65.00	£70.00
<i>Bulletin &amp; Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record &amp; Bug Club Magazine</i>	£65.00	£70.00
<i>Bulletin, Entomologist's Record &amp; Bug Club Magazine</i>	£75.00	£80.00

**The Amateur Entomologists' Society**

PO Box 8774, London SW7 5ZG

[www.amentsoc.org](http://www.amentsoc.org)



Member's Price **£8.90**

Non-member's Price **£11.90**



## ***The larger water beetles of the British Isles***

For those who love the spectacular larger water beetles of the British Isles, this is the publication that you have been waiting for! It is the only modern publication with colour illustrations of all of our aquatic coleopteran megafauna and it provides the most up-to-date distribution maps revealing their current distributions. Jam-packed with fascinating details of their life-histories, this book covers 11 species including the six native 'Great Diving Beetles' and the 'Silver Water Beetles'. It is also copiously illustrated with text figures and has much additional information including details of observed climate-induced range changes and the conservation measures required to ensure their continued survival.



The above publication is sent post free to U.K. addresses. Outside U.K. please add 10% to order value for postage by surface mail. For postage by air-mail outside Europe please add 30% to order value. Please allow 28 days delivery

Please make all cheques/postal orders payable to 'AES Publications' and send to:  
AES Publications, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Telephone 01277 224610 • Fax: 01277 262815 • E-mail: [aespublications@btconnect.com](mailto:aespublications@btconnect.com)

# AES Publications

Amateur  
Entomologists' Society

## British Butterflies throughout the year by Peter May

This new book from the AES describes the adults of different species of British butterflies, according to the time of year they appear on the wing. Nearly all the 60 British species are illustrated. Focussing on encouraging an interest in entomology among the young, and the young at heart, there is a helpful calendar of flight times and a useful checklist to help you keep track of your observations.

£ 5.00

Members price £ 3.80

## Preparing and maintaining a collection of Butterflies and Moths

by P. May and M. White. A practical manual detailing the various methods used to prepare specimens for a collection, from killing methods, setting the specimens and repairing damaged ones, to storage and preservation, including pest prevention and cure.

£4.85

Members price £3.65

## The Hymenopterist's Handbook by Dr. C. Betts et al.

2nd edition dealing with the history of their families, classification and structures; natural history; studying, collecting, breeding, attracting and preserving Hymenoptera. Appendices include keys to the families. 214 pages with numerous tables, keys and figures (1986)

£ 11.45

Members price £ 8.60

## Revised Flight Tables for the Hymenoptera

Revised flight tables for the Hymenoptera giving, wherever possible, times, location, flower visits and some indication of distribution and abundance. 24 pages (1988)

£ 3.10

Members price £ 2.35

## A Coleopterist's Handbook

Edited by J. Cooter & M.V.L. Barclay. The *Coleopterist's Handbook*, is now available as a fully revised and expanded fourth edition. Nomenclature has been brought inline with current use, collecting/curatorial methods reflect best practice and plant/beetle and beetle/plant lists are included together. Recent additions to the British fauna, modern and traditional techniques are included. All advice and comment given in the book is based upon collective years of practical experience of both curatorial methods and field craft; beetle family chapters have each been written by an internationally recognised authority.

£ 54.00

Members price £ 39.00

## Host plants of British Beetles: A List of Recorded Associations

A list of a wide range of plants, in alphabetical order, together with the beetle species that have been recorded as being associated with them. 24 pages (1992)

£ 3.10

Members price £ 2.35

## A Silkmother Rearer's Handbook by B.O.C. Gardiner

SPECIAL OFFER PRICE £ 7.70

No further discounted price available

## A Dipterist's Handbook by A.E. Stubbs, P.J. Chandler and others

A practical handbook for both the beginner and the initiated on collecting, breeding and studying the two-winged flies. Describes equipment, trapping, preservation, habitat, plant and animal associations and behaviour. Includes a detailed chapter on larval stages with an illustrated key to families. An essential book for the keen Dipterist. 260 pages with drawings of larvae and equipment (1978, reprinted 1996)

£ 14.20

Members price £ 10.60

## Practical Hints for Collecting and Studying the Microlepidoptera

by P.A. Sokoloff. A practical manual for those interested in the smaller moths, describing techniques for collecting adult moths, collecting immature stages, rearing, killing, setting and mounting. A list of useful books and journals as well as details of societies and suppliers is included. 40 pages, 11 figures (1980)

£ 4.20

Members price £ 3.15

## Rearing and Studying Stick and Leaf-Insects by P. D. Brock

Specifically intended for beginners, although it is also suitable for experienced Phasmid enthusiasts, it is one of the few guides to rearing that features the majority of the culture stocks available, 22 species in detail. The informative text is complemented by 8 colour plates, 14 black and white plates and 29 figures. (New edition, 2003)

£ 11.20

Members price £ 8.20

## The Study of Stoneflies, Mayflies and Caddisflies by T.T. Macan

A comprehensive guide to collecting and studying the biology and ecology of these aquatic insects. 44 pages, 10 figures and bibliography (1982)

£ 4.20

Members price £ 3.15

## Breeding the British Butterflies by P.W. Cribb

A practical handbook covering all aspects of butterfly breeding, including general techniques, equipment and hints on how to breed each of the British species. 60 pages, 6 figures, 5 plates. Revised (2001)

£ 5.20

Members price £ 3.85

## Practical Hints for the Field Lepidopterist by J.W. Tutt

Written at the turn of the century, this hook has been reprinted because of its scarcity and value to students of Lepidoptera. It gives a complete month by month guide to which species and stages of macros and micros to look for and how to find them. Also contains a biological account of the early stages and how to keep, rear, photograph and describe them. 422 pages. Hardback. (Reprinted 1994).

£ 24.00

Members price £ 18.30

## An index to the modern names for use with J.W. Tutt's Practical Hints for the Field Lepidopterist by B.O.C. Gardiner

A valuable cross-reference guide between the scientific and English names used in the early 1900s and the present time.

£ 4.70

Members price £3.50

## A Guide to Moth traps and their use by R. Fry and P. Waring

The first sections deal with the measurement and properties of light leading into the types of lamp available and the electrical circuits needed to operate them. The next sections give details of the construction of the most popular traps used in the UK. The last half deals with the practical use of traps in the field including where and when to trap, limitations of traps and their relative performance. 68 pages, 21 figures, 15 plates (1996)

£ 6.85

Members price £ 5.05

## The Amazing World of Stick and Leaf Insects by Paul D. Brock

A superb, comprehensive guide, for all those intrigued by these groups of insects. Topics covered include structure, fascinating facts, life history and development, defence behaviour, enemies, collecting, breeding (including trouble shooting), preserving, taxonomic studies, important collections in Museums etc. around the world and elaborate stories, beliefs and poems. Also outlines the major known species around the world on a regional basis. A section on Fossils is included. Includes a comprehensive glossary of the technical terms used in the description and classification of stick and leaf-insects. Hardback A5, 184 pages, 46 figures, 26 black and white plates and 40 pages of colour plates (containing 83 photographs and 4 drawings/paintings of insects and their habitats). (1999)

£ 18.90

Members price £ 14.10

## Rearing Parasitic Hymenoptera by M. Shaw

This booklet provides information on the parasitic Hymenoptera to enable successful studies to be made of this little understood group of the British insect fauna. Details are given on the general biology of parasitic wasps, rearing principles, efficient rearing practices and detailed methods of dealing with adult wasps. 52 pages, 4 colour plates (New edition - 2001)

£ 5.70

Members price £ 4.20

## Larval Foodplants of the British Butterflies by Peter May

A comprehensive compilation of the known larval foodplants of our native and immigrant butterflies. Also including "How to Encourage Butterflies to Live in Your Garden" by the late Peter Cribb 62 pages. (2003)

£ 7.40

Members price £ 5.45

## The larger water beetles of the British Isles by Peter Sutton

For those who love the spectacular larger water beetles of the British Isles, this is the publication that you have been waiting for! It is the only modern publication with colour illustrations of all of our aquatic coleopteran megafauna and it provides the most up-to-date distribution maps revealing their current distributions. Jam-packed with fascinating details of their life-histories, this book covers 11 species including the 6 native 'Great Diving Beetles' and the 'Silver Water Beetles'. It is also copiously illustrated with text figures and has much additional information including details of observed climate-induced range changes and the conservation measures required to ensure their continued survival.

£ 11.90

Members price £ 8.90

## Glossary for the Young Lepidopterist

6 pages, 2 figures. (1951)

£ 1.05

Members price £ 0.90

## A Label List of European Butterflies

20 pages. (Revised 1981)

£ 2.35

Members price £ 1.85

## Some British Moths Reviewed

Aid to the identification of some of the more difficult species. Reprinted from the *Amateur Entomologist* Vol. 5 (1941) and a *Guide to the Critical Species of Lepidoptera*, reprinted from *Entomologists' Gazette* 1969-72. 64 pages, 6 black and white plates, numerous figures (1985)

£ 4.45

Members price £ 3.35

## Butterflies of Cyprus 1998 (Records of a years sightings) by Eddie John

Observations of the 44 species of butterfly found on the island in 1998 including notes on each species and distribution maps. 46 pages (2000)

£ 4.30

Members price £ 3.25

## Collecting Het. Bugs (Hemiptera: Heteroptera)

12 pages (including 2 plates). (1946)

£ 1.20

Members price £ 1.00

## Collecting Clearwings

12 pages (including 2 plates), 4 figures. (1946)

£ 1.10

Members price £ 1.00

## Collecting Lacewings

9 pages, 8 figures, 5 plates. (2nd edition 1976)

£ 2.25

Members price £ 1.75

## An Amateur's Guide to the Study of the Genitalia of Lepidoptera

16 pages, 15 figures. (1973)

£ 3.10

Members price £ 2.35

## Rearing the Hymenoptera Parasitica

16 pages, 1 plate, 10 figures. (1974)

£ 2.55

Members price £ 2.00

## Rearing Crickets in the Classroom

12 pages, 2 plates. (1986) (Reprinted 1993)

£ 2.10

Members price £ 1.65

## Guidelines for Entomological Site Surveys

Published on behalf of the JCCBI. 7 pages (2000) (Reprinted 2003)

£ 3.10

Members price £ 2.35

## The Journal of the Entomological Exchange and Correspondence Club 1935-1936

An AES Jubilee Publication. Fascinating reprint of the very first volume of the AES journal. 100 pages.

£ 4.20

Members price £ 3.35



All the above publications sent post free to U.K. addresses. Outside U.K. please add 10% to order value for postage by surface mail. For postage by air-mail outside Europe please add 30% to order value. Please allow 28 days delivery.

Please make all cheques/postal orders payable to 'AES Publications' and send to:

AES Publications, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Telephone 01277 224610 • Fax: 01277 262815 • E-mail: aespublishings@btconnect.com

# NOTE FOR YOUR DIARY: EXHIBITION DATE SATURDAY 17th OCTOBER 2009

*Whether you're young or old, beginner or expert, there is something for everyone who loves bugs at the **largest** insect extravaganza of the year.*

*Join us at Kempton Park Racecourse on Saturday 17th October.*



- ◆ Over 100 dealers
- ◆ Caterpillars and Butterflies
- ◆ Praying Mantids
- ◆ Exotic Pets
- ◆ Bug Pottery and Toys
- ◆ Antique Boxes and Cabinets
- ◆ Insect Identification Guide
- ◆ Join Clubs and Societies
- ◆ Rare and Recent Books
- ◆ Meet other enthusiasts
- ◆ Stick insects
- ◆ Tarantulas and Scorpions
- ◆ Nets, Traps and Equipment
- ◆ Netting and Cages
- ◆ Mounted Specimens
- ◆ Leading Insect Artists

*Kempton Park is situated under a mile from Junction 1 of the M3. Rail services operate to Sunbury Station (half a mile from the racecourse) and Kempton Park Station (400m from the exhibition entrance) from London Waterloo. Please note Kempton Park Station is NOT wheelchair accessible from London bound platform. Further information from [www.southwesttrains.co.uk/SWTrains/pdfs/TimetablesApril2009/PTT01.pdf](http://www.southwesttrains.co.uk/SWTrains/pdfs/TimetablesApril2009/PTT01.pdf)*

## AMATEUR ENTOMOLOGISTS' SOCIETY ANNUAL EXHIBITION AND TRADE FAIR

Saturday 17th OCTOBER 2009

11.00am - 4.30pm

Kempton Park Racecourse  
Staines Road, Sunbury, Middlesex

*For further details contact the AES at:  
PO Box 8774, London SW7 5ZG*

*or alternatively visit the Society's Website at*

*[www.amentsoc.org](http://www.amentsoc.org)*

# HOW TO GET THERE



## BY CAR

From the M25. Exit at Junction 12 (M3) towards Sunbury.

Exit the M3 at Junction 1 and take the A308 sign posted for Kempton Park.

The racecourse is situated one mile on the left hand side.

## BY TRAIN

Two services an hour are operated from London Waterloo to Sunbury station by South West Trains. Journey time is approximately 40 minutes.

For more information contact London Travel Information on 020 7222 1234

The  
**Bulletin**  
*of the Amateur Entomologists' Society*

Volume 68 • Number 485

August 2009

**CONTENTS**

Editorial .....	127
AES Member wins major Insect Conservation Award .....	128
Sutton P. J. Corfu, an introduction to its invertebrate fauna.....	129
Sutton P. J. A checklist of the butterflies of Corfu .....	130
Sutton P. J. A checklist of the dragonflies of Corfu.....	136
Sutton P. J. A selection of beetles from the island of Corfu.....	145
Sutton P. J. A checklist of the Orthoptera and allied insects of Corfu .....	152
Sutton P. J. Diary notes from the island of Corfu, 1994 - 2007 .....	161
AES Events Calendar 2009 .....	169
Society Matters.....	170
AES Membership Rates 2009 .....	171

ES 36 A

# The Bulletin



*of the Amateur Entomologists' Society*

Volume 68 • Number 486

October 2009

NATURAL  
HISTORY MUSEUM

- 4 NOV 2009

PRESENTED  
ENTOM LIBRARY



ISSN 0266-836X

Editors: Dr P. Wilkins & M. Hough



000174465



Founded in 1935

The AES • P.O. Box 8774 • London • SW7 5ZG

<http://www.amentsoc.org>

### Officers of the Society

<i>President:</i>	Robin Wootton
<i>Secretary:</i>	Dafydd Lewis
<i>Treasurer:</i>	Peter May
<i>Acting Registrar:</i>	Dafydd Lewis
<i>Bulletin Editors:</i>	Phil Wilkins & Martin Hough
<i>General Editor:</i>	Jacqueline Ruffle
<i>Advertising Secretary:</i>	Peter Hodge
<i>Exhibition Secretary:</i>	Wayne Jarvis
<i>Youth Secretary:</i>	Kieren Pitts
<i>Conservation Secretary:</i>	David Lonsdale
<i>Webmaster:</i>	Kieren Pitts
<i>ICN Editor:</i>	David Lonsdale
<i>Wants &amp; Exchange:</i>	Peter May

---

THE AES WORKS TO PROMOTE AND DISSEMINATE ENTOMOLOGICAL KNOWLEDGE AND TO ENCOURAGE AN INTEREST IN ENTOMOLOGY AMONG THE YOUNGER GENERATION.

---

#### **BULLETIN ADVERTISING RATES:**

Advertising in the AES *Bulletin* is a cost effective way of reaching all AES members and many others who benefit from institutional subscriptions.

Full page £75 for each advert or £375 for six adverts in the same year.

Half page £50 for each advert or £250 for six adverts in the same year.

Quarter page £30 for each advert or £150 for six adverts in the same year.

---

#### **NOTICE**

It is to be distinctly understood that all views, opinions, or theories, expressed in the pages of this Journal are solely those of the author(s) concerned. All announcements of meetings, financial grants offered or sought, requests for help or information, are accepted as bona fide. Neither the Editor, the Officers and Council of the Society, nor its Trustees, can be held responsible for any loss, embarrassment or injury that might be sustained by reliance thereon.

# Worldwide Butterflies [www.wwb.co.uk](http://www.wwb.co.uk)



## The new Goodden Light 12v for use in remote areas

Now  
available  
alone or  
with the  
**Moonlander  
Moth Trap**

By studying the light output from MV, Robert Goodden has developed this sophisticated portable unit with aspects in common with MV, using so little power that it runs all night on a 7.5Ah battery. It attracts insects much better than actinic lights, even powerful ones requiring heavy batteries. **Rainproof and safe.** An in-line photoswitch puts the light on and off automatically. With this switch the unit can be used vertically or horizontally in any moth trap.

See [www.wwb.co.uk](http://www.wwb.co.uk) for prices and more.



## Moonlander Moth trap

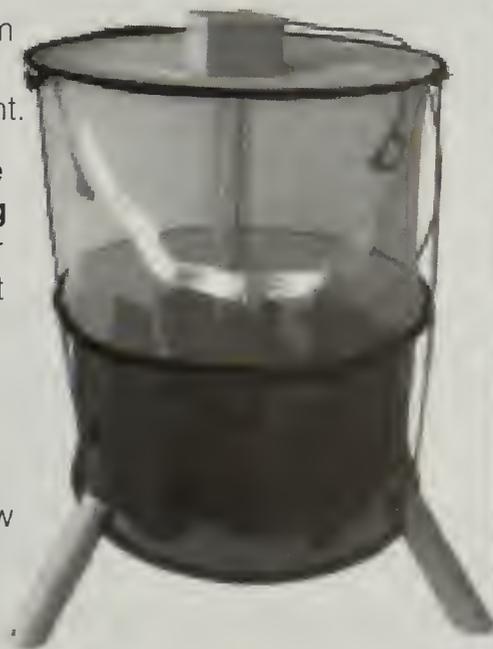
Folds totally flat and is contained in a convenient slim shoulder bag. Very lightweight.

**The Moonlander turns the principle of moth trapping upside down!** Moths enter from the bottom and cannot escape through the top. **Works as sheet and trap combined.**

Better than traditional egg boxes, moths prefer the new **reticulated foam moth shelters** and cone.

**The Moonlander** is now available **without electrics, or with Battery, Mains or BOTH.**

See the options on [www.wwb.co.uk](http://www.wwb.co.uk)



*No escape through the top*



**Both trap and light are total innovations by Robert Goodden.**

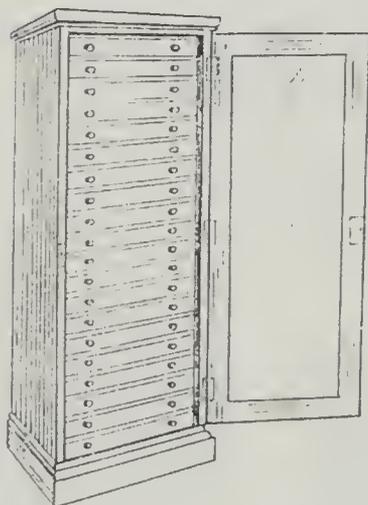
They are tried and tested in Europe and the tropics. In good conditions the results are spectacular.

**Worldwide Butterflies** website offers **Livestock and Equipment for breeding and study. Specimens for specialist collectors will be added as available.** The system enables you to see exactly what is currently available as the season changes. From time to time there are special **Sale Offers** of equipment, books, livestock and specimens - an ever changing situation.

[www.wwb.co.uk](http://www.wwb.co.uk) Add it to your **Favorites** - check it regularly.

# ATROPOS ANTIQUES\*

## PURVEYORS OF FINE COLLECTOR'S CABINETS



*Many of you will have met us at the  
AES London Fair where we regularly  
show entomological cabinets for sale*

- We are specialist dealers in fine collector's cabinets.
- We can offer a choice of at least 30 cabinets, varying in purpose, construction, quality and price.
- We can supply both restored and un-restored cabinets and will undertake to restore and paper cabinets for clients.
- We are always interested in the purchase or exchange of cabinets, with or without a collection.
- Callers to our showrooms are always welcome by appointment.
- We offer a specialist collection and delivery service throughout the UK and have full expertise in the safe transportation of cabinets and collections.

**George Morgan**

**97, West Street, Hartland, N. Devon EX39 6BQ**

**T: 01237-441205/984 M: 07973 302190**

**E-mail: [george@atropos.wanadoo.co.uk](mailto:george@atropos.wanadoo.co.uk)**

\* We are an independent dealership of 30 years standing and have no association with any similarly named business.



## ARE YOU MISSING OUT? THE ENTOMOLOGIST'S RECORD and Journal of Variation

Publishes notes, observations, articles and reviews, mainly on the Lepidoptera and Coleoptera of the British Isles and Europe.

Founded in 1890 by J. W. Tutt, and still going strong, we publish six issues a year – alternating with the AES *Bulletin*. This means there is now a first class entomological journal available every month of the year!

Our subscription price is £25 per year. If you would like to see a specimen copy, please send your name and address, and a couple of second class stamps to cover postage to:

**The Editor, 14 West Road, Bishops Stortford, Hertfordshire CM23 2QP.**

***Write now! You never know what you could be missing.***

The Entomologist's Record is a publication of the Amateur Entomologists' Society.  
To ensure high standards of production we use Cravitz Printing Company.



## Ian Johnson Natural History Books

*(Pemberley Books)*

Specialist in *Entomology* and related subjects  
Also *Zoology, Ornithology, Botany* etc.

- CATALOGUES – Second-hand, Antiquarian and New books – free catalogues available on request.
- SPECIALIST BOOKSHOP at Richings Park, Iver, just to the West of London – easy to reach by car or train. Visitors are welcome to visit and view our stock, but please telephone first to confirm opening times.
  - \* *By car:* only 10 minutes drive from the M25 via the M4 (Junction 5), or M40 (Junction 1). 15 minutes from Heathrow Airport.
  - \* *By train:* 20 minutes from London Paddington to Iver Station on the Paddington-Slough Thames Trains service (2 trains every hour). We are 1 minute's walk from Iver Station.
- WEBSITE – view our stock on our website: [www.pemberleybooks.com](http://www.pemberleybooks.com).
- BOOKS BOUGHT – We are always interested in purchasing books in our specialist field, particularly antiquarian, academic and scholarly works on insects and other invertebrates.

18 BATHURST WALK, RICHINGS PARK, IVER, BUCKS SL0 9AZ  
Tel: 01753 631114/Fax: 01753 631115 • e-mail: [ian.johnson@pemberleybooks.com](mailto:ian.johnson@pemberleybooks.com)



# SPECIAL OFFER

£7.50 each

(inc. UK p&p)

£9.50 each (overseas)



## *Hazards of Butterfly Collecting*

by Torben B. Larsen

## *Rearing Stick and Leaf Insects*

by Ronald N. Baxter

### ORDER YOUR COPY NOW FROM

Cravitz Printing Company Limited, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Tel: (01277) 224610 • Fax: (01277) 262815 • E-mail: [CravitzPrinting@btconnect.com](mailto:CravitzPrinting@btconnect.com)

### Bulletin Cover



The cover picture this month is of the Giant Sabre Comb-horn Cranefly, Diptera: Tipulidae/*Tanyptera (Ctenophora) atrata*. It is to be found in damp woods between April and July.

The photo was taken by Dr. David Skingsley. More of his work can be found on his website "The Bug Botherer's natural history picture archive from near Alsager in South Cheshire" <http://www.bugbotherer.org.uk/>

We are most grateful to him for allowing us to use his pictures in this and the next few issues of the *Bulletin*.

# The Bulletin

of the Amateur Entomologists' Society

NATURAL HISTORY MUSEUM

- 4 NOV 2009

PRESENTED ENTOM LIBRARY

Volume 68 • Number 486

October 2009

## THE AES WEBSITE: [www.amentsoc.org](http://www.amentsoc.org)

Dr Kieren Pitts, who designs and manages our Website, has been notified that it has been selected as being among the best wildlife websites in Britain by BBC Countryfile Magazine. Our website was praised for the way it explains biodiversity and insect conservation.

Only 50 websites were chosen by the magazine, across six categories, and ours was among the top ten in the Best Bug Sites category (see [www.bbccountryfilemagazine.com/50-wildlife-sites](http://www.bbccountryfilemagazine.com/50-wildlife-sites)).

Food for thought: some of the other websites selected belonged to some extremely well-resourced organisations. The AES website differs from those in one important respect: the design, implementation and content of our website are entirely the result of unpaid work carried out by volunteers, at no cost to the Society. Another example of how the AES truly 'punches above its weight' among entomological and natural history organisations!

The screenshot shows the homepage of the Amateur Entomologists' Society (AES) website. The browser address bar displays <http://www.amentsoc.org/>. The page features a navigation menu with links for About us, Membership, Bug Club, Publications, Events, Insects, Shop, and Members. A search bar is also present. The main content area is divided into several sections: 'Join', 'Inspire', 'Conserve', 'Identify', and 'Learn', each with a small image and a brief description. The 'Join' section states that the AES is the UK's leading organisation for people interested in insects. The 'Inspire' section mentions the production of four publications, including the AES Bulletin and the Entomologist's Record and Journal of Variation. The 'Conserve' section describes the annual exhibition, Members' Day, and field trips. The 'Identify' section highlights the exhibition as one of the largest of its kind in the UK. The 'Learn' section notes the AES's affiliation with major natural history and conservation organisations. On the right side, there are sections for 'Events' and 'News', each listing recent activities and dates. At the bottom, there are links for Contact us, Site map, Help, Privacy, Conditions, News feeds, Links directory, and Tell a friend. The footer contains the contact information for the AES, including the address (PO Box 8774, London, SW7 5ZG), the website URL, and the registered charity number (267430).



## Membership Matters

Enclosed with this issue of the *Bulletin* is the annual membership renewal information. Three points are worth highlighting:

1. If you renew your membership by standing order, you need do nothing other than check that the amount is correct for the category of membership you want (the categories are listed in the leaflet) and amend it if necessary. You do not need to send in the renewal form unless there are any changes to your details (e.g. address, entomological interests, membership category). Please quote your membership number as your standing order reference.
2. If you renew your membership through our online shop, the cost is exactly the same as renewing through the post (but you don't have to find a stamp!) Online shop payments are made using PayPal – you do not need to have a PayPal account to use this service. Only when renewing online will you receive confirmation (by e-mail) that your membership has been renewed.
3. Regrettably, we are no longer able to process credit card payments, other than through PayPal.
4. Any questions about your membership should be sent to [registrar@amentsoc.org](mailto:registrar@amentsoc.org) or by post to the Registrar at the Society's PO Box address.

### Data Protection Act

Please note that all personal information supplied to the Society is treated in accord with the requirements of current data protection legislation and will be used only for the purposes of administering the Society. We will not divulge member information to any third party unless legally required to do so. It is technically possible for us to generate membership lists but there are no plans to do so during the coming membership year.

### Forthcoming Events

#### Saturday 7th November 2009

Worcestershire Entomology Day.

A day of talks and displays organised by the Wyre Forest Study Group. This year the event will focus on changes in the insect fauna of the county resulting mainly from climate change. Prebooking is advised – please note there is a charge of £8 for this event! The meeting will be



held at Heightington village hall at SO764711. If you would like to attend please contact Geoff Trevis (AES Conservation Representative for Worcestershire) on 01905 774952 or by e-mail at geoff.trevis@btinternet.com

### **Saturday 23rd January 2010**

Young Entomologists' Day.

Oxford University Museum of Natural History, Parks Road, Oxford OX1 3PW.

11:00 - 4:00.

This will involve talks by Bug Club members and others followed by entomological activities centered on the Hope Entomological Collections. Please let the secretary know if you plan to attend.

### **Saturday 24th April 2010**

AES Members' Day & AGM.

Angela Marmont Centre for UK Biodiversity, The Darwin Building, Natural History Museum, London.

Detailed information to follow in future issues of the *Bulletin*.

## **The Michael Majerus Grant**

The AES Grant Scheme will be replaced in 2010 by a new scheme, to be known as the Michael Majerus Grant. The Grant is named after Professor Mike Majerus, President of the AES 2005-2009.

The aim of this new Grant is to encourage active involvement in entomology by a new generation of entomologists. It will support new projects which aim to advance amateur entomological study, research or education. It is anticipated that in most cases these projects will be based in the British Isles, and projects involving the promotion of entomology amongst the young will be viewed particularly favourably.

For a project to be eligible for the Grant, it must represent new activities; money will not normally be awarded for costs already incurred. Members of the AES including trustees and their families are eligible to apply, provided that in the latter case the project is not in any way related to their work as trustees of the Society.

The first awarding of the Grant is expected to be possible in June 2010. Applications, which must be in writing, will be accepted at any time of the year and will normally be considered by the AES Grants Panel, and recommendations made to the AES Council at the quarterly meeting immediately following receipt of the application. Applicants



will be offered part, all or none of the amount requested, or a suitable alternative award, as appropriate. Awards may be conditional on, for example, the submission of a report on the project for which the grant is awarded; any conditions will be determined by Council in each individual case.

The AES Council's decision will be final and will normally be notified to the applicant within two weeks of the meeting at which the application is considered. Payment of the award will be made at the earliest suitable opportunity, subject to any conditions that Council may stipulate.

Initial funding of this Grant is with money donated in memory of Mike Majerus. As with all AES funds, public donations, directly or via legacies, are always welcome. Individuals and organisations wishing to donate to the Michael Majerus Fund are invited to contact the Treasurer of the Society in the first instance. AES Treasurer, PO Box 8774, London SW7 5ZG. Email: treasurer@amentsoc.org.

## **A New Scarlet Tiger Moth Colony**

*by Graham Best (7928)*

*12 Northam Lane, Almondsbury, Bristol, BS32 4JH.*

Some 25 years ago I bred the beautiful day-flying Scarlet Tiger Moth (*Callimorpha dominula*) in captivity on potted-up Common Comfrey (*Symphytum* spp.). From my garden discards this invasive plant became established in the adjoining south-west facing field edge where this plant, brambles and nettles (also *dominula* food plants), have been kept severely in check by horses. Rewiring and slight realignment of the boundary fence last winter protected these plants, and to my surprise two post-hibernation yellow and black larvae appeared in the spring in my garden, followed by ten or so moths in July. Where they came from is uncertain, but it is possible that an unnoticed low level population from previously escaped larvae had existed in the grounds of a nearby hospital site, which has been derelict for 15 years after closure and has now been developed for housing. The nearest previously known colony from where they may have flown in was a mile or so upwind to the South West, at a brick works. With their black forewings spotted with white and bright scarlet rear wings they are a spectacular addition to the day flying insects my garden and would not be difficult for anyone to introduce.



## **Alien vs. Predator: Can Natural Enemies Control the Harlequin Ladybird?**

*by Remy Ware*

*Department of Genetics, University of Cambridge, Downing Street, Cambridge, CB2 3EH, UK*

**This paper was presented as the Annual Tesch Lecture on the AES Members' Day 18th April 2009**

### **Introduction**

Good afternoon everyone. I hope you've enjoyed the day so far. I'm going to finish off today's talks with a presentation about the Harlequin ladybird, *Harmonia axyridis*. I'm pretty confident that almost everyone in the audience has heard of the Harlequin ladybird, indeed some of you may have been present for my AES talk in 2005 when I was first starting my PhD. What I want to do today is to give you a quick re-cap of the problems associated with this alien insect and then move on to consider possible ways in which it might be controlled, focussing in particular on biological methods.

### **The Harlequin ladybird**

The Harlequin ladybird arrived in Britain in 2004. It was never intentionally introduced here but most likely arrived from continental Europe via multiple routes such as on fruit and vegetables or by flying across the Channel. It was first spotted in September 2004 in a pub garden and received massive media attention following this press release by Mike Majerus:

"The Ladybird has Landed! A new ladybird has arrived in Britain. But not just any ladybird: this is *Harmonia axyridis*, the most invasive ladybird on Earth."

The Harlequin ladybird has been released widely in continental Europe and North America as a classical biological control agent of aphids and scale insects. It is now considered an invasive alien species in many countries where it has become established outside initial release sites. Many of the features for which the Harlequin was selected as a biological control agent, such as its voracious appetite for aphids (eating up to 12000 aphids in a year!) and its high reproductive potential, are now contributing to its invasiveness outside its native range.

The Harlequin ladybird is now one of the fastest-spreading non-native insects in Britain and across Europe. Since its arrival in south-



east England in 2004, it has spread at a staggering rate and even reached Orkney in 2008. The public have been fantastic in contributing records to the Harlequin Ladybird Survey ([www.harlequin-survey.org](http://www.harlequin-survey.org)), and this has enabled us to track the spread of the species with great accuracy. Harlequins come in a variety of colour pattern guises (Figure 1), and are often confused with other species, such as melanic 2-spot ladybirds, *Adalia bipunctata* (Figure 2). Some hints for identification can be found on the website.

### **1000 species at risk!**

Mike Majerus once estimated that over 1000 species, including non-target aphids and coccids, other aphidophages and coccidophages, and the predators, parasites and pathogens that attack them, may be negatively affected by the Harlequin ladybird in Britain. Harlequins have a very generalist diet, and, whilst preferring aphids, they will also turn to eating the juices of ripe fruit, and the eggs and larvae of other insects, such as butterflies and other ladybirds. Harlequins pose a particular risk to other members of the aphidophagous guild, such as other ladybirds and lacewing and hoverfly larvae. They pose a major risk through competition: they gobble up all the aphids! The competitive dominance of the Harlequin can be attributed to several factors – its wide dietary range (allowing it to survive when normal prey runs short), its voracious appetite, its high reproductive rate (completing at least two generations per year in Britain whilst most native species only complete one) and its ability to thrive in a wide variety of habitats. And to add insult to injury, Harlequins will eat their competitors too! Here's a Harlequin eating the eggs (Figure 3) and a larva (Figure 4) of the 7-spot ladybird, *Coccinella septempunctata*.

### **A nuisance to humans!**

And as many of you may be aware from personal experience, Harlequins can be a real nuisance to humans as well. In autumn 2007 and 2008, the Harlequin Ladybird Survey was inundated with complaints from householders in southern and eastern England, that hundreds, thousands or even tens of thousands of *H. axyridis*, were invading their homes in search of overwintering sites (Figure 5). Finally, Harlequins are known to cause extensive damage to crops. In the late summer they may be attracted to ripe fruit, causing damage in vineyards and contaminating wine.



## **Can Harlequin ladybirds be controlled?**

Various methods for controlling the Harlequin have been considered. These can be divided up into mechanical, chemical and biological. Unfortunately, most of the methods proposed so far involve prevention or removal of ladybird aggregations in houses or in vineyards – rather little has been done with regards to limiting the ecological impacts of the Harlequin.

There are some obvious ways of preventing ladybirds getting into your home, such as sealing any possibly entry sites, such as gaps or holes around windows. When large aggregations are found, such as on this windowsill, they can be removed simply with the use of a dustpan and brush, or even a vacuum cleaner which could be adapted to stop the ladybirds entering the vacuum. Various methods of trapping have been considered, such as using black light traps to capture beetles in attics. Research is ongoing into whether we could develop a trap based on aggregation pheromones. The hope is that this would be Harlequin-specific and allow the capture of large numbers of beetles at once.

Insecticides may seem like an obvious choice for control, but are not without their problems. Their use indoors is considered undesirable due to the potentially harmful effects on people and pets. In addition, due to the lack of specificity of such chemicals, they are likely to have a negative effect upon native ladybird species and other insects. The repellent properties of some volatile chemicals, such as camphor and menthol, which can be applied to a building's exterior, may have some potential. In America, some householders were advised to paint their houses purple to discourage Harlequins, which tend to aggregate on pale-coloured surfaces!

## **The use of natural enemies**

Classical biological control is defined as the introduction of a natural enemy from the region of origin of the pest to the region of introduction for permanent establishment. The rationale for this strategy is that introduced (invasive) species are often so successful because they are typically free of, or are less affected by, the natural enemies (competitors, predators, and parasites) that they would normally encounter in their native range – this is known as the enemy release hypothesis. This means that one could theoretically restore population control of an invasive pest by 're-uniting' it with its own natural enemies. However, this is a potentially risky strategy since 'biocontrol gone wrong' is the reason we are in this mess in the first place! It would be absolutely imperative that thorough risk-assessments



into the non-target effects on native species be conducted before any such strategy by considered. However, one might also reasonably hold out some hope that, in time, the natural enemies of ladybirds that we find in Britain and Europe would start to adapt to a new host.

Ladybirds generally have very few major enemies. They are distasteful or toxic to many predators and advertise this with their bold contrasting warning colours. Ladybirds also release a yellow fluid called 'reflex blood' when disturbed (Figure 6), and this is packed full of bitter-tasting chemicals. But they are attacked by a range of other natural enemies, including fungal pathogens, bacteria and viruses, parasitoids and parasites. I am going to explore a few of these now, and consider their potential role in control.

A major cause of mortality of British ladybirds during the winter is a pathogenic fungus, *Beauveria bassiana*. Work done by several of my colleagues showed that the native 2-spot ladybird and 7-spot ladybird were much more susceptible to this disease than Harlequins. But interestingly, Japanese Harlequins were more susceptible than British Harlequins. This may provide some evidence that introduced Harlequins may actually have been selected for increased pathogen resistance during commercial culturing. Some follow-on work to this revealed that although it was difficult to kill Harlequins with this fungus, some sub-lethal effects on fitness were seen, in that infected individuals laid fewer eggs.

Another significant enemy of ladybirds is the parasitoid wasp *Dinocampus coccinellae*. Adult wasps lay their eggs into the underside of an adult ladybird. A single larva develops inside, munching its way through the fat body and reproductive organs, and chews through the nerves supplying the legs. It then exits and spins a silk cocoon amongst the legs of its paralysed host to pupate (Figure 7). Work conducted here in Cambridge showed that Harlequins were more resistant to *D. coccinellae* than 7-spots: they were attacked at similar rates, but significantly fewer wasps emerged from Harlequins, suggesting it was a less suitable host than the 7-spot. Again, an interesting difference between British and Japanese Harlequins was found, in that British Harlequins seemed more resistant. Evidence from summer 2007 indicates that *D. coccinellae* is also able to develop successfully within Harlequin ladybird larvae and pupae (it is usually considered to be an adult parasitoid).

Pupae of many ladybirds in Britain are killed by parasitoid flies. These flies lay several eggs inside ladybird pupae, just at the transition between pre-pupa and pupa, when the larval skin splits (Figure 8).



There are two species, *Phalacrotophora fasciata* and *Phalacrotophora berlinensis*. During the first few years since the arrival of the Harlequin in Britain, there were no observations of these flies attacking Harlequins in the field. But recent evidence suggests that these parasitoids may be starting to adapt to the Harlequin as a novel host. No phorids were recovered from any pupae collected in 2004, 2005 or 2006. In 2007, two pupae out of 500 were infected, and last year this jumped to 16 out of 1000. Although it is currently unclear whether this is a significant increase, it seems possible that British phorids are adapting over time.

It actually does seem reasonable to expect that natural enemies of native ladybird species would eventually become adapted to *H. axyridis* as a novel host. However, there is a risk that, in the time that elapses before they adapt sufficiently, *H. axyridis* may have already done considerable damage to elements of native biodiversity. Perhaps there is something we could do to help. A rather interesting candidate for biological control is the sexually transmitted mite *Coccipolipus hippodamiae*, a known parasite of some European ladybirds which causes females to become sterile. This mite infests the undersides of ladybirds' elytra (Figure 9), and is transmitted between hosts via sexual contact. It is present on several ladybirds found in continental Europe, but is currently absent from almost all British species. This is thought to be due to the paucity of mating between overwintered populations and the new generation, which presents a barrier to vertical transmission. While species such as the 2-spot ladybird can undergo two generations per year in continental Europe, only one can be completed in Britain due to temperature and food availability. Meanwhile, the Harlequin undergoes at least two generations per year in the UK, so could be a suitable host. Emma Rhule, a PhD student in my group, has been investigating whether the mite can successfully be transferred to Harlequins. She has shown that it can indeed be transferred, both through artificial and sexual contact with infected hosts.

Emma has also shown that it has a significant effect on female fertility. Within twenty days of being infected with the mite, Harlequin females became almost completely sterile. Further work is needed on this system, but evidence so far suggests that the introduction of this sexually transmitted mite could go some way to controlling Harlequin population density. Importantly, this method is somewhat less risky than introducing an Asian natural enemy, since the mite is already present in Europe and prevented from persisting on British ladybirds due to their life history.



### Conclusion

In summary, mechanical and chemical control may relieve some of the anthropogenic impacts of the Harlequin, but does nothing to ameliorate the negative effects on native biodiversity. Biological control might be considered, but should not be undertaken lightly. Enemies of European ladybirds may start to attack the Harlequin. One of the most promising ideas for control is through a sterility-inducing sexually transmitted mite.

### Acknowledgements

Thank you to all my colleagues in the British Ladybird Research Group.

### Dedication

I would like to dedicate this lecture, and indeed my entire career, to my mentor and friend, Mike Majerus. Here we are on a ladybird-collecting trip in Puerto Rico (Figure 10).



## Moth Larvae on Bee Orchid (*Ophrys apifera*)

by Roy Goff

April Cottage, Kate's Bridge, Bourne, Lincolnshire PE10 0EN  
roy.goff@hotmail.com

I have several Bee Orchids growing in the back lawn which I keep an eye on to protect them from grazing by rabbits. I noticed that one of the young plants had one of its main leaves (it only had three leaves) tightly rolled up and spun together with silk. I opened it up to discover a small dark larvae of the tortricid group of moths, probably *Celypha lacunana*. The larva itself was nearly full grown and was moved a reasonable distance from the orchid where, being polyphagous I hope it could find a new home without eating my orchids. This is the first time I have found any lepidopterous larva on an orchid plant.



## iSpot – helping people learn how to identify wildlife

by Martin Harvey

*M.C.Harvey@open.ac.uk*

The Open University has launched a new website that aims to help beginners learn how to identify wildlife. It is called iSpot, and can be found at: <http://ispot.org.uk>

On iSpot, people can upload digital photos, and/or descriptions, of the species they've seen, and are encouraged to try identifying it for themselves. Other users on the site can click a button to show agreement with the suggested identification, or if it's not correct they can add an alternative species name. The site has been developed by the Open University's Biodiversity Observatory team, under the leadership of Jonathan Silvertown, Professor of Ecology, as part of the Open Air Laboratories project (OPAL).

Anyone can see the observations on iSpot by going to the above website. To make use of the site, and upload observations yourself, you'll need to register, a simple (and free) process that just needs you to provide a user name and password.

Many readers of this *Bulletin* are of course already experienced in helping people identify insects, and if any AES member would be willing to spend a bit of time helping others on the iSpot site we would be delighted – if you have got a few minutes to spare, you can help by confirming identifications made by beginners on the site, or by solving some of the trickier identification questions that may come up (or indeed pointing out that a safe identification can't be arrived at from a photo alone). It's entirely up to you how much time you wish to devote to this of course, there is no expectation that any one person will have to respond lots of observations on the site.

There is already a link from iSpot to the AES website, but to build on this there is also the possibility to have people on the site who can act as "AES representatives" – these people can be 'badged' as such, so that whenever they post an observation or comment on the site the AES logo appears next to it, with a link back to the AES website. If you're interested in taking on such a role for the Society, please contact Dafydd Lewis, AES Secretary ([secretary@amentsoc.org](mailto:secretary@amentsoc.org)).

Alongside iSpot the Open University is offering a brand new introductory level course, "Neighbourhood Nature", which combines theory and practice and includes the use of iSpot as a field-based



activity. For further information on this see: <http://www3.open.ac.uk/study/undergraduate/course/s159.htm>

We hope that iSpot will encourage people to enjoy observing the wildlife around them, and that some of them will develop their skills and go on participate in recording and conserving insects and other wildlife. For any further information about iSpot please contact Martin Harvey: [M.C.Harvey@open.ac.uk](mailto:M.C.Harvey@open.ac.uk)

iSpot is an OPAL (Open Air Laboratories) project, and is funded by the Big Lottery Fund. For more about OPAL see: <http://www.opalexplorenature.org/>



## **Butterfly House in Golders Hill!**

*by Wesley Caswell (3133)*

*46 Leuigars Avenue, Kingsbury, London NW9 8AS.*

For members in the London area (NW) there is now a nice little Butterfly House in Golders Hill Park near Golders Green. I visited it recently, and there were quite a number of tropical butterflies on the wing, also quite a large 'cage' at the end with lots of butterfly pupae waiting to emerge.

There were also some cocoons of the Atlas moth (*A. atlas*).

The volunteer staff are very friendly, and admission is – free! It is not a very big place, but nice for a visit, though it is a bit difficult to find – there is only one signpost to it, and that is right by the entrance, so you may need to ask someone where it is. I have suggested they put up more signs to it.

It is open between 2 pm and 4 pm.



## Return to Corfu

by Clive Betts (4976)

*Green Tree Cottage, Broadclyst, Devon EX5 3HW.*

### Prologue

Following Peter Sutton's special feature edition of the August 2009 Bulletin I would like to present my own snapshot of Corfu, recounted not from Peter's in-depth experience, but from brief encounters separated by nearly four decades. I hope readers will find my experiences complement Peter's accounts.

In the summer of 2009 I was lucky enough to be able to return to the Greek Island of Corfu, 36 years since I visited the island with my mum and dad as a 14-year-old. Back then I was still very much a novice entomologist, bursting with excitement at the prospect of visiting the childhood home of one of my literary heroes – Gerald Durrell.

Corfu in 1973 was one of the first "package holiday abroad" destinations, although the first proper airport passenger terminal had opened only the previous year. As a result the facilities were charmingly basic, the people incredibly welcoming and still curious about tourists in the untouched fishing villages along the coast and tiny tavernas tucked away among the cypress and olive trees. I was overwhelmed by the brilliant sunshine, the sound of the cicadas, the insects I spotted and collected, and by the strangeness of the beautiful, lush scenery.

Four decades on I was cautious about how the island would have changed; although my passion for natural history, insects in particular, has stayed with me undiluted. Furthermore, I was returning to my childhood paradise with my own children and really hoped that they too would enjoy their stay as much as I had.

It was certainly as hot as I remembered: 34 degrees Celsius on arrival in the late afternoon. The transfer to our hotel took us through the ancient backstreets of Corfu town and along the narrow coastal road to Dassia where our hotel was situated. The route made it hard to gauge just how much development had happened since my last visit, although I knew that some parts of the island had become brash and spoiled. The beach resort of Dassia was busy but quite small, being confined to a narrow strip of hotels, shops, restaurants and tavernas facing a stunningly beautiful bay. We had spent a number of terrific family holidays in the Balearic Islands, especially Ibiza with which it



was tempting to compare Corfu. Corfu, however, is about three times the size of Ibiza and much greener even in late July.

We had soon settled into our hotel and I could start to take in the sights and sounds of the hotel environs. Apart from the ever-present cicadas, one of the first things I noticed was the large numbers of social paper wasps *Polistes*. I don't get on with these wasps: they seem to be aggressive and intrusive and I wasn't used to such numbers. I quickly discovered that they were nesting in the roof space of the hotel bar. My understanding was that *Polistes* nested exclusively in the open on branches, under eaves etc: clearly not the case here. They were also gathering around a water overflow, joined frequently by hornets (*Vespa crabro*) that appeared to be very cautious of the much smaller *Polistes*. I didn't blame them.

Our hotel was up a hill away from the main road and we had views over the swimming pool and out across the bay towards the distant hills of Albania. Our first morning set the routine for the rest of the holiday: lazing around the swimming pool watching brightly-coloured swallows swooping across the surface dipping the lower part of their beak briefly into the water and scooping up a tiny amount at a time. I quickly took to patrolling the splashes around the pool's edge where the leggy mud-dauber wasps *Sceliphron distillatorum* collected water to help with their nest building. After a wonderful swim I perched myself on the pool balcony and puzzled over the hotel's attempts to grow English roses in the baking Mediterranean heat. After a few moments examining the withering plants I spotted several large, spindle-waisted sphecid wasps (*Sphex* ? *rufocinctus*) darting around at high speed and then disappearing into large burrows in the loose soil around the base of the roses. These handsome wasps are hunters of grasshoppers and crickets and I was pleased to have my first sight of them nesting.

Later that day I took my eldest son down to the beach and we went exploring along the shingle. Only metres from the gently lapping sea, olive trees and grassy tussocks hummed with insect life. We saw large numbers of the large grasshoppers *Oedipoda*. Chinery describes the different species which have different wing colours (*O. germanica*, red; *O. caerulescens*, blue). Both species were common although the red wings clearly dominated this location. In the same grasses I also spotted the weirdly wonderful *Acrida ungarica*. This large grasshopper has a massively elongated head and long thin body. My son was amazed by its alien appearance and remarkable mimicry of the thick grasses upon which it was resting. Further along, by a freshwater inlet



we watched small, red dragonflies darting around us. Using Chinery again I thought these were probably *Sympetrum* sp., as they were too slim for the beautiful *Crocothemis erythraea* I had found in 1973.

We couldn't get further around the rocky headland so headed inland from the beach, meandering up a lane past old houses, gardens and vegetable plots. In one plot I caught sight of my first carpenter bee *Xylocopa violacea*. These massive, shining black hulks of the bee world are amazing to watch as they drone heavily from flower to flower. Durrell called them "electric blue bees" and when the sun catches their dark wings there's a flash of violet and blue giving these wonderful creatures an even greater aesthetic appeal. On a nearby mass of brambles and mixed flowers were a number of darting and battling anthophorid bees of the genus *Anthidium*. We have seen *Anthidium manicatum* in our Devon garden but some of these ones were the much bigger *Anthidium florentinum*. These shiny black and yellow bees are really good at hovering and precision aerobatics in the hot sunshine, and are also very territorial. Even in the short time we spent watching them disputes were breaking out everywhere between each other and with other bees such as the leaf-cutters (*Megachile* sp.) that were also on the flowers.

My eldest is not a passionate naturalist but likes rambles and tolerates my entomological gait (walk, slow motion, stop, slow motion, stop, walk again) which so irritates the rest of the family. A few days later we discovered another place worth exploring just down the hill from the hotel. Here, a track led away into the wilder stretches of countryside behind the resort and just metres from the turning there was a cascade of purple and yellow bindweed. It was a mass that stretched along an old fence for maybe six metres and the same, vertically, into a small Holm Oak (*Quercus ilex*, a relict of ancient Corfu forests). To my delight the large, tubular flowers were being visited by several carpenter bees *Xylocopa*, smaller bees (including our own common garden humble *Bombus terrestris*) and a large, pristine Scarce Swallowtail butterfly *Iphiclides podalirius*. These large and majestic butterflies can be very aerobatic but this one was fluttering slowly up over the bindweed then gliding away like a paper plane. wings held in a "v" shape.

Eventually we walked on further away from the resort. All along the roadside were many small umbellifers whose flowerheads were teeming with the red and black striped Harlequin Bugs *Graphosoma italicum*. Occasionally they were joined by black and red "fire bugs" *Pyrrhocoris apterus* and large black ants (? *Camponotus*) – monsters compared to our own UK formicids.



Further along, the road turned into a narrow track that wound along the side of a large olive grove. The trees here were massive: much taller than the olives I had seen elsewhere on the island. All we could hear now was the constant call of cicadas and the occasional wasp buzzing past. Above us large gingery-brown butterflies (probably the Silver Washed Fritillary, *Argynnis paphia*) performed aerobatic feats and zoomed off too fast for a novice lepidopterist to identify properly. We walked for a few more minutes, taking us away from the olive grove and into wilder country. Here the ground was carpeted with herbs and tall grasses and I was watching out for more *Acrida* and maybe some praying mantids. On a previous reconnaissance back towards the hotel I had seen a tiny mantis perched on the tip of a slender grass-stem but we were having no such luck here in the wilder grassland. Suddenly a large movement caught my eye off to my left. Here a low bank was shading some denser foliage of herbs and shrubs. I stood and watched as some of the larger stems swayed and then stopped, swayed again and then stopped. I beckoned to my son and we carefully moved off the path we had been following and headed towards the regular disturbances. I was hoping it was a big lizard or a snake as I hadn't had a good look at any large wildlife so far on this holiday. As we gingerly approached, to my astonishment I saw a richly coloured tortoise-shell, then a small grey head and four wrinkled legs protruding: we had found a Greek tortoise (*Testudo hermani*)! We watched and photographed the wonderful animal as it tramped clumsily through the dense brush. Its shell was scored and scraped on the front but the colouration on the top was vivid sandy and dark chocolate brown; black where it was worn and dusty. Both my son and I were awe-struck by this large animal, familiar only as pets or in zoos.

Back at the hotel it was hard to convey my excitement to the rest of the family: it was definitely a "had to be there" moment. Later that afternoon we were once again by the hotel pool and I was still enthusing to my long-suffering youngest son about the tortoise, when there was a loud whirring noise and small clunk nearby. I looked up and perched on the edge of a sun-bed was a rather dazed looking cicada. It was a handsome speckled-grey beast, being some 45mm (or so) long and with glistening wings. I picked it up and showed my youngest the eyes and deceptively dangerous-looking mouthparts and it dutifully chirped away allowing me to show him the tymbal organs on its abdomen. My computer-game obsessed son was utterly captivated – who said insects aren't exciting?!



We were by now more than half-way through our holiday and I was beginning to realise that I had been mentally ticking off all the insects I had seen this time that I had also found on my first trip in 1973. I am no fan of the tick-list style of natural history as the list can become more important than the natural history. However, I forgave myself this time as the comparison of what I had seen previously and what I was finding 36 years later had set me thinking and kept me exploring.

Whilst pondering these thoughts one morning by the pool, I became aware of the occasional hum as something big flew past. At first I thought "carpenter bee" but the hum wasn't right and the insect looked too big even for a carpenter bee. I saw only two of these bulky insects all morning but the rather clumsy flight path led me to conclude these were in fact big beetles. The big flying beetles I have seen tended to be chafers or dung beetles (Family *Scarabaeidae*) of some sort, although sometimes the long-horns (Family *Cerambycidae*) can be equally impressive in flight. I couldn't catch one to prove either theory and turned my attention back to my family who were preparing to head off to the beach.

It was only a short walk to the beach but the path led along the side of some rough ground where large numbers of bulky coreid nymphs wandered suicidally over the pavement and red-winged grasshoppers (*Oedipoda gernaminca*) scattered ahead of our footfalls. I was taking in these sights when I stopped even more abruptly than usual, eliciting groans from my daughter and wife behind me. On the pavement at my feet was a brilliant, metallic green jewel about 30mm long by 20mm wide, with legs and small, comb-like antennae. It was a large chafer *Cetonia ? aeruginosa* (rather big for *aurata*), completely intact but very dead: so this was what had been flying around up by the pool. I picked it up and showed it to the family who were genuinely impressed, for about ten seconds, with its amazing colour.

The rest of the week flew by and before we knew it we were having our last swim in the pool and our last walk to the seashore. I had found one other addition to my 1973-2009 list, a small spider-hunting wasp (possibly *Anoplius viaticus*) and had only one significant missing record: the large brown and yellow potter wasp *Rhynchium oculatum* that I remember being ubiquitous before.

On the flight home I pondered the holiday, the island, its people and all the terrific animals we had encountered. We may have been fortunate in our chosen resort but our holiday to Corfu held enough of the 1973 magic for me to suggest that the ravages of mass-tourism had not yet altered the spirit of the place nor the hospitality of the people.



## The 'Queen of Entomologists' Part 2: Mrs Hutchinson and the golden Comma

by Peter Holland (6700)

*peter.holland57@ntlworld.com*

In an earlier article, I described the role that Emma Sarah Hutchinson (1820-1905) played in furthering our knowledge of the Pinion-spotted Pug moth (*Eupithecia insigniata*). Hutchinson is remembered today chiefly through the scientific name of the 'golden' form of the Comma butterfly, *Polygonia c-album* f. *hutchinsoni*, typical of the first of the two annual broods that this species has in England. In the entomological literature, however, there has been ambiguity over the role that Emma played in deciphering the life cycle of the Comma, and discussion over whether *hutchinsoni* is an appropriate name for the golden form. The intention of the present article is to try to clarify this thread of entomological history.

One early debate in the literature centred on a technical issue concerning nomenclature precedence; this argument was resolved by Shipp (1897) who pointed out that the name *hutchinsoni* was given to the golden form in 1881, fifteen years before alternative names – *lutescens* or *pallida* – were proposed. A second, and more subjective issue, is whether Hutchinson was the most appropriate person to associate with the golden Comma. It is certainly the case that distinct dark and golden forms of the Comma butterfly were noted more than a century before Emma Hutchinson was born. P.B.M. Allan aired his opinion in his collection of reminiscences, *A Moth Hunter's Gossip*. Writing long after Emma's death, Allan wrote 'Now, who the collector was that gave Mr. or Mrs. or Miss Hutchinson's name to the pale form of *c-album* I know not; but James Petiver has admirable drawings of both forms and clearly distinguishes between them.... It would seem that this seventeenth-century virtuoso has been robbed of his birthright.... Should we say var. *petiveri* or var. *hutchinsoni*?'





When I had the chance to look at Petiver (1717), however, it was apparent to me that the 'Old Moth Hunter' had greatly overstated the case. Petiver did indeed draw both the dark form and also a 'Pale Comma' (describing it as 'paler than the last'), but he made no indication that they were the same species. Furthermore, he depicted two other forms, which he named the Jagged Wing'd Comma ('wings are deeper cut and more vivid; it's finely marbled underneath with small greenish eyes speckled with black') and the Small Comma ('it's very dark below, and in all parts less'). Certainly Petiver gave no hint of the key point: that the species is double-brooded with the Pale Comma representative of the first brood. Through the eighteenth and nineteenth centuries there was much debate over the life cycle of the Comma butterfly. Moses Harris (1766), amongst others, wrote of two generations per year, but these views were not universal and were robustly challenged a century later by Edward Newman (1869) who wrote 'An idea seems to be emerging that there are two broods in the year... I think this is a mistake'. It was not a mistake, and so the significance of the golden or pale form of the Comma remained in confusion. Resolving the picture was hampered, of course, by the fact that this species declined massively in abundance during the nineteenth century, becoming a rarity across most of England.

John Robson clarified the situation in a short note published in the journal he edited, the *Young Naturalist*, in 1881 (expanded upon in 1892). Robson bemoaned the confusion caused by Newman, writing 'It is said, that if a lie has twenty minutes start, it will travel all round the world before it can be overtaken. So of a scientific error'. In his articles, Robson describes four colour variants of the Comma (though quite different from Petiver's four descriptions), and assigns these to the male and female of a summer brood and an autumn brood. He wrote 'the summer form is so different, and so constant in its appearance, that it ought to have a distinctive name, and we suggest it be called *Hutchinsoni*, in compliment to that lady whose liberality has enriched so many cabinets with specimens; whose knowledge of the species... is not exceeded by that of any living, and to whom we are greatly indebted for the information mentioned above' (Robson 1881).

What Robson was referring to was known by every lepidopterist of the day: the foremost expert on the Comma butterfly was Emma Hutchinson. Even Newman, whose error had frustrated Robson, wrote 'Mrs Hutchinson... is better acquainted with the butterfly than any other entomologist in the kingdom'. Emma, the wife of a Herefordshire vicar, was famed for her skill at breeding Lepidoptera, and also for her

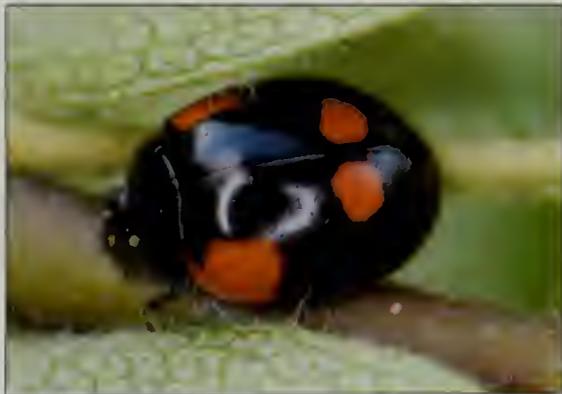


generosity in providing livestock and specimens for entomologists around the country. In 1881, Emma Hutchinson wrote that she had been noting the habits of *c-album* for fifty years (certainly an exaggeration), bribing hop-growers to bring her larvae and pupae they had found, and sending hundreds to other naturalists either for their collections or for release into the wild. Indeed, the Comma butterflies in Robson's own cabinets included specimens reared from larvae she provided (Eales 2001). With her experience, Emma must have been very familiar with the Comma's life-cycle, but as far as I can ascertain she did not publish a clear description until 1887. She reported that eggs collected in April/May 1886 were reared through to emergence in late June; these were mated in captivity and the offspring reared to give a second brood emerging in August, but these second brood insects would not pair. She does not explicitly report their colouration, but she will certainly have known that golden Commas are produced only in the first brood and she supplied specimens of these to other collectors (see Plate). Emma's eldest son Thomas, himself an accomplished naturalist, was incorrect when he wrote in 1892 'my mother was the first to draw attention to the fact that this species is double-brooded'. She was not the first to suggest it, but she was probably the first to prove it.

The life-cycle of the Comma in England is actually slightly more complicated, as it is only partially double-brooded. The late summer and autumn butterflies, which over-winter as adults, comprise entirely the darker form. After these insects lay eggs in spring, the larvae do not generate exclusively the pale *hutchinsoni* form, but also some offspring of the darker form. The *hutchinsoni* adults mate immediately (producing dark over-wintering offspring), while their slower-developing darker siblings will join the over-wintering cohort. It is not clear whether Hutchinson knew that the first brood consists of a mixture of the two forms, although it seems likely because she was breeding the butterfly in captivity and was a careful observer. Either way, it was the great lepidopterist F.W. Frohawk who took the credit for showing that not all first brood adults were *hutchinsoni*, writing 'I disproved this by rearing a large number of both forms from the same parent' (Frohawk, 1934). His comment refers to his experiences in 1894, when 275 eggs obtained from a single Herefordshire Comma were reared to give 200 adults: 41 *hutchinsoni* and 159 of the darker form (Frohawk 1894). Frohawk knew this was a significant finding, and exhibited the 200 set specimens at the South London Entomological and Natural History Society meeting on 11 March 1895, and again at the Entomological Society of London on 20 March 1895



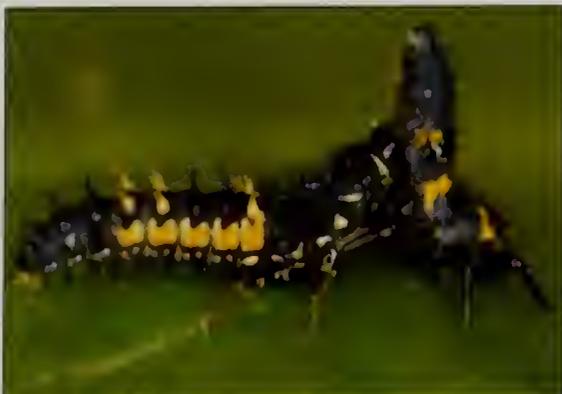
**Figure 1.** Colour pattern variation in the Harlequin ladybird. Top left: *f. succinea*; top right: *f. conspicua*; bottom left: *f. spectabilis*; bottom right: *f. axyridis* (not yet found in Britain).



**Figure 2.** A melanic 2-spot ladybird (*f. quadrimaculata*).



**Figure 3.** Harlequin ladybird larva eating the eggs of a 7-spot ladybird.



**Figure 4.** Fourth instar Harlequin ladybird larva attacking a fourth instar 7-spot ladybird larva.



**Figure 5.** Harlequin ladybirds found aggregating on a windowsill during the winter.



**Figure 6.** An Eyed ladybird, *Anatis ocellata*, reflex-bleeding.



**Figure 7.** A 7-spot ladybird parasitised by the wasp *Dinocampus coccinellae*. The wasp has spun a silk cocoon amongst its host's legs to pupate.



**Figure 8.** A female phorid fly (*Phalacrotophora* spp.) ovipositing into a ladybird pupa.



**Figure 9.** The underside of the elytra of a Harlequin ladybird, showing infection by the mite *Coccipolipus bippodamiae* (adult mites and their eggs are visible).



**Figure 10.** Mike Majerus and Remy Ware on fieldwork in Puerto Rico in 2006.

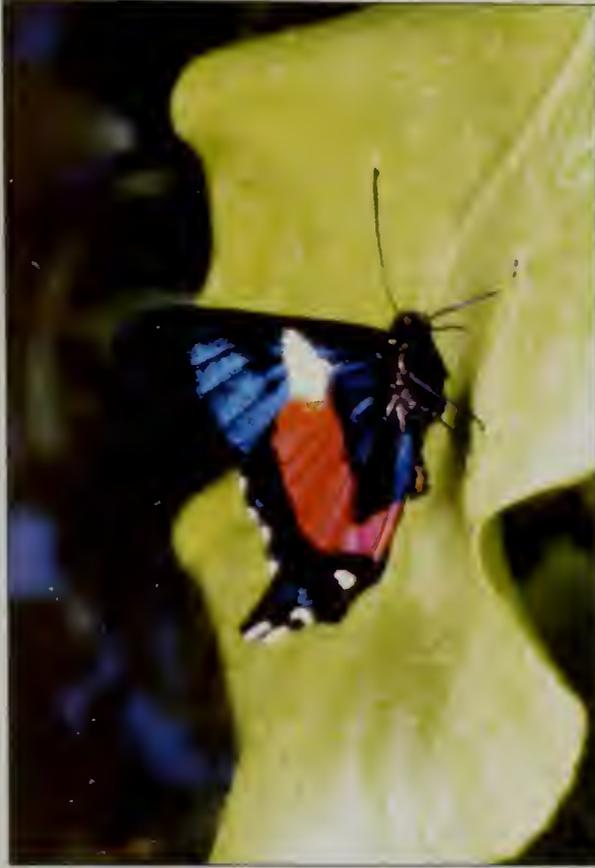


Figure 2. *Ancyluris formosissima*.

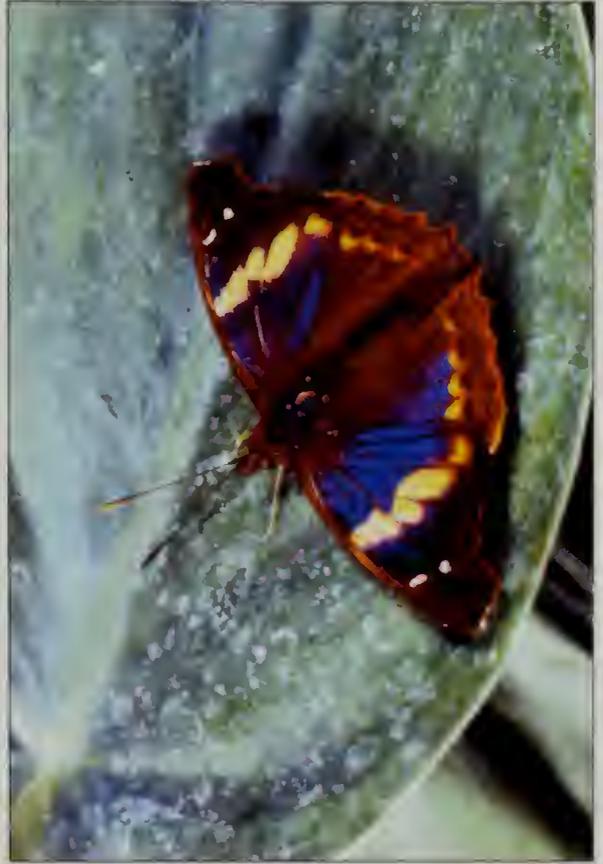


Figure 4. *Doxocopa clis fabinus*.



Figure 1. *Perisama clisithera*.

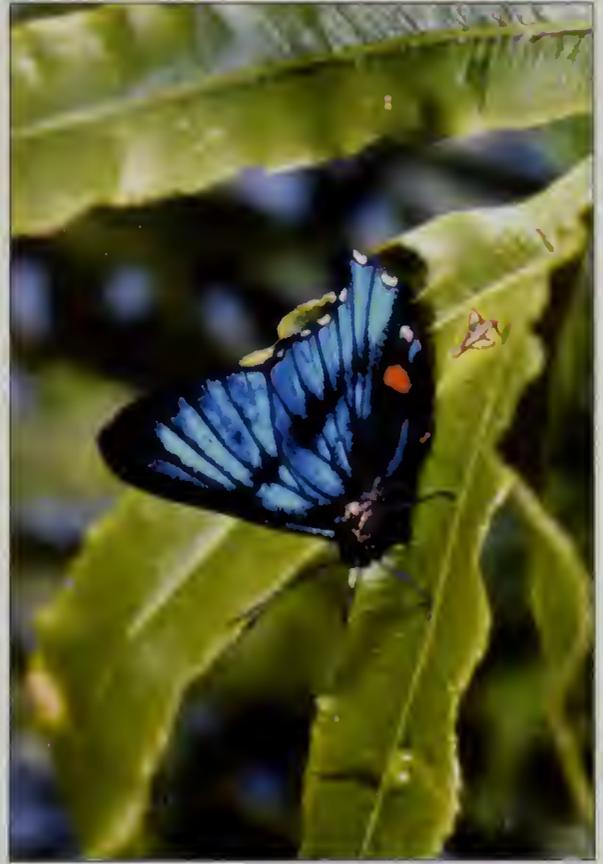


Figure 3. *Ancyluris buascar*.



Figure 6. *Agrias claudina lugens* (Ex situ)



Figure 5. *Adelpha lara mainis* (Ex situ)

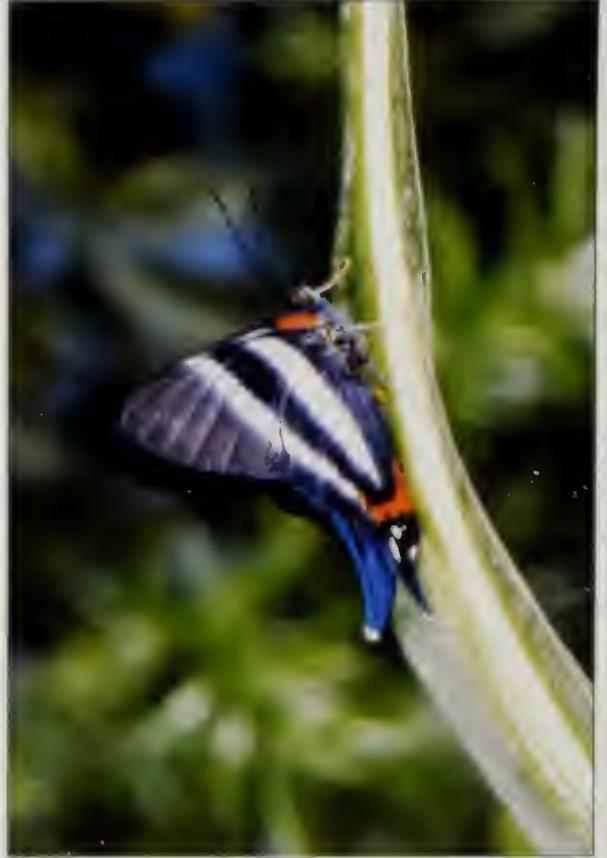


Figure 8. *Diorina dysonii*.



Figure 7. *Agrias beata*



(Frohawk 1895). Although Frohawk took the credit for the discovery, he did acknowledge that 'my success in working out and completing the life-history of this interesting butterfly this season is entirely due to the great kindness of Mrs Hutchinson, of Leominster' (Frohawk 1894).

In summary, the golden form of the Comma has been commented on for three hundred years. Several entomologists suggested they comprise the first brood of a double-brooded species, but these were speculations made from scattered observations. Hutchinson went further by breeding the butterfly and proving that it could have two broods in a year. She may or may not have known that the summer brood was produced facultatively, but she certainly assisted Frohawk who did report this. As for the environmental trigger that causes the switch between development into *hutchinsoni* or the darker form, this was not discovered for another century (Nylin 1989). Emma Sarah Hutchinson made major contributions to our knowledge of the life cycle of the Comma, and it is fitting that her name is remembered in the scientific name *Polygonia c-album f. hutchinsoni*.

### Acknowledgements

I thank James Hogan and Darren Mann for access to material in the Hope Entomological Collections, Stella Brecknell for assistance in the Hope Library, David Rogers for permission to reproduce photographs, and Jeremy Thomas for helpful discussions.

### References

- Allan, P.B.M. (1947). *A Moth Hunter's Gossip*. London: Watkins & Doncaster.
- Eales, H.T. (2001). The John E. Robson Collection of British Butterflies. *The Vasculum* 86, 9-18.
- Frohawk, F.W. (1894). *The Entomologist* 247, 257-262 & 287-289.
- Frohawk, F.W. (1895). *The Entomologist* 28, 138 & 184.
- Frohawk, F.W. (1934). *Complete Book of British Butterflies*. London: Ward, Lock & Co.
- Harris, M. (1766). *The Aurelian*. London.
- Hutchinson, E.S. (1881). *The Entomologist* 14, 250-252.
- Hutchinson, E.S. (1887). *Entom. Monthly Magazine* 23, 186.
- Hutchinson, T. (1892). Herefordshire Lepidoptera. *Woolhope Club Transactions*.
- Newman, E. (1869). *An Illustrated Natural History of British Butterflies and Moths*. London: Glaisher.
- Nylin, S. (1989). *Ecological Entomology* 14, 209-218.
- Petiver, J. (1717). *Papilionum Britanniae Icones, Nomina etc.* Printed by the author.
- Robson, J.E. (1881). *Young Naturalist* 11, 108-110.
- Robson, J.E. (1892). *British Naturalist* 21, 194-197.
- Shipp, J.W. (1897). *The Entomologist* 30, 16.



## Mothing in the Gambia

by Roy Goff

*April Cottage, Kate's Bridge, Bourne, Lincolnshire PE10 0EN*

*roy.goff@hotmail.com*

Several times when I have been surfing the internet looking for moth-related items I have come across pictures of tropical moth catches. They have shown white sheets absolutely plastered in all types of moths, many looking very spectacular. As a result I have wanted to have a go at tropical mothing myself but never really expected to do so. Then whilst at work I heard a travel programme on Radio Four which featured a section on Gambia in West Africa and mentioned the three most important factors that I thought necessary for a tropical mothing session.

- 1). The official language was English.
- 2). It was only a six-hour direct flight from England.
- 3). It was cheap.

As soon as I got home I looked up Gambia and moths on the Internet. The result was just one site which was that of the Makasuto Wildlife Trust (MWT) based at Abuko nature reserve. At the same time there was a week available at a very good hotel in January for slightly less than £450 a head including meals! Just to add an incentive the Abuko nature reserve was only a few miles from the hotel and they had an e-mail address. The trip was on.

I have to admit to knowing nothing about moth-catching in Africa but I wasn't going to let a minor detail like that get in the way. I e-mailed the MWT to ask them about moth trapping – what I would like to do and what time of year was best. Also listed on the MWT web site was the total Gambian moth list; about 85 species, the largest family being hawk moths. The reply was encouraging in that they would be delighted to see me but they really had no idea as to what time of year would be best, but we could talk in January. Information gleaned from the Internet did not really give much extra information about flight times and African moth catches, with even less about West Africa. I wanted to get a look at the country, having never been to Africa before, and eagerly awaited the trip in January 2007.

A very enjoyable holiday ensued with lots of bird watching around the hotel and surrounding countryside. A walk in the evening touring the hotel lights produced a few moths – mostly pyralids and quite dull but that did not put me off. A meeting with Malang Jambang (the then



acting director of the MWT) was very fruitful in that they would be very keen to have moth trapping done at Abuko Nature Reserve and they also had basic accommodation which I could use. They also had a generator which would make my equipment list a lot lighter for air travel.

At Abuko they have been doing butterfly transects on a weekly basis for several years but had very little knowledge about the moths' flight times. Butterfly numbers peaked at the end of October/ early November so this fitted neatly with my forthcoming holiday arrangements and also air flight times during the holiday season in West Africa (October – April).

During the intervening months I met up with a friend, Graham Finch, who wanted to join me on the trip. This made transporting both equipment and personal effects much easier and would be good company for the trip. Graham is a much more experienced moth-er than me and also very knowledgeable about birds, another interest we both share.

We arrived in Gambia in the early afternoon of 10th November 2007 and were quickly installed in the nature reserve compound. There was a restaurant opposite the main entrance to the reserve which had closed but when we knocked on the door and asked for a meal each evening at 5.00pm every day for the next week, they soon agreed. We soon made friends with the staff and had some great conversations which once or twice meant that we were a little late in getting the traps on after our meal!

That evening we set up in Abuko just a hundred yards or so from the compound in an area of savannah forest with open grassy patches and medium height tree cover. We operated a single 125W mercury vapour bulb suspended over a white sheet on the ground. Trapping took place from dusk (about 7.30pm) until shortly after midnight, by which time few new species were arriving at the sheet. Malang accompanied us to see how we worked and to talk. He sent out one or two of his staff most evenings to help us and to learn.

Unfortunately we soon found out that November is not the best time for moth catching but it was still very rewarding. Most of what we caught could not be identified because there is very little reference material but we could guess at families for most of our catch and specimens were taken for future reference.

That first night we caught several hawk moths species but by far the commonest group caught were pyralids which were delightful in their



variety and colours. A few of the moths we caught were identified because they were species we get in the UK although they are rare species over here, eg Levant Blackneck, *Tathorhynchus exsiccata*. Although the catch was a little disappointing in that we were not inundated with weird and wonderful species, with hindsight it was much better for us because we would have had difficulty coping with a deluge. By the end of the trapping session, though, we had caught over a hundred species which is always a good night in my view.

During the week we trapped on six different occasions in a variety of habitats around the reserve which included the edge of a permanent pool (which contained crocodiles!); tropical gallery forest; dry savannah grassland, and intermediates between them. The number of species caught declined very rapidly during the week, so on the final night we trapped at our first site back near the compound again to see how the two catches varied. The second catch at the compound was very low but still attracted more than twenty species new to the trip, so it was hard to be disappointed even though numbers had dropped off so quickly. We have no information to explain the drop in numbers except that we were now almost two months into the dry season and we think that the decline was that we hit the tail end of moth activity.

A recent e-mail conversation with a Finnish couple who trapped during February 2009 revealed that they caught about twenty species in the whole week, which does support this view. I have since found out that the peak season for moth activity is the rainy season which in Gambia starts about July and ends during September. However it is difficult, and a lot more expensive, to visit the country during those few months when the holiday season is closed.

Collecting any form of wildlife is illegal in Gambia without permission from the Department of Wildlife and Parks Management. Any specimens taken out of the country are only permitted if they remain the property of Gambia and are available to be returned if and when required. However the appropriate licence is not difficult to come by, and it is a means of gathering revenue by the DWPM. By the end of the six nights' collecting we had papered just under 400 specimens of about 200 species and this was where the difficulties now lay.

Having prepared and set the specimens back in England I now had the task of identifying them. Very few books exist to help and there is even less information available on the Internet. A few museums have photos posted on the net but these tend to be of some type specimens



and not all the species they hold within the collection. Many hours of trawling through the Internet did give rise to names for some species and at least family or generic names for many others but it was slow work and difficult to know if the specimen I held was the actual species illustrated, or a close relative, because the individual I had might not exactly fit the example on the Internet and, without other related species, how do you know if the illustration is variable or if there are several closely marked species to consider?

The only real way to gain accurate identifications was to visit the Natural History Museum in London and start searching through the reference collection draws. My thanks go to Martin Honey and his staff for making Graham and myself welcome and for helping us get started in our search. Firstly we were pointed in the direction of the best books to look through before we were introduced to the filing system and two huge rooms full of row upon row of specimen drawers. I have made several subsequent visits to the collection and each time I manage to come away with about twenty new identifications after about six hours of searching.

So far we have managed to identify 147 specimens, most to species level but some only to genus. I have several dozen specimens that do not appear to be in the NHM collection and some on which I still have more work to do, but that will have to wait for now as I am due to move out to Gambia shortly so I can spend more time working on the moths. The present list of Gambian species is now just over 200.

I am hoping to improve the amount of information available to moth hunters in Africa by photographing live and set moths and placing them on the Internet at [www.africanmoths.com](http://www.africanmoths.com) with as many species identified as possible.

Species identified Abuko nature reserve, The Gambia 10th - 15th November 2007.

#### PTEROPHORIDAE

(Probably) *Pterophorus albidus*

#### ARCTIIDAE

*Amerila saalmulleri*

*Apisa bourgognei*

#### COSSIDAE

*Azygophelps inclusa*

*Atteva syncallii*



## GEOMETRIDAE

*Aprochiaria* spp.  
*Chaisma nubilata*  
*Coenina dentaria*  
*Isturgia catalaunaria*  
*Melinoessa fulvescens*  
*Semiothisa majestic*  
*Tephrina purlinda*  
*Zamarada seydele*  
*Zamarada suda*  
*Scopula dysmorpha*  
*Traminda neptunaria*

## LASIOCAMPIDAE

*Chrysopsyche imparilis*  
*Mimopacha brunnea*

## LIMACODIDAE

*Birbama saturate*  
*Latoia amaris*

## LYMANTRIIDAE

*Beralade perobliqua*  
*Crorenia mentions*  
*Dasychira heiroglyphica*  
*Dasychira poliotis*  
*Euproctis fasciata*  
*Euproctoides acrisia*

## NOCTUIDAE

*Acontia basifera*  
*Acontia gratiosa*  
*Acontia wahlbergi*  
*Cretonia platyphaeella*  
*Eublemmoides truncate*  
*Schausia leona*  
*Aubrina sobrina*  
*Acantholipes circumdata*  
*Bareia incidens*  
*Catephia alchymista*  
*Episparis penetrate*



*Maxera brachypecten*  
*Maxera marchalii*  
*Maxera nigriceps*  
*Melanephia trista*  
*Oedebasis prionofratia*  
*Plusiodontia commoda*  
*Sarothroceras bathisalis*  
*Trichopalpina zethesia*  
*Achea catella*  
*Anoba atriplaga*  
*Anomis flava*  
*Anomis involuta*  
*Anomis sabacifera*  
*Antarchaea subflavalis*  
*Anticarsia irrorata*  
*Anua davidioides*  
*Anua melonconisia*  
*Athyрма discimacula*  
*Audea kathrina*  
*Caranilla angularis*  
*Entomogramma pardus*  
*Heliophisma xanthoptera*  
*Heiliophisma xanthoptera demaculata*  
*Libystica simplex*  
*Mocis convienens*  
*Mocis mayeri*  
*Ophiusa overlaeti*  
*Parallelia algira*  
*Pericyma mendax*  
*Plecopterodes moderata*  
*Prodotis stolidia*  
*Trigonodes hyppasia*  
*Eublemma anachoresis*  
*Eublemma ecthamata*  
*Eublemma ragusama*  
*Lithacodia blandella*  
*Bryophilopsis lunifera*  
*Callopietria maillardi*  
*Leucania stenographa*  
*Sesamia nonagroides*  
*Spodoptera cilium*



*Spodoptera litura*  
*Tathorynchus exsiccate*  
*Adisura affinis*  
*Helicoverpa armigera*  
*Lophiophora purpurata*  
*Hypena abstitalis*  
*Hypena lividalis*  
*Hypena obstitalis*  
*Agrotis spinifera*  
*Chrysodeixis acuta*  
*Plusia signata*

## NOLIDAE

*Gigantoceras perinetti*  
*Maurilia arcuata*  
*Negeta luminosa*  
*Odontestis prostica*  
*Pardasena roeselioides*  
*Petrinia lignosa*  
*Xanthodes malvae*  
*Earias biplaga*  
*Earias cupreoviridis*  
*Westermannia agrapha*

## PYRALIDAE

*Isotauria serraticornis*  
*Sacasta erythropis*  
*Crocidolomia binotalis*  
*Lamoria imbella*  
*Noorda blitealis*  
*Parapoynx fluctuosalis*  
*Mussidia nigrivenella*  
*Hypsopygia ignetimbrialis*  
*Omphalobasella suffusalis*  
*Diaphania indica*  
*Lamprophaia ablactalis*  
*Desmia horaria*  
*Glyphodes argyraspides*  
*Hydriris ornatalis*  
*Hymenia recurvalis*  
*Maruca vitrata*



*Notarcha quarternalis*  
*Palpita metallata*  
*Pardomima callixantha*  
*Pardomima zanclophora*  
*Psara atritermina*  
*Samoedes cancellalis*  
*Sylepte ovialia*  
*Synclera traducalis*

#### SPHINGIDAE

*Basiothea medea*  
*Cephonodes hylas virescens*  
*Hippotion Osiris*  
*Nephele funebris*  
*Nephele oenopion*  
*Neopolyptychus ancylis*  
*Polyptychus andosa*  
*Polyptychus coryndoni*  
*Pseudoclanis molitor*  
*Pseudoclanis occidentalis*  
*Agrius convolvulus*  
*Acheronita atropos*  
*Coelonia fulvinotata*

My thanks go to David Agassiz, Graham Finch, Martin Honey, Ian Kitching, Paul Waring and Malang Jambang of the Makasutu Wildlife Trust.

#### References

- Goater, Barry (1986) *British Pyralid Moths*, Cambridge: Harley Books  
Townsend, Martin and Waring, Paul (2009)  
*Moths of Great Britain and Ireland*, Gillingham: British Wildlife Publishing  
Pinhey, E. C. G. (1975) *Moths of Southern Africa* Cape Town:Tafelberg  
[www.lepsbarcoding.org](http://www.lepsbarcoding.org)  
[www.nhm.av.uk](http://www.nhm.av.uk)  
[www.metafro.be](http://www.metafro.be)





## Questing in Ecuador

by *Ronald N. Baxter (1267)*

*45 Chudleigh Crescent, Seven Kings, Ilford, Essex, IG3 9AT.*

This is an account of a four-week journey I made in September 2005 to Ecuador. I had boarded a KLM plane at Heathrow late one evening bound for Amsterdam, being the first leg of my journey to Quito. At Amsterdam a change of plane was made for a much larger plane which would fly the whole way to Quito with stops at Bonaire, Guayaquil and finally Quito.

I was met at Quito airport just after 8 a.m. two days later, by Paul and Susana, who had travelled overnight from Baños, where Paul has a small hotel for backpackers. This was to be my base while I was in Ecuador. Once I was clear of customs, Paul and Susana whisked me back to the hotel where they had stayed overnight, for a very welcome breakfast of ham, eggs and tea.

Breakfast over, we set off for the long drive to Baños. But first we made a detour to photograph Mt Cotopaxi, which was partly covered in snow and light cloud. We then rejoined the road to Baños. This is a very unpleasant drive along a very dusty road which is lined each side with ramshackle buildings which serve as both shops and houses. A common sight is pigs and half starved dogs running about, their ribs and backbone clearly visible.

Frequently along the route we saw dead dogs at the roadside, killed by passing traffic; their owners, if they had any, unconcerned. Feral dogs are everywhere, as in most South American countries.

We arrived at Paul's hotel late in the afternoon, somewhat travel weary. My first task was to get my baggage into my room so that I could unpack my camera equipment and check that everything was working; check batteries; clean lenses and load bags with fresh film and tapes in readiness for the first excursion.

That evening, over a meal of fried bacon, tomatoes and chips (cooked by Paul) we discussed subjects I was interested in photographing. Since hummingbirds were at the top of my list, Susana suggested that we go first to Mindo, which was not far away, where there was a hummingbird centre. We decided that this should be the first excursion and that an early start would be made the next morning by having breakfast at about 7am.

I went to my room at about 10p.m., watched television for a while and then retired for the night, wondering if I would wake before 7a.m.



as I had no alarm clock. As it happened, I would have no worry about over-sleeping, for at 6.45a.m. sharp there was a loud pealing of bells which seemed to go on for ever, signalling morning assembly at the convent school, a little way down the road. The bells later gave way to an amplified nun's voice giving instructions in Spanish which continued well after 7a.m. This, I was later informed, occurred each morning.

After breakfast, we set off for Mindo. The morning was somewhat misty and very cold, and I was having doubts about the hummingbirds appearing when, suddenly, lying in the roadside ahead was a dead cow. We stopped the motor to inspect the cow, and it was then that I could see that a group of fifteen or so medium-size vultures were already tearing open the cow's belly. The vultures were black with grey 'wigs' which covered their heads and part of their necks. I hastily took some stills before they flew into the nearest tree, where they regrouped on a large branch. We got back inside the motor and continued our journey to Mindo.

By the time we arrived at the hummingbird centre, the mist had already cleared and the sun was shining through the trees. At the centre, we were met by the warden and his wife, who directed us to the viewing platform at the lodge.

The centre is the result of collaboration between the Government of Ecuador and the Italian centre in Trieste. Studies are made of physiology and methods of reproduction of the hummingbirds, birds of fundamental importance in the balance of South American forests.

The viewing area overlooks the forest, providing a clear view of the hummingbirds which at times exceed 50 in number, flying to and fro. Each morning they come to be fed by the warden who hangs out a number of feeding bottles containing a sweet liquid food. On this occasion however, the warden had delayed feeding them so that I could film and take stills of them without the feeding bottles appearing in my shots.

The hummingbirds kept on coming. There were birds with long blue tails, others were metallic green-blue and others moss green and black. The hummingbirds were later joined by two brilliantly-coloured tanagers. These were about 20cm in length; golden yellow with black and blue wings. They fed on the ripe bananas which had been placed on the trunks of trees.

After an hour, the camera tape came to its end. It had been a most rewarding experience to see so many different species of birds in such a short time, completely wild and free.



My quest to film hummingbirds achieved, we set off to a site where dragonflies and butterflies were known to abound. We drove for some distance and then turned off down a gravel road which came to an abrupt boggy end by a river. On one side of the road was a shallow stream inhabited by a scarlet bodied *Libellula* species. Although these were darting to and fro at speed it was not difficult to obtain good shots of them as dragonflies always return to the same resting place. In due course the *Libellula* obliged.

In the boggy area was a thriving colony of the Silver Argiope Spider, *Argiope argentata*. There were about twenty of them, all mature females. Some appeared to be gravid as they had much larger abdomens. Each spider was resting in the centre of its web, legs widespread. Some were consuming prey which were at various stages of being consumed. Some of the spiders had captured black Papilios of the genus *Parides*, which were flying low in the area.

A muddy patch by the river was host to numerous butterflies; there were several species of Pieridae including *Phoebis philea*, *P. argante* and *P. rurina*. A single specimen of the '89' butterfly *Diaethria clymena*, its silver and black underside was very conspicuous among the yellow butterflies. Further along the river edge was another group of butterflies again predominantly Pieridae, but jostling among them was a single *Marpesia corinna* and a single specimen of *Catacore kolyma*. The underside of the latter is very similar to that of *D. clymena*, except that the figures '89' are reversed. The centre spots are white instead of black, and the whole of the underside is also darker and richer in colour, having a greenish tinge.

The next destination was Misahuali, where I would hopefully fulfil my next quest which was to film a colony of capuchin monkeys that live there. These monkeys live in a plantation by the edge of the Napo River. The monkeys are very fond of fruit and vegetables, so we stopped at the local store to purchase some carrots, small red onions, bananas and grapes.

As soon as we reached the plantation, and put down our bags, the monkeys became very inquisitive. We first cut the bananas into pieces which we lobbed up to them and they expertly caught. Next, we lobbed up some of the small onions which were also expertly caught and they quickly began breaking them into pieces. Some pieces they ate, other pieces they began to anoint themselves with, rubbing the onions vigorously all over their bodies, paying particular attention to their backs and under their arms. Perhaps they find some medicinal value in the onions; perhaps the onions provided soothing properties



to their skin or, indeed they might just simply have used them as a deodorant!

The monkeys soon became very bold and it was not long before they were helping themselves from our bags. They tried to open my camera bag but could not work out how to unfasten the flaps. In their frustration they began chewing the straps. I let them help themselves to the remainder of the food but drew the line at eating my camera bag. Everywhere there were monkeys eating carrots, onions and bananas.

When they had eaten all the food, the monkeys returned to the trees. They spread themselves along the boughs, legs and arms dangling down. Some females had small babies clinging to their backs, fast asleep. Soon the chattering became quieter and finally fell silent. It was siesta time.

As we were leaving Misahuali, I chanced to look up at the windows of the store where we had purchased the food and noticed several large moths resting on the walls. The shop proprietor eagerly gave me permission to go and collect them. They were a species of *Dirphia* (Saturnidae) and to my disappointment, all five were males. Apparently they come each evening and fly about the lights.

We left Misahuali and travelled to an area of scrubland with several dilapidated wooden buildings which were promising habitats for spiders. Careful searching however, revealed no tarantulas (Theraphosidae) but there was a female Orb Spider (*Nephila*) which was about 40mm in length. The carapace was pale bluish-white and its abdomen was olive-green with a white line along the length of each side. Its long legs were also olive-green.

After photographing the spider we left for another likely site. After driving several miles we came to a halt. Ahead was a hold-up of several lorries laden with logs. The cause of the hold-up was a wooden bridge which had collapsed under the weight of one of the lorries. There was no way for us to pass, so we reversed and went back the way we had come. We eventually stopped at a lightly wooded area which hopefully would provide some interesting subjects.

After a short search I found a colony of the large leaf-cutting ant *Atta cephalotes*. This ant is about 20mm in length and has six large spines on its thorax and abdomen, together with a huge swollen head.

The ants were busy cutting portions of leaf from very old and tough banana leaves. Now, ants are reckoned to be highly intelligent insects, but I was about to witness a large worker ant being far from intelligent.



I had already set up the camera when I suddenly realised that this particular worker was going about his task in the wrong way. Instead of positioning itself across the leaf so that it would cut a portion from the opposite side, this worker was cutting a semi-circle from the section it was holding onto. Other, somewhat smaller, sub-workers were frantically running round the large worker, touching its antennae, some were baring their mandibles, as if about to attack it. But all the time the worker continued diligently with his task of cutting out a portion of leaf, undeterred by all the commotion by the other workers. Finally, having cut the semi-circle of leaf the worker fell to the ground, still clutching the portion of leaf. I had filmed the whole sequence.

I had just finished filming the ants when a large shield bug (Pentatomidae) flew past me and settled on a nearby bush. It was a handsome beast of approximately 38mm in length. Its wings were greyish-black with whitish veins and its huge thorax was black with yellow dots and blotches. Each side was ornamented with huge antler-like protrusions. After allowing me to obtain several shots of it, it opened its large wings, raised its legs and, with a loud buzzing, lumbered into the air.

We returned to Baños for a few days in readiness for my next quest, which was to visit the Huaorani Indian village at Tenna. The journey would be several days so extra baggage would be necessary.

My plan had been researched and arrangements had been made for me to film the Huaorani Indians in their village and, hopefully, hunting with their blowpipes. I had drawn-up a rough shooting script which should not be too difficult to film.

We had set out early and were well under way when we encountered a hold-up. Lorries leaving the forest, loaded with logs, had been prevented from moving by Indians blocking the road. The Indians were complaining that loggers were destroying their forest and if anyone should benefit from the timber it should be them; and rightly so.

There seemed to be no way out of this dispute, so we waited until the lorry blocking the road was allowed to move to let us to pass. After some distance, we came upon another hold-up. We were stopped this time by an Indian staggering in the middle of the road with several more Indians standing by. He was drinking from a very large jar which he balanced on his arm as he drank; it was obvious from his movements that he was very much the worse for drink. Furthermore, he was holding in the other hand a boulder the size and shape of a rugby



football. I was expecting the boulder to come through the windscreen at any minute. I did not like the look of this situation one bit.

There was one Indian, apparently their spokesman, who kept purposely supplying the troublesome Indian with drink. Eventually, the Indian could take no more drink and sank to the ground. We were informed that the Indians in this area are at present unsettled by strangers entering their zone and that it would be safer not to attempt to go any further. I instantly agreed to this and so we turned round to find another locality and subject.

After an hour's drive, we came across a hotel in a garden setting. As this looked a promising site for butterflies we stopped and ventured into the grounds. There did not appear to be anyone about so we ventured deeper into the grounds. The hotel itself was a very new building but it was the old out-buildings which gained out attention.

On one side of the first building we inspected was a very large spiny grasshopper at least 100mm in length. It was yellowish green with black markings and had very long antennae. After spending some time observing and photographing the grasshopper, we focussed our attention to the over-hanging roofs.

It was not long before we spotted a sub-adult *Avicularia* sp. tarantula-type spider outside its retreat. This was about 50mm, brown, with dark abdominal bands; and its legs were greyish. There have been specific names given to this spider in the past, but none have been valid, so they are not repeated here. Further searches revealed a mature adult female masticating the remnants of what appeared to be a spiny grasshopper of the species seen earlier.

In the hotel grounds were several large plants. Various species of *Heliconia* had been planted in beds together with banana and *Datura*. Elsewhere there were many flowering shrubs which were attracting numerous species of butterflies including a species of Owl butterfly (*Caligo*) and several *Adelpha lara mainas*

As I was photographing the spiders and insects we were joined by two members of the hotel staff, who were very interested in what we were doing. After explaining that we were interested in tarantulas and that we were filming them, they seemed quite happy for us to continue. But they did not want the tarantulas injured or removed. Having assured them that we had not interfered with them in any way, we shook hands and left.

We returned to Baños that evening to prepare for my final quest which was to visit Garena Lodge, amidst the jungle at Tenna. Garena Lodge lies east of Tenna and is named after the Garena River which



flows through the primary rainforest. The lodge itself is situated on high ground and is accessed by large steps which are covered with strips of bark to aid walking up them.

During the first day of the journey to Tenna, we frequently made stops for exploration, which often provided good opportunities for photography. It was one of these stops which gave me hopes of one of my quests, which was to search for the most sought-after butterflies – members of the *Agrias* genus. Morphos may be blue and large, but it's the sight of an *Agrias* sp. which gets the adrenalin running! The most likely species to be seen is *A. claudina lugens*, which is red and blue on brown wings. *A. beata* is also likely to be seen. This is greenish-grey with subdued blue. However, all *Agrias* are elusive butterflies, keeping to forest clearings where they fly around the tops of trees. Occasionally they descend to the ground to feed from carrion and it is then that they are likely to settle on foliage.

We pulled off the road and made our way to a small, fast running stream which was rather photogenic, and provided some nice video stock shots. Blue Morphos were flying along the stream at great speed but were flying much too fast to photograph. Meanwhile several small butterflies were flying about the stream which I had not seen in previous localities. These were Nemeobiidae or metalmarks as they are called, brilliantly coloured jewels. But, again they were either flying too fast or too far away to identify or, indeed, photograph. Finally, I glanced up at the tree tops just in case *Agrias* might be up there somewhere, but there was no sign of one.

We left the stream and visited an Indian family living a short way in the forest. We explained that we were looking for insects and spiders - especially butterflies (Mariposas). The headman then walked away and returned with a perfect *Agrias claudina lugens*. This he had captured in his trap earlier. There may yet be a chance of my seeing these butterflies as we were certainly heading in the right direction.

We continued our journey to Garena Lodge and eventually arrived at a hotel in the heart of the rainforest where we stayed the night. But before entering, visitors were requested to remove their footwear to avoid damaging the polished floors. So we obligingly removed our shoes and walked into the hotel barefoot.

We had arrived at there during the afternoon on the second day of our journey, and had been met by very helpful staff who carried our bags up to the lodge. Accommodation was in thatched cabins, constructed with rough cut timber from the forest. Each cabin had a bed, toilet, shower and wash basin. Lighting was by a candle in a glass jar.



After unpacking my bags and making my cabin comfortable I made my way to the lodge. This serves as a dining room and rest room for relaxing in chairs or hammocks; and, for those wishing to spend the night sleeping in a hammock, it had a wonderful view of the forest. We were brought tea and sandwiches, which were very welcome after such a long journey.

It was while we were enjoying the refreshments that a green and yellow parrot appeared on the veranda rail, screeching. It first did a sideways walk to the right for about two feet, gave a couple of screeches, and then repeated its actions, only this time, to the left. It then proceeded to walk to the right again. It then introduced a somewhat difficult manoeuvre to its act: it turned completely round on the spot, gave a couple of screeches and bowed twice and finally walked off its stage.

The staff were delighted that their pet parrot had given one of its performances. It was then that the second part of the entertainment began. Up in the rafters were a couple of squirrel monkeys, busily chattering to each other; probably discussing their act.

Squirrel monkeys are small; their coats are olive green and yellowish; they have large round heads, black eyes and an endearing, though mischievous, countenance. As we were finishing our tea and sandwiches, the two decided to make their entrance. They simply dropped in upon us and gave us a look, such as only squirrel monkeys can, and attempted to help themselves to our sandwiches

Prevented from doing this, one immediately bared his teeth and began chattering angrily. Then, it attempted to help himself by snatching at my sandwich again. Turning towards me endearingly, he sat down facing me, leaned back and directed a stream of urine towards me. After this, there was such a sudden change in his behaviour; he now half closed his eyes, as if in anger. I brushed him away, but he was determined and fearless. He immediately directed another stream of urine towards me, wetting my shirt. For this, I christened him Water Pistol. From then onwards, Water Pistol, together with his mate, were kept in a cage in the staff quarters while visitors were present

The entertainment over, Paul set up a white sheet, together with lamp, in readiness for attracting insects later, when it was dark. In the meantime, back at my cabin, I had set-up the MD recorder outside on the windowsill in a sheltered position, in case of rain. The idea was that I should leave it running for the disc's duration and record the jungle sounds later that night.



After supper, we ran the light trap. It was quite some time before much arrived. But as it got darker, more and more insects began arriving. The sheet, by now, was literally covered in small black flies and mosquitoes, the latter frequently biting. As the night wore on, small cicadas and lantern flies began arriving. There were several beetles, including a large female *Megasoma* sp. Moths of all descriptions began arriving after 10pm. Most common were the Geometrid moths. These were of various sizes and colours, some multicoloured. Some large Saturnids began arriving, including some *Rothschildia* sp. but these were always males. SpHINGIDS were also frequent visitors.

Later, it began to rain quite heavily and the already muddy ground became muddier so we decided to retire to the lodge. It rained all night and through the next day. I decided to spend some time filming from the veranda; filming rain dripping off leaves, the river and forest in general. These shots would be useful as cut-aways. Although there were many animals all around, they could only be heard not seen; there was grunting, croaking, screeching, humming and cicadas singing non-stop.

Later that night, I returned to my cabin feeling rather disappointed that the weather should have turned for the worse. So I played back the MD disc and listened to the animal noises and rain!

The next day, the rain having eased off to a drizzle, I decided to inspect the area around the light sheet. There were several moths which had settled on foliage and on the side of the lodge. One particular specimen which attracted my attention was very similar to our native Leopard moth, *Zeuzera pyrina*. Its body length was almost 50mm and its colour was white and brown, instead of the bluish-black. Another interesting moth resembled our native Lappet moth, *Gastropacha quercifolia*. It had a tuft of hair on the thorax similar to that of the Coxcomb Prominent, *Ptilodon capucina*.

The rain eventually stopped and the grey sky gave way to blue and eventually the sun shone. The air was now becoming very hot and humid. I followed the narrow path into open forest where the vegetation was a mixture of ferns and flowering plants. One such plant was the common garden plant 'Busy Lizzie' which was growing everywhere along with yellow Canna lilies.

As the temperature rose, many butterflies were becoming active. Most notably were the brilliantly coloured Nemeobiidae which by now were flying about the open forest. Some were basking on foliage, their



wings open, while others were resting with their wings closed. I managed stealthily to approach some of them to secure photographs but most of them took to the wing before I could get close enough. I got about ten good photographs before most of the butterflies had 'warmed-up' and disappeared.

I spent some time searching the tree-tops for Agrias but none appeared. I searched everywhere, even when I thought I could smell some carrion. They must be about; I thought; after all, the Indian I had seen had captured one. You have to hand it to them; they know how to capture Agrias.

The next day we left for Baños as my month in Ecuador was drawing to a close. After a couple of days at Baños I left Ecuador and arrived at Heathrow two days later.



## Hyacinths a must for the Butterfly Garden

by Jan Koryszko (6089)

3, Dudley Place, Meir, Stoke-on-Trent, Staffordshire, ST3 7AY.

Hyacinths are among the best spring bulbs for the butterfly garden, providing terrific scent in a vast range of gorgeous colours from whites and creams to pinks, reds and blues. If you want something a little different try *H. orientalis* – City of Harlem – a variety which bears highly scented, soft primrose-yellow flowers.

The Peacock butterfly (*Inachis io* L.), Small Tortoiseshell (*Aglais urticae* L.), Orange Tip (*Antocharis cardamines* L.) and Brimstone (*Gonepteryx rhamni* L.) and of course the three whites – Large White (*Pieris brassicae* L.) Small White (*Pieris rapae* L.) and Green-veined White (*Pieris napi* L.) are all attracted to Hyacinths. The blue strong-scented species are the most popular with butterflies.

Hyacinths grow to around 30 cm (12 inches) and look great either in the rock garden or planted in pots. Place the pot at head height if you can, so that on going out in the patio you get a waft of the delicious scent and see the butterflies on a lovely spring day.

Bulbs should be planted in the autumn, 10cm (4 inches) deep in fertile, well-drained soil. Pea sticks tend to help support the plants in pots and in the rockery in rough weather, keeping them standing firm.



## Larvae back from the Dead

by Wesley Caswell (3133)

46 Leugars Avenue, Kingsbury, London NW9 8AS.

During the summer of 2009, I had two separate occasions when I had larvae come "back from the dead".

The first was a *Hemileuca maia* fully grown larva, which managed to get into the water jar holding the food plant.

I found the larva during the evening near the bottom of the jar, and took it out "lifeless". I placed it on a few sheets of toilet paper and left it for a while to do other things. About half an hour later it started to make small movements, and a short while later it was crawling about and "healthy", and pupated into a healthy pupa.

The second 'death to life' was even more unusual. It was a second instar larva of *Antomeris zephyria*. It appeared to get a virus and went limp, so I put it by itself on some toilet paper. (I know, you are all saying – you should have flushed it down the toilet to stop further infection – which I normally do, but not this time).

Anyway the larva lay there for three – four days not making any movement until one day I blew on it, and its head twitched! I then sprayed it with fine spray and put it in a plastic box in the greenhouse out of the sun.

Over the next couple of days it slowly started moving about again, and finally it went onto a cherry leaf and started eating! (In case you are thinking that it was going through an instar change - it was not).

I eventually returned it to the other larvae, and after some days it did go through an instar change, but was about a week behind the others.

Conclusion? Perhaps I have magic toilet paper!





## Book Reviews

### *Insectos de Espana y Europa*

by Patrice Leraut. Hardback 22 x 14cm. 527 pages, 185 colour plates with additional line drawings in the text. ISBN 978-84-96553-27-9 Lynx Edicions, Montseny, 8. E-08193 Bellaterra, Barcelona, Spain. First Edition: February 2007. Eur. 42 (excluding postage).

Ever since I started to come on holiday to Spain I have been trying to find a general introduction to the insects of this country. After I moved here at the end of 2004 I have found books in the larger towns only to be disappointed by their contents. Time and again they are far too general with inadequate descriptions and dreadful illustrations.

Whilst waiting in Santander, northern Spain, for the ferry to England on 22 June 2009 I had time to spare so, after visiting the Cathedral (well worth a visit), my wife and I wandered round the city and came upon a bookshop nearby. I headed for the Natural History section and saw a book with a black spine on which was printed in white "*Insectos de Espana y Europa*" etc. Expecting this to be yet another volume that would not be worth buying I was staggered when I read the details on the back cover, prior to opening it.

One casual glance at the plates and the layout of the book was enough to persuade me to part with 42 euros.

Let me say that the text, in Spanish, is a translation by Oriol Cabrero and Nuria Losantos of the French work by Patrice Leraut published in 2003 with the title "*Le guide entomologique*" by Delachaux et Niestle S.A. (Paris). I gather that the French book is available for 61 euros so if you can find a copy of this Spanish edition you will save a few pounds.

After a two page introduction to the history of insects there follows approximately 40 pages explaining the general classification of insects in their respective Orders. This section is illustrated with excellent line drawings of examples of insects from each Order.

This is followed by seven pages giving advice on finding, collecting and classifying insects.

After this there are the colour plates and opposite each is a page (sometimes followed by two additional pages) of text. This gives the full scientific name of each species illustrated together with some information about each species. The family name is always included and, where applicable, the common Spanish name. In addition, there is



further information about each insect but the amount of such information varies greatly. For example, with the larger insects such as the Dragonflies and Butterflies, the description runs to two or even three paragraphs. However, for the smaller insects a very limited amount of space is available so the data is, of necessity very short – e.g. name, family, “Europe and North Africa, under stones”. However, for the parasitic groups the hosts are usually named - by family if not by species.

All the illustrations are from photographs of pinned specimens. Most, such as the dragonflies, butterflies, moths etc are depicted in the recognised “set” position. However, the flies, bees, wasps etc are frequently unset and a lot of the beetles are carded. The quality of the plates is generally good but some do lack definition. All in all, one cannot really complain when you consider the staggering number of specimens that have been included.

At the back of the book there are three Appendices – the first gives details of some changes in the nomenclature since first publication. The second gives details fuller details of a new species of Tortricidae that is illustrated in the book, with drawings of the genitalia. Eight line drawings of Scarabid beetles form the third Appendix.

These are followed by a single page Glossary and a three page Bibliography before two Indices complete the book. The first index (18 pages) gives the full scientific name and the second (two pages) gives common Spanish names for some of the insects. The first index, as I say, only shows the full name. Thus, for example, for the Swallowtail butterfly you have to look up “*Papilio machaon*” as the specific names are not given separately.

For the price, this book is an absolute gem for anyone interested in trying to identify insects seen whilst on holiday in Europe or, at least, in France and Spain. It does not set out to include every species but I wish there was an indication of how many similar species (if any) exist. It would help to have a basic knowledge of Spanish (or, I guess French if you opt for that edition).

I would certainly recommend this book.

David Keen (3309L)



## ***A Pocket Guide to the Shieldbugs and Leatherbugs of Britain and Ireland***

by Bryan J. Pinchen, published by Forficula Books 2009, 114 pp, 46 species illustrated in colour. Price £8.50, paperback. ISBN 978-0-9549349-4-1. May be purchased direct from the author for £9.40, including p&p. Cheques should be made payable to B. J. Pinchen, 7 Brookland Close, Pennington, Lymington, Hampshire SO41 8JE.

Here is another useful colour identification guide on British insects by Bryan Pinchen (the others in the series are on bumblebees, ladybirds, grasshoppers and allied insects). Measuring 15 cm x 10.5 cm, it is easily carried in one's pocket and ideal for checking species in the field, including recent introductions not featured in other publications. For most frequently encountered species, last instar nymphs are also illustrated.

Following an introduction and clear sketches on how to distinguish the two groups covered, the main species coverage has a concise text including comments on field characters, size, host, habitat, season and remarks on similar species, also general distribution. Opposite a large colour illustration of each species is a brief text, which includes mention of colour variants (a particular area of confusion for novices). The author has usefully included a section on recording bugs and a further reading section, also a ruler on the back cover. I have already found the book user friendly on field trips and have consulted other works / websites, when requiring more detailed information.

Suitable for beginners and experts, this is a welcome, reasonably priced, colourful and informative guide to the shieldbugs and leatherbugs (stinkbugs and squashbugs) of Britain and Ireland, ideal for field trips.

Paul D. Brock (4792)



## ***Butterflies of the Cayman Islands***

By R.R. Askew and P.A. van B. Stafford. 2008. Hardback, 169 pages with 6 colour plates, 119 colour photographs, maps and other figures. ISBN 978-97-88757-85-9. £38 exc. P&P, published and available from Apollo Books, Kirkeby Sand 19, DK-5771 Stenstrup, Denmark.

Not being an ardent Lepidopterist, I was concerned that in reviewing this book I may not have done Messrs. Askew and van B. Stafford justice.

However, it quickly dawned on me that *Butterflies of the Cayman Islands* is an absolute gem, and no lack of my subject knowledge could have prevented my joy at leafing through its beautifully illustrated pages. The authors are clearly experts in the field, and their knowledge, experience and passion for the islands' butterflies shine through.

The book focuses on two of the Lepidopteran superfamilies found in Grand Cayman, Little Cayman and Cayman Brac – the 'True' Butterflies, Papilionoidea, and the Skippers, Hesperioidea. The first few pages contain general information relating to historical records of the islands' butterfly species, basic butterfly morphology, where and when best to see butterflies, and specific information such as the effect of hurricanes on the different species encountered. It's a fascinating insight which sets the scene well, and draws you into the natural heritage of these far-flung islands.

The rest of the book focuses on the different species found, grouped by family, and containing detailed information on recognition, subspecies, species range and distribution, habitat, history and biology. Each section is wonderfully illustrated with clear and detailed photographs, and the colour plates further aid identification.

The book ends with an overview of some of the more favoured nectar plants and larval food-plants, and a general insight into the butterfly-like moths found in the area. There's even a section covering those butterflies which you can find on Cayman postage stamps.

In all I've fallen for *Butterflies of the Cayman Islands* hook, line and sinker. The pages radiate the beauty and warmth of the islands and their butterfly fauna; I just wish I could afford to travel there, but who knows - if my lottery ticket comes good this weekend, I'll be on the first plane from Heathrow, going first class, butterfly net in tow.

## British Butterflies throughout the year by Peter May

This new book from the AES describes the adults of different species of British butterflies, according to the time of year they appear on the wing. Nearly all the 60 British species are illustrated. Focussing on encouraging an interest in entomology among the young, and the young at heart, there is a helpful calendar of flight times and a useful checklist to help you keep track of your observations. £ 5.00

Members price £ 3.80

## Preparing and maintaining a collection of Butterflies and Moths

by P. May and M. White. A practical manual detailing the various methods used to prepare specimens for a collection, from killing methods, setting the specimens and repairing damaged ones, to storage and preservation, including pest prevention and cure. 21 pages, 4 figures and 5 plates. (2006) £4.85

Members price £3.65

## The Hymenopterist's Handbook by Dr. C. Betts et al.

2nd edition dealing with the history of their families, classification and structures; natural history; studying, collecting, breeding, attracting and preserving Hymenoptera. Appendices include keys to the families. 214 pages with numerous tables, keys and figures (1986) £ 11.45

Members price £ 8.60

## Revised Flight Tables for the Hymenoptera

Revised flight tables for the Hymenoptera giving, wherever possible, times, location, flower visits and some indication of distribution and abundance. 24 pages (1988) £ 3.10

Members price £ 2.35

## A Coleopterist's Handbook

Edited by J.Cooter & M.V.L.Barclay The *Coleopterist's Handbook*, is now available as a fully revised and expanded fourth edition. Nomenclature has been brought inline with current use, collecting/curatorial methods reflect best practice and plant/beetle and beetle/plant lists are included together. Recent additions to the British fauna, modern and traditional techniques are included. All advice and comment given in the book is based upon collective years of practical experience of both curatorial methods and field craft; beetle family chapters have each been written by an internationally recognised authority. 496 pages including 32 colour plates. £ 54.00

Members price £ 39.00

## Host plants of British Beetles: A List of Recorded Associations

A list of a wide range of plants, in alphabetical order, together with the beetle species that have been recorded as being associated with them. 24 pages (1992) £ 3.10

Members price £ 2.35

## A Silkmoth Rearer's Handbook by B.O.C. Gardiner

SPECIAL OFFER PRICE £ 7.70

No further discounted price available

## A Dipterist's Handbook by A.E. Stubbs, P.J. Chandler and others

A practical handbook for both the beginner and the initiated on collecting, breeding and studying the two-winged flies. Describes equipment, trapping, preservation, habitat, plant and animal associations and behaviour. Includes a detailed chapter on larval stages with an illustrated key to families. An essential book for the keen Dipterist. 260 pages with drawings of larvae and equipment (1978, reprinted 1996) £ 14.20

Members price £ 10.60

## Practical Hints for Collecting and Studying the Microlepidoptera

by P.A. Sokoloff. A practical manual for those interested in the smaller moths, describing techniques for collecting adult moths, collecting immature stages, breeding, killing, setting and mounting. A list of useful books and journals as well as details of societies and suppliers is included. 40 pages, 11 figures (1980) £ 4.20

Members price £ 3.15

## Rearing and Studying Stick and Leaf-Insects by P. D. Brock

Specifically intended for beginners, although it is also suitable for experienced Phasmid enthusiasts, it is one of the few guides to rearing that features the majority of the culture stocks available. 22 species in detail. The informative text is complimented by 8 colour plates, 14 black and white plates and 29 figures. (New edition, 2003) £ 11.20

Members price £ 8.20

## The Study of Stoneflies, Mayflies and Caddisflies by T.T. Macan

A comprehensive guide to collecting and studying the biology and ecology of these aquatic insects. 44 pages, 10 figures and bibliography (1982) £ 4.20

Members price £ 3.15

## Breeding the British Butterflies by P.W. Cribb

A practical handbook covering all aspects of butterfly breeding, including general techniques, equipment and hints on how to breed each of the British species. 60 pages, 6 figures, 5 plates. Revised (2001) £ 5.20

Members price £ 3.85

## Practical Hints for the Field Lepidopterist by J.W. Tutt

Written at the turn of the century, this book has been reprinted because of its scarcity and value to students of Lepidoptera. It gives a complete month by month guide to which species and stages of macros and micros to look for and how to find them. Also contains a biological account of the early stages and how to keep, rear, photograph and describe them. 422 pages. Hardback. (Reprinted 1994). £ 24.00

Members price £ 18.30

## An index to the modern names for use with J.W. Tutt's

### Practical Hints for the Field Lepidopterist by B.O.C. Gardiner

A valuable cross-reference guide between the scientific and English names used in the early 1900s and the present time. £ 4.70

Members price £3.50

## A Guide to Moth traps and their use by R. Fry and P. Waring

The first sections deal with the measurement and properties of light leading into the types of lamp available and the electrical circuits needed to operate them. The next sections give details of the construction of the most popular traps used in the UK. The last half deals with the practical use of traps in the field including where and when to trap, limitations of traps and their relative performance. 68 pages, 21 figures, 15 plates (1996) £ 6.85

Members price £ 5.05

## The Amazing World of Stick and Leaf Insects by Paul D. Brock

A superb, comprehensive guide, for all those intrigued by these groups of insects. Topics covered include structure, fascinating facts, life history and development, defence behaviour, enemies, collecting, breeding (including trouble shooting), preserving, taxonomic studies, important collections in Museums etc. around the world and elaborate stories, beliefs and poems. Also outlines the major known species around the world on a regional basis. A section on Fossils is included. Includes a comprehensive glossary of the technical terms used in the description and classification of stick and leaf-insects. Hardback A5, 184 pages, 46 figures, 26 black and white plates and 40 pages of colour plates (containing 83 photographs and 4 drawings/paintings of insects and their habitats). (1999) £ 18.90

Members price £ 14.10

## Rearing Parasitic Hymenoptera by M. Shaw

This booklet provides information on the parasitic Hymenoptera to enable successful studies to be made of this little understood group of the British insect fauna. Details are given on the general biology of parasitic wasps, rearing principles, efficient rearing practices and detailed methods of dealing with adult wasps. 52 pages, 4 colour plates (New edition - 2001) £ 5.70

Members price £ 4.20

## Larval Foodplants of the British Butterflies by Peter May

A comprehensive compilation of the known larval foodplants of our native and immigrant butterflies. Also including "How to Encourage Butterflies to Live in Your Garden" by the late Peter Cribb 62 pages. (2003) £ 7.40

Members price £ 5.45

## The larger water beetles of the British Isles by Peter Sutton

For those who love the spectacular larger water beetles of the British Isles, this is the publication that you have been waiting for! It is the only modern publication with colour illustrations of all of our aquatic coleopteran megafauna and it provides the most up-to-date distribution maps revealing their current distributions. Jam-packed with fascinating details of their life-histories, this book covers 11 species including the 6 native 'Great Diving Beetles' and the 'Silver Water Beetles'. It is also copiously illustrated with text figures and has much additional information including details of observed climate-induced range changes and the conservation measures required to ensure their continued survival. £ 11.90

Members price £ 8.90

## Glossary for the Young Lepidopterist

6 pages, 2 figures. (1951)

£ 1.05

Members price £ 0.90

## A Label List of European Butterflies

20 pages. (Revised 1981)

£ 2.35

Members price £ 1.85

## Some British Moths Reviewed

Aid to the identification of some of the more difficult species. Reprinted from the *Amateur Entomologist* Vol. 5 (1941) and a *Guide to the Critical Species of Lepidoptera*, reprinted from *Entomologists' Gazette* 1969-72. 64 pages, 6 black and white plates, numerous figures. (1985) £ 4.45

Members price £ 3.35

## Butterflies of Cyprus 1998 (Records of a years sightings) by Eddie John

Observations of the 44 species of butterfly found on the island in 1998 including notes on each species and distribution maps. 46 pages (2000) £ 4.30

Members price £ 3.25

## Collecting Het.Bugs (Hemiptera: Heteroptera)

12 pages (including 2 plates). (1946)

£ 1.20

Members price £ 1.00

## Collecting Clearwings

12 pages (including 2 plates), 4 figures. (1946)

£ 1.10

Members price £ 1.00

## Collecting Lacewings

9 pages, 8 figures, 5 plates. (2nd edition 1976)

£ 2.25

Members price £ 1.75

## An Amateur's Guide to the Study of the Genitalia of Lepidoptera

16 pages, 15 figures. (1973)

£ 3.10

Members price £ 2.35

## Rearing the Hymenoptera Parasitica

16 pages, 1 plate, 10 figures. (1974)

£ 2.55

Members price £ 2.00

## Rearing Crickets in the Classroom

12 pages, 2 plates. (1986) (Reprinted 1993)

£ 2.10

Members price £ 1.65

## Guidelines for Entomological Site Surveys

Published on behalf of the JCCBI. 7 pages (2000) (Reprinted 2003) £ 3.10

Members price £ 2.35

## The Journal of the Entomological Exchange and Correspondence Club 1935-1936

An AES Jubilee Publication. Fascinating reprint of the very first volume of the AES journal. 100 pages. £ 4.20

Members price £ 3.35



All the above publications sent post free to U.K. addresses. Outside U.K. please add 10% to order value for postage by surface mail.

For postage by air-mail outside Europe please add 30% to order value. Please allow 28 days delivery.

Please make all cheques/postal orders payable to 'AES Publications' and send to:

AES Publications, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Telephone 01277 224610 • Fax: 01277 262815 • E-mail: aespublishings@btconnect.com

The  
**Bulletin**  
*of the Amateur Entomologists' Society*

Volume 68 • Number 486

October 2009

**CONTENTS**

The AES website .....	171
Membership Matters .....	172
The Michael Majerus Grant .....	173
Best, G. A New Scarlet Tiger Moth Colony .....	174
Ware, R. Alien vs. Predator: Can Natural Enemies Control the Harlequin Ladybird.....	175
Goff, R. Moth Larvae on Bee Orchid ( <i>Ophrys apifera</i> ) .....	180
Harvey, M. iSpot – helping people learn how to identify wildlife .....	181
Caswell, W. Butterfly House in Golders Hill! .....	182
Betts, C. Return to Corfu .....	182
Holland, P. The 'Queen of Entomologists' Part 2: Mrs Hutchinson and the golden Comma	188
Goff, R. Mothing in the Gambia.....	192
Baxter, R.N. Questing in Ecuador .....	200
Koryszko, J. Hyacinths a must for the Butterfly Garden.....	209
Caswell, W. Larvae back from the Dead .....	210
Book Reviews .....	211

ES 36 A

# The Bulletin



*of the Amateur Entomologists' Society*

Volume 68 • Number 487

December 2009

NATURAL  
HISTORY MUSEUM

- 7 JAN 2010

PRESENTED  
ENTOM LIBRARY



ISSN 0266-836X

Editors: Dr P. Wilkins & M. Hough



000174467

The Amateur Entomologists' Society



Founded in 1935

The AES • P.O. Box 8774 • London • SW7 5ZG

<http://www.amentsoc.org>

### Officers of the Society

<i>President:</i>	Robin Wootton
<i>Secretary:</i>	Dafydd Lewis
<i>Treasurer:</i>	Peter May
<i>Acting Registrar:</i>	Dafydd Lewis
<i>Bulletin Editors:</i>	Phil Wilkins & Martin Hough
<i>General Editor:</i>	Jacqueline Ruffle
<i>Advertising Secretary:</i>	Peter Hodge
<i>Exhibition Secretary:</i>	Wayne Jarvis
<i>Youth Secretary:</i>	Kieren Pitts
<i>Conservation Secretary:</i>	David Lonsdale
<i>Webmaster:</i>	Kieren Pitts
<i>ICN Editor:</i>	David Lonsdale
<i>Wants &amp; Exchange:</i>	Peter May

---

THE AES WORKS TO PROMOTE AND DISSEMINATE ENTOMOLOGICAL KNOWLEDGE AND TO ENCOURAGE AN INTEREST IN ENTOMOLOGY AMONG THE YOUNGER GENERATION.

---

#### **BULLETIN ADVERTISING RATES:**

Advertising in the AES *Bulletin* is a cost effective way of reaching all AES members and many others who benefit from institutional subscriptions.

Full page £75 for each advert or £375 for six adverts in the same year.

Half page £50 for each advert or £250 for six adverts in the same year.

Quarter page £30 for each advert or £150 for six adverts in the same year.

---

#### **NOTICE**

It is to be distinctly understood that all views, opinions, or theories, expressed in the pages of this Journal are solely those of the author(s) concerned. All announcements of meetings, financial grants offered or sought, requests for help or information, are accepted as bona fide. Neither the Editor, the Officers and Council of the Society, nor its Trustees, can be held responsible for any loss, embarrassment or injury that might be sustained by reliance thereon.

# Worldwide Butterflies [www.wwb.co.uk](http://www.wwb.co.uk)



Now available alone or with the Moonlander Moth Trap

## The new Goodden Light 12v for use in remote areas

By studying the light output from MV, Robert Goodden has developed this sophisticated portable unit with aspects in common with MV, using so little power that it runs all night on a 7.5Ah battery. It attracts insects much better than actinic lights, even powerful ones requiring heavy batteries. **Rainproof and safe.** An in-line photoswitch puts the light on and off automatically. With this switch the unit can be used vertically or horizontally in any moth trap.

See [www.wwb.co.uk](http://www.wwb.co.uk) for prices and more.

## Moonlander Moth trap

Folds totally flat and is contained in a convenient slim shoulder bag. Very lightweight.

**The Moonlander turns the principle of moth trapping upside down!** Moths enter from the bottom and cannot escape through the top. **Works as sheet and trap combined.**

Better than traditional egg boxes, moths prefer the new **reticulated foam moth shelters** and cone.

**The Moonlander** is now available **without electrics, or with Battery, Mains or BOTH.**

See the options on [www.wwb.co.uk](http://www.wwb.co.uk)



*No escape through the top*



**Both trap and light are total innovations by Robert Goodden.**

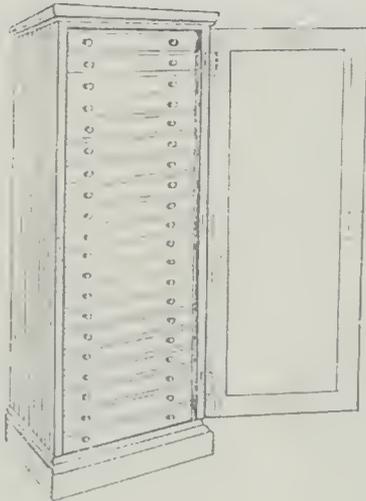
They are tried and tested in Europe and the tropics. In good conditions the results are spectacular.

**Worldwide Butterflies** website offers **Livestock and Equipment for breeding and study. Specimens for specialist collectors will be added as available.** The system enables you to see exactly what is currently available as the season changes. From time to time there are special **Sale Offers** of equipment, books, livestock and specimens - an ever changing situation.

[www.wwb.co.uk](http://www.wwb.co.uk) Add it to your **Favorites** - check it regularly.

# ATROPOS ANTIQUES\*

## PURVEYORS OF FINE COLLECTOR'S CABINETS



*Many of you will have met us at the AES London Fair where we regularly show entomological cabinets for sale*

- We are specialist dealers in fine collector's cabinets.
- We can offer a choice of at least 30 cabinets, varying in purpose, construction, quality and price.
- We can supply both restored and un-restored cabinets and will undertake to restore and paper cabinets for clients.
- We are always interested in the purchase or exchange of cabinets, with or without a collection.
- Callers to our showrooms are always welcome by appointment.
- We offer a specialist collection and delivery service throughout the UK and have full expertise in the safe transportation of cabinets and collections.

**George Morgan**

**97, West Street, Hartland, N. Devon EX39 6BQ**

**T: 01237-441205/984 M: 07973 302190**

**E-mail: [george@atropos.wanadoo.co.uk](mailto:george@atropos.wanadoo.co.uk)**



# Watkins & Doncaster

The Naturalists

Established 1874

Over 135 years specialising in the manufacture and supply of entomological equipment

- Variety of moth traps available to suit all uses
- Comprehensive range of butterfly and insect nets
- Microscopes and accessories
- Lenses, magnifiers and binoculars
- Boxes and containers for collecting and examining specimens
- Bumblebee nesters and bug boxes
- Bat detectors and mammal traps
- Breeding cages
- Books and charts
- Water nets and pooters
- Botanical equipment



Order online at [www.watdon.co.uk](http://www.watdon.co.uk)



or call 0845 833 3133



Call for our free fully illustrated colour catalogue

Watkins & Doncaster, PO Box 5, Cranbrook, Kent, TN18 5EZ

Tel 0845 833 3133; Fax 01580 754054;

e-mail: [sales@watdon.co.uk](mailto:sales@watdon.co.uk)



## Ian Johnson

# Natural History Books

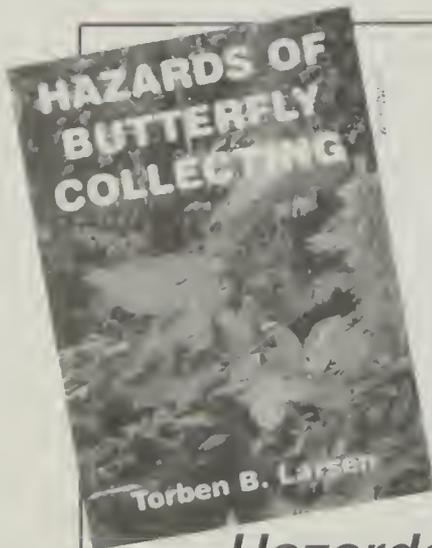
(Pemberley Books)

Specialist in *Entomology* and related subjects  
Also *Zoology*, *Ornithology*, *Botany* etc.

- CATALOGUES – Second-hand, Antiquarian and New books – free catalogues available on request.
- SPECIALIST BOOKSHOP at Richings Park, Iver, just to the West of London – easy to reach by car or train. Visitors are welcome to visit and view our stock, but please telephone first to confirm opening times.
  - \* *By car*: only 10 minutes drive from the M25 via the M4 (Junction 5), or M40 (Junction 1). 15 minutes from Heathrow Airport.
  - \* *By train*: 20 minutes from London Paddington to Iver Station on the Paddington-Slough *Thames Trains* service (2 trains every hour). We are 1 minute's walk from Iver Station.
- WEBSITE – view our stock on our website: [www.pemberleybooks.com](http://www.pemberleybooks.com).
- BOOKS BOUGHT – We are always interested in purchasing books in our specialist field, particularly antiquarian, academic and scholarly works on insects and other invertebrates.

18 BATHURST WALK, RICHINGS PARK, IVER, BUCKS SL0 9AZ

Tel: 01753 631114 / Fax: 01753 631115 • e-mail: [ian.johnson@pemberleybooks.com](mailto:ian.johnson@pemberleybooks.com)



# SPECIAL OFFER

**£7.50 each**  
(inc. UK p&p)  
£9.50 each (overseas)



## *Hazards of Butterfly Collecting*

by Torben B. Larsen

## *Rearing Stick and Leaf Insects*

by Ronald N. Baxter

### ORDER YOUR COPY NOW FROM

Cravitz Printing Company Limited, 1 Tower Hill, Brentwood, Essex CM14 4TA.

Tel: (01277) 224610 • Fax: (01277) 262815 • E-mail: [CravitzPrinting@btconnect.com](mailto:CravitzPrinting@btconnect.com)

## Bulletin Cover



This month's cover depicts a female *Crabro cribarius*. This solitary wasp is fairly widespread in Britain, being found as far north as Nairn. It flies from May to September and is found in sandy areas. Here the females can their nests. These are stocked with flies for the larvae to feed on. The males have very distinctive front legs. The tibiae are very broad and flattened like plates.

The photo was taken by Dr. David Skingsley. More of his work can be found on his website "The Bug Botherer's natural history picture archive from near Alsager in South Cheshire" <http://www.bugbotherer.org.uk/>

We are most grateful to him for allowing us to use his pictures in this and the next few issues of the *Bulletin*.

# The Bulletin

*of the Amateur Entomologists' Society*

Volume 68 • Number 487

December 2009

## Editorial

As 2009 draws to a close, it is time to reflect. This *Bulletin* includes reports of the Annual Exhibition. As Martin Hough comments in his article, this was one of our biggest and best Exhibitions ever! Hence, as the Society approaches its 75th Anniversary, the outlook is encouraging. There are details in this *Bulletin* of official Anniversary events, but if you are thinking of celebrating the Society, then please contact us, so we can publicise this. We would also like to publish any recollections of the AES in its early years. So if there are any long-standing members reading this – please get writing!

In terms of insects, we are currently at an exciting time of change. New species are colonising these shores – either naturally or assisted by man (deliberately or accidentally). Many of these species are not in the standard textbooks, so articles on these would be a welcome feature of the *Bulletin*.

**Phil Wilkins**



The Rosemary Leaf Beetle *Chrysolina americana* is one of the increasing number of relatively new colonisers in Britain which appear to be spreading. This is common in built up areas on Rosemary and Lavenders. The editor found several specimens in a garden in Norwich recently.



## Society Matters

**THANK YOU:** The Society is very grateful to all those members and friends who helped out at this year's Annual Exhibition. We will not name names in case we miss anyone out, but you (and we!) know who you are.

We would also like to thank all those people who have kindly made donations to the Society during the year. Many members have taken the opportunity to include a donation with their membership renewals, and donations 'in kind' have ranged from large quantities of stick insects to give away to budding entomologists at the exhibition to an 'as new', fully functional moth trap, generously donated to the Bug Club by Peter Baker. We also continue to receive donations specifically for the new Michael Majerus Fund.

**EXTERNAL FUNDING:** We are pleased to announce that we have received a grant of £800 from the OPAL project (Open Air Laboratories <http://www.opalexplornature.org/>) towards the cost of promotional materials and IT equipment. In addition, we have acted on behalf of the Tachinid Recording Group so that they could obtain an OPAL grant of £2000 towards essential equipment which will place their activities on a firm footing. We have also been promised £1000 from the W.F. Southall Trust, which will enable Council member David Tatham to progress an AES Bug Garden project with a local scout group.

**JUNIOR EXHIBITS** at the 2009 exhibition: Exhibit details will be described separately (in the AES Bulletin) but it is worth noting that we had a bit of a problem this year with the junior exhibits. There was a good turnout of Bug Clubbers. However, it proved exceptionally difficult to decide which exhibit should not receive a prize, as they were all so very good, and in very different ways. This is a good problem to have, really.

**MEMBERSHIP BENEFITS:** This year we have entered into a reciprocal membership arrangement with the **Entomology Section of the Devonshire Association**. This means that AES and Bug Club members can attend events organised by Devonshire Association on the same basis as their own members (usually this will mean free admission to their events). We hope that this will be found especially useful to members in the West Country.



We also hope that everyone is taking advantage of all the other AES member benefits, and in this last *Bulletin* of 2009 we remind you again what some of them are.

In addition to helping to advance entomology and to support the charitable aims of the Society by being AES members, the most obvious benefit is of course the periodicals you receive, whether those include the *Bulletin* or the *Entomologist's Record*, which are accompanied by the well regarded *Invertebrate Conservation News*, or indeed the *Bug Club Magazine*. With our membership numbers on the increase, we would encourage you to make maximum use of the **Wants & Exchange List**, as it now reaches almost 1500 members, as well as an extended institutional readership.

For those of you who are 'online' there is much information available on our new website, both for members of the public and within our **Members' Area** (have you explored that yet?!) Our Webmaster, Kieren Pitts, is not one to allow cobwebs to gather (though some of us might find cobwebs of interest, naturally) and an excellent **Entomologists' Glossary** has recently been added to the site! It includes around 350 words an entomologist might be familiar with, and some we had never heard of! Each term is defined on two levels – there is a brief definition, and an option to drill down to a more detailed, illustrated encyclopaedia style definition.

It is also worth remembering that all current AES members are eligible for discounts on publications and events arranged by the Royal Entomological Society, which has special interest groups covering all the main areas of interest to professional entomologists. AES members have access to the excellent **Royal Entomological Society's library**, which is now located in St Albans. See the RES website for more information, or get in touch with the AES Secretary if you have any questions.

**AES HISTORY:** At our 2010 Members' Day (see below) we will mark the 75th anniversary of the Society with a historical display. Any members who think they may have any historical information or items that would be of interest to other members are encouraged to get in touch with the Hon. Secretary ([secretary@amentsoc.org](mailto:secretary@amentsoc.org) or write to the PO Box).





## AES Events In The New Year

**Saturday 20th February 2010:**

### **Young Entomologists' Day & Oxford University**

Oxford University Museum of Natural History,  
Parks Road, Oxford OX1 3PW.

11:00am – 4:00pm.

This will be the first event to mark the 75th anniversary of the AES in 2010. The day has been planned by AES member Joss McLeod and will be kick-started by a talk by Dr George McGavin, who is nowadays often seen on our TV screens. Children between the ages of 4 and 18 are invited to bring exhibits they are willing to talk about to fellow members – or they can just give a brief talk with or without slides. The kids will be able to use the Museum's lecture theatre for their talks, and prizes will be awarded for the best presentations. Anyone wanting to give a talk should contact the AES Secretary in good time ([secretary@amentsoc.org](mailto:secretary@amentsoc.org)) to get a copy of the judging criteria for the talks.

There will also be tours of the Hope Collections, and information about the AES, National Insect Week and the new Angela Marmont Centre at the Natural History Museum will be displayed. There is no charge for admission to members and their guests but please complete a booking form (available from the AES Secretary or downloadable online).

Depending on the number of speakers, the schedule for the talks will be roughly as follows:

10.30 Arrival, settle in

11.00 Introduction and welcome from the AES President, Dr Robin Wootton

11.15 Presentation: Dr George McGavin

11.45 Children's presentations - Under 9 category

12.15 10-13 age category

12.45 Lunch break

1.45 14-18 age category

2.15 Judges' deliberations

2.30 Prizes presented to winners by Dr George McGavin



## **Saturday 24th April 2010: AES Members' Day & AGM**

Our 75th Anniversary Members' Day will take place at the Angela Marmont Centre for UK Biodiversity, in the Darwin Building at the Natural History Museum, London.

It will include a series of talks, two workshops, displays and members' exhibits, some interesting 'behind-the-scenes' tours and an insect crafts table. There will be a chance to meet museum staff and find out what new resources are available to entomologists throughout the year at the new Darwin extension.

We also plan to launch a new series of children's books on the day, which we predict will generate a lot of interest – all will be revealed in the next issue of the *Bulletin*!



## **The Bug Project**

*Pat Ellacott*

[www.patellacott.co.uk](http://www.patellacott.co.uk) [patellacott@btconnect.com](mailto:patellacott@btconnect.com) 01200 426297

The Bug Project, by artist Pat Ellacott, is sponsored by the Arts Council and is a series of large drawings of insects affected by environmental changes in the UK. The aims are to show that bugs are fascinating, not fearsome and are important indicators of environmental change. The work has been used to stimulate very successful art workshops in schools.

The dates are:

5 Jan – 13 Feb: Lancaster Environment Centre atrium, Library Avenue, Lancaster University, Lancaster LA1 4YQ, Tel 01524 510 223.

Open daily, admission free.

20 Feb – 21 March: Haworth Art Gallery, Manchester Road, Accrington, Lancashire BB5 2JS Tel 01254 233782.

Open 2.00 pm to 5.00 pm Wednesday, Thursday, Friday and Bank Holidays, 12.00 pm to 4.30 pm Saturday and Sunday

(All the paintings from the school workshops will be on show here as well)

1 April – 4 July: Steward's Gallery, Clitheroe Castle Museum, Castle Hill, Clitheroe, Lancashire, BB7 1BA. Tel 01200 424568.

Open daily, 11am - 5pm, admission free.



## **AES Annual Exhibition and Trade Fair: Kempton Park 17th October 2009**

*Collated and edited by Martin Hough, AES Joint Bulletin Editor*

The 2009 exhibition was one of the biggest and best attended yet. There were more dealers' tables booked than ever, and visitors were able to pore over an impressive display of books, specimens and equipment. Our undercover detectives were there looking out for any trading which contravenes conservation law and our own rigorous standards, but encountered hardly any problems at all. Traders were, as ever, helpful and co-operative in adhering to our requirements.

Sadly, while trading seems to grow from year to year, the number of adult exhibits does not. It is an annual opportunity for members to demonstrate the work that they have been doing during the year, and it is a great pity that more people do not avail themselves of it. However, this is not to decry the quality of the exhibits produced by those who did take the time and effort to make a contribution: there was some extremely fine work displayed, and choosing winners of the Anson and Bradford awards proved a difficult task for our panel of judges.



The mastermind for the whole event – Exhibition Secretary, Wayne Jarvis.



## Prizewinners 2009

### Bradford Award

**Winner:** Dr David Oram

**Highly commended:** Henry Berman and Alan Rix

### Ansorge Award

**Winner:** Theo Tamblyn, for his revealing exhibit on phorid flies.

**Highly Commended** (in alphabetical order):

Isabella Baylis, for her nice exhibit on Atlas moths.

Samuel Baylis, for his two exhibits – one photographic, and one showing insect classification.

Jody Holland, for his interesting Robin Moth exhibit.

David May, for his well done exhibit on wasps' nests.

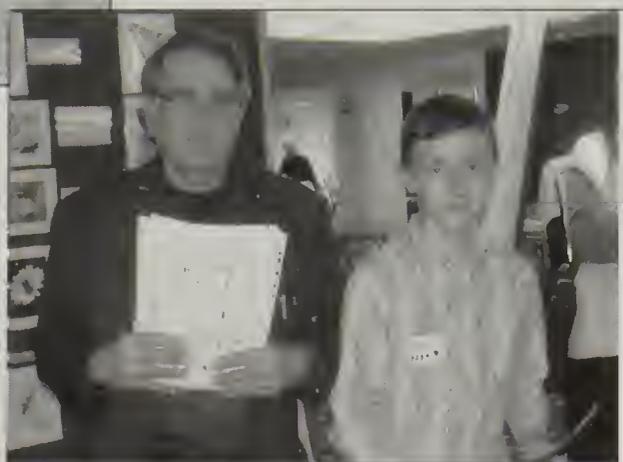
Rachel McLeod, for her excellent exhibit on various aspects of cockroaches.

Daniel Osmond, for his great collection of stick insects.

These exhibits were all very different, and reflected the different journeys our young exhibitors have followed.



AES President, Robin Wootton with Dr David Oram, winner of the Bradford Award.



Theo Tamblyn receives the Ansorge Award.



Alan Rix and Henry Berman, runners up for the Bradford Award.



The Junior Prizewinners.

## Exhibits-with notes as supplied by exhibitors

Species seen, mainly in Scotland in the last week of July 2009 along with some specimens from the Cambridgeshire area and Devon

by Roy McCormick (3375)

1393 *Udea uliginosalis* Steph

Several of these seen flying in the sunshine near the top of Carn an Tuirc, Braemar 25.7.2009

1424 *Endotricha flammealis* D & S

This very dark variety taken in my garden trap at Teignmouth 15.6.2009.

1756 *Eulithis litbeata* Linn Northern Spinach

This strange-looking specimen taken near the top of Carn an Tuirc Braemar. 25.7.2009.

1774 *Colostygia olivata* D&S Beech-green Carpet

The species. was seen at Teanacoil Wood. Inverness and at a wood near Kirkhill, Inverness. This one from the latter site. 28.7.2009.



- 1806 *Perizoma blandiata blandiata* D.& S. Pretty Pinion  
There were two of this species in the trap after a very windy night (a condition we suffered from this trip) at our B&B in Grantown-on-Spey 28. 7.2009 See *L. porphyrea*.
- 1854 *Eupithecia pusillata pusillata* D. & S. Juniper Pug  
This chalky variety was seen at several sites in the Inverness Braemar and Strathspey areas. These from Teanacoil Wood, Inverness, 26.7.2009, and Feshiebridge, 27 7.2009.
- 2109 *Noctua comes* Hubn Lesser Yellow Underwing  
Some of the varieties of this species. including a couple with dark hindwings. All taken at Grantown-on-Spey, 25-29.7.2009.
- 2118 *Lycophotia porphyrea* D & S True Lover's Knot  
These two specimens taken at Grantown-on-Spey on the same windy night as *P. blandiata*. These are the smaller mountain form taken on 28.7.2009.

### Good species for Devon this year

The specimens shown are not necessarily the ones seen or taken.

- 132 *Incurvaria praenaitella* D.&S.  
Although considered to be widely distributed, I only have seven records on my database with four of these in the last couple of years. These from Ashclyst Forest, 5.6.2009.
- 416 *Argyresthia galucinella* Zell.  
This is the first record of this local species in VC4. I have four 1978 records from Yarner wood and seven other VC3 records from 1999 to 2004. This one from West Week Farm, Chulmleigh, 27.6.2009.
- 862 *Dichomeris marginella* Fab. Juniper Webber  
This is one of the species that has come into Devon, probably on imported juniper bushes from garden centres. I had my first sighting of this at Teignmouth this year on 22.6, and 13.7.2009. I have ten records on the database.
- 888 *Mompha propinquella* Stain.  
Although this species is widely distributed, I only have six records on my database with four of these this year. This one taken at Hennock, 5.7.2009.
- 1096 *Apotomis sauciana* Frol.  
This is the first record of this species in VC4 taken on 27.6. 2009, at West Week Farm. Chulmleigh.  
An uncommon species with only one other record on the database from VC3.

1119a *Ancylis diminutana* Haw.

All records for 1119 *A.geminana* are now likely to be under this species. I have seven records on the database with six of these in the last couple of years and all taken on moorland or heathland.

This one from Challacombe, Dartmoor, 12.6.2009.

1146 *Epinotia rubiginosana* H - S.

Only five records on the database for this uncommon species, these seen from 2003 to present day with this specimen from Great Plantation, 12.6.2009.

1217 *Eucosmomorpha albersana* Hubn.

A species we have few records of with only four recent ( 1998 to present day) on the database; the other two were from Rothamstead survey traps from the 60's. This specimen from Great Plantation, 12.6.2009.

### Some Insects from the Island of Bali, Indonesia (during June 2009)

by David Oram (2005)

Bali is a small island midway along a string of islands that makes up the Indonesian Archipelago. The island consists of a mountainous chain with a string of volcanoes, several peaks reaching 2000 metres. Bali is volcanically active and extremely fertile; rice fields cover only about 20% of the island's surface area and there is a great variety of environmental zones; from dry scrub to patches of dense jungle in the valleys and the slopes of the volcanoes. The island is geologically young, most of its living things have migrated from elsewhere, and truly native wild animals are rare. The specimens here have been found on the slopes of volcanoes in the northwest (at around 1500m) and the beaches in the south east.

Specimens displayed included beetles: *Oryctes rhinoceros* (Rhinoceros Beetle), *Curinus caeruleus* (Coccinellidae); butterflies: *Danaus plexippus*, *Euploea* sp., *Suniana* spp. and *Telicota* spp.; and bees of the genera *Amegilla* and *Thyreus*. *Amegilla* is part of a tribe of robust, fast-flying, anthophoriform, pollen-collecting bees. Wings are largely bare, the distal parts beyond the veins being strongly papillate. Nests of *Amegilla* are burrows in the soil, either in banks or in flat ground. Some groups have metallic blue or green pubescence especially on the metasoma as shown. *Thyreus* is an old world genus which is very different from other Melectinae. The body is less robust than that of most *Melecta*, probably best called apiform with a striking



pattern often including pale to bright blue or greenish areas of appressed hairs. They break into closed cells of their hosts, oviposit (on the cell cap or upper cell wall) and reclose the cells with earth moistened with a secretion. Under the microscope extra plates covering the main body joints can be seen as protection against attack by the host.

### ***Pseudacteon* phorid flies**

by Theodore Tamblyn (12075)

Towards the end of July 2009 in Abergavenny, South Wales, I noticed several small fly or wasp-like creatures which appeared to be attacking worker ants of the species *Lasius niger* around a nest entrance. The ants were swarming and the activity evidently attracted the insects which worked singly or in pairs to confuse their prey. The ants were very much aware of their assailants, swiping wildly at them with outstretched antennae and turning round with open mandibles. Research revealed that the attackers were parasitic phorid flies from the genus *Pseudacteon*.

*Pseudacteon* is a genus of small flies in a large, widespread family known as Phoridae. They are notable for their unusual breeding habits, the larvae being parasites on various species of ants. The genus is well-distributed over most of the temperate and tropical regions.



Theo Tamblyn at his display.



*Pseudacteon* flies are small about the size of a host ant's head. They have a rather humpbacked appearance with large rounded wings and appear, in the field, like tiny fuzzy dots hanging around ant colonies.

The flies have an unusual lifecycle. A female fly implants an egg in an ant using her distinctive ovipositor. *Pseudacteon* flies are host specific – a fly will only oviposit onto a certain species or group of species. The fly attacks from the air, attempting to land on an ant; sometimes the flies will work together to disorientate their victims. The ants snap wildly at their tiny assailants but the flies are nimble in the air. When a fly manages to implant an egg, generally in the ant's abdomen, it migrates to the ant's head capsule and consumes its contents, killing the ant in the process. The ant's head then falls off and the fly pupates inside, later emerging through the ant's oral cavity.

Recently, there has been research into using *Pseudacteon* flies as a biological control agent against the invasive fire ants, *Solenopsis* sp. Several species of these ants have been introduced into the USA, and are wreaking havoc with the native fauna including the other ants. North America has its own native *Pseudacteon* species but being host-specific the native flies do not parasitise the fire ants. It has been suggested that various species of *Pseudacteon* be introduced from South America, the fire ants' home, as these species parasitise them only. It remains to be seen what will come of this theory but it appears to be a worthy suggestion. The flies themselves cause little damage to a colony, but if a group of flies terrorises an ant column; the ants spend more time panicking, attempting to defend the column and running for cover. Consequently they spend less time foraging and extending their destructive influence over their territory; and indeed when the flies are present ants spend more time underground than ants of unmolested colonies. So, the phorids rule more by influence than by actual effects on a fire ant colony.

## **Rearing the Robin Moth**

*Photos and text by Jody Holland (13729)*

Instructions for rearing Robin moths

1. Put cocoons in a plastic box with air hole. Keep cocoons cold over winter. For example, in an ordinary fridge which is 4°C to 6 °C (not the freezer!).
2. Take cocoons out of the fridge in April and put in a netting cage or a cardboard box with netting over the top. Put a few sticks in so the moths can climb on them when they emerge.



3. Keep the air moist by spraying the cocoons with a little clean water every few days. I use a plant sprayer but you can just flick water with your fingers. Don't let them get too wet.
4. The adult moths should emerge in 24-28 days. Males and females can be told apart by the antennae which are more feathery in the males.
5. Males and females will mate straight away. They will mate for about a day.
6. The female will start laying eggs the next day, and carry on for about three days. One female will lay about 100 eggs.
7. Put eggs into small plastic containers (not air tight!)
8. After about two weeks the eggs should hatch. Don't worry if some don't hatch you should still have enough.
9. Don't take the caterpillars away from the eggs straight away because they need to eat their old egg shell. Just add some fresh apple leaves so they can start eating them when they are ready.
10. Every day give them fresh apple or pear leaves. If you don't have an apple or pear tree you could try other trees. Every few days remove the old leaves and the 'frass' (polite word for caterpillar dung).
11. As the caterpillars grow you will need to move them to bigger boxes, then cages. The big caterpillars need a lot of food, so you will need to give them branches or twigs full of leaves. Or you can try growing them in netting cages on apple trees outside, but don't let them escape.
12. After about 7 to 11 weeks, they should pupate. The caterpillars start by spinning a silk cocoon in amongst the leaves and twigs (or on the side of the cage), then they change to a pupa inside. Do not try to move them for several days.
13. When the silk is hard, you can move the cocoons to a cardboard or plastic box (with lots of air holes). Don't let them get too hot, or too dry, over summer.
14. Then in autumn put them in the fridge, or share them with friends.  
And here we go again!

## **Silk**

*by Brian Gardiner (225)*

I spotted the exhibited display of silk in a Cambridge auction last year and could not resist bidding for it – note that an *Anthrenus* beetle or other pest has devoured the insects but not touched any of the silk.



I suspect that it is not a unique product but was produced as a display case both for advertising and for sale as a wall decoration as it has hooks on the back so it can be hung like a picture.

The obvious choice that first sprang to mind was that it was a product of Lady Hart Dykes's Lullingstone Silk Farm but the fact that some of the labelling is German made me think it was produced for advertising by the Guterman Company whose name is displayed on some of the reels and whose premises were in Perivale, Middlesex.

Founded in 1364 in Vienna, the Guterman firm later moved to Germany and then spread into a world-wide organisation and is still going strong as a supplier of silk and other thread products.



Upstairs at Kempton Park.

The downstairs exhibition hall.



Another view of the downstairs exhibition hall.



## Wasps

by David May

There are two types of wasp that are commonly found in this country and they are the Common Wasp *Vespula vulgaris* and the German Wasp *Vespula germanica*. These species are almost identical to look at. The Common Wasp has an anchor-shaped black mark in the middle of its face, and the German Wasp has three black dots instead.

All wasps feed their young on meat such as insect larvae, scraps of dead animals and so on. The wings of other insects are cut off by the workers powerful mouthparts and the remains are divided up and chewed into round food balls which are carried home to the larvae. The workers themselves (these are females with undeveloped reproductive organs) feed on liquid food.

Although adult wasps are fond of sweet things, they do not have the nectar-sucking mouthparts of bees, but they do have very powerful jaws and a short tongue. Even so they can be seen drinking nectar from flowers and the juices of ripe fruit, and strangely they are also fed by the larvae. In exchange for flesh the larvae regurgitate a sugary liquid which the workers eagerly lick up. In addition to providing the workers with a form of energy this mutual feeding also has a social factor, for it serves to bind the colony together.

Unlike the Honey Bee, wasps have not developed methods of storing food for the winter, and this is why their colonies normally only last for one season in this part of the world. Each colony starts to fall apart in the autumn and the workers die of cold. However, before this happens new queens and males have been developed and have swarmed out of the colony to mate. The males die soon after mating, but the young fertilized females search for a sheltered spot where they can spend the winter. Dormant queens can often be found in outhouses and lofts during the winter and they sleep in a small paper nest they have made for the winter.

The nest that the queen starts is about as big as a walnut but as soon as the first workers hatch, they set about rapidly increasing the size of the nest and there was one treated in 1997, which supposedly measured about five-feet square or something like that, and was up for the Guinness Book of Records. Unlike bees, the wasps have no wax producing glands and therefore cannot construct wax combs.

To get around this they use paper-type material which they make from wood pulp, just like we make paper from wood pulp. The wasps use their powerful jaws to scrape wood from trees, fence posts and



other wooden things, and then chew this up and mix it with saliva and then carefully spread it out to make combs, with all the cells opening downwards. The completed nest is generally ball-shaped (unless items around it such as walls distort it) and covered with a very fine film of paper which is banded, each band being the work of one wasp. The entry to the nest is usually near the bottom to keep the rain out.

Wasp colonies are divided into queens, males, and workers, a bit like us really. The queens and males are only concerned with reproduction and making more wasps, while the workers do everything else. The first cell of the colony is built by the queen (who usually emerges from her winter sleep in early spring) as there aren't any workers at this time. Inside this nest the queen constructs between 10-20 hexagonal cells and she lays an egg in each. When these hatch the queen is kept very busy for the first month feeding the larva. When these larvae pupate and hatch (about the end of May) they are workers and so after this the queen can concentrate on laying more and more eggs as the workers now take over the running of the nest. In late summer a fully mature wasp nest can have several thousand wasps in it which is not something you would want to poke with a stick.

Towards the end of the summer the wasps rear males and new queens in special large cells. Once these have reached maturity the colony begins to break up. The workers have no more larvae to feed and they turn their attention to fruit, jam and other suite substances; and this is when they become a nuisance. But as the weather turns cold they die, leaving only the mated queens to carry on the race in the following year; and they overwinter under the ground or in other dry places such as sheds, emerging in the spring.

The main thing that worries people about wasps is their sting—because it hurts a lot. A wasp uses its sting for killing small prey, but it also uses it very effectively for defending itself. In very extreme cases people can die after anaphylactic shock. A sting in the mouth or neck can be serious, making it difficult for you to breathe.

### **Photographs of Lepidoptera and other orders taken in France**

*by T Scott (4561)*

### **Microscopy and Cockroaches** *by Rachel McLeod*

### **Photographs of Butterflies from Austria** *by Chris Gardiner (5249)*



AES Secretary, Dafydd Lewis on the Society Stand.



Henry Berman's display.

## Photographs of aberrations bred during 2009

by Robin James (5005)

Camberwell Beauty (*Nymphalis antiopa* Linn.)

Three aberrations, bred out of a batch of about 100 larvae reared from eggs laid in early July 2009. The adults hatched in late August. Shown above with a typical example for comparison. The aberrant phenotype 'hygiaea' without the blue spots is inducible by cold stress during development but it is not known whether these were produced by this as the larvae were reared inside and not intentionally stressed.

**Reference:** Shapiro A.M. Phenotypic plasticity in temperate and subarctic *Nymphalis antiopa* (Nymphalidae): evidence for adaptive canalization

*Journal of the Lepidopterists' Society* 35(2). 1981. 124-131

Swallowtail (*Papilio machaon* Linn.)

Aberrant female, missing the blue scales, bred from a small number of over wintering pupae from Chinese stock bred last autumn.

An attempt was made to breed from this female, although it was hand paired it remained motionless whilst the normal type laid eggs readily. The female died naturally after 48 hours.



### Clouded Yellow (*Colias crocens* Geoffrey)

One of a selection of aberrations bred this year from stock from Southern Spain. Several of this type where the 'black' scales are missing were bred in both males and females along with a single ab. *Russurmi*.

### British Flea distribution; the county lists of our flea fauna

by R. S. George (1402)

### A few specimens from my childhood collection of Lepidoptera

by Dafydd Lewis (10103)

### Twelve different species of butterflies from the Alpine regions of NW Italy (Torino) and their foothills in SP. France (Hautes-Alpes)

by Peter Russell (8977)

Colle Basset (Italy, Torino; 2100-2300m.) was found to be very verdant when it was visited in late July 2009 and *Colias phicomone* Esper was particularly common, the set of six specimens shown demonstrate the variation in colour in both males and females. Other common species including *Erebia montanade* Prunner and *E. euryale* Esper, examples of which are shown. Specimens of *Polyommatus eros* Ochs, *Agriades glandon* de Prunner and *Plebejus idas* L. are included; these were mostly quite fresh and rather common, together with *Fabriciana niobe* L. in both forms: the typical one with silver spots on the underside of the hindwing (in the female shown) and the f. *eris* Meigen, with a similar pattern but the spots being of a pale yellow in colour (demonstrated by a male). The alpine foothills near Guillestre (France, Hautes-alpes; c. 900m) were much drier but still very rich in species: *Arethusa arethusa* Denis & Schiffermuller was abundant and their wide variability in coloring in both sexes and spot pattern in females can be seen from those included in the exhibit; *Satyrus actaea* Esper was common, the females being quite fresh and *Chazara briseis* L. was just emerging. *Pyrgus cirsii* Rambur was present at this lower level and this is contrasted with *P. carlinae* Rambur found at Col Basset; although the undersides can be seen to be rather similar the upper side white spotting is much more prominent on the uppersides of both fore- and hindwings in *P. cirsii* from Guillestre.



## **The British Plant Gall Society**

by Alan Rix (13060)

The Society was formed in 1985 to promote the study of plant galls and their causers.

The display shows the parasitic interaction between insects (and some fungi) and plants. Almost every plant and tree has galls, the Oak having over 30 species, but not all at once. Some galls can only be identified by breeding out the causer and identifying it. The slide show of galls and close-up images of some of their causers runs throughout. Examples of dried and fresh galls are on display as well as examples of the Society's journal, *Cecidology*.

## **Insect classification: display with photographs**

by Samuel Baylis (12941)

I have chosen to do something on Insect Classification as an exhibit as it is a very complex and a hard to understand subject. I wanted to try and simplify it a little bit so that I could gain a better understanding although I think that even if you studied this for years it would still be complex. I hope that I have achieved this. I have done an overview of classification in general, then the Class Insecta then I have given some species examples and tried to explain their main characteristics which puts them into the grouping they are in.

Illustrative specimens included Emperor Scorpion *Pandinus imperator*, the scarab beetle *Chelorrhina polyphemus*, the Giant Malaysian Shield Mantis *Rhombodera basalis*, the Meadow Brown Butterfly *Maniola jurtina*, the Giant Atlas Moth *Attacus atlas* and the Giant African Millipede *Archispirostreptus gigas*

## **Rearing Atlas moths**

by Isabella Baylis (12953)

## **Activities of the Derbyshire and Nottinghamshire Entomological Society**

by Neil Ward (12596)

The Society was formed in 1914.

We promote the study of Insects and other land Arthropods within Derbyshire and Nottinghamshire.

Our key aim is to increase public awareness of insects and their conservation, promoting this through events and activities.



We record and map the distribution of insect species throughout the two Counties, participating in a number of national recording schemes.

We identify threatened local insect species, enabling resources to be targeted for their conservation.

The Society publishes a number of important publications on insects, the most recent being *Dragonflies in Derbyshire*.

### **Phasmids: Black Beauty Stick Insects, Thorny Stick Insects, Indian Stick Insects**

*by Daniel Osmont (12573)*

I have been keeping phasmids for three years now, my first being some Indian stick insects that my friend Rhys gave me. When I got these they instantly started laying eggs after being put into a new container. Following these phasmids, I purchased some *Aretaon asperrimus* from the AES event. These stick insects were more chunky and robust than the others. At the last exhibition where I was exhibiting my Indian and Thorny Stick Insects, I brought two males and a female Black Beauty Stick Insect. At this exhibition I also joined the Phasmid Study Group and I have learned a lot from the magazines.

Black Beauty Stick Insect. This is a very stunning stick insect. Although it is very small the males grow to about 40-50mm and the females 50-60mm. I purchased two males and a female at the last exhibition at Kempton Park. Since then they have laid eggs and I have some small nymphs.

As nymphs they are the fastest stick insects that I have ever seen! As soon as I open the lid of the cage to clean them out they come running out, so when I clean the cage I now have to have another cage next to it, to put the quick little things in! Nevertheless they are quite calm insects as adults. Even though I had two males they never fought over the female, which is nice because I can put them all in one large cage.

Even as nymphs they have antennae nearly as long as their body. They are very pretty with their jet black bodies, long stripy antennae, golden eyes and their short red wings.

Indian (Laboratory) Stick Insects. The first species of stick insect that I have kept. To start with I had two, but foolishly kept all the eggs, and in total about 350 hatched! These stick insects breed through parthenogenesis, which means that the females lay the eggs without males fertilizing them, but these eggs all hatch into female which in turn breed through parthenogenesis. I soon started giving a lot of them



away to friends, after giving them rearing instructions and a care sheet, but I eventually gave most of them to a pet shop.

These stick insects reach a fair size, the female usually reaching 7-8 cm, but I once had one that grew to 9.6cm (excluding antennae). These insects have a smooth body and are shades of brown, yellow and, occasionally, green. I feed them mostly on privet and bramble but they will also take ivy. They can be kept at room temperature, but will grow more quickly at a warmer temperature.

The name Indian Stick Insect is very misleading because it has a very wide range, and there are even some released cultures in England.

Thorny Stick Insect. Probably my favourite stick insect, although others have found it frightening. The males reach 45-60mm and the females 75-85 mm. The female lays oval eggs in a pot of peat – however, I was using Oasis to keep the foodplant fresh and discovered that the females were laying eggs here as well. The nymphs of this species look like miniatures of the adult. Males and females should be kept separately – last year I had only one male and one female.

They are not very active and will sometimes rest in one place for days. The female has a more robust body with more spines. The male, although smaller, has four spines in the middle of the body, slightly larger and sticking out more. Although looking spiny this species is completely harmless to humans. I feed them mostly on bramble and oak but I have found they will also accept raspberry and loganberry leaves. They will also eat rose but I don't give them that for obvious reasons.

Many people think that insects are heartless creatures and don't feel emotions. This is complete rubbish. When my adult female died this year the male refused to eat for nine days and even after that he didn't eat much at all. He sat in one corner of the tank for a week. A month and a half later he died, but two weeks later his children hatched and these are the ones I am showing today.

## **Lepidoptera Recorded in East Devon 2007-9**

*by Peter Baker (9086)*

The years 2007, 2008 and 2008 have been poor for numbers and records of Lepidoptera in East Devon. In spite of this a few interesting records have been noted, mainly from my garden in West Hill.

The Passenger *Dysgonia algera*

A last minute record which "made" 2007. Attracted by light, 2.ix.07.



Purple Bar *Epiblemma ostrina*

A new record for the garden. 19.viii.09

Clay Triple-lines *Cyclophora linearia*

To the left is a typical example, which happens to be a second brood specimen. Top right is a normal second brood form. Bottom right is a first brood variety.

Small Fan-foot Wave *Idaea biselata*

Examples of this dark form turn up most years, 27.v.08

Cypress Carpet *Thera cypressata*

Now well established in Exmouth with good numbers of both broods noted.

Double-striped Pug *Gymnoscelis rufifasciata*

The later broods, especially, can be very variable. Which is a typical specimen?

Common Wave *Cabera exanthemata*

This example, found 9.v.08 (rhs), looks very similar to the "normal 2" variety, obtained from a pairing between a typical specimen ("normal") with the dove grey variety ("normal 3").

Shuttle-shaped Dart *Agrotis puta*

This second brood example, on the right, seems to have found life in 2008 somewhat difficult!

Flame Shoulder *Ochropleura plecta*

These somewhat worn late season examples may show how some *O.lencogaster* records have originated.

Heath Rustic *Nestia agathina*

This and its associated species *S. anomala* used to be common in the garden. This is the only specimen of either recorded in the 21st century

The Sprawler *Brachyonychia sphinx*

The first garden record, 31.x.06.

Brindled Green *Dryobotodes eremita*

This well-marked form turns up most years

Note. Parts of this display were originally prepared to show at the 2008 exhibition but I was thwarted by a car breakdown.

## Two Signs of Climate Change

by Andrew Halstead (6346)

Glasshouse Thrips (*Heliothrips haemorrhoidalis*) and Fluted Scale (*Icerya purchasi*) are two non-native insects that have occurred in Britain for many years as pests in heated glasshouses. If they got out



onto garden plants in the summer, they were killed by low temperatures in winter. At the beginning of this century both pests began to be reported to the Royal Horticultural Society's advisory service as pests on outdoor plants in central London gardens. This trend has continued every year since and it would seem that these pests are now surviving all year round on outdoor plants in sheltered gardens. Central London is known to be a "heat island" with average temperatures several degrees higher than in the suburbs. Frosts are nowadays rare in the city centre.

Glasshouse Thrips can attack a wide variety of plants but seems to have a preference in gardens for evergreen shrubs. *Viburnum tinus* (shown here) is the most frequently recorded garden host plant, others are Bay Tree (*Laurus nobilis*) and Rhododendron. The thrips are narrow-bodied insects up to two mm long. The adults are black, while the immature nymphs are creamy white. They suck sap from the underside of the leaves, which become soiled with the thrips' brownish black excrement. The upper surface of infested leaves develops a silvery white discoloration.

Fluted Scale derives its common name from the white waxy egg mounds, which have a grooved or fluted appearance. The adult females can be seen perched on the sides of their ovisacs. Several overlapping generations occur, so adults, eggs and nymphs can be found together. A wide range of garden plants is attacked, including *Acacia dealbata*, *Albizia julibrissin*, *Choisya ternata* (shown here), *Cytisus battandieri*, *Hedera helix*, *Hypericum*, *Nandina domestica* and *Pittosporum tobira*.

Heavy infestations cause plants to lack vigour. A black sooty mould grows on the foliage where the scale's sugary excrement has accumulated.





## Riverfly Monitoring

by David Tatham

40 Keswick Avenue, Merton Park, London SW19 3JE.

It is early morning in the Welsh countryside, and a workman in a fork lift truck is stacking treated timber in the yard of an industrial unit bordering a river. The owners of the yard want it stored outside, until it can be moved for sale; hundreds of pieces of timber bide their time, open to the elements, but protected by a man-made cocktail of chemicals, sprayed on each piece to prevent it rotting.

It has been a wet summer, and this day is particularly rainy – the heavens open early on, and continue unabated for hours on end. The fork-lift truck driver has to fetch his anorak, and carries on stacking in the deluge, miserably wiping away a continuous trickle of drips off the end of his nose. Unbeknown to him, the rain pouring off the timber takes with it some of the chemicals used to protect the wood. This contaminated rainwater runs into the yard's storm drains, and is expelled in a foaming torrent, out into the softly flowing waters of the river.

The chemicals kill most of the invertebrate life in the river for 12 miles downstream. With the demise of the insect life goes the fish, birds, mammals and other creatures reliant on these staples of the food chain. No longer can you see the dappled glint of a trout resting in the river's crystal clear shallows, and the elusive flash of a Kingfisher's azure form has to be searched for elsewhere.

This is not a fictional event – this actually happened recently, and similar occurrences continue to happen, all over the UK. It was a relative ecological disaster, but this sort of event rarely makes the news – in fact, without regular monitoring of water quality, such pollution events can easily go unnoticed.

It was for this reason that I found myself standing knee deep in the swirling clear waters of the river Wey, just south of Guildford, bright and early on a Sunday morning in early autumn. I was wearing a rather old pair of borrowed and heavily repaired waders ('I don't *think* there are any leaks, but there's only one way to find out, I suppose...' was my colleague's rather disarming quote as he handed them to me) and brandishing a net, bucket, and a rather large turkey baster. Not my usual Sunday morning attire, but I shall endeavour to explain.

I was here as part of the Angler's Monitoring Initiative, scheme spearheaded by the Riverfly Partnership to monitor river invertebrate



and pollution levels. The project supports groups of anglers (as well as other interested parties such as amateur entomologists) to recognise groups of aquatic nymphs and shrimps on a checklist of the most common and pollution sensitive species. These species are then regularly checked for (usually once a month), along given stretches of river. From these data a 'norm' can be established to indicate what kinds of invertebrate species make that particular area their home, and the approximate numbers of each species you could expect to find there.

This is the basis for the project's simple success; if any pollution event occurs, this will be reflected in a reduction in numbers or loss of species found; if the numbers fall beneath an agreed benchmark below the norm, alarm bells ring, and the Environment Agency are called in to undertake further tests to identify the source of the pollution and swiftly implement any remedial action required. The Agency lacks the resources to undertake regular monitoring of the frequency required, so the use of keen stakeholders is vital in ensuring that a watchful eye is kept on our fragile river eco-systems.

The beauty of the scheme is that, once a pollution event is identified, further monitoring can be undertaken upstream, until the normal invertebrate levels expected are again seen – this will then indicate the site of pollution entering the river system and, hopefully, point a very big and weighty finger at the culprit.

This is increasingly resulting in some fairly hefty fines being levied against polluters, and as the network grows and the coverage of the scheme becomes more widespread, the Angler's Monitoring Initiative looks set to be a first line of defence in the fight to conserve our dwindling river invertebrate populations.

I was keen to test the theory myself, so hence me being knee deep in the Wey's clear waters. Never one to pass up an opportunity to spend a day in the wilds, I enrolled on the course when I heard about it through my local fly-fishing club, the Wandle Piscators. The club has embraced the initiative with open arms, and now provides a very thorough monitoring presence on the River Wandle in London.

It's a simple process. Take your net (standard Environment Agency specifications) and, over the course of three minutes, take a sample from each of the main habitat types in the area of river you are monitoring. This involves 'kick sampling', where you disturb the gravelly areas of the riverbed with your foot upstream of the net, and allow the resident water beasties to float into it, and 'sweep sampling' where, as the name suggests, you sweep the weed-residing creatures from the river's aquatic vegetation.



Once you have taken a representative sample, you transfer the contents of your net to a sorting bucket, from which you can clear out some of the larger bits of detritus trawled up as part of the process. You are then left with a murky soup which contains, hopefully, a myriad of insect life and other invertebrates.

Once back on the safety of dry land, the sample is poured into a long rectangular white tray – this makes it easier to see and sort the creatures you are seeking.

This is where the Turkey baster comes into its own – it's the riverfly version of the pooter, used to vacuum up each species you are counting. Once the murk settles, your eyes quickly adjust to what invertebrate life there is residing in your sample. I must admit that I was quite taken aback by the variety and number of insects we had collected. The young of Damselflies, Stone Flies, Mayflies and cave-laden Caddis Flies were all present in large numbers, together with a variety of other odd creatures. We saw many Signal Crayfish scuttling about under the glinting eddies of the river; their bright red boxing glove claws distinguishing them from their British cousins, and the sample tray contained numerous examples of their offspring.

However, we were only counting the 'up-winged' flies, together with Caddis Flies, Stone Flies and *Gammarus* – a small freshwater shrimp. These are the species most susceptible to pollution and most widespread across British waters, making them ideal indicator species to monitor.

I'm glad to say that the river at this point seems in relatively rude health, and the course has piqued my interest in aquatic insects to the point where I will be undertaking monitoring work on a regular basis, rubber clad and sporting a turkey baster – what better way to spend a Sunday morning?

To check whether there is a local monitoring group near you, contact the Riverfly Partnership at: Fishmongers' Hall, London Bridge, London EC4R 9EL. Email: [info@riverflies.org](mailto:info@riverflies.org) Tel. 020 7929 6966.

### Did you know...?

The AES is well known in the Cork area of Southern Ireland!

When I was there a while ago, I saw quite a number of vans with 'AES' on the side, **AND** a painted butterfly! Actually it was some sort of cleaning firm, but every time I saw it I thought of the AES!

Wesley Caswell (3133)



## Late developing ichneumonid – an update

by David Keen (3309L)

*Calle Casto Bancalero 11, 41650 El Saucejo, Sevilla, Spain.*

Following the publication of my article in the April 2009 *Bulletin*, I received a letter from Mark Shaw (National Museums of Scotland, Edinburgh). He was interested in seeing the wasp and the remains of the host. These were duly sent to him and they will remain in the museum's collection. Mark was quickly able to identify the ichneumonid.

It is a male of *Eutanyacra glaucatoria* (Fabricius) (Ichneumonidae: Ichneumoninae). There are several British specimens in the National Museums of Scotland collection that have been reared from The Wormwood moth, *Cucullia absinthii*. They have all been reared 'ex pupa' from larvae collected the previous year. Why my example should have gone through two winters before emerging is a mystery that has yet to be unravelled.

However, Mark feels that it is more than probable that the moth pupa was 'alive' from 2007 until the winter of 2008/9, (i.e. that the ichneumonid had not completed its growth until relatively soon before it emerged). Further, when I checked the specimen on 12th March 2009 we guess that it was the ichneumonid that was wriggling within the pupa – prior to its emergence four days later.

The next question to answer, of course, is what is the name of the host of my specimen? While a lot of the hosts of this ichneumonid recorded in the literature are species of *Cucullia* (*sensu lato*), various other noctuid moths have also been recorded. Mark, after examining the pupa, says that it seems to be superficially compatible with the *Cucullia* group of noctuids. But, of course, quite a few of this group have distinctly marked larvae whereas the larva that I found was 'just another noctuid larva'. Further, the said larva was found walking across a track in the countryside so I have no idea what it had been feeding on.

From the literature that I have relating to European and Spanish Lepidoptera, there are only four species of this group that have been recorded down here in this part of Andalucia. These do not include *C. absinthii* which, in Spain, has not been found this far south.

Mark suggested that I should refer to Martin Honey at the BMNH in London and he kindly referred me to the website - <http://www.leps.it>

From this I was able to refer to very good photographs of the larvae of all four of "our" species of *Cucullia* and was then able to dismiss



three of them as they had distinctive markings on all specimens illustrated. For the fourth species, there are three photos and whereas the first two show distinctively marked larvae the third one is far from distinctive. In fact, it bears a very striking resemblance to the larva I found.

Thus, it is possible, if not probable, that the host was a larva of the Chamomile Shark, *Cucullia chamomillae*. I have many records for adults of this species which comes readily to light and can also often be found resting on walls during the day. Manuel Diaz refers to this species as being the commonest of the group in Andalucia.

I would like to express my sincerest thanks to Mark Shaw for all his help in the preparation of this article and to his encouragement in general. In addition, I would like to thank Martin Honey for pointing me in the direction of the very useful website.

### References

- Diaz, Manuel. 1998. *Mariposas Diurnas y Nocturnas de Andalucia*, Seville: Centro Andaluz del Libro, S.A.
- Keen, David. 2009. Late developing Ichneumon. *Bulletin of The Amateur Entomologists' Society*, **68**(483): 79.
- Porter, Jim. 1997. *The Colour Identification Guide to Caterpillars of the British Isles* (Macrolepidoptera), London: Viking.
- Ronkay G. & Ronkay L. 1994. *Cuculliinae I. – Noctuidae Europaeae* volume 6, Soro: Entomological Press.
- Shaw, Mark. 2009. Personal communications.



## Conclusion of the article 'Larvae back from the dead' in *AES Bulletin*, vol 68, no 486

by Wesley Caswell (3133)

I would like to update members on the outcomes of two larvae in this article.

Firstly, the *Hemileuca mara* larva pupated successfully, and emerged as an adult. The second one [slight spelling mistake in the *Bulletin*, should be *Automeris* (not *Automeres*) *zephyrial*]. This larva continued feeding for many weeks, long after all the others had spun up. It eventually died when almost fully grown, and this time it did not "come back from the dead"!!



## Discovering the legacy of Jean-Henri Fabre in three French museums

by Liz Clayden

Hillside, Rowborne Road, Nadderwater, Exeter, Devon EX4 2JE.

[lizclayden@tiscali.co.uk](mailto:lizclayden@tiscali.co.uk)

### **Micropolis – la Cité des Insectes**

This impressive museum, in the south of France, has been built into a hillside overlooking the village of Saint-Léons in the Aveyron, a few miles north of Millau. Although the entomologist and naturalist Jean-Henri Fabre (1823-1915) spent most of his life at Sérignan near Orange, he was born in Saint-Léons and Micropolis is dedicated to his memory.

The unusual and innovative design of this large Museum reflects various shapes and structures of the natural world. Since its opening in the year 2000, Micropolis has become very popular in France, with many thousands of visitors. However, it is hoped that the development of the airport at Rodez (about 45 km away), from which there are now flights to and from London, will encourage more people to come from further afield, especially from the UK.



The entrance to Micropolis.



The aim of this ambitious venture is to encourage an understanding of 'the world of insects'. It begins by trying to make visitors feel 'insect sized' as they walk along the path to the main exhibits, meandering through a forest of giant grass stems which reach towards the high ceiling. The rest of the Museum is divided up into fifteen areas, each of which focuses on a different aspect of insect life, such as insect societies; the relationships between plants and insects; and between humans and insects; as well as their classification. Some of the displays are interactive enabling the information they contain to be accessed at different levels. As well as collections of pinned specimens, there are also exhibits of live insects, including ants' nests, a bee hive and a small tropical butterfly garden inside the main building. In addition, there are sometimes special exhibitions. In 2009 for instance, there was one called 'insect builders' which included the nests of termites, wasps etc.



Part of the collection of beetles at Micropolis.

For three days in October 2006, Micropolis was host to a symposium entitled 'Insectes et Biodiversité'. I attended this event, along with about 140 others, many of whom were either professional entomologists or had an interest in entomology through their work in occupations such as the French equivalent of the Forestry Commission.



There were also a number of schoolteachers and amateur entomologists. Most of the participants were French, but two were from Japan, where the life and work of J-H Fabre is very well known and highly regarded. This is certainly partly due to the fact that, from 1977-1999, the school curriculum for 9-10 year olds in Japan included the study of biography featuring the life of Fabre.

The Museum also provides a venue for entomologists – students and naturalists as well as research scientists – to carry out their work on a temporary basis.

This is one of the few museums to focus on insects and it is well worth a detour or even a special trip. There are excellent refreshments available, and there is also another, but smaller museum just a short walk away at the birthplace of J-H Fabre.

### **La Maison Natale de Jean-Henri Fabre and Museum**

Situated in the village of Saint-Léons, next to the school and in front of the small château, is the building where Jean-Henri was born in 1823. This tiny one-roomed house was renovated about 40 years ago and furnished as an example of a typical home of a poor country family, such as Fabre's, in the 19th century. The view from its windows now includes the sight of a very different building, Micropolis.



The statue of Jean Henri Fabre at La Maison Natale museum.



In 1993 a small museum was built facing the house on an adjoining plot of land that was given to the village by the then owner of the château, Marc Chodkiewicz. As well as providing displays of general entomological interest, the Museum seeks to interpret and replicate some of the work carried out by Fabre, both inside and outside the building. For instance, there is a box on a stand in the small garden which contains a collection of tubes which are used as nest sites by solitary bees. It is very similar to the 'insect box' that is readily available today but this one is perhaps more like Fabre's original design.



Insect box in the garden at La Maison Natale museum.

Reproductions of the fine water colour drawings that Fabre made of the fungi of the Vaucluse hang on the walls inside the museum and there is a collection of some of his many books. His most important work, a series of ten volumes known collectively as the *Souvenirs Entomologiques*, provided a rich source of material for the editors of the books that were published after his death, many of which were translated into several languages. There is a representative selection of these books in the Museum. Recent biographies of Fabre are for sale and there is a good selection of modern books about the natural world, many suitable for children.



These two buildings are administered by a group of local people known as 'Les Amis de Jean-Henri Fabre'. A visit here and to 'the garden of insects' that has been established in the village by Les Amis is a perfect complement to a visit to Micropolis, which is only a ten minute walk away.

### **L'Harmas**

The Fabre trail can be continued, or indeed started, by a visit to the house at Sérignan du Comtat, near Orange where he spent the last 36 years of his life. He called it 'L'Harmas' which in the Provençal language means a dry and stony piece of land. When Fabre moved here in 1879, at 56 years of age, it meant that he had at last acquired a laboratory 'in the open fields', something that had been his dream for the past 40 years.

Fabre spent only his first nine or ten years in and around Saint-Léons. Then his family moved from one town to another, settling eventually in Avignon when he was 17 years old. It was here that he seemed to decide to take charge of his rather neglected education. In steady succession he became qualified to teach in primary schools, gained degrees in science and maths, which enabled him to become a secondary school teacher, and then, at the age of 32 successfully submitted his doctoral thesis in biological science to the Faculté des Sciences in Paris. Fabre earned a living by teaching in schools but he continued to spend all his free time investigating the lives of many kinds of insect. He became well known as an entomologist, both in France and elsewhere. He entered into a short correspondence with Charles Darwin who, in *The Origin of Species* (1859), called him 'that inimitable observer'. When Louis Pasteur was investigating the disease that was ruining the silk moth industry, he visited Avignon in 1865 in order to consult Fabre about the life cycle of this moth.

Two years later, in 1867, a new government Minister of Public Instruction (i.e. Education), Victor Duruy, visited Fabre and it was as a result of this meeting that Fabre was able to wear the red ribbon of a Chevalier of the Légion d'honneur.

One of Duruy's initiatives as a government minister was to set up evening classes for adults, both men and women. He asked Fabre to give a series of lectures on science. Fabre agreed to do so not knowing that it would lead to a turning point in his life. His talks and demonstrations proved to be very popular with the students but they offended others who were opposed to young women learning about such topics as the fertilisation of flowering plants. Unfortunately, these



people were very influential in the town so that Fabre had not only to resign from the evening lecture programme but also from his teaching post at the Lycée and, in addition, he was given notice to vacate his rented house.

It was at this point that he was given help from an unlikely benefactor, an English philosopher living in Avignon, John Stuart Mill. The two men had met some years earlier and a common interest in botany had led to a close friendship. They worked together on a record of the flora of the Vaucluse, and it was at this time that Fabre began to draw the fungi of the region. So perhaps it is no surprise that Mill responded generously to Fabre's request for a loan which enabled him, with his wife and children, to move to Orange.

By this time, Fabre had already published several articles in various journals and about 16 textbooks for children on different aspects of science. But now, the knowledge that he had to generate an income as well as repay Mill, spurred him on to use the time released from the demands of teaching to write thirty books in the next nine years. In this way he was able not only to pay back the loan but also, in 1879, to buy the rather neglected house at Sérignan and realise his dream:

'For forty years I have fought, with steadfast courage, against the paltry plagues of life; and the long-wished-for laboratory has come at last.' (*The Life of the Fly*, 1919 p.12)

Within the house there is a large room that Fabre used as an indoor laboratory and study. He had written Volume I of the *Souvenirs Entomologiques* whilst in Orange. Now, sitting at a small table and writing in an exercise book, he completed the subsequent nine volumes. The last one was published when he was 84 years old. Many chapters from this series were translated into English and collected together in the early 20th century under titles such as *The Life of the Fly*, *Mason Bees*, *The Hunting Wasps*, and *The Life of the Caterpillar*.

Fabre was nearly 90 years old before his work was fully recognised and he was made an honorary member of several entomological societies, including, in 1901, the Entomological Society of London. He died in 1915.

Fortunately, L'Harmas was purchased by the state in 1923 and became a museum under the supervision of the Museum d'Histoire Naturelle in Paris. I first visited the house in 1993 and although it was a fascinating place, all the more so for being just as it had been when Fabre lived there, the fabric of the building had been allowed to deteriorate and the curator had to sleep in what had been Fabre's bedroom. It was not until the year 2000 that funds were made available



for the extensive renovation work that was required. It was then closed to the public so that the necessary work could be started. This included a new roof and a careful renovation of Fabre's workroom and the dining room. The first stage of the restoration of the garden was also undertaken at this time. Most of the building and the grounds were opened again to the public in the spring of 2006. There is still work to be done but it is now possible to walk again around Fabre's laboratory with its large central workbench covered with specimens and apparatus, to stand beside the small writing table and to look at his vast collections in the glass cabinets around the walls.

Fabre was a remarkable man. His interests and knowledge ranged so widely from agriculture, chemistry, fungi, molluscs and his pioneering entomological work on living animals, to the study of the Provençal language, that he can truly be called a polymath. This is not to say that he did not have several shortcomings. Most of these are probably related to his rather hermit-like existence which meant that he seems to have been unaware of work, relevant to his own, that was being undertaken by his peers. Consequently he was not part of the society of scientists of his time. In addition, although he gained a number of degrees and prizes he was largely ignored by the French people when he was alive, criticised as a scientist after his death and even now is little known in France.

The life and work of Jean-Henri Fabre certainly deserve to be recognised and celebrated today, especially during the lead up to 2015 which will be the 100th anniversary of his death. The **Maison Natale Museum** in Saint-Léons and **L'Harmas** at Sérignan du Comtat are two significant buildings containing fascinating artefacts; and **Micropolis** at Saint-Léons takes forward his inspiration into the 21st century.

### Acknowledgements

The Directrice and staff of Micropolis and Les Amis de Jean-Henri Fabre of la Maison Natale de J-H Fabre were generous with their help and they have also given permission to include photographs of these two museums situated in Saint-Léons.

I would also like to thank my husband, Tony Clayden, for taking the photographs.

Naoko Oono very kindly undertook the research into the school curriculum in Japan.



## References

- Cambefort, Y. 1999. *L'oeuvre de Jean-Henri Fabre*. Delagrave, Paris.
- Clayden, E. 1994. J-H Fabre – 'The Insects' Homer'. *Antenna* Volume 18, 3: 113-120.
- Clayden, E. 2001. A new French museum of insect life, dedicated to the memory of Jean-Henri Fabre. *Antenna* Volume 25, 3: 154-157.
- Clayden, E. 2009 Three French museums associated with Jean-Henri Fabre, the French entomologist (1823-1915). *Antenna* Volume 33, 1: 39-43
- Darwin, C. 1859 *On the Origin of Species by means of Natural Selection*. Murray.
- Delange, Y. 1985 *Album de Famille et lieux privilégiés de Jean-Henri Fabre*. Alain Barthelemy & Actes Sud. Avignon.
- Delange, Y. 1986. *Jean-Henri Fabre l'homme qui aimait les insectes*. Champion-Slatkine, Paris.
- Teale, E.W. 1949. *The Insect World of J.Henri Fabre*. Fisher Unwin, London.

Many books containing selections of Fabre's work (such as *The Life of the Fly*), were translated into English by Alexander Teixeira de Mattos, and published by Hodder and Stoughton in the early 20th century. They can still be found today. As can a collection of chapters from these publications which were put together by Mrs Rodolph Stawell to produce a small book called *Fabre's Book of Insects*, published in 1921 by Dodd, Mead and Company Inc. New York. A more recent edition of this publication was produced in 1998 by Dover Publications, New York and Constable and Company Ltd., London. A new selection of Fabre's writing from the original translations was brought together and illustrated by Marlene McLoughlin under the title *The Passionate Observer* and published in 1998 by Chronicle Books, San Francisco.

## Museum web sites

Maison Natale and Museum  
[www.musee-jeanhenrifabre.com](http://www.musee-jeanhenrifabre.com)  
Telephone: 00 33 [0]5 65 58 80 54

Micropolis  
[www.micropolis.biz](http://www.micropolis.biz)  
[www.micropolis-insectworld.com](http://www.micropolis-insectworld.com)  
Telephone: 00 33 [0]5 65 58 50 50

L'Harmas  
[www.museum-paca.org/harmas-collections.htm](http://www.museum-paca.org/harmas-collections.htm)  
[www.museum-paca.org/harmas-infos.htm](http://www.museum-paca.org/harmas-infos.htm)  
Telephone: 00 33 [0]4 90 30 57 62

This article is based on 'Clayden, E. 2009' as listed above.





## Black-tipped Soldier Beetle (*Rhagozycha fulva*) Col. Cantharidae pollinating Broad-leaved Helleborine

by John Walters

[www.jobnwalters.co.uk](http://www.jobnwalters.co.uk)

On 14th July 2009 I observed several black-tipped soldier beetles (*Rhagozycha fulva*) on two broad-leaved helleborine (*Epipactis helleborine*) plants in a meadow by Brook Wood, Buckfastleigh, south Devon (SX71 67). At least four of the beetles had pollinia attached to them and were observed pollinating the flowers.

This beetle is known to pollinate the frog orchid (*Coeloglossum viride*) but I have been unable to trace any records of it pollinating broad-leaved helleborine. All references give social wasps *Dolichovespula* as the main pollinators of this plant.

Thanks to Keith Alexander for providing information on the pollination habits of this beetle.





## *Actias luna*

*Richard McIntosh*

*Plant Health Policy Team, Food Camp, Environment Research Agency*

Given recent concerns about the import and breeding of *Actias luna* I thought it would be helpful to clarify the legal position and to update your members on recent developments.

The plant health regime is in place to deal with those organisms which are not present in the EU but have the potential, on the basis of a risk assessment, to have damaging effects to crops or the environment. While the aim is not to unnecessarily restrict the activities of entomologists or others, sometimes it is necessary to prohibit the introduction of certain organisms, because of their damaging effects. In such cases a licensing system is available, to allow the introduction of the prohibited organism under certain circumstances (such as for trials and scientific use), provided that safeguards are in place to prevent the risk of escape and establishment.

Where it is considered that an organism does not present a plant health risk, then there are no plant health restrictions on the importation and breeding of such organisms, although the Wildlife and Countryside Act 1981 continues to apply. This prohibits the release into the wild of any animal (including invertebrates) which is not normally resident in Great Britain.

The plant health requirements are administered by the Food and Environment Research Agency (Fera), part of Defra, and are described in greater detail in the leaflet PHI 8 (available from the Fera website at <http://www.fera.defra.gov.uk/plants/forms/plantHealthForms.cfm>). This includes, at Appendix A, a list of organisms which are prohibited from importation and, at Appendix B, a list of organisms that are not covered by plant health restrictions. The leaflet is advisory only and is revised in light of developments. Fera should be contacted for the most up to date advice in relation to particular organisms (email: [planthealth.info@fera.gsi.gov.uk](mailto:planthealth.info@fera.gsi.gov.uk) or tel: 01904 465625).

In determining whether a plant health risk applies in particular cases, Fera scientists consider the risk of establishment and economic or environmental damage from the organism concerned. More recent assessments have taken into account factors such as the extent to which the relevant species are traded without reports of plant health incidents before reaching a final conclusion, but earlier assessments were more precautionary in nature. A large volume of enquiries are received regarding the import of potentially harmful organisms and



assessments can only be made on the basis of available evidence, but are subject to review in the light of new information.

In the case of *A. luna*, we have reviewed the original assessment (which concluded that it should be prohibited and subject to licensing) in response to the concerns expressed to us. In the absence of plant health incidents despite information to suggest that this species has been widely traded in the past, we have concluded that the current plant health restrictions on importation and keeping this organism should be lifted. As mentioned above, the requirements of the Wildlife and Countryside Act 1981 will continue to apply.

We have also reviewed the position on two other Saturniid species – *Automeris io* and *Antheraea polyphemus* which are currently prohibited and subject to plant health licensing. These species will also no longer be subject to plant health restrictions.

In making changes to the PHI 8 leaflet to reflect these changes we will take the opportunity to correct an editorial error, which suggests that the whole family Sphingidae is prohibited and subject to plant health licensing. This is not the case and some species may be imported and kept without plant health restrictions. We will clarify the position in the revised PHI 8 leaflet.

It may be helpful to publicise these changes with your members. I would emphasise that it is not our intention to unnecessarily restrict the activities of those who enjoy keeping and breeding invertebrates, but where the importation of a particular species is prohibited, this is based on the best available evidence to minimise the risk of economic or environmental damage in the UK. I would urge your members if they are interested in importing invertebrates to contact Fera in advance for advice. Equally, if they have information in relation to the species listed in Appendix A of PHI 8 which they believe has relevance for our assessments, then please let us know. We wish to work with you in protecting the UK environment while facilitating the legitimate interest of those involved with this activity.





## Butterflies in Benidorm

by Andrew Grayson (8621)

56, Piercy End, Kirkbymoorside, York, YO62 6DF

e-mail: andrewgrayson1962@live.co.uk

Benidorm, on Spain's Costa Blanca, was a small fishing community until the advent of large-scale package holidays to sunny destinations. Consequently, it rapidly became the large town it is today, dominated by hundreds of skyscrapers. From 19th to 26th July 2008, I visited Benidorm together with my then partner and some of her family members. In between the inevitable numerous requirements of a family holiday, I was able to spare enough time to at least partly investigate the local landscape and its fauna.

During the period of my visit, the landscape was dry, dusty and rocky with no stagnant or running water. Unsurprisingly, there were no crops, and no grazing animals. There were few natural flowers, and the vegetation mainly consisted of sparse dry coarse grasses, dry scrubby bushes, and various coniferous trees and palm trees. The urban area was noticeably devoid of invertebrates aside from cicadas. There were many houses with flowers fed by continuously-piped water, but these rarely attracted any insects, which was unsurprising, as most Mediterranean insects are not in evidence during the hot, dry and inhospitable month of July. Likewise, there were very few birds in evidence apart from a few sparrows scavenging in the town and swifts flying above the mountains.

Feasibly, I was only able to explore two localities which held entomological interest. One was an area of rough ground, probably awaiting development, and bisected by the Avenida Ciudad Real. The special interest here was a deep-cut drain [centred on longitude and latitude co-ordinates 38°32'32.19"N 0°06'23.06"W elev. 6m (source: 'Google Earth')]. This drain was mainly dry at the time of my visit; nevertheless, insects were noticeably present, including cicadas, robber-flies and particularly hymenopterans. There were also two butterflies, viz. Wall Brown (*Lasiommata megera*) and Small White (*Artogeia rapae*).

The other locality investigated comprised the mountainous hills called Sierra Helada, which are situated to the east of Benidorm, and stretch north-eastwards in a strip about 1 km wide and about 5km long. Sierra Helada are surrounded by sea to the east, north and south, and by the heavily-developed and populated lowland plain between Benidorm and l'Albir to the West. On the seaward sides, Sierra Helada suffers coastal erosion; hence there are steep cliffs.



I visited Sierra Helada [central point: 38°32'16.51"N 0°05'35.41"W elev. 158m] on five days during the period 19th to 25th July 2008, and noted that insects were present but not generally plentiful. The fauna included several resident species of grasshopper; cicadas; a few dipterans, principally several species of robber-fly; and a few hymenopterans, principally solitary bees. A few darter dragonflies seen on 24th July were here as migrants.

I undertook my most extensive walks on Sierra Helada on Sunday 20th, Thursday 24th and Friday 25th July, accessing the mountains from Avenida de Malta [38°32'21.04"N 0°05'55.71"W elev. 61m], and ascending the rough rocky paths. On these days, butterflies were mainly present on the mid and upper regions of the mountains, and the fauna included some of the largest species to be found in Europe. The large Striped Grayling (*Pseudotergumia fidia*) was present in small numbers throughout Sierra Helada on all three days of extensive walking, and particularly so on the rocky mid slopes. This species is undoubtedly a resident here, as are Black Satyr (*Satyrus actaea*) and Dusky Heath (*Coenonympha dorus*), which were both present on a grassy area of the mid slopes on 20th July, but were not seen elsewhere nor thereafter. Another undoubted resident of Sierra Helada is the Wall Brown (*Lasiommata megera*), which occurred in small numbers on the lower to mid slopes on 25th July.

The other butterflies I recorded on Sierra Helada were probably passage migrants visiting flowers etc. Mostly, these were encountered on the mid slopes in flatter areas with light coniferous tree cover. It was here on 20th July that I saw an Apollo (*Parnassius apollo*) make a brief investigation around trees, and also here on 25th July that several Scarce Swallowtail (*Iphiclides podalirius*) came to feed at flowers. The same area attracted several Two-tailed Pasha (*Charaxes jasius*) on both 24th and 25th July. These showed no interest in the few flowers present, and spent their time flying in the vicinity of, or resting on, conifers. I reached the summit of the southern part of the mountains only on 20th July, and here, feeding at flowers were several Swallowtail (*Papilio machaon*). This species was not noted elsewhere on the mountains during that day, nor was it seen on the other four days.





## Book Review

### *Guide des sauterelles, grillons et criquets d'Europe occidentale*

by Heiko Bellmann and Gérard Chr. Luquet, 2nd edition revised, published by Delachaux & Niestlé, 2009, 384 pp., 306 colour photos plus many line drawings and figures, text in French. A5 Hard cover, 15.00 Euros (plus postage & packing). ISBN 978-2-603-01564-3. Contact: Coralie Matera [cmatera@lamartinriere.fr](mailto:cmatera@lamartinriere.fr) web site: [www.delachauxetniestle.com](http://www.delachauxetniestle.com). Tel: (from the UK) 0033 1 40 51 98 96.

Originally published in 2006, this revised edition contains several new photographs as well as updated species accounts and other important information.

The volume is divided into three main sections – Généralités, Guide Illustré & Annexes (General Information, Illustrated Guide & Appendices) – each of which are subdivided into a number of different topics. These are clearly listed on the Sommaire (Contents) page.

Almost every conceivable aspect of the study of this fascinating group of insects is covered in the guide. As well as the excellent photographs of adult insects there is a detailed dichotomous key to every species, illustrated with thumbnail drawings in the margins. There is also a key to species using stridulation patterns, illustrated with wave charts.

The geographical area covered encompasses Belgium, Switzerland, Germany (only for comparison with Western Europe), France (including Corsica), Luxembourg and the Netherlands (but not the Iberian peninsula or the British Isles) and a useful table shows the countries from which each species has been recorded.

Tucked in a neat plastic pouch inside the front cover is a CD-ROM containing 94 short clips of song recordings for 77 different species. The files on the CD bear numbers but no names to identify them so it is necessary to refer to the Appendix (Annexes) on pages 352-359 where summaries of the sounds are given. The songs have not been modified and to hear some of the quieter species the sound has to be turned up to maximum.

Also in the Annexes there is a glossary (Glossaire), a bibliography (Travaux Consultés) and two separate indexes, one for the common names used in the different countries (Index des noms vernaculaires), the other for scientific (Latin) names (Index des noms scientifiques).



Species accounts form the main part of the book and generally consist of up to one page per species, with the relevant colour plates on the facing page. All 163 species are illustrated with colour photographs of live specimens, taken in their natural surroundings. Common names used in each country (including English names where applicable) are listed beneath the Latin name.

The format of this book allows it to be easily packed in a suitcase for anyone wishing to study the group whilst travelling abroad. A staggering number of different grasshoppers and crickets are recorded from western Europe, when compared with the impoverished fauna of the British Isles, and this book is just what is needed to help a keen observer to learn about the orthopteran fauna of Continental Europe.

It is hard to find fault with this splendid work. Some might find the green typeface, coupled with the small font used in the distribution table on pages 63-68, hard to read. A useful addition to the species accounts would be a series of thumbnail distribution maps of western Europe. These could either accompany the text for each species or placed in a separate chapter. However these are very minor points and should not deter anyone from buying the book.

*Peter Hodge (5335)*



The Dark Bush Cricket *Pholidoptera griseoaptera* is quite widespread in Britain. It is found in Bramble and other thick vegetation.

## British Butterflies throughout the year

by Peter May  
This new book from the AES describes the adults of different species of British butterflies, according to the time of year they appear on the wing. Nearly all the 60 British species are illustrated. Focussing on encouraging an interest in entomology among the young and the young at heart, there is a helpful calendar of flight times and a useful checklist to help you keep track of your observations.

£ 5.00

Members price £3.80

## Preparing and maintaining a collection of Butterflies and Moths

by P. May and M. White. A practical manual detailing the various methods used to prepare specimens for a collection from killing methods, setting the specimens and repairing damaged ones, to storage and preservation, including pest prevention and cure. 21 pages, 4 figures and 5 plates. (2006)

£4.85

Members price £3.65

## The Hymenopterist's Handbook

by Dr C. Betts *et al*  
2nd edition dealing with the history of their families, classification and structures, natural history, studying, collecting, breeding, attracting and preserving Hymenoptera. Appendices include keys to the families. 214 pages with numerous tables, keys and figures (1986)

£ 11.4

Members price £ 8.60

## Revised Flight Tables for the Hymenoptera

Revised flight tables for the Hymenoptera giving, wherever possible, times, location, flower visits and some indication of distribution and abundance. 24 pages (1988)

£ 3.10

Members price £ 2.35

## A Coleopterist's Handbook

Edited by J. Cooter & M. V. Barclay. The *Coleopterist's Handbook* is now available as a fully revised and expanded for the century. Not an enclosure has been brought in line with current use, collecting, curatorial methods reflect best practice and plant beetle and beetle plant lists are included together. Recent additions to the British fauna, modern and traditional techniques are included. All advice and comment given in the book is based upon collective years of practical experience of both curatorial methods and field craft. Beetle family chapters have each been written by an internationally recognised authority. 496 pages including 37 colour plates.

£ 54.00

Members price £ 39.00

## Host plants of British Beetles: A List of Recorded Associations

A list of a wide range of plants (and aphid beetle) order together with the beetle species that have been recorded as being associated with them. 14 pages (1992)

£ 3.10

Members price £ 2.35

## A Silkmoth Rearer's Handbook

by B. O. C. Gardiner  
SPECIAL OFFER PRICE £ 7.70  
No further discounted price available

## A Dipterist's Handbook

by M. Stubbs, P. L. Chandler and others.  
A practical handbook for both the beginner and the interested on collecting, breeding and studying the two winged flies. Describes equipment, trapping, preservation, habitat, plant and animal associations and behaviour. Includes a detailed chapter on larval stages with an illustrated key to families. An essential book for the keen Dipterist. 260 pages with drawings of larvae and equipment (1978, reprinted 1996)

£ 14.20

Members price £ 10.60

## Practical Hints for Collecting and Studying the Microlepidoptera

by P. A. Sokoloff. A practical manual for those interested in the smaller moths, describing techniques for collecting, adult moths, collecting immature stages, breeding, killing, setting and mounting. A list of useful books and journals as well as details of societies and suppliers is included. 40 pages, 11 figures (1980)

£ 4.20

Members price £ 3.15

## Rearing and Studying Stick and Leaf-Insects

by P. D. Brock.  
Specially intended for beginners, although it is also suitable for experienced Phasmod enthusiasts, it is one of the few guides to rearing that features the majority of the culture stocks available. 22 species in detail. The informative text is complimented by 8 colour plates, 14 black and white plates and 29 figures. (New edition, 2003)

£ 11.20

Members price £ 8.20

## The Study of Stoneflies, Mayflies and Caddisflies

by T. T. Macan.  
A comprehensive guide to collecting and studying the biology and ecology of these aquatic insects. 14 pages, 10 figures and bibliography (1982)

£ 4.20

Members price £ 3.15

## Breeding the British Butterflies

by P. W. Cribb.  
A practical handbook covering all aspects of butterfly breeding, including general techniques, equipment and hints on how to breed each of the British species. 60 pages, 6 figures, 5 plates. Revised (2001)

£ 5.20

Members price £ 3.85

## Practical Hints for the Field Lepidopterist

by J. W. Tutt.  
Written at the turn of the century, this book has been reprinted because of its scarcity and value to students of Lepidoptera. It gives a complete month by month guide to which species and stages of macro and micro to look for and how to find them. Also contains a biological account of the early stages and how to keep, rear, photograph and describe them. 122 pages. Hardback (Reprinted 1991)

£ 24.00

Members price £ 18.30

## An index to the modern names for use with J.W. Tutt's

### Practical Hints for the Field Lepidopterist

by B. O. C. Gardiner.  
A valuable cross reference guide between the scientific and English names used in the early 1900s and the present time.

£ 4.70

Members price £3.50

## A Guide to Moth traps and their use

by R. Fry and P. Waring.  
The first sections deal with the measurement and properties of light leading into the types of lamp available and the electrical circuits needed to operate them. The next sections give details of the construction of the most popular traps used in the UK. The last half deals with the practical use of traps in the field including where and when to trap, limitations of traps and their relative performance. 68 pages, 21 figures, 15 plates (1996)

£ 6.85

Members price £ 5.05

## The Amazing World of Stick and Leaf Insects

by Paul D. Brock.  
A superb, comprehensive guide, for all those intrigued by these groups of insects. Topics covered include structure, fascinating facts, life history and development, defence behaviour, enemies, collecting, breeding (including trouble shooting), preserving taxonomic studies, important collections in Museums etc. around the world and elaborate stories, beliefs and poems. Also outlines the major known species around the world on a regional basis. A section on fossils is included. Includes a comprehensive glossary of the technical terms used in the description and classification of stick and leaf insects. Handbook A5. 184 pages, 46 figures, 26 black and white plates and 40 pages of colour plates (containing 83 photographs and 4 drawings/paintings of insects and their habitats) (1999)

£ 18.90

Members price £ 14.10

## Rearing Parasitic Hymenoptera

by M. Shaw.  
This booklet provides information on the parasitic Hymenoptera to enable successful studies to be made of this little understood group of the British insect fauna. Details are given on the general biology of parasitic wasps, rearing principles, efficient rearing practices and detailed methods of dealing with adult wasps. 52 pages, 3 colour plates (New edition 2001)

£ 5.70

Members price £ 4.20

## Larval Foodplants of the British Butterflies

by Peter May.  
A comprehensive compilation of the known larval foodplants of our native and migrant butterflies. Also including "How to Encourage Butterflies to Live in Your Garden" by the late Peter Cribb. 62 pages. (2003)

£ 7.40

Members price £ 5.45

## The larger water beetles of the British Isles

by Peter Sutton.  
For those who love the spectacular larger water beetles of the British Isles, this is the publication that you have been waiting for! It is the only modern publication with colour illustrations of all of our aquatic coleopteran megalana and it provides the most up-to-date distribution maps revealing their current distributions. Jam packed with fascinating details of their life histories, this book covers 11 species including the 'native Great Diving Beetles' and the 'Silver Water Beetles'. It is also copiously illustrated with text figures and has much additional information including details of observed climate induced range changes and the conservation measures required to ensure their continued survival.

£ 11.90

Members price £ 8.90

## Glossary for the Young Lepidopterist

6 pages, 2 figures (1951)

£ 1.05

Members price £ 0.90

## A Label List of European Butterflies

20 pages (Revised 1981)

£ 2.35

Members price £ 1.85

## Some British Moths Reviewed

Aid to the identification of some of the more difficult species. Reprinted from the *Amateur Entomologist* Vol. 5 (1911) and a *Guide to the Central Species of Lepidoptera*, reprinted from *Entomologists' Gazette* 1969/72. 64 pages, 6 black and white plates, numerous figures (1985)

£ 4.45

Members price £ 3.35

## Butterflies of Cyprus 1998 (Records of a years sightings)

by Eddie John.  
Observations of the 44 species of butterfly found on the island in 1998 including notes on each species and distribution maps. 46 pages (2000)

£ 4.30

Members price £ 3.25

## Collecting Hct.Bugs (Hemiptera: Heteroptera)

12 pages (including 3 plates) (1946)

£ 1.20

Members price £ 1.00

## Collecting Clearwings

12 pages (including 2 plates, 4 figures) (1946)

£ 1.10

Members price £ 1.00

## Collecting Lacewings

9 pages, 8 figures, 5 plates. (2nd edition 1976)

£ 2.25

Members price £ 1.75

## An Amateur's Guide to the Study of the Genitalia of Lepidoptera

16 pages, 15 figures (1973)

£ 3.10

Members price £ 2.35

## Rearing the Hymenoptera Parasitica

16 pages, 1 plate, 10 figures (1974)

£ 2.55

Members price £ 2.00

## Rearing Crickets in the Classroom

12 pages, 2 plates (1986) (Reprinted 1993)

£ 2.10

Members price £ 1.65

## Guidelines for Entomological Site Surveys

Published on behalf of the ICCBI. 7 pages (2000) (Reprinted 2003)

£ 3.10

Members price £ 2.35

## The Journal of the Entomological Exchange and Correspondence Club 1935-1936

An AES Inbilee Publication. Fascinating reprint of the very first volume of the AES journal. 100 pages.

£ 4.20

Members price £ 3.35



All the above publications sent post free to U.K. addresses. Outside U.K. please add 10% to order value for postage by surface mail. For postage by air-mail outside Europe please add 30% to order value. Please allow 28 days delivery.

Please make all cheques/postal orders payable to 'AES Publications' and send to:  
AES Publications, 1 Tower Hill, Brentwood, Essex CM14 4TA.





## AES Membership Rates 2010

Membership of the Society runs from 1st January to 31st December each year. New members will receive all publications published during the year of enrolment subject to availability, except for those joining on or after 1st October.

Any member joining on or after 1st October will be deemed to have joined for the following year unless he or she specifically requests membership for the current year. If such a request is made, the publications already published that year will be sent with the enrolment confirmation letter and the remaining ones will be sent when they are published. A further membership subscription will be necessary for the following year.

If you have any queries about membership please contact us via the website, [www.amentsoc.org](http://www.amentsoc.org) or PO Box 8774, London SW7 5ZG

### Individual Adult Membership

Membership sub-category	UK	Overseas
<i>Bulletin</i> only	£20.00	£25.00
<i>Entomologist's Record</i> only	£25.00	£30.00
<i>Bug Club Magazine</i> only	£20.00	£25.00

### Individual Bug Club / Junior Membership

Membership sub-category	UK	Overseas
Junior under-18 ( <i>Bug Club Magazine</i> only)	£12.00	£17.00
Junior aged 13-17 ( <i>Bulletin</i> only)	£12.00	£17.00

### Family or Combined Membership

Membership sub-category	UK	Overseas
<i>Bulletin</i> & <i>Entomologist's Record</i>	£40.00	£45.00
<i>Bulletin</i> & <i>Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record</i> & <i>Bug Club Magazine</i>	£35.00	£40.00
<i>Bulletin</i> , <i>Entomologist's Record</i> & <i>Bug Club Magazine</i>	£48.00	£53.00

### Associate / Institutional Membership

Membership sub-category	UK	Overseas
<i>Bulletin</i> only	£20.00	£25.00
<i>Entomologist's Record</i> only	£50.00	£55.00
<i>Bug Club Magazine</i> only	£20.00	£25.00
<i>Bulletin</i> & <i>Entomologist's Record</i>	£65.00	£70.00
<i>Bulletin</i> & <i>Bug Club Magazine</i>	£28.00	£33.00
<i>Entomologist's Record</i> & <i>Bug Club Magazine</i>	£65.00	£70.00
<i>Bulletin</i> , <i>Entomologist's Record</i> & <i>Bug Club Magazine</i>	£75.00	£80.00

**The Amateur Entomologists' Society**

PO Box 8774, London SW7 5ZG

[www.amentsoc.org](http://www.amentsoc.org)

The  
**Bulletin**  
*of the Amateur Entomologists' Society*

Volume 68 • Number 487

December 2009

**CONTENTS**

The AES website .....	215
Society Matters .....	216
AES Events In The New Year .....	218
Ellacott, P. The Bug Project .....	219
AES Annual Exhibition and Trade Fair: Kempton Park 17th October 2009 .....	220
Tatham, D. Riverfly Monitoring.....	238
Caswell, W. did you know . . . ? .....	240
Keen, D. Late developing ichneumonid – an update.....	241
Caswell, W. Conclusion of the article 'Larvae back from the dead' in <i>AES Bulletin</i> , vol 68, no 486 .....	242
Clayden, L. Discovering the legacy of Jean-Henri Fabre in three French museums.....	243
Walters, J. Black-tipped Soldier Beetle ( <i>Rhagonycha fulva</i> ) Col. Cantharidae pollinating Broad-leaved Helleborine .....	251
McIntosh, R. <i>Actias luna</i> .....	252
Grayson, A. Butterflies in Benidorm .....	252
Book Review .....	256

ES 36 A

The  
**Bulletin**  
*of the Amateur Entomologists' Society*

World list abbreviation

*Bull. amat. Ent. Soc.*

Registered Charity No. 267430

**Index to**

*The Bulletin of the Amateur Entomologists' Society*

Vol. 68 (2009)

**Edited by Dr Phil Wilkins**

**and Martin Hough**

**and to**

*Invertebrate Conservation News*

Vols. 58, 59, 60 (2009)

**Edited by David Lonsdale**



**Index compiled by Jacqueline Ruffle**

**Published by**

**The Amateur Entomologists' Society**

**P.O. Box 8774, London SW7 5ZG**

**ISSN 0266-836X**

© The Amateur Entomologists' Society

All Rights Reserved

Natural History Museum Library



000174466

## AUTHOR INDEX

Issue / Pages

### A

Abu Hashesh, Talaat A. *see*: Shebl, Mohamed A.

### AES

AES annual report for the year ended 31 December 2008 .....	484: 90-95
AES website: <a href="http://www.amentoc.org">www.amentoc.org</a> .....	486: 171
Amateur Entomologists' Society grants and awards .....	484: 88
Data Protection Act .....	486: 172
Everyclick .....	482: 30
Membership matters .....	486: 172 482: 38 485: 170, 171
The Michael Majerus Grant .....	486: 173-74

### Anon

Book review: Bees of Surrey ICN .....	58: 8-10
Belted Beauty ( <i>Lycia zonaria</i> ) .....	483: 69
Butterflies of the Cayman Islands .....	486: 214
Charles Darwin's beetles .....	483: 80
Jordan's Cereals' big buzz .....	483: 81
Book review: Water bugs and water beetles of Surrey .....	ICN 58: 7-8

### B

**Baxter, Ronald N.**

Questing in Ecuador .....	486: 200-09
---------------------------	-------------

**Best, Graham**

A day with the Emperor .....	483: 46-47
A new Scarlet Tiger moth colony .....	486: 174
Breeding the Deaths Head Hawk Moth in captivity .....	482: 31-32
Breeding the Deaths Head Hawk Moth in captivity .....	483: 54-55
Butterfly photography .....	483: 63
Food plant preference in Privet Hawk (Lepidoptera: <i>Sphinx ligustri</i> ) larvae .....	484: 117
Sugaring for Red Underwings ( <i>Catocala nupta</i> ) .....	483: 49-50

**Betts, Clive**

Return to Corfu .....	486: 183-87
-----------------------	-------------

**Brock, Paul**

Book review: Pocket guide to the shieldbugs and leatherbugs of Britain and Ireland .....	486: 213
--	----------

### C

**Caswell, Wesley**

Butterfly house in Golders Hill! .....	486: 182
Conclusion of the article 'Larvae back from the dead' .....	487: 242
Did you know? .....	487: 240
Larvae back from the dead .....	486: 210

**Clayden, Liz**

Discovering the legacy of Jean-Henri Fabre in three French museums .....	487: 243-50
--	-------------

**Cole, Stuart**

Insects in Malta: Summer 2007 .....	484: 108-112
-------------------------------------	--------------

## D

Dickson, Richard

- Another importation of the Great Capricorn Beetle (Coleoptera: *Cerambyx cerdo*) .....484: 122  
Herald Moth (*Scoliopteryx libatrix*) on dog dung .....484: 100

## E

Ellacott, Pat

- The Bug Project .....487: 219

Ellis, Hewett A.

- A primary gregarious egg parasitoid (Hymenoptera: *Chalcidoidea*, *Trichogrammatidae*) of the Small Skipper (*Thymelicus sylvestris*) .....482: 23-30

Ellis, Steven J. and Ellis, Hewett A

- Long-tailed blue in Northumberland (Lepidoptera: *Lampides boeticus*) .....484: 98-99

## F

## G

Gardiner, Tim

- Detection rates of adult male and larval Glow-worms *Lampyrus noctiluca* from transect sampling .....  
.....484: 118-19  
Is this a Glow-worm I see before me? .....484: 120-21

Goff, Roy

- Moth larvae on bee orchid (*Ophrys apifera*) .....486: 180  
Mothing in the Gambia ..... 486: 192-99

Grayson, Andrew

- Butterflies in Benidorm .....487: 254-55

## H

Harvey, Martin

- iSpot - helping people learn how to identify wildlife .....486: 181-82

Hodge, Peter

- Guide des sauterelles, grillons et criquets d'Europe occidentale .....487: 256-57

Holland, Peter

- The 'Queen of Entomologists' Part 1: Mrs Hutchinson and the Pinion-spotted Pug .....484: 113-18  
The 'Queen of Entomologists' Part 2: Mrs Hutchinson and the golden Comma .....486: 188-91

Hough, Martin

- AES Annual Exhibition and Trade Fair: Kempton Park 17th October 2009 .....487: 220-37  
Light and sheet in the mountains of Thailand .....484: 64-69  
Book review: Colour identification guide to moths of the British Isles (Macrolepidoptera): 3rd revised & updated edition) .....484: 123-25

## I

## J

K

Kamel, Soliman M. *see*: Shebl, Mohamed A.

Keen, David

Insectos de Espana y Europa.....	486: 211
Late developing Ichneumon .....	483: 79
Late developing ichneumonid: An update .....	487: 241-42
Letter from Spain: 7th in a series: Spanish winter butterflies: a further update .....	484: 96-97
Mantids found in this area - an update for 2008.....	483: 48-49

Koryszko, Jan

A local abundance of Angle Shades moths? (Lepidoptera: <i>Phlogophora meticulosa</i> L.).....	482: 22
Hyacinths a must for a butterfly garden .....	486: 209

L

Lonsdale, David

Water bugs and water beetles of Surrey .....	482: 35-37
--	------------

M

Majerus, Michael E.N

Bright defensive colour patterns of insects, Part 1: The conundrum of the evolution of true warning colouration .....	482: 2-14
---	-----------

Majerus, & Scullion, Catherine *see*: Scullion, Catherine

McIntosh, Richard

<i>Actias luna</i> .....	487: 252-53
--------------------------	-------------

O

Osman, Mohamed A. *see*: Shebl, Mohamed A

P

Partridge, Rob

The Great Green Bush-cricket <i>Tettigonia viridissima</i> in 'old' Cambridgeshire.....	484: 101-107
---	--------------

Pitts, Kieren

Book review: British moths and butterflies: A photographic guide .....	482: 33-34
Book review: Cockroach.....	482: 34-35

R

Renwick, Matthew

Photographing Damselflies .....	483: 77-78
---------------------------------	------------

Ruffle, Isobel

The beetles I found on holiday .....	484: 121
--------------------------------------	----------

Ruffle, Jacqueline

Exciting opportunity to carry out survey work on Headley Heath!.....	484: 88-89
--	------------

S

Scullion, Catherine & Majerus, Michael E.N.

Reflections on an evolutionary paradigm: the case of the Peppered Moth (Lepidoptera: *Biston betularia* Linn.).....482: 15-22

Shebl, Mohamed A. et al

The most common insect species in Alfalfa field in Egypt.....483: 70-76

Stevens, Graham

An unusual occurrence in Latvia.....484: 100

Sutton, Peter G.

Corfu - Special issue [covering Rhopalocera, Odonata, Coleoptera and Orthoptera).....485: 129-68

T

Tatham, David

Riverfly monitoring.....487: 238-40

Tebbutt, Peter

Further notes on gynandromorphs .....483: 50-53

Orange Tip (*Anthocharis cardamines*) gynandromorphs .....483: 42-45

Trevis, Geoff

Events in Worcestershire.....483: 45

U

V

W

Walters, John

Black-tipped Soldier Beetle (*Rhagozycha fulva*) Col. Cantharidae pollinating broad-leaved Helleborine.....487: 251

Ware, Remy

Alien vs. predator: Can natural enemies control the Harlequin Ladybird? .....486: 175-80

Waring, Paul

Moths Count event, 28-29 June 2008, Margrove, Tees Valley, Cleveland, North Yorkshire .....483: 56-60

Wilkins, Philip

Reflections on the Pale-lemon Sallow *Xanthia ocellaris* (Borkhausen, 1792).....483: 61-63/459: 53-56

## ***SUBJECT INDEX***

	<b>Issue / Pages</b>
<b>Aberrations</b>	
Orange Tip ( <i>Anthocharis cardamines</i> ) gynandromorphs .....	483: 42-45
Further notes on gynandromorphs .....	483: 50-53
<b>AES</b>	
AES member receives major Insect Conservation Award.....	485: 128
Grants and schemes.....	484: 88
Society matters .....	487: 216-17
Did you know? .....	487: 240
<b>Africa</b>	
Mothing in the Gambia.....	486: 192-99
<b>Agriculture</b>	
£10 million initiative to tackle bee and pollination decline in the UK .....	ICN 59: 5
The most common insect species in Alfalfa field in Egypt.....	483: 70-76
<b>Annelida</b>	
Medicinal leech in the UK.....	ICN 58: 5-6
<b>Ants <i>see</i>: Hymenoptera</b>	
<b>Aquatic life</b>	
Riverfly monitoring.....	487: 238-39
<b>Beetles <i>see</i>: Coleoptera</b>	
<b>Behaviour</b>	
Herald Moth ( <i>Scoliopteryx libatrix</i> ) on dog dung .....	484: 100
<b>Biodiversity</b>	
<b>Biological control</b>	
Alien vs. predator: Can natural enemies control the Harlequin Ladybird? .....	486: 175-80
<b>Book &amp; publications: reviews</b>	
Ark sites for White-clawed crayfish: a new pamphlet from Buglife .....	ICN 59: 12-13
Bees of Surrey .....	ICN 58: 8-10
British moths and butterflies: A photographic guide .....	482: 33-34
Butterflies of the Cayman Islands.....	486: 214
Cockroach.....	482: 34-35
Colour identification guide to moths of the British Isles (Macrolepidoptera): 3rd revised & updated edition) .....	484: 123-25
Foodplant leaflets from Butterfly Conservation.....	ICN 60: 13
Guide des sauterelles, grillons et criquets d'Europe occidentale.....	487: 256-57
Insectos de Espana y Europa.....	486: 211
Pocket guide to the shieldbugs and leatherbugs of Britain and Ireland.....	486: 213
Water bugs and water beetles of Surrey .....	482: 35-37

## Breeding

- Breeding the Deaths Head Hawk Moth in captivity .....482: 31-32  
Breeding the Deaths Head Hawk Moth in captivity .....483: 54-55  
Food plant preference in Privet Hawk (Lepidoptera: *Sphinx ligustri*) larvae .....484: 117

## Bugs *see*: Hemiptera

## Butterflies *see*: Lepidoptera

## Cicadas *see*: Hemiptera

## Coleoptera

- A selection of beetles (Coleoptera) from the island of Corfu (Kérkira).....485: 145-51  
Alien vs. predator: Can natural enemies control the Harlequin Ladybird? .....486: 175-80  
Another importation of the Great Capricorn Beetle (Coleoptera: *Cerambyx cerdo*) .....484: 122  
Black-tipped Soldier Beetle (*Rhagozycha fulva*) Col. Cantharidae pollinating broad-leaved  
Helleborine.....487: 251  
Charles Darwin's beetles .....483: 80  
Detection rates of adult male and larval Glow-worms *Lampyris noctiluca* from transect sampling.....  
.....484: 118-19  
Is this a Glow-worm I see before me?.....484: 120-21  
The beetles I found on holiday .....484: 121  
Correction regarding the Crucifix ground beetle ..... ICN 59: 6

## Conservation: general

- AES member receives major Insect Conservation Award .....485: 128  
Countryside access in England: impacts on vulnerable invertebrates.....ICN 60: 3-5  
Forestry Commission (England): proposed open habitats policy.....ICN 60: 7  
Misleading claims about ragwort .....ICN 60: 7-9  
Neonicotinoid pesticides: proposal for a ban in the UK.....ICN 60: 5-7

## Conservation: Sites and species of interest

- Correction regarding the Crucifix ground beetle .....ICN 59: 6  
Dungeness, Kent: further information .....ICN 60: 9-11  
Dungeness, Kent: plans for a new nuclear power station .....ICN 59: 6-7  
Hines Emerald Dragonfly in the USA.....ICN 60: 11-12  
Medicinal leech in the UK.....ICN 58: 5-6  
New project on White-clawed crayfish in England.....ICN 58: 3  
New strategy for insect conservation in Scotland .....ICN 58: 2  
The 2012 Olympic Games: invertebrates in the Lea Valley, east London.....ICN 59: 7-11  
Thurrock Marshes, south-east England .....ICN 58: 3-5

## Corfu

### Corfu special issue, comprising:

- A checklist of the butterflies (Rhopalocera) of Corfu ) (Kérkira).....485: 130-35  
A checklist of the dragonflies (Odonata) of Corfu ) (Kérkira) including a new record for the Ionian  
Islands, the Black Pennant *Selysiotemis nigra* (Vander Linden, 1825) .....485: 136-44  
A checklist of the Orthoptera and allied insects of Corfu (Kérkira).....485: 152-60  
A selection of beetles (Coleoptera) from the island of Corfu (Kérkira).....485: 145-51  
Corfu: an introduction to its invertebrate fauna .....485: 129-30  
Diary notes from the island of Corfu, 1994-2007.....485: 161-68  
Return to Corfu .....486: 183-87

<b>Crickets</b> <i>see: Orthoptera</i>	
<b>Crustacea</b>	
New project on White-clawed crayfish in England.....	ICN 58: 3
<b>Damselflies</b> <i>see: Odonata</i>	
<b>Defence</b>	
Bright defensive colour patterns of insects, Part 1: The conundrum of the evolution of true warning colouration .....	482: 2-14
<b>Dietary</b>	
Breeding the Deaths Head Hawk Moth in captivity .....	482: 31-32
Breeding the Deaths Head Hawk Moth in captivity .....	483: 54-55
Food plant preference in Privet Hawk (Lepidoptera: <i>Sphinx ligustri</i> ) larvae.....	484: 117
Moth larvae on bee orchid ( <i>Ophrys apifera</i> ) .....	486: 180
<b>Distribution</b>	
A local abundance of Angle Shades moths? (Lepidoptera: <i>Phlogophora meticulosa</i> L.).....	482: 22
<b>Dragonflies</b> <i>see: Odonata</i>	
<b>Earwigs</b> <i>see: Dermaptera</i>	
<b>Ecuador</b>	
Questing in Ecuador.....	486: 200-09
<b>Egypt</b>	
The most common insect species in Alfalfa field in Egypt.....	483: 70-76
<b>England</b>	
Belted Beauty ( <i>Lycia zonaria</i> ) .....	483: 69
Exciting opportunity to carry out survey work on Headley Heath!.....	484: 88-89
Long-tailed blue in Northumberland (Lepidoptera: <i>Lampides boeticus</i> ) .....	484: 98-99
Reflections on the Pale-lemon Sallow <i>Xanthia ocellaris</i> (Borkhausen, 1792).....	483: 61-63
The Great Green Bush-cricket <i>Tettigonia viridissima</i> in 'old' Cambridgeshire .....	484: 101-107
<b>Errata</b>	
Correction regarding the Crucifix ground beetle .....	ICN 59: 6
Invertebrate surveys in the UK.....	ICN 60: 13
<b>Evolution</b>	
Bright defensive colour patterns of insects, Part 1: The conundrum of the evolution of true warning colouration .....	482: 2-14
Reflections on an evolutionary paradigm: the case of the Peppered moth ( <i>Biston betularia</i> Linn.).....	482: 15-22
<b>Exhibitions</b>	
AES Annual Exhibition & Trade Fair.....	487: 220-37
The Bug Project.....	487: 219
<b>France</b>	
Discovering the legacy of Jean-Henri Fabre in three French museums.....	487: 243-50

Foodplants *see*: Dietary

Garden entomology

Hyacinths a must for the butterfly garden.....486: 209

Habitats

Forestry Commission (England): proposed open habitats policy.....ICN 60: 7

Hymenoptera

£10 million initiative to tackle bee and pollinator decline in the UK .....ICN 59: 5

A primary gregarious egg parasitoid (Hymenoptera: Chalcidoidea, Trichogrammatidae) of the Small Skipper (*Thymelicus sylvestris*).....482: 23-30

Late developing Ichneumon .....483: 79

Late developing ichneumonid: An update .....487: 241-42

Identification

Exciting opportunity to carry out survey work on Headley Heath!.....484: 88-89

iSpot - helping people learn how to identify wildlife.....486: 181-82

Immature stages

Conclusion of the article 'Larvae back from the dead'.....487: 242

Larvae back from the dead.....486: 210

Insecticides *see*: Pesticides

Invertebrates other than insects

Italy

Latvia

An unusual occurrence in Latvia.....484: 100

Lepidoptera

*Actias luna* .....487: 252-53

A checklist of the butterflies (Rhopalocera) of Corfu (Kérkira) .....485: 133-35

A day with the Emperor .....483: 46-47

A local abundance of Angle Shades moths? (Lepidoptera: *Phlogophora meticulosa* L.).....482: 22

A new Scarlet Tiger moth colony .....486: 174

A primary gregarious egg parasitoid (Hymenoptera: Chalcidoidea, Trichogrammatidae) of the Small Skipper (*Thymelicus sylvestris*).....482: 23-30

An unusual occurrence in Latvia.....484: 100

Belted Beauty (*Lycia zonaria*) .....483: 69

Breeding the Deaths Head Hawk Moth in captivity .....482: 31-32

Breeding the Deaths Head Hawk Moth in captivity .....483: 54-55

Butterfly house in Golders Hill!.....486: 182

Butterfly photography .....483: 63

Further notes on gynandromorphs .....483: 50-53

Herald Moth (*Scoliopteryx libatrix*) on dog dung .....484: 100

Letter from Spain: 7th in a series: Spanish winter butterflies: a further update .....484: 96-97

Long-tailed blue in Northumberland (Lepidoptera: *Lampides boeticus*) .....484: 98-99

Moth larvae on bee orchid (Ophrys apifera) .....486: 180

Nothing in the Gambia.....486: 192-99

Moths count event, 28-29 June 2008, Margrove, Tees Valley, Cleveland, North Yorkshire.....	483: 56-60
Orange Tip ( <i>Anthocharis cardamines</i> ) gynandromorphs .....	483: 42-45
The 'Queen of Entomologists' Part 1: Mrs Hutchinson and the Pinion-spotted Pug.....	484: 113-18
The 'Queen of Entomologists' Part 2: Mrs Hutchinson and the golden Comma .....	486: 188-91
Reflections on an evolutionary paradigm: the case of the Peppered Moth (Lepidoptera: <i>Biston</i> <i>betularia</i> Linn.).....	482: 15-22
Reflections on the Pale-lemon Sallow <i>Xanthia ocellaris</i> (Borkhausen, 1792).....	483: 61-63
Sugaring for Red Underwings ( <i>Catocala nupta</i> ) .....	483: 49
<b>Malta</b>	
Insects in Malta: Summer 2007 .....	484: 108-112
<b>Mantodea</b>	
Mantids found in this area - an update for 2008.....	483: 48-49
<b>Methodology</b>	
Sugaring for Red Underwings ( <i>Catocala nupta</i> ) .....	483: 49
<b>Mimicry</b>	
Bright defensive colour patterns of insects, Part 1: The conundrum of the evolution of true warning colouration .....	482: 2-14
<b>Obituaries</b>	
Prof. Michael Majerus .....	ICN 58: 11-12
William Parker.....	ICN 58: 10-11
<b>Odonata</b>	
A checklist of the dragonflies (Odonata) of Corfu (Kérkira) including a new record for the Ionian Islands, the Black Pennant <i>Selysiothemis nigra</i> (Vander Linden, 1825) .....	485: 136-44
Hines Emerald Dragonfly in the USA.....	ICN 60: 11-12
Photographing Damselflies .....	483: 77-78
<b>Orthoptera</b>	
A checklist of the Orthoptera and allied insects of Corfu (Kérkira).....	485: 152-60
The Great Green Bush-cricket <i>Tettigonia viridissima</i> in 'old' Cambridgeshire .....	484: 101-107
<b>Parasitism</b>	
A primary gregarious egg parasitoid (Hymenoptera: Chalcidoidea, Trichogrammatidae) of the Small Skipper ( <i>Thymelicus sylvestris</i> ) .....	482: 23
Late developing Ichneumon .....	483: 79
<b>Photography</b>	
Butterfly photography .....	483: 63
Photographing damselflies .....	483: 77-78
<b>Plants</b>	
Misleading claims about ragwort .....	ICN 60: 7-9
<b>Pollination</b>	
£10 million initiative to tackle bee and pollinator decline in the UK .....	ICN 59: 5

**Pesticides**

Neonicotinoid pesticides: proposal for a ban in the UK.....ICN 60: 5-7

**Pollution (see also: Pesticides)**

Reflections on an evolutionary paradigm: the case of the Peppered Moth (Lepidoptera: *Biston betularia* Linn.).....482: 15-22

Riverfly monitoring.....487: 238-39

**Research notes**

House sparrow research in relation to invertebrates .....ICN 59: 11-12

**Scotland**

New strategy for insect conservation in Scotland .....ICN 58: 2

**Spain / Portugal**

Butterflies in Benidorm .....487: 254-55

Letter from Spain: 7th in a series: Spanish winter butterflies: a further update .....484: 96-97

Mantids found in this area - an update for 2008.....483: 48-49

**Survey**

Detection rates of adult male and larval Glow-worms *Lampyris noctiluca* from transect sampling.....  
.....484: 118-19

Exciting opportunity to carry out survey work on Headley Heath!.....484: 88-89

Moths count event, 28-29 June 2008, Margrove, Tees Valley, Cleveland, North Yorkshire.....  
.....483: 56-60

**Thailand**

Light and sheet in the mountains of Thailand.....483: 64-69

**Trade**

*Actias luna* .....487: 252-53

**UK**

Exciting opportunity to carry out survey work on Headley Heath!.....484: 88-89

**USA**

Hines Emerald Dragonfly in the USA.....ICN 60: 11-12

## INDEX TO SCIENTIFIC NAMES:

[bot] = Botanical sp. [orn.] = Ornithological sp

### A

<i>Acherontia atropos</i> .....	482: 31-32
<i>Actias luna</i> .....	487: 252-53
<i>Alfalfa</i> [bot.] .....	483: 70-76
<i>Anthocharis cardamines</i> .....	483: 42-45
<i>Apatura iris</i> .....	483: 46-47
<i>Austropotamobius pallipes</i> .....	ICN 58: 3 ICN 59: 12-13

### B

<i>Biston betularia</i> .....	482: 15-22.
-------------------------------	-------------

### C

<i>Callimorpha dominula</i> .....	486: 174
<i>Catocala nupta</i> .....	483: 49
<i>Celypba lacunana</i> .....	486: 180
<i>Cerambyx cerdo</i> .....	484: 122

s

### D

<i>Dinocampus coccinellae</i> .....	486: 178
-------------------------------------	----------

### E

<i>Epipactis helleborine</i> [bot.] .....	487: 251
<i>Eupithecia insigniata</i> .....	484: 113-16, 486: 188-91
<i>Eutanyacra glaucatoria</i> .....	487: 241-42

### H

<i>Harmonia axyridis</i> .....	486: 175-80
<i>Hirudo medicinalis</i> .....	ICN 58: 5-6
<i>Hyacinthus</i> [bot.] .....	486: 209

### I

<i>Ilcbneumonidae</i> .....	483: 79, 487: 241-42
-----------------------------	----------------------

### L

<i>Lampides boeticus</i> .....	484: 98-99
<i>Lampyrus noctiluca</i> .....	484: 118-20, 484: 120-21
<i>Lycia zonaria</i> .....	483: 69

### M

<i>Medicago sativa</i> [bot.] .....	483: 70-76
<i>Meloe violaceus</i> .....	484: 121

### N

<i>Nyctelia fitzroyi</i> .....	483: 80
<i>Nymphalis antiopa</i> .....	484: 100

### O

<i>Ophrys apifera</i> .....	486: 180
-----------------------------	----------

**P**

<i>Panagaeus cruxmajor</i> .....	ICN 59: 6
<i>Passer domesticus</i> [Orn.] .....	ICN 59: 11-12
<i>Phlogophora meticulosa</i> .....	482: 22
<i>Pieris napae</i> .....	483: 50-53
<i>Polygonia c-album f. hutchinsoni</i> .....	486: 188-91

**R**

<i>Rhagonycha fulva</i> .....	487: 251
-------------------------------	----------

**S**

<i>Scoliopteryx libatrix</i> .....	484: 100
<i>Selysiothemis nigra</i> .....	485: 136, 137, 140, 142
<i>Senecio jacobaea</i> [bot.] .....	ICN 60: 7-9
<i>Somatochlora bineana</i> .....	ICN 60: 11-12
<i>Sphinx ligustri</i> .....	484: 117

**T**

<i>Tettigonia viridissima</i> .....	484: 101-107
<i>Trichogramma</i> .....	482: 23
<i>Thymelicus sylvestris</i> .....	482: 23-30

**V**

<i>Vanessa atalanta</i> .....	484:100
<i>Vespa crabro</i> .....	484:100

**X**

<i>Xanthia ocellaris</i> .....	483: 61-63
--------------------------------	------------



