

## Entomology Day 2014, 'Insects, People & Place'

### Chairman Brett Westwood

COMPILED BY SUSAN LIMBREY

This year's theme gave speakers the opportunity to cover topics ranging from symbolism of butterflies in art, through the impact of blood-sucking flies, the faunas found in cess pits, the value of orchards for conservation of insects, the importance of deadwood in providing habitat for insects, the aquatic insects of ponds and rivers, to some recent significant insect records.

In 'The Secret History of Butterflies', Peter Marren said that the natural history of British butterflies was well known to naturalists, but he offered another way of looking at them, through their cultural history. Butterflies in art and literature appear in imaginative ways, not as they are in nature but as they are seen through the eyes of the artist. He surveyed their representation in art, from ancient Egypt and Minoan Crete through medieval to recent times and their deployment in advertising. He has traced the word 'butterfly' to Saxon times, and the German 'Schmetterling' to early Germanic languages of central Europe, with connotations of 'cream thief', and explained the connections to dairying by white butterflies being attracted by pheromone-like compounds in the smell of milk left to stand for the cream to rise and then churned out of doors.

In the ancient world butterflies are depicted on the skirts of Minoan figurines and reflected in the shape of their axe heads, and an Egyptian tomb painting shows butterflies among the birds being hunted, with the aid of a cat, in a reed bed. In European art, depictions of white butterflies and the Red Admiral appear consistently as symbols of good and evil, often in the same painting, the whites for purity, with parallel

in angels' wings, and the vivid red stripe of the Red Admiral being the flames of hell against their black background. White butterflies are associated with the Virgin Mary in a number of paintings.

Peter paid particular attention to Heironymus Bosch's Garden of Earthly Delights, where there are lots of butterflies associated with the naughty goings-on in the garden and with the torments being inflicted on those indulging in them. Later on, Gainsborough's painting of his two little daughters (see photograph) shows the younger, who died in childhood, reaching out for a white butterfly, probably indicating that the portrait was posthumous, and Holman Hunt's The Hireling Shepherd's wicked intentions towards a shepherdess are indicated by a death's-head moth cradled in his hand. Balthus's mysterious painting of a naked girl and two moths seems to explore the difference between illusion and reality.

Damien Hirst's use of thousands of butterfly wings in a large sun-symbol, and the monarch butterflies tattooed on a celebrity's back bring their exploitation right up to date. Showing examples of use of butterflies in advertisements of anything from soap to cars, Peter said that advertisers rarely need to spell out their tempting qualities, it is the consumer who makes the connection: it may be a sense of freedom, aerial beauty, happiness, or closeness to nature. Whatever it is, butterflies sell. They sell because we like them.

Pete Boardman, in 'Humans, a relatively late Addition to the Tabanidae Menu', said that most people knew only too well the horseflies, clegs and their equivalents with common names in other continents. Discussing their position in the Tabanomorpha, and the history of their taxonomic status, he said that there would undoubtedly prove to be more than the 4,400 species described in 2013. They are split into 4 sub-families, the Tabanidae familiar to us here, the mostly tropical Pangoniinae, the deer flies, Chrysopsinae, and the few species of Sepsidinae found on beaches in South Africa and Brazil. The life cycle of the Tabanidae involves aquatic larvae and blood-feeding females: small species imbibing 20-20mg, large species up to 200ml, and taking ten days to digest it.

From the Jurassic, Chinese fossils show that they were originally flower-feeders. A flea-like creature on the alar membrane of a pterosaur suggests that they moved on to feeding on cold blooded animals, and probably by the Miocene they were taking blood from the ears of ungulates.

Pete then talked about aspects of their anatomy: their eye colours produced by contrast-filters maybe



Gainsborough's 'The Painter's Daughters' - with permission from the National Gallery

having a sexual signalling function, their mouth parts having flesh-cutting components. They are attracted to water, as other aquatic insects are, by horizontally polarised light, and to food sources by carbon dioxide and ammonia. Polarized light has also recently been shown to influence attraction to brown, and even more to black, rather than white, coats of animals, with spotted or striped animals confusing them and so being best protected, even counteracting the chemical attractants.

Tabanids have fewer effects on human health than other biting flies, not being vectors of blood-borne diseases or parasites, though in the tropics they do transmit the nematodes causing filariasis. A very rare allergic reaction can be fatal, but it is otherwise their nuisance value to humans that can be extreme, reports in Russia telling of numbers reaching such levels that outdoor work had to be done at night, and animals kept housed. Animal health is affected: livestock can be weakened, and Tabanids transmit Bovine Leukaemia Virus and Equine Infective Anaemia. There are, however, potential medical applications, their saliva containing a protein having the angiogenesis-inhibitor properties used in cancer treatment, as well as anti-thrombotic enzymes and peptides.

Pete talked about some non-human hosts, including experiments in Brazil showing approach behaviour of the flies and avoidance behaviour of targets, including caiman and snakes, and reports of the elephant fly in Africa.



*Haematopota pluvialis*

Rosemary Winnall

He then looked at the distribution of Tabanids in Shropshire, covering 17 species found in the range of habitats provided by the meres and mosses, the fens, wet woodlands, wet grasslands and other boggy places. *Haematopota pluvialis*, the Notch-horned Cleg, (see photograph) is ubiquitous in boggy places and wet grassland, but most of the others, such as another cleg, *H. crassicornis*, the five species of deer fly in the genus *Chrysops*, and nine species of horsefly in the genera *Hybomitra* and *Tabanus* have far fewer records,

the deer fly *C. sepulchris* and the horsefly *H. lurida* each with one historic record on Whixall Moss, where too the Cheshire horsefly *Atylotus plebeius* was last recorded in 1980.

All these British Tabanids have common names, pointing up their pestiferous familiarity. Pete finished with a mention of the species *Scaptia beyonceae*, known in Australia as the 'Gold Bum Fly'.

David Smith, in 'Life down the Dunny', presented the evidence from archaeological insect analysis for a distinctive cess pit fauna, starting with his work on guardrobe pits excavated in London. The fauna dominated by a range of fly puparia including the latrine fly, *Fannia scutellaris*, the rat-tailed maggot fly, *Eristalis tenax*, and the small seaweed fly *Thoracochaeta zosterae* (see photograph). Beetles commonly include the spider beetles, *Ptinus fur* and *Tipnus unicolor*, often lots of Histerid pill beetles, which feed on young fly maggots and microbial slime, and often the small brown fungus beetle, *Mycetia hirta*. The grain weevil *Sitophilus granarius* and the pea weevil, *Bruchus pisorum*, are also present and this is explained by consumption of poor quality stored products. This insect fauna matches that from a barrel excavated in Worcester in the 1970s which was the centre of Peter Osborne's range of personal experiments which demonstrated that identifiable beetle remains survive the human digestive system. David proposes three possible cess pit faunas, depending on wetness, of which that from drier sites, especially where straw or hay have been put in to 'freshen' the pit, has spider beetles and other synanthropic species. Wetter material is dominated by fly larvae and the histerids. Saturated material with standing water is the home to the latrine fly and the drone fly. They could have come in with dumped rubbish, but equally could live in the dryer parts of pit contents. David said he had observed that in Greek hill villages, cess pits were kept dry. Many fly larvae are found calcified, suggesting hard water supply or lime deposition. These pits also have lots of fruit seeds, spices and small fish bones. Statistical analysis on 17,500 items from 31 samples covering Roman to medieval times in London show clear association with cess on the basis of the four characteristic beetles plus the sewage flies.

Many excavated pits, however, may contain cess but have domestic and industrial rubbish deposited as well. David consulted a military manual and recent documents on composting loos, and found that addition of domestic rubbish is recommended to accelerate decomposition; historical records show that the well paid 'rakers' who cleared pits in London made



extra money by selling compost. He suggests that there are four kinds of archaeological feature that will routinely contain cess with other rubbish, indicated by characteristic insect assemblages: one-off 'cat holes'; straddle trenches; deep latrines, which may be wicker-lined, like those in Viking York, or contain bottomless barrels several deep; and stone-built wardrobe pits like those in London. Analysis of insect remains contributes significantly to resolution of questions about the function of pits excavated on archaeological sites and the sources of other materials found in them, whether deposited deliberately or arriving by chance.



Calcified *Thoracochaeta zosterae*

David Smith

Harry Green, in 'Four Insects using Apple Trees', presented results from the two year survey project 'Wildlife of Traditional Orchards' organised by Becky Lashley for Worcestershire Biological Records Centre, with Heritage Lottery funding. The project supports volunteers to assess the condition of orchards, data being added to the National Orchard Inventory for England. Volunteers are trained to search for evidence of Noble Chafer *Gnoremus nobilis*, people are asked to look for the leaf mines of the Mistletoe Marble moth *Celypha woodiana*, and bird watchers are asked to record birds visiting orchards throughout the year.

So far of 61 orchards surveyed for Noble Chafer, 21 have shown their presence, Mistletoe Marble moth sites have increased from 2 to 7, 20 orchards have been assessed as potential Local Wildlife Sites, 5 training events have been delivered, and 4 talks given.

Harry then told us about a large two-year (2012-2014) Leverhulme Trust funded project in which a University of Birmingham component is looking at temporal and weather associations in the emergence and flight and the foraging behaviour of Noble Chafer, at University of Wales Aberystwyth the genetics of apparently separate populations are being studied, and at Royal Holloway University of London volatile chemicals and pheromones are being analysed. At Birmingham they are also doing social studies of the relationship between people and orchards.

The Noble Chafer, a rare insect whose larvae feed on naturally decaying wood in fruit trees, reveals its presence by its distinctive excrement, a long spoon being used to fish in tree holes. Among the large ovoid excreta, larvae can be found, and the wide tunnels are seen in the dead wood. Harry showed a map of its national distribution, with the main concentration in Worcestershire, Herefordshire and Gloucestershire. Pre-1980 there are records from the Thames valley and Hampshire but few there more recently. Archaeological records show former distribution as far as Yorkshire. Worcestershire records show foci in the Vale of Evesham, the Teme valley and the Wyre Forest, and in Herefordshire, the Wye valley below Hereford and a scatter across the north east of the county.

Harry went on to talk about three other insects from the orchards: from a pupa among globular frass from an apple tree in the Teme valley, the crane fly *Ctenophora pectinicornis* emerged (see photograph), the first record from a fruit tree of this one of the 6 species in the genus, all of which are extremely scarce, rare or endangered; several others of this species have now been found in the orchards of Herefordshire and Worcestershire. In an apple orchard at Kempsey, the leaf mines of the Mistletoe Marble moth, were found, recorded so far only in the Severn and Avon valleys. Finally, the Mistletoe Weevil, *Ixapion variegatum*, first found near Bromyard in 2000, has now been found in several more sites in Herefordshire and Worcestershire.

So: four of the many reasons to conserve old traditional orchards (never mind the fruit!)



*Ctenophora pectinicornis*

Harry Green

John Bingham, in 'Life in the (dead) wood?' talked about perceptions of dead wood among foresters, land owners and the general public: that it was useless stuff, untidy, diseased and rotten, and should be cleared away. However, 13% of British invertebrates and fungi have life cycles dependant on dead wood and in total almost 5000 British species are known to be associated with dead wood. He discussed forestry wood piles and the dilemma they present: left to season before being



*Ptilinus pectinicornis*

John Bingham

carted away, carrying with them the larvae of wood-borers. Describing the variety of habitats provided by trees, including stag-heads, old hulks, pollards and orchard trees, dead branches offering sun and shade, wet and dry, light and dark; rot holes in healthy trees; fallen trunks, branches and twigs, lying on land and in water; stumps and roots; hard and soft wood; bark and spaces under it, John pointed out that nature does best, so when dealing with dead wood we should try to preserve this range: leave it standing, leave it lying, put it in heaps and in places that reproduce natural conditions (but not on top of other good habitats).

John's enthusiasm for beetles and for fungi was manifest in his description of relationships between them in dead wood, but other invertebrates, birds, mammals and reptiles got their credits too. Rot caused by fungi and the fungi themselves provide habitats for huge numbers of insects and other invertebrates. John's superb photographs illustrated the range of species. The beetle *Hylecoetus dermestoides* 'farms' a fungus that is only found in holes that they have made. The ant beetle *Thanasimus formicarius* preys on dead wood beetles. John's own new record for the forest, and for Shropshire, is the recent introduction, *Epiphanis cornutus*, found on spruce stumps. He discussed the beetle *Agrilus biguttatus*, once rare but becoming commoner, worrying, but is it following the disease acute oak decline, rather than causing it? Among the Hymenoptera, he mentioned hornets needing nest sites and material, and the wasp *Trichrysis cyanea* needing dry wood. The Diptera were represented by *Xylota sylvarum* and *Callicera aurata*, the common *Myathropa florea* and the rare *Caliprobola speciosa*.

For the Lepidoptera, the micromoths *Esperia oliviella* and *Oecophora bractella* provided beautiful representatives. Some species have particular requirements, such as the fly *Chalcosyrphus eunotus* needing woody debris in streams, or the longhorn beetle *Pogonocherus hispidus* using only small twigs. Finally, hole-nesting birds, such as starlings and woodpeckers, and adders finding stumps to be warm and comfortable basking sites, extended John's range of examples into the vertebrates.

So, in summary, dead wood is dead good.

Will Watson in 'Water Beetles: recording methods, ecology and local distribution' introduced the five families of water beetles, Dytiscidae, Gyrinidae, Hygrobiidae, Haplidae, and Hydrophilidae, plus other families in which there are aquatic species, with tables of number of species having RDB and Nationally notable status. He then showed photographs of beetles and of typical sites, together with distribution maps for Worcestershire. He said that ponds provide a greater number of species, however, as far as rivers go the River Teme does provide a good range because the diversity of habitats.

In ponds, of the Dytiscidae, the Great Diving beetle, *Dytiscus marginalis*, is widespread in Worcestershire, *D. circumflexus* has fewer sites, but is spreading, and *D. semisulcatus* is only in the west of the county. Of the lesser diving beetles, with their distinctive larvae, only one, *Acilius sulcatus*, is present in Worcestershire; *Colymbetes fuscus* is widespread. *Agabus bipustulatus* is common and widespread, occurring in most pools, while there are few sites in the county for *A. didymus*, a running water species. The only member of the Hygrobiidae, squeak beetles, in Britain, *Hygrobia hermanni*, is also widespread in our pools.

The River Teme has both deep pools and riffles. In the river diving beetles, the Dytiscids, *Platambus maculatus* appears to be widespread throughout the length of the river and *Stictotarus duodecimpustulatus* is present where there are open gravelly sections of habitat and occurs mainly in the west of the county. The Elmids *Limnius volckmari*, is a common specialist riffle beetle with long claws to grip the substrate. Dead wood in rivers hosts the scarce Dryopid *Pomatinus substriatus*, with only a few sites on the Teme and the Severn. Overhanging vegetation on river banks creates habitat that overlaps with ponds, and suits the whirligig beetle *Gyrinus urinator* at a few sites, and the hairy whirligig, *Orectochillus villosus* also at a few sites only in the West of the county, both occurring on the Teme.



*Acilius sulcatus* larva

Will Watson





*Acilius sulcatus* adult male

Will Watson

Will then showed a short video sequence featuring surveying on the river Teme using three minute sampling which was explained and demonstrated.

Rosemary Winnall, updated us on 'Entomological Happenings in and around Wyre'. She started with snow fleas, *Boreus hyemalis*, a regular target in winter, with a map of records demonstrating new skills with our GIS facility. Significant records made by Tony Simpson include the first Shropshire (and Wyre Forest) record of the moth *Acleris abietana* (see opposite), a species known in Scotland and Herefordshire, with just two records in Worcestershire, and the distinctive zoned leaf mines of the micromoth *Leucoptera laburnella*. The spectacular crane fly *Tanyptera atrata* was photographed ovipositing in wood. Other crane flies included Mick Blythe's favourite tufa flush crane fly, *Elypteroideus alboscuteellus*, and he is to be congratulated on his identification of *Paradelphomyia ecalcarata* and splendid stacked microphotography of its genitalia.

Rosemary's enthusiasm for ants was demonstrated in her report of *Leptothorax acervorum* nest excavations in a felled trunk on Devil's Spittleful, with the ants in action. The beetle *Pyrrhidium sanguineum* is extending

its range and was seen ovipositing, and several recent Wyre records were made of the beetle *Platycis minutus* after a first sighting in Ribbesford woods in 2007.

On a bug hunt with the help of Joe Botting we found the leaf hopper *Eurhadura pulchella*, which feeds on oak, the spear thistle lace bug *Tingis cardui*, and the Psychopteran *Graphopsocus cruciatus*. Continuing studies of the associates of the wood ant, *Formica rufa*, produced the beetle *Clytra quadripunctata* (see opposite), which hangs on foliage over the ants' nest and deposits its eggs so that the ants take them into the nest where the larvae feed on debris, the Scarce 7-spot Ladybird *Coccinella magnifica*, which is not bothered by the ants whose nests they run about on, Land Caddis larvae, collected by the ants but whether just as objects to add to the nest or actively sought with the larvae in for some reason, and the shining guest ant, lots of them being visible in Rosemary's movie clip. Slave-making ants, *Formica sanguinea*, were shown in their nest alongside their slave ants *Formica fusca*.

The ivy bee, *Collytes hederæ*, a recent arrival in the area, was found to be nesting in large numbers in a bank at a Stourport carpark, where it was reported by Jane and Dave Scott.

Rosemary also reported on her continuing study of insects on extra-floral nectaries, recording the ants *Myrmica rubra* on Bracken and Peony, *Lasius niger* on Garlic Mustard and the buds of Ash trees, and *Myrmica ruginodis* on *Vicia sativa*.

Finally, she showed her photographs of the remarkable association of a plant, a fungus and a fly, with the fungus *Epichloë* sp. on a grass stem, an egg of the fly *Botonophila* sp. hatching and the larva feeding. She has enclosed the grasses in the hope of seeing and identifying the emergent fly.



From left: John Bingham, Will Watson, David Smith, Peter Marren, Brett Westwood, Pete Boardman, Harry Green, Rosemary Winnall

Mike Averill