

Bulletin of the Royal Entomological Society Spring 2011 Volume 35 (2)

antenna



**NIW PHOTOGRAPHY COMPETITION
ORGANIC SELECTIONISTS**

meetings of the society

for more information on meetings and contact details see meetings page on www.royensoc.co.uk

2011

- March 31 Medical & Veterinary Entomology Special Interest Group
Venue: The Linnean Society, London
Convenors: Prof. Stephen Torr
Prof. Steve Lindsay
Dr Mary Cameron
- Apr 13 South-East Regional Meeting
Venue: Brogdale Farm, Faversham, Kent
Convenor: Mr John Badmin
- May 12 Conservation Special Interest Group
Venue: Rothamsted Research, Harpenden, Herts.
Convenor: Dr Alan Stewart
- June 1 **RES Annual General Meeting**
Venue: Venue: The Mansion House, Chiswell Green Lane, St Albans
- June 30 Northern Irish Regional Meeting
Venue: Ulster Museum
Convenor: Dr Archie K. Murchie
- Jul 3 Insect Festival
Venue: York Museum Gardens, York
Convenor: Mrs Julie North
- Sept 7-9 Ento'11 Symposium on 'Chemical Ecology' and National Meeting
Venue: University of Greenwich, Medway Campus, Chatham Maritime, Kent
Symposium Convenors: Profs David Hall, Bill Hansson & John Pickett
National meeting convenors: Dr Gabriella Gibson & Prof David Hall
- Sep 14-16 A joint meeting with the Soil Ecology Society
Venue: The National Marine Aquarium, Plymouth
Convenor: Prof. Rod Blackshaw
- Sep 21 Aphid Special Interest Group
Venue: James Hutton Institute (formerly SCRI) Dundee, Scotland
Convenors: Drs Brian Fenton, Gaynor Malloch, Jorunn Bos & Jon Pickup
- Oct (tbc) Sustainable Agriculture Special Interest Group
Convenor: Dr John M Holland
- Nov 2 (tbc) Orthopterists' Special Interest Group
Venue: Natural History Museum
Convenors: Dr. David Robinson
Mrs Judith Marshall
- Nov 10 Biology of Lepidoptera
Venue: Rothamsted Research, Harpenden, Herts.
Convenors: Dr Jason Chapman
Dr James Bel

2012

- Feb 1-2 Postgraduate Forum
Venue: Liverpool (tbc)
Convenor: Mr Steven Parratt
- Mar 7 Verrall Lecture
Venue: Flett Lecture Hall, Natural History Museum
- Jun 6 **RES Annual General Meeting**
- Jun 25 – 1 Jul **National Insect Week**

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COVER PICTURE

NIW Week 2010 Riverfly photo competition winner “Mayfly at sunset” – see page 61

Photograph by Danny Beath

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EDITORIAL



I recently had the pleasure of receiving a letter from a six year old boy from a local school. His class was involved in a writing project, where they wrote to people in different professions, asking about what they did and why. I wrote back, saying that I studied insects, I looked for them in different places, watched what they did and how they did it and I counted them. I also said there were lots of different types, ranging from those that looked beautiful through to those that looked like “aliens”, and they did lots of useful things for us, like producing honey and pollinating crops and flowers. I don't

want a discussion about what I should or should not have said, but this does illustrate some of the themes in this Antenna; namely the beauty and the beast nature of insects, their importance, outreach and those who study them.

Our President, Stuart Reynolds, discusses why insects are important, focusing on how many insects there are. Stuart's article does make the point that insects are everywhere and so everyone should take notice in one way or another. Diversity is illustrated by the article on the Neotropical butterfly park, which also specialises in education. Outreach is further emphasised through the fun report on the insect film festival at Plymouth, introduced by Nick Baker and attracting a large number of children and their parents. The meeting reports include the Global Conference on Entomology and the recent Medical and Veterinary Special Interest Group, both representing a diversity of interests and a very important outreach activity of the Society. Dick Vane-Wright, in his article on the Organic Selectionists, reminds us of the central role insect have played in understanding selection and evolution, particularly the importance of *Drosophila* and the dedication of initially a few entomologists.

It is with great pleasure that we feature the winners and runners up in the National Insect Week 2010 photographic competition. The images are stunning and congratulations to the winners, the runners up, the highly commended and everyone who took part. I know the judges had a very hard time in choosing the winners in each of the categories. These photographs do show how beautiful, unique and, let's face it, weird, some insects can look. They also prove that insects are a great subject for photographers.

Following on, what are you doing for National Insect Week 2012? Come on; get involved, we all have something to offer. There is a theme of diversity and all the details are on the NIW website; <http://www.nationalinsectweek.co.uk/>. From personal experience, it is great fun getting involved with NIW, so start making your plans now.

We always welcome comments, letters, suggestions for themed issues and of course articles. We can be contacted on antenna@royensoc.co.uk and we look forward to hearing from you. In the autumn we are aiming to have a special issue on climate change, so if anyone has any thoughts, comments or articles they wish to submit, please do.

Greg Masters

CORRESPONDENCE

Dear Editors,

I took the three attached pictures of a sawfly larvae in my Cambridgeshire garden last year, they were on a Cape Fuchsia plant. I cannot tell the species as I am only a novice, please could you or a member of the Society help me. (Please reply to the Editors at Antenna@royensoc.co.uk)

Yours sincerely,
Colin Matthews



Insects by Numbers



Stuart Reynolds

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Most people who will read this column are entomologists of one sort or another, and are presumably already committed to being very interested in, possibly totally obsessed with insects. I have plenty of sympathy with that. I really like insects too! Lots of us were first attracted to insects because butterflies, hawkmoths, hoverflies, leaf beetles, lacewings, damselflies (or whatever) are simply beautiful. Even cockroaches (well some of them) have their fans.

But there has to be more to it than that. We'd all like to think that insects are important. But can we justify that?

In my first column for *Antenna*, I'll begin by saying that insects are important because there are so many of them. Because they occur in such large numbers, insects are major players at every level in almost all terrestrial and freshwater ecosystems. Some are consumers of plant primary production, others are predatory carnivores, parasites, and parasitoids that prey upon (mostly) other insects. And some are scavengers utilising the dead remains and waste products of other animals (mostly other insects of course). Still other insects farm herds of aphids (they are insects too) or cultivate fields of fungi. Not infrequently their ecological impact spills over into our own affairs so that we consider some insects to be agricultural pests. Some of us who have to persuade the taxpayer to support our careers as entomologists have successfully argued that insects deserve

attention because they eat our grub, carry the diseases of our crops and our animals, or make holes in our woolly jumpers (I had better confess here that the President of the Royal Entomological Society currently has an outbreak of *Tineola bisselliella* at home...). And of course some are also vectors of serious human diseases like malaria and plague.

I was intrigued to read that Bert Hölldobler and Edward O Wilson (2009) guessed that there might be as many as 10^{15} - 10^{16} ants alive in the world at any one time, so I decided to do a few more (obviously somewhat rough and ready, perhaps even naïve) sums of the same kind.

It's true that the social insects so dear to Hölldobler and Wilson can be particularly prolific. Like humans, their social organisation has in some cases enabled them to live in very large societies. Eusocial bees (especially honey bees) and wasps are the paradigm for studies of colony size, and honey bee societies can be large (around 50,000 individuals at the seasonal peak), but the nests of termites and ants are much bigger. The invasive Formosan subterranean termite, *Coptotermes formosanus*, has particularly large colonies. According to Su and Scheffrahn (1988) in New Orleans, Louisiana, USA, colonies can contain up to 6.8×10^6 individuals. Despite not having a physical "home" doryline army ant colonies are particularly huge, and those of the African driver ants (*Dorylus* spp.) can reach estimated sizes of 1.5×10^7 individuals (Schneirla, 1971).

The record for the largest single ant society seems to be held by the invasive Argentine ant, *Linepithema humile*, which in the course of its unwelcome spread throughout the world has established a limited number of immense "supercolonies". Each comprises many individual ant nests, but because they are all closely related, the ants behave as though they were all members of a single society. In the best studied example (Giraud *et al.*, 2002), hundreds of nests along a 6,000 km stretch of Mediterranean and Atlantic coasts in Portugal, Spain, France and Italy all belong to a single supercolony that contains millions (multiples of 10^6) of individual nests and queens, and billions (multiples of 10^9) of workers. Giraud *et al.* have proposed that this extraordinary population genetic structure arose not as a result of a

previous genetic bottleneck, but through a process of “genetic cleansing” associated with rapid population expansion into an enemy-free environment.

But there are plenty of other insects that need big numbers to describe their population sizes. In their wartime study of English pasture land, George Salt and Frank Hollick (1949) found that the population density of elaterid beetle larvae can be as high as 2.5×10^6 ha⁻¹. With 3.8×10^6 ha of permanent pasture (DEFRA, 2010) that means there might be as many as 10^{14} wireworms in England alone. The total area of permanent pasture in the world is 3.3×10^9 ha (FAOStat, 2011) indicating that if wireworms occurred at this level everywhere, then there would be $\sim 2.2 \times 10^{16}$ of them in the world.

There are plenty more examples like this. Lake Myvatn (literally “Midge Lake”) in Iceland is famous for its chironomid midges (mostly *Tanytarsus gracilentus*). Gardarsson et al. (2004) operated window traps (the size of the window was 20 x 20 cm) over a 20 year period and found that one of these traps in a particularly midgy place caught an average of 161,000 midges each season. It’s hard to turn this into absolute numbers, but the area of Myvatn is 37 km², so that if this was the

chironomid density over the whole surface of the lake, the total number of midges per year would be 1.5×10^{14} . I’m not even going to try to estimate the area of midge-infested eutrophic lakes, and thus the number of midges in the world, but it’s obviously a lot.

If I were going to wager on the winner of the title of world’s most common insect, then surely it must be a member of the Order Collembola (springtails). Robert Eaton (2006) found up to 7000 collembolans m⁻² (i.e. 7×10^7 ha⁻¹) in the leaf litter under a loblolly pine plantation in North Carolina, USA. The estimated area of forest in the world in 2008 (FAOStat, 2011) was 4×10^9 ha, meaning that there could be as many as 2.8×10^{17} collembola just in the leaf litter of the world’s forests. But springtails are even more numerous in soil. Steve Hopkin (1997) gave a figure of 40,000 – 200,000 collembolans m⁻² in the soil of temperate grassland. Taking the median figure of 120,000 m⁻², and using the FAO figure quoted above for world pasture area, but ignoring possible differences between tropical and temperate permanent grassland, we get an estimate of around 4×10^{20} springtails in the world.

Just to put a bit of perspective on this astronomically large figure, the current world population of humans is

estimated by the United Nations (probably rather accurately) to be 7.1×10^9 people. That means there must be around 6×10^{10} springtails for every person. Since each collembolan is in the order of 1 mm long, that means that each person on earth could have (if they wanted) their own personal nose-to-tail queue of springtails roughly 6×10^4 km long. That’s about 1.5 times the circumference of the earth at the equator (4.0×10^4 km).

The almost ridiculously large numbers that I have presented above are mostly the consequence of the fabulously prolific style of insect reproduction. Glenn Herrick (quoted in Sabrosky, 1952) estimated that if left unmolested by predators and disease, the progeny of one cabbage aphid (*Brevicoryne brassicae*) in one season in a New York State cabbage field would amount to 1.56×10^{24} individuals! Obviously aphid numbers don’t ever really grow to this extent, but you can see the point.

Figures like this ought to help us entomologists persuade others that knowing about insects and their ways is not a luxury. Thomas Eisner said (reported by Holden, 1989) “Bugs are not going to inherit the earth. They own it now.”

Next time: insect diversity.

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Whatever happened to the Organic Selectionists?

ARTICLE

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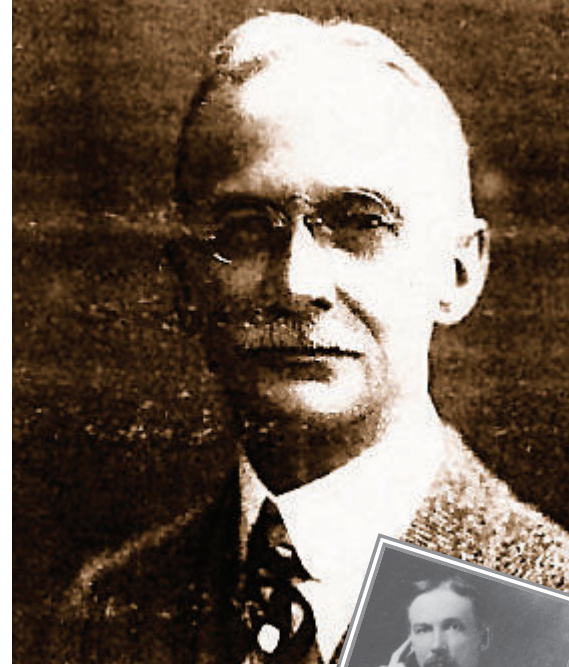


Dick Vane-Wright is an Honorary Fellow of the RES, Honorary Professor of Taxonomy at the Durrell Institute of Conservation and Ecology (University of Kent), and a Scientific Associate of the Natural History Museum, London. His interest in genetic assimilation was first sparked as an undergraduate, when he bought a battered second-hand copy of Waddington's *Strategy of the Genes* from the former H.K. Lewis lending library at 136 Gower Street, London W.C.1. Forty-five years later it is still in use.

In summer 1908 Professor James Mark Baldwin was arrested during a raid on a Baltimore brothel. This ended his career at John Hopkins University – he fled to Paris in disgrace – and may have changed the course of evolutionary thinking during the 20th century.

By the end of the 19th century the ideas of Jean-Baptiste Lamarck on the inheritance of acquired characteristics were still being debated. One of the alternative approaches to the problem of inheritance, behaviour and evolution was that of the organic selection movement, which embraced the ideas of Conway Lloyd Morgan, Henry Fairfield Osborn and, especially, James Mark Baldwin. The suggestion was that individual learning could guide the evolutionary process. Learnt abilities that positively affected fitness would be replaced in subsequent generations by inherited mechanisms that saved the cost of learning – thus behaviours initially acquired by learning could later become instinctive. This was not conceived as happening by a direct, Lamarckian mechanism, but by an indirect “screening” effect, such that individuals that more readily exhibited the behaviour, or performed the behaviour more effectively, would be favoured by selection (Corning, 1983: 38).

This two-step process, involving a sequential dynamic between the benefit of learning and its cost, could be repeated again and again, so that the growing instinctive knowledge (or intelligence) that the organism had about managing effective interactions and relationships within normal and (within limits) abnormal environments, could be the basis for progressive, adaptive evolution. Such evolution would not be random – even though, for heritable change, as we now know, it would ultimately be dependent on mutation and genetic recombination.



James Mark Baldwin has been called “the first great developmental psychologist in modern history” (Ken Wilber, *Integral Psychology*, Shambhala, Boston Mass., 2000) but unlike Morgan, and as these grainy images seem to attest, Baldwin's place in the pantheon of evolutionary biologists seems less secure. Even so, one of the most outspoken evolutionary commentators has offered respect for “the Baldwin Effect” (Dennett, 1995: 77–80, 322–323).

These ideas have had a strong and continuing impact in psychology and cognition (e.g. the work of Jean Piaget, and his ideas on mental ‘assimilation’ and ‘accommodation’), but by the time of Baldwin's dismissal from John Hopkins, the mainstream of evolutionary biology had already turned elsewhere. More realistically than the impact of Baldwin's clandestine sex-life, the organic selection movement had already been derailed by the triple rediscovery of Mendel's laws – by Hugo De Vries (1900), Carl Correns (1900), and Erik von Tschermak (1900) – and in the wake of this, the rise of mutationism.

Baldwin was first and foremost a psychologist and philosopher, and DeVries, Correns and von Tschermak were all botanists. However, at precisely this period a crucially important insect entered the game: *Drosophila (Sophophora) melanogaster*. Charles W. Woodworth is believed to be the first person to breed *Drosophila* in large numbers, in 1900-1901, during a brief period at Harvard. The potential was seen by Harvard colleague William E. Castle, an embryologist inspired by the rediscovery of Mendel's work to become a geneticist. Castle was later



Thomas Hunt Morgan was born at Hunt-Morgan House, Gratz Park, Lexington, Kentucky, on 25th September 1866. This “many-sided leader in biology’s advance” is suitably commemorated close by, on Lexington’s North Broadway. Photographs: R.I. Vane-Wright.

the supervisor of Sewall Wright, but it was another of his students, F.E. Lutz, who is credited with introducing Thomas Hunt Morgan to the idea of using *Drosophila*.

In 1904 Morgan was appointed to the new Chair of Experimental Zoology at Columbia University. Convinced by Edwin Wilson, cytologist and Chair of the Department, that the key to understanding development lay in understanding heredity, Morgan started to work on rats and mice – but found they reproduced too slowly. Apparently at the suggestion of Lutz, in about 1907 Morgan switched to *Drosophila*. Initially little of note seemed to happen but, after about eighteen months, striking mutants started to appear in his cultures. His investigations of these, by breeding literally millions of flies in the laboratory, opened the way to numerous fundamental discoveries in genetics, including the linear arrangement of genes along the chromosomes, and of linkage (see, e.g., Morgan et al., 1915).

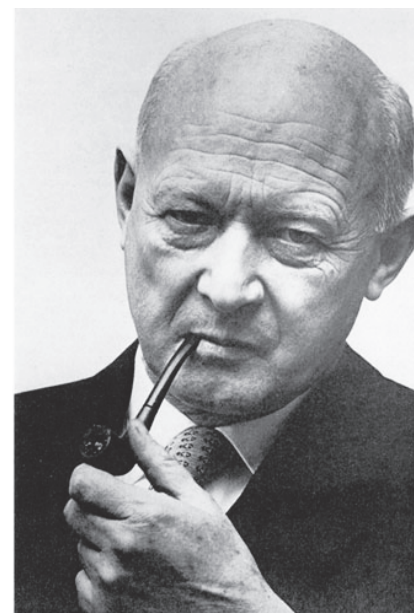
Morgan was so impressed by the impact of mutations in his *Drosophila* cultures that he lent his increasingly powerful voice (he was awarded a Nobel Prize in 1933) to the idea that Darwinian natural selection was of little or no consequence in the origin of species. The idea that new species arose abruptly, by mutation, had been put forward by De Vries as early as 1901, and was criticised by Baldwin in print even the following year (Baldwin, 1902: 33) – but to little avail. Over the first three decades of the 20th century the mainstream view became that genes, and their mutations, drove evolution and the origin of species, not

natural selection. Of course, some held out against this view – among the entomological fraternity most notably Sir Edward Bagnall Poulton, President of the RES on three occasions during this period.

Eventually, however, the views of Poulton, and more critically the emergence of ecology and population genetics in the hands of Charles Elton, Theodosius Dobzhansky, Sewall Wright, J.B.S. Haldane, Ronald Fisher, Ernst Mayr and Julian Huxley, among many others, led to a resurgence of interest in natural selection and its role. During the mid 1930s to 1940s this produced what is essentially the normal-science view of today, the modern evolutionary synthesis – often referred to as neo-Darwinism. This view is gene based, and in many ways it had to be – the mutationists had made huge strides in understanding the mechanisms of heredity, and this could not be denied. It is surely significant that Julian Huxley dedicated his highly influential *Evolution. The Modern Synthesis* to none other than T.H. Morgan, “many-sided leader in biology’s advance” (Huxley, 1942: v).

So, what of the organic selectionists in all of this? Even though briefly mentioned with apparent approval by Huxley (1942: 304), they had become little more than a footnote. However, not all was lost. Simpson (1953) reignited interest in organic selection by calling it the “Baldwin effect” – although insisting that the mechanism did not really differ from conventional natural selection. What is also now seen by some as an important contribution came from Colin Pittendrigh, a Tynesider who worked on mosquitoes and malaria transmission in Trinidad

during WWII. He went on to become a founder of chronobiology and the study of circadian rhythms – the importance of which had been impressed upon him by his mosquito work. Pittendrigh found it necessary to introduce the term *teleonomy* to acknowledge the quality of apparent purposefulness seen in living organisms without ascribing, as in *teleology*, any notion of conscious purpose, intention or foresight (Pittendrigh, 1958). Following this lead, some famous evolutionary



Conrad Hal Waddington (1905–1975). Waddington’s view of biology was that it is intrinsically complex, and that in order to deal with it realistically, it was necessary to develop appropriate ways for thinking about complex systems as such. He also had a sense of humour – in *Tools for Thought* (C.H. Waddington, 1977, Paladin) he famously introduced COWDUNG, to stand for Conventional Wisdom of the Dominant Group – something he was always keen to be rid of!

biologists, perhaps most notably Jacques Monod (1971), have embraced his term – and the spirit of the distinction intended – to affirm that the capacities (Walsh, 2006) of whole organisms are of fundamental importance in organic evolution.

During this same period, C.H. Waddington (e.g. 1953) began to explore organic selection within the emergent framework of cybernetics and systems theory. Quoting Huxley's (1942) reference to Baldwin, Waddington (1957: 164) pointed out that, unless a non-Lamarckian link could be demonstrated between the plastic emergence of the novelty (e.g. new behaviour), and the subsequent emergence of genetic factors in the population that produce the same or similar phenotypic trait, then organic selection is trivial. It depends either on Lamarckism and is therefore wrong, or on normal selection and is therefore redundant.

Waddington was interested in the possibility mutation might not always be random, and could in some way be potentiated by feedback from an environmental stimulus. He pursued this through his ideas on developmental “canalisation” and potential remodelling of the “epigenetic landscape” (Waddington, 1957). These notions gave rise to what Waddington termed “genetic assimilation” – a process related to but more sophisticated than organic selection with respect to how the initially acquired trait would become fixed genetically. He investigated this by experiments on development in *Drosophila* under various forms of environmental stress, and was able to interpret some of his results in terms of his novel idea. He concluded at one point: “Organismic thinking has some contributions to make to evolutionary theory, as a complement to the atomistic outlook, whether that is put in terms of simple causation or of random chance.” (Waddington, 1961: 98.)

What is the current status of the Baldwin effect, teleonomy and genetic assimilation? Interest remains very active (e.g. Wcislo, 1989; Turney et al., 1996; Eshel & Matessi, 1998; Weber & Depew, 2003; Grether, 2005; Crispo, 2007, 2008; Aubret & Shine, 2009; Auletta, 2010; Otaki et al., 2010) but, to some extent, controversial (e.g. de Jong, 2005). Pigliucci et al. (2006: 2366) suggest that resistance may be

due to a misconception that these ideas constitute “a threat to the Modern Synthesis”, whereas they are instead “a welcome expansion of its current horizon”. Even so, the notion that these ideas are potentially “subversive” should be countenanced – insofar as they may reflect a shift from modernism to post-modernism (Kull, 2004).

Regardless of whether some special mechanism (e.g. genetic assimilation) is necessary, or if ‘conventional’ natural selection is all that is required (as Huxley, Simpson and Mayr all claimed), a considerable weight of opinion now favours the idea that behaviour plays a key role in the evolution of populations and species (e.g. West-Eberhard, 2003; Bateson, 2004, 2005; Corning, 2005). Thus, although mutation may be random, the direction of evolution is not, as it is often shaped by the emergence of novel plastic behaviour, notably when faced with new environmental challenges, within the framework of an organism’s inherited behavioural/phenotypic repertoire. “Adaptive evolution is a two-step process: first the generation of variation by development, then the screening of that variation by selection.” (West-Eberhard, 2003: 139.) “The decision-making and adaptability of the organism is recognized as an important driver of evolution and is increasingly seen as an alternative to the gene-focused views.” (Bateson, 2005: 31.) There has been “A flood of publications on the role of behavior, social learning, and cultural transmission as pacemakers of evolutionary change” (Corning, 2005: 1.)

Perhaps the greatest interest in these systems lies in the relationship between individual learning and racial instinct, and its impact on evolution, including human evolution (Weber & Depew, 2003; Corning, 2005). This was recognised very early by the organic selectionists: “We reach a point of view which gives to organic evolution a sort of intelligent direction after all; for of all the variations tending in the direction of an instinct, but inadequate to its complete performance, *only those will be supplemented and kept alive which the intelligence ratifies and uses for the animal’s individual accommodations.* The principle of selection applies strictly to the others or to some of them. So natural selection eliminates the others; and the *future development*

of instinct must at each stage of a species evolution be in the directions thus ratified by intelligence.” (Baldwin, 1902: 69; emphases original.)

Long ago on the flyleaf of the copy of Baldwin (1902) held in the Linnean Society of London library, someone wrote: “Highly metaphysical throughout. Endless discussions that lead to nothing!” Baldwin’s book is certainly not light reading, and one could have sympathy with such a view. However, for a considerable number of well-informed contemporary biologists, this is certainly not the case. In an evolutionary world apparently divided, at least in the public eye, between the Young Earth creationists and Intelligent Design movements on the one hand, and those of the neo-Darwinist persuasion still emphasising a view that evolution is driven by random genetic changes and a “blind, algorithmic process” (Dennett, 1995: 59) on the other, there is surely a need to continue investigating Baldwin’s ‘third-way’: the role of the organism’s own behaviour as a key ‘creative’ factor in the evolutionary process.

For those interested in the current status of the organic selection movement, the Linnean Society of London is holding a one-day international symposium on 8th September 2011: *The role of behaviour in evolution – “organisms can be proud to have been their own designers”*. The eight speakers will be Peter Corning (Institute for the Study of Complex Systems), Denis Walsh (Philosophy of Biology, Toronto), John Dupré (Philosophy of Science, Exeter), Sir Patrick Bateson (Animal Behaviour, Cambridge), Anne Magurran (Ecology & Evolution, St Andrews), Gregory Grether (Ecology and Evolutionary Biology, UCLA), Birgit Arnholdt-Schmitt (EU Marie Curie Chair, Évora, Portugal), and Kalevi Kull (Biosemiotics, Tartu, Estonia) – Kull’s (2000) paper being the inspiration for the meeting’s subtitle.

In addition to the Linnean Society, the meeting is being sponsored by the Royal Entomological Society, the British Ecological Society, and the Natural History Museum. Anyone interested in more details about the programme should contact the author of this note. Anyone interested in attending the meeting should contact Claire Inman at the Linnean Society (Claire@linnean.org).

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NIW Photography Competition 2010

We launched our third Photography Competition during National Insect Week 2010 and received several hundred entries, almost all of very good quality, in the two main categories of 18-plus and Under-18 and in the bonus category of Best Riverfly Photograph.

The Riverfly category was co-sponsored by the Riverfly Partnership.





FIRST PRIZE 18 plus.
Emerging crane fly by Danny Beath



SECOND PRIZE 18 plus.
'Observer' – *Formica* sp. by Pawel Bienewski



FIRST PRIZE under 18.

Beauty from the beast – a southern hawker by Sam Baylis



SECOND PRIZE under 18.

Broad-bodied chaser (*Libellula depressa*) rests in the golden sunlight by Ruth Carter



FIRST PRIZE – RIVERFLY CATEGORY

Mayfly at sunset by Danny Beath



SECOND PRIZE – RIVERFLY CATEGORY

Matfly on water by Lance Ostler



Figure 1 (above): The flight area of the “Neotropical Butterfly Park”.

Figure 2 (below): One of the greenhouses, where large amounts of food plants for caterpillars are grown.



Focus on education: The “Neotropical Butterfly Park” in Suriname

ARTICLE

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Photos: Amira Mendieta-Eriks



Torsten van der Heyden was born in Hamburg in 1959. His special interest in Lepidoptera started during his studies at the University of Hamburg – especially during several field trips. He wrote a thesis on migrational behaviour of different Lepidoptera species. After finishing his studies he worked as a biologist in Butterfly Houses in Germany and on the Canary Islands/Spain in the late eighties. On the Canary Islands he did research on several species of Lepidoptera and Heteroptera. Since then he has published various papers and articles – especially on butterfly migration, the biology, ecology and distribution of butterflies. From 1999 until 2006 he lived and worked in Costa Rica. Today he lives in Hamburg where he is working as a teacher of Biology and Geography. He is a member of various societies and associations: Royal Entomological Society (FRES), The Linnean Society of London (FLS), Deutsche Forschungszentrale für Schmetterlingswanderungen, Entomologischer Verein Apollo e. V., Deutsche Gesellschaft für allgemeine und angewandte Entomologie e. V., Sociedad Hispano-Luso-Americana de Lepidopterologia, Asociación española de Entomología, Real Sociedad Española de Historia Natural, Societas Europaea Lepidopterologica and Fotografía y Biodiversidad.

Back in 1996 Amira Mendieta-Eriks, who originally comes from Ecuador, and her husband Ewout Eriks, who studied Tropical Agriculture in the Netherlands, started their butterfly business “Neotropical Insects” in Lelydorp (district Wanica), a village near Paramaribo, the capital of Suriname, located in the coastal northern part of South America.

The main focus of “Neotropical Insects” was and still is the professional breeding of tropical butterflies and the export of pupae – mainly to the United States. Twenty-two butterfly species of Suriname are reared at “Neotropical Insects”.

Information and education have become another main focus of the owners of that business since last year, when the “Neotropical Butterfly Park” was officially opened on July 16th, 2010 in Lelydorp. All butterflies shown in the flight area are reared in the breeding facilities of the sister company “Neotropical Insects”.

The main purpose of the butterfly park is to provide an educational facility for tourists – from Suriname and abroad – and for pupils from the neighbourhood: Especially children from the Elementary School of Lelydorp who visit the “Neotropical Butterfly Park” to learn more about the life of these insects.

“Usually they get the lesson about the butterfly at school but due to the lack of materials the schools organize school trips to the Butterfly Park. At the park the children get a tour around the farm, where they get to see real life butterflies, eggs, caterpillars, pupae and the lifecycle of a butterfly and learn about the butterfly anatomy”, stated Amira Mendieta-Eriks.

Besides, the “Neotropical Butterfly Park” offers a hand-painted 3 metres high and 40 metres long realistic

panoramic view of typical landscapes of Suriname, an educational space, an expo area and an insect museum. “In the insect museum there are all kinds of insects that one can find in Suriname. It is also important for the children to know which kinds we have in Suriname”, said Amira Mendieta-Eriks.

Thinking ahead, Amira Mendieta-Eriks and her crew at the “Neotropical Butterfly Park” have another dream: “At the moment we can’t afford to do research, maybe in the future...”



Fig. 3: A guide from the park explains the different kinds of pupae, colour, size and camouflage to a group of pupils.



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Bugs on Camera

- A celebration of insects in the movies -

ARTICLE

On January the 9th the University of Plymouth hosted a festival of insect films in their Jill Craigie cinema and the adjacent cavernous crosspoint atria. While this may be the first such venture in the UK it was inspired by May Berenbaum's legendary Insect Fear Festival that she runs each year at the University of Illinois in the USA. Now in its twenty-eighth year I believe.

The festival was opened by the presenter and author Nick Baker who gave an enthusiastic talk which ranged from his early experiences with woodlice to his travels in South America. Caught up in the heady entomological atmosphere he then stayed on to enjoy the rest of the day.

The first films were the family friendly Disney Pixar animation *Bugs Life* and an episode from the *Smalltalk diaries* series. The diaries were short films of real insects with a humorous voice over that discussed the biology of the insects on screen. The series was made for CBBC by Ammonite, a Bristol based production company who had engaged entomologists to ensure the biology was accurate.

Before the films began to roll a range of stands and activities were on offer in

the Crosspoint atria. The now world famous Dartmoor zoo brought a range of invertebrates along which were supplemented by an exotic collection of arachnids and insects supplied by local entomologist Mike Jope. Plymouth City Museum had a display of insect cabinets from their collection, the University bookseller offered a range of entomological titles and the Devon based company Edible Unique had insect snacks and jewellery for sale. There were also a series of stands from organisations such as Buglife, Butterfly Conservation, the Royal Entomological Society, the British Science Association and the Bug Club.

Students from the biology department offered hands on activities including bug building, face painting, mask making, insect brass rubbing and invertebrate jigsaw puzzles.

The crosspoint atria hummed with activity as hundreds of children accompanied by eager parents toured the stands while waiting for the first movie. Strange and curious faces appeared and many members of the audience had dressed for the occasion bringing a range of entomological fashions to the afternoon.



Peter Smithers

School of Biomedical and
Biological Sciences,
University of Plymouth



The second cinema slot began with the short film *While Darwin Sleeps*. This was a visual exploration of the vast range of size and morphology exhibited by insects. Individual insects in museum collections were photographed and these images were strung together to produce an animation that tracks across the forefront of insect evolution. The main film was the 1950's ant horror movie *THEM*, a Frankensteinian tale of giant ants emerging in the desert following the atom bomb test ten years earlier. The author gave a brief introduction to the film its historical context and the biology behind it.

This was followed by another interval with a bar and the Ento Café which was provided by the Michelin star chef Peter Gorton. Peter set up a kitchen and cooked a mango and cricket risotto which was followed by cricket and mealworm chocolate cake. Both dishes vanished rapidly leaving some diners scraping the bowls to obtain a second serving. Peter talked the audience through the preparation of both dishes while the author chipped in with facts on why and where people around the world ate insects. Following a group photograph of the surviving audience, they settled down for the final film *BUG*. This was a tense and disturbing tale of paranoia triggered by a fear of insects.

The day had been sponsored by the universities Peninsular Arts and the British Science Association. It had been a tremendous success with a stream of requests for another festival next year please. We have a long way to go but we are now in hot pursuit of Mays Bernbaums twenty eight year run.





THE WALLACE AWARD

This award is made annually for postgraduate work leading to a Ph.D degree, with no age limit.

University supervisors are now invited to nominate postgraduate students who have been awarded their PhD during the academic year October 2010 - September 2011, and whose work they considered to be exceptional. The research involved should be a major contribution to the science of entomology. The assessment will be based on the candidate's thesis (which must be in English), plus a one-page submission from the candidate explaining in layman's language how his or her work has "moved entomological science forward"

Nominations should be sent to the Registrar, on a form which is downloadable from the Society's website . The deadline for submissions for this year's Wallace Award is 1st October 2011. Applications should be routed through heads of department. Please do not send any theses or supporting documents until asked to do so by the Registrar.

Comparative assessment of the candidate's work will be done by a panel of Fellows of the Society, and the result will be announced in April 2012. The winner of the Wallace Award will receive a certificate plus a cash sum of £750, and one year's free membership of the Society.

The winner's university department will also receive a certificate. The winner will be invited to give a presentation of their work at an appropriate meeting of the Society.

Meeting Reports

Global Conference on Entomology 2011

5th-9th March 2011

Miss Bobbie Johnson

University of Birmingham
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The global conference on entomology was held in the beautiful surrounds of Chiang Mai, Thailand. After a 30 hour journey from Birmingham, UK, we arrived at the hotel for a much needed sleep before the conference commenced. After having a few problems registering and a bit of a wait, we enjoyed a fantastic Thai opening ceremonial dance, wishing all delegates a successful conference. Professor Michael Samways was the first plenary lecturer and gave an excellent talk regarding landscape conservation in South Africa, afterwards Doctor Mark Benbow on the application of statistics to forensic entomology, Professor Siriwat Wongsiri on the climatic effect on Asian honey bees and Professor Boris Krasnov on the ecology of haematophagous arthropods. After lunch talks were run in six concurrent sessions. Regrettably, a great many of the programmed delegates failed to present their talks leading to confusion over timings. Unfortunately, this led to talks that I had intended to listen to being missed as timings could not be

relied on. As the talks finished early there was enough time to see the breathtaking mountain top temple, Wat Phrathat Doi Suthep, before the evening poster session commenced. After a very pleasant evening, we retired to sleep off the last of our jet lag before the next day of the conference.

Day two commenced with plenary talks from Doctor V.S. Chauhan regarding recent developments in blood stage vaccines of malaria, another excellent talk from Professor Michael Samways on dragonfly conservation and Doctor Rajinder Saini gave a lecture on arthropod traps in sub-Saharan Africa. Due to the amount of people missing talks the previous day the afternoon talks were compiled into three concurrent sessions, though no new revised schedule of talks was devised, leading to another frustrating afternoon of missed talks and opportunities. On the final day plenary lectures were given by lecturers that were either distantly linked to the field of entomology or had been approached to give a plenary lecture on the

previous day. Despite the short notice Doctor Jian Liu gave an informative talk on Bamboo wireworm in China and Doctor Petersen regarding problematic tribal bee farming techniques in South East Asia. Seemingly not learning from the past two days, the afternoon sessions followed much as they had for the previous two days.

The closing meal was very pleasant and provided a good opportunity to talk to delegates whose lectures I had missed over the past three days. On the final day of the conference a tour of a gem factory was organised, which was strange as we were situated next to one of Thailand's best national parks, renowned for its butterfly diversity. Not surprisingly many delegates missed the gem factory tour and opted to spend the day elsewhere. This provided a fitting end to a somewhat disappointing conference, although I did attend some excellent presentations, I cannot help feeling that with a little more organisation this conference could have been much

The Royal Entomological Society's Medical and Veterinary Entomology Special Interest Group

Frances Hawkes

Natural Resources Institute

The Linnean Society at Burlington House, Piccadilly served as the grand and awe-inspiring venue for the March meeting of the Medical and Veterinary Entomology Special Interest Group. It was at a meeting of the Linnean Society in July 1858 that Charles Darwin and Alfred Russel Wallace, both Fellows of the RES, made their first communication of their views on the origin of species by natural selection. Their imposing portraits, along with those of other great naturalists of the Linnean Society, looked down upon proceedings and, over 150 years after their seminal ideas were put forward, it was a pleasure to see the presentation of new and exciting entomological science of a calibre fitting the surroundings. With a theme exploring novel methods of vector control, there was plenty of ground to cover in the fields of tsetse, mosquito and biting midge monitoring and control, in addition to interesting work on flea, tick and bedbug initiatives.

Stephen Torr (Natural Resources Institute) chaired the Veterinary Entomology session, which started the day with a talk by Iñaki Tirados (Natural Resources Institute). This looked at advances in the use of insecticide-treated targets to control the tsetse fly, *Glossina palpalis palpalis*, an important vector of Gambian sleeping sickness in Côte d'Ivoire. The responsiveness of the species to visual stimuli has been exploited in the development of small but effective targets; these offer the prospect of a ten-fold increase in the cost-effectiveness of vector-based interventions against sleeping sickness.

Richard Selby (University of Edinburgh) continued the tsetse theme with a report on a project based in

Uganda. The Stamp Out Sleeping sickness (SOS) intervention undertook a mass treatment of cattle with trypanocides, to target the parasitic cause of sleeping sickness, combined with an application of residual deltamethrin insecticide, to control the vector tsetse population.

Working with *Glossina swynnertoni* and *Glossina pallidipes* from the Serengeti National Park, Tanzania, Harriet Auty (University of Glasgow) outlined some of the difficulties of identifying human African trypanosomiasis in samples of tsetse. Whilst dissections and PCR-based methods offer various advantages and disadvantages when attempting to confirm the presence of the parasite, neither technique is completely accurate. However, field-based estimates derived using either of these methods, or theoretical estimates derived from simulation models, arrived at reassuringly similar results. Perhaps we are closer to an understanding of the real infection rate than we thought?

Moving on to *Culicoides* species, Simon Carpenter (Institute of Animal Health) gave a history of Orbivirus epidemics in India and the particular challenges faced when attempting to control mass periodic outbreaks in a largely subsistence farming community. The 2006/2007 outbreak of bluetongue virus in the UK was used to contextualise these issues and summarise the requirements for future control strategies for *Culicoides*.

Georgette Kluiters (University of Liverpool) wrapped up the session by delivering a presentation describing how the distribution of *Culicoides* bluetongue vectors in Bala, North Wales was modelled using field data

integrated with satellite-derived variables at a spatial scale of 1 km.

Lunch was held in the Linnean Society's library, with tomes both old and new lining the floor-to-ceiling bookcases. With representatives from industry and academia, there were lively discussions regarding the application of vector control strategies, both at home and abroad, and the need for ongoing work to explore vector biology, ecology and behaviour. Three posters were presented during the break and all were well-received by delegates. Geoff Thompson (Queen's University Belfast) and colleagues directly addressed the meeting's theme of vector control strategies by presenting a novel method for on-animal monitoring of adult *Culicoides* species. After testing different coloured sticky traps on heifer backs, they found white and transparent traps caught significantly more *Culicoides* adults than other colours. The poster submitted by Nick Golding (University of Oxford) and colleagues mapped the distribution of possible UK vector mosquitoes species by modelling their ecological niches, with a plan to overlay the resulting risk maps with host distributions. Finally, Frances Hawkes (Natural Resources Institute) and colleagues presented a poster outlining the development and early experimental application of a large wind tunnel in which the flight behaviours of nocturnal mosquito species could be recorded in three dimensions.

The first afternoon session was on Mosquitoes and was chaired by Mary Cameron (London School of Hygiene and Tropical Medicine) and saw the first talk from a European colleague, Sander Koenraadt (University of

Wageningen). Sander joined us from the Netherlands to talk on the use of fungal biopesticides as a green and 'evolution-proof' malaria vector control tool. After testing different formulations, suspensions and delivery mechanisms, results from field trials in Kenya and Tanzania showed a reduction in malaria transmission of around 80% after using entopathogenic fungi, highlighting the potential this approach offers in controlling mosquito vectors.

In the next presentation, Chris Jones (Liverpool School of Tropical Medicine) covered his work on the ever-relevant topic of insecticide resistance in *Anopheles* and *Aedes* mosquitoes. Based on field data from Burkina Faso and laboratory work in the UK, the relationship between ageing and susceptibility to insecticides was explored and the implications of this relationship on resistance discussed.

Efficacy of gravid traps was the focus of the talk given by Seth Irish (London School of Hygiene and Tropical Medicine). With the aim of monitoring lymphatic filariasis in blood-fed mosquitoes, various gravid traps were tested in different locations and with different water infusions, the most successful (and smelly) infusion being grass cuttings soaked in water.

The session finished with a presentation by Steve Lindsay (London School of Hygiene and Tropical Medicine) who advocated a re-evaluation of the use of larval spraying as a means of malaria vector control. Spraying a bacterium, *Bacillus thuringiensis israelensis* (Bti), which only targets mosquito species and is safe to humans, was effective in

reducing larval numbers of mosquitoes and consequently reduced parasitic infection in children around test sites. It was suggested that larval spraying may therefore be an effective component of control and elimination programmes.

After a tea break in the library, the final session of the day, Ectoparasites, got underway, with Steve Lindsay as chair. Katharina Kreppel (University of Liverpool) outlined her field work on fleas in Madagascar. Both the endemic flea *Synopsyllus fonquerniei* and the exotic flea *Xenopsylla cheopis* transmit the plague bacteria *Yersinia pestis* and live on rodents across the island. Katharina's dedication to the field was evident as she completed the unglamorous and unenviable task of probing hundreds of rat burrows for temperature and humidity readings in order to develop a picture of the microclimates that influence flea dynamics as they develop on their rodent hosts.

Next, Faith Smith (University of Bristol) gave an account of a national survey which monitored tick numbers on UK dogs. Species of interest included *Ixodes ricinus*, *Ixodes hexagonus* (the hedgehog tick), *Ixodes canisuga* (the canine tick) and the invasive European meadow tick, *Dermacentor reticulatus*. Findings from the survey of over 170 veterinary practices found that at least 14.9% of dogs in half of the practices were infested with ticks, and in 14.6% of practices more than 50% of dogs were infested.

The final presentation of the session, and the day, was given by James Logan (London School of Hygiene and Tropical Medicine) on behalf of his

PhD student Emma Weeks, who he graciously excused from proceedings in order to prepare for her viva the following day! Emma's work focused on identifying the aggregation pheromone of the bedbug, *Cimex lectularis*, and developing a synthetic odour blend that could then be used in the development of attractive traps which lure bedbugs from their refuges. In closing, the chairs thanked all participants for their excellent presentations, and the Linnean Society for hosting the meeting.

The complexity of vector control strategies reflects the complex characteristics of the particular insect species under investigation; it is crucial to develop a full understanding of their life cycles, behaviours, their interaction with the environment and indeed with our interventions. It is perhaps appropriate then, that as we attempt to keep a step ahead of the insect vectors of human and animal diseases, we should be overseen by the likes of Darwin and Wallace. Vector control is an ongoing endeavour, as the species we study evolve and adapt to our direct interventions, but also to the more indirect changes we induce in the world around us, be that climate change, the introduction of exotic species through our growing transport network, or the creation of new domestic niches in which insects can thrive. We therefore need to continue developing novel and innovative methods with which to monitor and control vector species and the presentations given at the meeting showcased some of the scientific and technical ingenuity with which that aim can be achieved.

Library News

Val McAtear

RES Librarian



As I promised many of you who have patiently entered and re-entered Pin numbers to access the library database, the library database has moved to a new server. According to the reports I have received access is much better although there does seem to be a problem if you use the AOL search engine. So to all those who perhaps gave up with access please do try again.

As mentioned in the last *Antenna*, Dr Martin Luff gave the Society his collection of Carabid Reprints and at the same time he sent us a bundle of Index cards handwritten by F.I. Van Emden itemising all published references to Carabid Larvae up to 1942 when his key to genera of Carabid Larvae was published. If you would like to consult these please contact the Library.

The books selected by the Library Committee for purchase are listed below. If you would like to borrow any of them please contact me. The Society will charge you recorded delivery postage and asks that you return items in person or by recorded delivery post.

Finally at the last meeting the Library Committee reviewed the list of journals subscribed to by the Society Library. Due to financial pressures on Library expenditure it was decided to stop our subscription to 'Archives of Insect Biochemistry'. This is an expensive journal and it is rarely used by the Fellows and Members of the Society.

New Additions to the Library

- Baldock, D.W. (2010). Wasps of Surrey
- Dicks, L.V. & Others (2010). Bee Conservation
- Radchenko & Elmes (2011). Myrmica Ants
- Aguilar Julio, C.A. (2010). Methods for catching Beetles
- Bellamy, C.L. (2008/09). World Catalogue of Jewel Beetles Volumes 1-5
- Rheinheimer, J. (2010). Die Russelkafer Baden-Wurttembers
- Warchalowski, A. (2010). The Palaearctic Chrysomelidae Volumes 1 & 2
- Cordoba-Aguilar, A. (2008) Dragonflies & Damselflies Modern organisms for Ecological & Evolutionary Research
- Garrison, R & Others. (2010). Damselfly Genera of the New World
- Holman, J. (2008). Host plant catalogue of Aphids
- Becker, N. & Others. Mosquitoes and their control 2nd edition
- Cerretti, P. (2010). Itachinidi della Fauna Italiana Diptera Tachinidae
- Pericart, J. (2010). Hemipteres Pentatomoidea Euro-Mediterranean
- Penney, D. (2010). Biodiversity of Fossils in Amber
- Porter, J. (2010). Caterpillars of the British Isles Reprinted
- Huemer, P. & O. Karsholt (2010). Microlepitoptera of Europe Gelechiidae II
- Fibiger, M. (2010). Noctuidae Europae Volume 12 & Supplement to Volumes 1-11
- Brunetta, L & C.L. Craig (2010). Spider silk
- Gordh, G & D.H. Headrick (2010). A Dictionary of Entomology 2nd edition

Society News

Council Matters October 2010

The October Council meeting was held in the Mansion House and chaired by the President, Prof. Reynolds. The first substantive items on the agenda were discussions about the role of the Conservation Committee and National Insect Week. Both the Conservation Committee and National Insect Week were considered to be increasingly important aspects of the Society's activities. This was particularly so as the Society realigned itself slightly in face of requirements from the Charity Commission to demonstrate a public benefit, beyond those provided purely to the entomological community. The Conservation Committee and National Insect Week also played an important role in helping the Society engage with other charities such as Butterfly Conservation, Buglife, the Amateur Entomological Society and others.

Dr Johnson (Scottish Regional Honorary Secretary) gave a report on the European Congress of Entomology, which was held in Budapest August 2010. Dr Johnson has been elected as Chair of the Presidium of the Congress and Prof. Reynolds to Chair of the organising committee for the 10th European Congress of Entomology, which will be organised under a Royal Entomological Society banner and held in York 2-8 August 2014. This is somewhat fitting as the 5th ECE was held in York, 20 years prior in 1994.

Mr Tilley gave an update of the Insect Festival, which is another example of the Society reaching out to the general populace. This will be held in the Hospitium and grounds of York Museum on Sunday 3rd July. It is only hoped that the weather will be as accommodating as at the last insect festival in 2009.

Dr Murchie (Honorary Secretary) gave a brief report on Ento'10 the National Meeting held in Swansea University in July 2010. The President commended this as a very successful meeting and expressed much thanks to all the convenors, and in particular Dr Miranda Whitten. The Registrar then

gave an update on progress with Ento'11, which will be held at the University of Greenwich/NRI, Medway Campus in September 2011. Prof Field (Honorary Editorial Officer) raised the issue of a Symposium volume from the meeting and explained several difficulties with obtaining manuscripts. The sad fact appearing to be that in this climate of research assessments, people are increasingly reluctant to offer book chapters. There was much discussion at Council on this matter and somewhat reluctantly Council agreed not to pursue a volume.

Prior to the meeting, nominations for the Wigglesworth Medal had been circulated to Trustees. The Wigglesworth Medal is for '*Outstanding services to the science of Entomology. The award will be made to a researcher who has contributed outstanding work to the science and who best reflects Sir Vincent Wigglesworth's standards of personal involvement in every aspect of his/her research.*' All nominations were of an exceptionally high standard and, after much careful consideration, Council agreed that the 2012 award will go to Prof. Stephen Simpson, University of Sydney, for his remarkable work on both insect swarming and nutrition.

The Society is entitled to nominate panellists for the HEFCE Research Excellence Framework. A list of candidates had been received by the President and these were circulated and discussed. After careful consideration, Council agreed to nominate Prof. Paul Brakefield (Cambridge) and Prof. John Pickett (Rothamsted).

Following from a query raised at the AGM, the Honorary Secretary asked whether a new list of members and their details should be published. Although a membership list was valued, the Registrar explained that the situation had changed since the last membership list was published in 2002. In particular, changes to data and privacy legislation made production of a list more problematic.

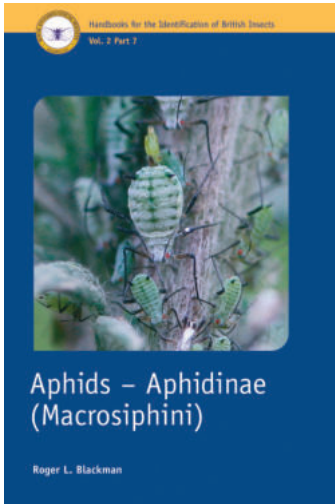
Council Matters December 2010

December Council was much depleted due to severe snowfall. The Registrar provided Council with feedback on his visit to the convenors of Ento'11 and reported that all was progressing satisfactorily. The Registrar reported that Professor Simpson had been delighted to accept the Wigglesworth Medal and that he would deliver a plenary at the International Congress of Entomology in Korea, where the medal will be officially presented. In the absence of Mr Tilley due to the snow, the Registrar was called upon to report on progress with the Insect Festival in York. The theme for this day is 'Insect Forensics' and the convenors are busy contacting exhibitors, arranging publicity and organising volunteers.

Dr Murchie (Honorary Secretary) gave the Meetings Committee report, detailing past and forthcoming meetings. Prof. Hardie (Honorary Treasurer) gave the Finance Committee report. Cash flow for the past year was very satisfactory in a difficult economic climate. RES bursaries for three students taking the MSc course in entomology at Imperial College had been funded. Prof. Field (Honorary Editorial Officer) reported on Publications Committee meeting held at the offices of Wiley-Blackwell in Oxford. A good attendance and representation of all the Society's publications were achieved. In particular, seven of our overseas editors had managed to make it, which was very welcome. All of the journals are doing well with good flow of copy and maintenance of 'impact factors'. Editors took the opportunity of this get-together to spin-off and discuss future strategy for individual journals. Prof. Field expressed her thanks to the liaison team at Wiley-Blackwell for their continuing input. Prof. Field also reported on the Handbook Steering Group's work. They are continuing to pursue more of the new style volumes and Prof. Field was delighted that the APHIDS - APHIDINAE (MACROSIPHINI) volume by Dr Roger L. Blackman was now available.

Archie K. Murchie (Hon Secretary)

Book Reviews



Handbooks for the Identification of British Insects Vol 2 Part 7 Aphids – Aphidinae (Macrosiphini)

By Roger Blackman

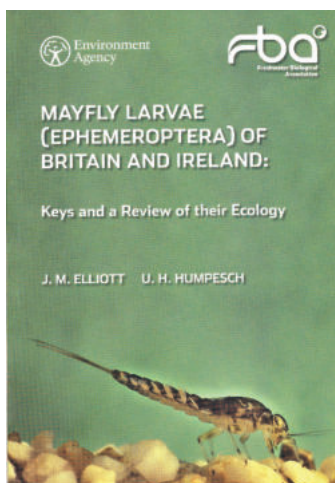
This is the third aphid Handbook in the series, the previous two being by Henry Stroyan. The first covered the Chaitophoridae (= Chaitophorinae according to the classification of Remaudière & Remaudière, as used in this book) and Callaphididae (= Calaphidinae, Phyllaphidinae, Saltusaphidinae and Therioaphidinae). The second covered the tribe Aphidini within the Aphididae (= Aphidinae) and the Pterocommatinae as a discrete subfamily, of which *Plocamaphis* and *Pterocomma* are now considered to belong in other tribe of the Aphidinae, the Macrosiphini, the subject of this volume. (Roger Blackman has chosen not to cover *Plocamaphis* and *Pterocomma* again.)

The first sentence of the abstract reveals the importance of this book to the nation's aphidologists, as the Macrosiphini comprises about half of the 620 British aphid fauna, many of them of significant economic importance. The book begins by describing the general characteristics of aphids and provides a key to the subfamilies of the Aphididae followed by a section on the various life cycles found within the Aphidinae. We then learn how to distinguish the two tribes of the Aphidinae, i.e. the Aphidini and the Macrosiphini. Surprisingly, only a very complex couplet achieves this. A very useful 20 page list of host plants linked to which of the Aphidinae feed on them, is followed by a 21 page check list with synonymy (from the Palaearctic literature only). Then comes a 46 page key to the British Macrosiphini genera, separate keys being provided for the apterous viviparae, alate viviparae and alate males. A systematic account of each genus is then provided with a key to the species and a description of them. From *Acaudinum* to *Wahlgreniella*, this section comprises 288 pages. The book closes with useful tips on collecting, rearing and studying aphids (although modesty seems to have forbidden mention of the 'Blackman Box', the beloved staple rearing unit of aphidologists worldwide), preservation and slide preparation, a glossary and a reference list.

Tucked inside the back page is a nice surprise – a CD containing pictures of slide-mounted specimens of most of the species described. The CD contains more photographic material than is displayed in the book itself and often includes between four and seven adult morphs per species, all reproduced to the same scale. Individual characters are always reproduced to the same scale so that their relative lengths can be compared.

Returning to the abstract, it suggests that the book can act as an identification guide for non specialists. This may be the case, but there are non-specialists and there are non-specialists. Clearly the non-specialists referred to must be pretty clued-up entomologists, ideally with some nice kit. The book is not for farmers and gardeners although, as the author points out, if you can identify the plant from whence your aphid came, and are not colour blind, you've got a fighting chance of identifying the aphid species without having to mount your specimen up. We're not that good on our plants, but the aphids our team at Rothamsted look at have been sucked out of the air and this book will be an invaluable resource, as have the two previous aphid volumes.

Review by Richard Harrington and Mark S. Taylor
Plant and Invertebrate Ecology Department, Rothamsted Research, Harpenden, AL5 2JQ



Mayfly larvae (Ephemeroptera) of Britain and Ireland

FBA Scientific Publication No 66

J.M. Elliott & U. H. Humpesch

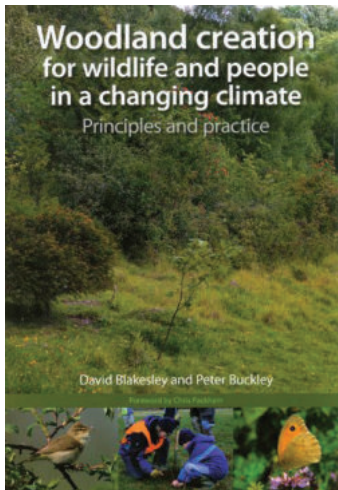
Published by the Freshwater Biological Association

This is a revision of the well known key that has been used by generations of UK freshwater biologist. This new edition updates the taxonomy and includes the three new species that have been added to the UK list since the last edition was published.

The new edition has been produced in a larger size than before which gives greater clarity to the diagrams. It contains an introduction to mayfly morphology, a check list of UK species, a pictorial key to families, a set of colour plates, plus a dichotomous key to families and species. The dramatic change is in the section covering the ecology of this group, which has been expanded to include recent advances in our understanding of the UK ephemeroptera. Like its

predecessors this handbook will become the essential starting point for any study of British mayflies and will prove a vital tool for students, professional biologist and natural historians.

Mike Wilson



Woodland creation for wildlife and people in a changing climate: principles and practice

By David Blakesley and Peter G. Buckley. 2010

Pisces Publications, Newbury, UK. xi + 171pp. ISBN 978-1-874357-44-5. A4 softcover £24.95. Available from NHBS-everything for wildlife, science and environment www.nhbs.com

Despite a slow increase in broadleaved woodland cover in Britain during the last 20 years, woodland species diversity is decreasing and woodland's potential for enhancing our quality of life is unrealised. In view of the current public and political will to increase woodland cover in Britain, and the need to ensure that newly-created woodland is of the highest possible ecological quality, this book is most welcome.

It is a formal, often detailed and sometimes technical text aimed at countryside planners and practitioners, landowners, conservation organisations and community groups. Its entomological content is limited but, given the potential benefits of newly-created woodland and its associated habitats for so many insect taxa, it fully deserves a mention here.

The main text is divided into two parts. The first five chapters cover the general principles of woodland creation and provide necessary background to a consideration of woodland creation practice in the remaining four. Topics include an overview of woodland cover in Britain, some of the organisms that it supports and its importance for people. Issues associated with climate change and the planning, design and management of new woodland are also considered. Two case studies effectively draw together the various topics discussed in the text.

For invertebrates, the importance of woodland rides, glades and edges is emphasised, and the value of dead wood, neglected coppice and bramble is noted. A table lists invertebrate habitat in woodland. Butterflies receive the most detailed treatment. Survey and monitoring protocol is described and there are tables describing those species likely to occur in newly-created woodland, the colonisation potential of habitat specialists, and larval foodplants.

The book concludes with a useful glossary and lists of acronyms, species mentioned in the text and cited references. The latter represent a wide range of published and unpublished material. Unfortunately there is no index, and the list of species would be more valuable if page numbers referred the names to the text. Nevertheless, this is an extremely useful and attractively presented handbook. It is generously illustrated with many figures and 170 images in full colour. Its comprehensive coverage of the issues associated with woodland creation in Britain cannot fail to be of value to its target readership. It also appears to be well-suited as a text for Further Education and foundation degree students studying countryside planning and land management. Certainly, many insects are likely to benefit from its sound advice.

Glenda Orledge



Suomen luteet

[Finnish bugs]

by Teemu Rintala & Veikko Rinne.

Tibiale, Helsinki 2010. Pp 352. Hardback.

ISBN 978-952-92-7512-0. Cost: around £55

This work on the Finnish Heteroptera has to be one of the most beautifully produced and designed books on bugs ever published.

Chapters on 'what is a bug'- and a history of Heteroptera study in Finland; photos of habitats in Finland and photos of living species; sampling and preservation introduce the main sections. This is a family by family, species by species account of the more than 500 species of the Heteroptera fauna. Each species is illustrated by a dorsal view in full colour and are of the highest quality. Three species are covered on each page so the illustrations are of good size. Text on description, distribution and biology is given. Months of the year when the species is active are indicated. Symbols indicate habitat type. A map of Finland illustrates the distribution. Keys are provided to families and to genera and species- and accompanied by line drawings of the characters required for species determination. Thirty one pages of colour plates (largely comprising the same images as used previously) are also provided. An index to genera and species and bibliography complete the book. Given the quality of the book it is a very good price.

If I have any comments on omissions my only wish would be that a checklist of the species could not have been provided. This book sets a new standard for identification guides in its presentation of the Finnish fauna. It will be used more widely than Finland although but its use would be more widespread if some keys and introductory text were also given in English. However, that does not detract from the author's achievement and they are to be congratulated on this work. I greatly look forward to an with some text in English.

Mike Wilson

Diary

Assistant Editor: Duncan Allen (e-mail: antennadiary@gmail.com)

Contributions please! Your support is needed to make this diary effective so please send any relevant items to the diary's compiler, **Duncan Allen**, E-mail: antennadiary@gmail.com. No charge is made for entries. To ensure that adequate notice of meetings, etc. is given, please **allow at least 6 months' advance notice**.

Recently, Special Interest Group (SIG) meetings have been held at Rothamsted, Harpenden and usually begin with registration and refreshments at 10am for a 10.30am start. Details of the day's programme can be downloaded from the RES website (www.royensoc.co.uk) and include a registration form, which has to be completed in advance so that refreshments can be organised. All meetings finish by 5pm.

Some SIG or monthly meetings may begin after lunch and be held at a different location, so it is best to consult the diary or the RES website for full details. Regional meetings, by definition, will be held locally.

2011

March **Medical & Veterinary Entomology Special Interest Group**

31 'Novel Methods of Vector Control'

Venue: The Linnean Society of London, Burlington House, Piccadilly from 10.00 to 17.00

Convenors: Prof. Stephen Torr
Prof. Steve Lindsay
Dr Mary Cameron

Apr 13 **South-East Regional Meeting**

'Environmental Impact Assessments and the Planning System - Will Insects Survive?'

Venue: Brogdale Farm, Faversham, Kent

Convenor: Mr John Badmin

The meeting aims to take a fresh look at the way invertebrate surveys are conducted while preparing Environmental Impact Assessments. The large majority of Biodiversity Action Plan species are not insects, despite insects and other invertebrates constituting 85% of the UK fauna: so how best can we protect their future? Preliminary Programme:

J. Dobson – Rapid preliminary assessment of invertebrate habitat quality potential during Phase 1 Habitat Surveys;

J. Denton – ISIS Invertebrate classification system for assessing conservation interest in relation to aquatic insects;

T. Witts – Local Record Centres and the Planning Process;

BugLife – The need for better EIA information on invertebrates;

M. Edwards – Surveying Hymenoptera hot spots.

May 12 **Conservation Special Interest Group**

'The impact of climate change on insect conservation'

Venue: Rothamsted Research, Harpenden, Herts.

Convenor: Dr Alan Stewart

Climate change is widely regarded as one of the most serious threats to global biodiversity. There is already good evidence that insects are responding through changes in range and phenology. This meeting will explore how a changing climate will impact upon insect conservation and what measures might be taken to mitigate adverse effects on insect species and communities.

June 1 **RES Annual General Meeting**

Venue: The Mansion House, St Albans from 14.15 to 16.00

Please note that the President's invited speaker will now give their talk at Ento '11, on Thursday 8th September 2011.

June 30 Northern Irish Regional Meeting

'Invasive insects: implications for plant health, animal health, public health and the environment'

Venue: Ulster Museum

Convenor: Dr Archie K. Murchie

Global trade, refrigerated transport and a warming climate are all factors that increase the likelihood of invasive insects establishing. Ireland, on the edge of Europe, has typically benefitted as an island and also because invasive species are usually seen in GB before they make it across the Irish Sea. One such species is the harlequin ladybird, which is well established in southern England but there have only been a few records in Ireland. However, it is also possible that some invasives will make it into Ireland directly, through the major seaports or through air carriage. This meeting will discuss the risks and management of invasive insects that can be disease vectors, plant pests and threats to biodiversity.

Confirmed speakers:

Jolyon Medlock (Health Protection Agency)
Helen Roy (Centre for Ecology & Hydrology)
Roy Anderson (Environmental Consultant)
John Kelly (Invasive Species Ireland)

Jul 3 Insect Festival

Venue: York Museum Gardens, York 10am - 4pm

Convenors: Mrs Julie North

Dr Luke Tilley

Dr Gordon Port

A festival for the general public and children, which celebrates the insect world (www.insectfestival.co.uk).

Come and see: live insect displays, crime scene insects, book sellers, entomologists' equipment and much more.

Take part in: mini-beast hunts, face painting, tour the Museum gardens and examine specimens with the IDENTomologists.

Sept 7-9 Ento'11 Symposium on 'Chemical Ecology' "Reception, Detection and Deception" and National Meeting

Venue: University of Greenwich, Medway Campus, Chatham Maritime, Kent

Symposium Convenors: Prof. David Hall, Prof. Bill Hansson & Prof. John Pickett

National meeting convenors: Prof David Hall & Dr Gabriella Gibson

The meeting will consist of three plenary sessions running in the morning of each day, which make up the International Symposium on Chemical Ecology, followed by themed sessions in the afternoons which make up the National Meeting. Oral or poster presentations on any entomological topic are invited, and all will be considered. There will be a general entomological session, along with a number of specialist topics.

Contributors include:

John Pickett (Rothamsted Research, UK)
Walter Leal (University of California, Davis, USA)
Laurence Zwiebel (Vanderbilt University Medical Centre, USA)
Dean Smith (University of Texas Southwestern Medical Center at Dallas, USA)
Bill Hansson (Max Planck Institute for Chemical Ecology, Jena, Germany)
Neil Vickers (Interdepartmental Program in Neuroscience, University of Utah, USA)
Mark A Stopfer (Laboratory of Cellular and Synaptic Neurophysiology, National Institutes of Health, Bethesda, USA)
Rickard Ignell (Swedish University of Agricultural Sciences, Alnarp, Sweden)
David Hall (Natural Resources Institute, University of Greenwich, UK)
Jim Miller (Department of Entomology, Michigan State University, USA)
Ring Cardé (University of California, Riverside, USA)
Murray Isman (University of British Columbia, Canada)

Sep 14-16 A joint meeting with the Soil Ecology Society

Venue: The National Marine Aquarium, Plymouth

Convenor: Prof. Rod Blackshaw

Soil has been described as the 'poor man's rainforest' because of the huge biodiversity that exists under our feet. It remains a scientific frontier of great importance to our understanding of processes essential to the maintenance of above-ground systems, and is key to the sustainable exploitation of land. The RES and Soil Ecology Society are organising their first joint meeting on soil biology. The aim is to bring together scientists from a range of biological backgrounds (microbes, mesofauna, macrofauna) to share experiences and understanding, and promote interdisciplinary thinking.

Sep 21 Aphid Special Interest Group

Venue: James Hutton Institute (formerly SCRI) Dundee, Scotland

Convenors: Drs Brian Fenton
Gaynor Malloch
Jorunn Bos
Jon Pickup

**Oct (tbc) Sustainable Agriculture Special Interest Group joint meeting with British Ecological Society
Agricultural Ecology SIG**

Convenor: Dr John M Holland

Nov 2 Orthopterists' Special Interest Group

(tbc) Venue: Natural History Museum

Convenors: Dr. David Robinson
Mrs Judith Marshall

Nov 10 Biology of Lepidoptera

Venue: Rothamsted Research, Harpenden, Herts.

Convenors: Drs Jason Chapman
James Bell

This is one-day meeting covering all aspects of the biology of butterflies and moths, from physiology to population dynamics and flight behaviour. Confirmed speakers include:

Ken Wilson (Lancaster) – Keynote Address
Jason Chapman (Rothamsted)
Richard Fox (Butterfly Conservation)
Melanie Gibbs (CEH)

Jane Hill (York)
Chris Thomas (York)
Jeremy Thomas (Oxford)

2012

Feb 1-2 Postgraduate Forum

Venue: Liverpool (tbc)

Convenor: Mr Steven Parratt

Mar 7 Verrall Lecture

Venue: Flett Lecture Hall, Natural History Museum

Jun 6 RES Annual General Meeting

Jun 25 –

1 Jul National Insect Week

Publications of the Royal Entomological Society



Agricultural and Forest Entomology provides a multi-disciplinary and international forum in which researchers can present their work on all aspects of agricultural and forest entomology to other researchers, policy makers and professionals.

2011 print or online prices: UK £590, Euroland € 751, USA \$1,091, Rest of World \$1,272

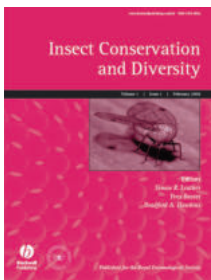
2011 print and online prices: UK £679, Euroland € 864, USA \$1,255, Rest of World \$1,463



Ecological Entomology publishes top-quality original research on the ecology of terrestrial and aquatic insects and related invertebrate taxa. Our aim is to publish papers that will be of considerable interest to the wide community of ecologists.

2011 print or online prices: (with Insect Conservation and Diversity) UK £973, Euroland € 1,236, USA \$1,800, Rest of World \$2,099

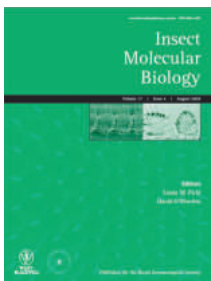
2011 print and online prices: UK £1,119, Euroland € 1,422, USA \$2,070, Rest of World \$2,414



Insect Conservation and Diversity explicitly associates the two concepts of insect diversity and insect conservation for the benefit of invertebrate conservation. The journal places an emphasis on wild arthropods and specific relations between arthropod conservation and diversity.

2011 print or online prices: UK £590, Euroland € 751, USA \$1,091, Rest of World \$1,272

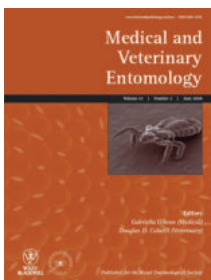
2011 print and online prices: UK £679, Euroland € 864, USA \$1,255, Rest of World \$1,463



Insect Molecular Biology has been dedicated to providing researchers with the opportunity to publish high quality original research on topics broadly related to insect molecular biology since 1992. *IMB* is particularly interested in publishing research in insect genomics/genes and proteomics/proteins.

2011 print or online prices: UK £984, Euroland € 1,249, USA \$1,818, Rest of World \$2,120

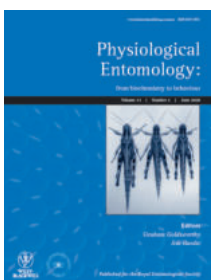
2011 print and online prices: UK £1,131, Euroland € 1,437, USA \$2,091, Rest of World \$2,438



Medical and Veterinary Entomology is the leading periodical in its field. The Journal covers all aspects of the biology and control of insects, ticks, mites and other arthropods of medical and veterinary importance.

2011 print or online prices: UK £566, Euroland € 721, USA \$1,048, Rest of World \$1,223

2011 print and online prices: UK £651, Euroland € 830, USA \$1,206, Rest of World \$1,407



Physiological Entomology is designed primarily to serve the interests of experimentalists who work on the behaviour of insects and other arthropods. It thus has a bias towards physiological and experimental approaches, but retains the Royal Entomological Society's traditional interest in the general physiology of arthropods.

2011 print or online prices: UK £522, Euroland € 664, USA \$965, Rest of World \$1,126

2011 print and online prices: UK £600, Euroland € 764, USA \$1,110, Rest of World \$1,295



Systematic Entomology encourages the submission of taxonomic papers that contain information of interest to a wider audience, e.g. papers bearing on the theoretical, genetic, agricultural, medical and biodiversity issues. Emphasis is also placed on the selection of comprehensive, revisionary or integrated systematics studies of broader biological or zoogeographical relevance.

2011 print or online prices: UK £940, Euroland € 1,195, USA \$1,739, Rest of World \$2,029

2011 print and online prices: UK £1,081, Euroland € 1,375, USA \$2,000, Rest of World \$2,334

Subscriptions and correspondence concerning back number, off-prints and advertising for the seven principal journals of the Society should be sent to the publishers, Wiley-Blackwell Publishing Ltd, 9600 Garsington Road, Oxford OX4 2DQ. (customerservices@blackwellpublishing.com)

Antenna (Bulletin of the Society). Free to Members/Fellows. Published quarterly at an annual subscription rate of £40 (Europe), £42 (outside Europe), \$70 (United States). This journal contains entomological news, comments, reports, reviews and notice of forthcoming meetings and other events. While emphasising the Society's affairs, *Antenna* aims at providing entomologists in general with a forum for their views and news of what is going on in entomology. Subscriptions and advertising enquiries should be sent to the Business Manager at The Mansion House, Chiswell Green Lane, Chiswell Green, St. Albans, Hertfordshire AL2 3NS and any other enquiries to the Editor.

Handbooks for the Identification of British Insects. This series now covers many families of various Orders. Each Handbook includes illustrated keys, together with concise morphological, bionomic and distributional information. A full list of Handbooks with order form is available. See website www.royensoc.co.uk

Symposia. Nos. 1-3 were published by the Society; Nos. 4-10 by Blackwell Scientific Publications; Nos. 11-17 by Academic Press and No. 18 by Chapman & Hall, No. 19 by Kluwer, No. 20, 21, 22 and 23 by CABI.

ento'11

University of Greenwich, Medway Campus
7-9 September 2011

- ▶ Symposium on Chemical Ecology:
Reception, Detection and Deception
- ▶ RES National Science Meeting

www.nri.org
www.gre.ac.uk



Specialist topics to include:

- General Entomology
- Chemical Ecology
- Medical and Veterinary Entomology
- Forensic Entomology
- Forestry Entomology
- Ecologically-based Management of Storage Insects
- Biocontrol: From Lab to Field
- Insect Pollination Biology and Ecology
- Insect Movement
- Modelling Insect Populations

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Further information, registration, abstract and accommodation booking forms available on www.royensoc.co.uk

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