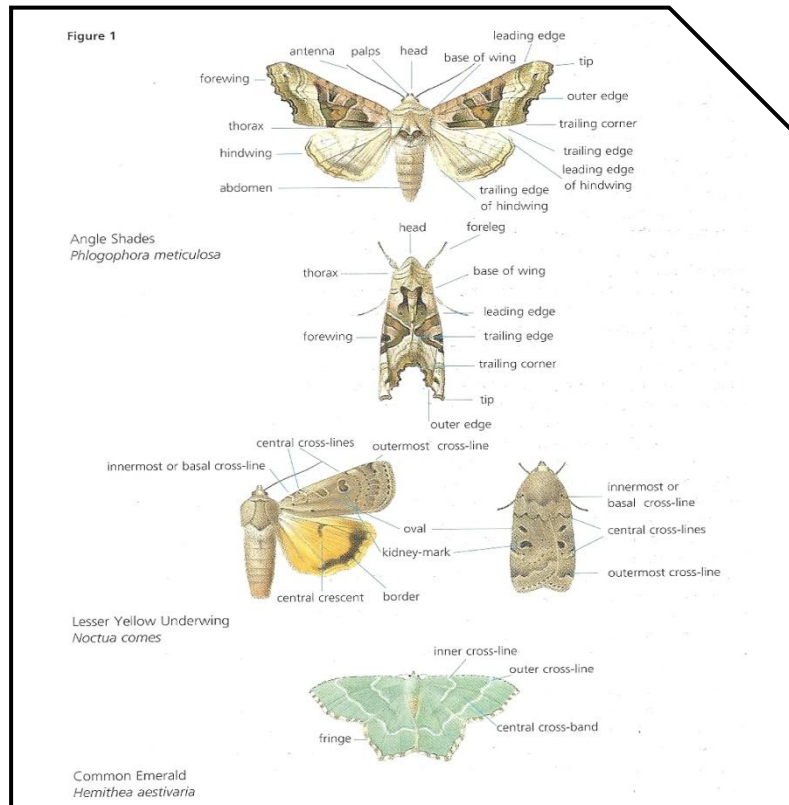


MFS Butterflies and Moths training 1st Session with Douglas Boyes- Monday 30th June 2014

Jane and Robin Emerson kindly agreed to host the first of our Butterflies and Moths training days, and seventeen of us met at Bryn-y-ffynon on a beautiful June morning, eager to make a start. Douglas was introduced, and was obviously keen to deliver whatever the group would find most useful, and to cater for both beginners and 'improvers' - we assured him we were all beginners!

He began by translating Lepidoptera as 'scaly wing' - the scales on the wings are modified hairs, and separate Lepidoptera from other groups eg Trichoptera (hairy wings).

He explained that there are about three times as many day-flying moths as there are butterflies in the UK, which surprised many of us. There are roughly 1600 micro-moths and 900 macros in the UK, and these can sometimes be confused with butterflies. The diagnostic features of most moths are the antennae, which are usually either bristle-like (setaceous) or feathery on both/one side (bi/pectinate), whereas butterflies have club-shaped ends to their antennae. We looked at a diagram showing the main anatomical terms which will be useful when trying to ID moths and butterflies.



In evolutionary terms, micro moths evolved before butterflies, which in turn pre-dated macro moths. Micro-moths are generally smaller in size, with a forewing length of 1cm or less, although there are examples of large micro-moths eg Mother of Pearl, and small macros eg Marsh Oblique-barred!! As macro moths are generally larger, they were more widely studied in the early days, and many people ignored the families of very small moths, as we beginners tend to do today! The most primitive micros have not developed a proboscis for feeding, and instead use mandibles, but a small number of primitive groups have developed quite large species, eg swifts, goats and clearwings, and these have become 'honorary macros'.

We then worked through the main macro-moth families, (and examples of moths within these families that are found in Montgomeryshire), which were explained succinctly and clearly by Douglas using his Powerpoint presentation. This should make it easier for us to narrow down our searches when identifying moths we find - it follows the British sequence, which is that used in text books, such as Field Guide to the Moths of Great Britain and Ireland, by Paul Waring and Martin Townsend. This is the 'bible' for most beginner moth-ers, and is the book to which most of us will be referring at this stage.

Sue Bosson suggested that Douglas might devise a handout, showing the main features of each family he illustrated in his Powerpoint presentation, and he agreed to prepare one for the next meeting. In brief (as each member of the group will shortly have the more comprehensive handout) the families are as follows:

1) Swifts - Hepialidae - eg Ghost Moth



2) Goat and Leopard Moths - Cossidae - eg Leopard Moth



3) Burnet Moths - Zygaenidae - eg Six-spot Burnet



4) Clearwings - Sesiiidae - eg Welsh Clearwing



5) Eggar Moths - Lasiocampidae - eg Oak Eggar



6) Emperor moths - Saturniidae - eg Emperor Moth



7) Hook-tips - Drepanidae - eg Oak Hook-tip



8) Lutestrings - Thyatiridae - eg Buff Arches



There are two families of moths in Great Britain which are much larger than the others - 'super families' - Geometridae and Noctuidae. The first of these is:

9) Geometridae - divided into sub-species:

9a) Emeralds - Geometrinae - eg Large Emerald



9b) Waves - Sterrhinae - eg Small Fan-footed Wave



9c) Carpets & Pugs - Larentiinae - eg Flame Carpet



and Brindled Pug



9d) Thorns & Beauties - Ennominae - Canary-shouldered Thorn,



Mottled Beauty



10) Hawkmoths - Sphingidae - eg Elephant Hawkmoth



11) Prominent & Kitten Moths eg Pebble Prominent



& Alder Kitten



Notodontidae

12) Tussock Moths - Lymantriidae - eg Pale Tussock



13) Tiger, Ermine and Footman moths - Arctiidae - eg Garden Tiger,

White Ermine



& Dingy Footman



14) Nolidae - eg Least Black Arches



The second 'super family' is :

15) Noctuids - also divided into sub-families as follows:

15a) Darts, Underwings and Clays - Noctuinae -

eg Heart & Dart



, Large Yellow Underwing



, Purple Clay



15b) Brocades, Quakers & Wainscots - Hadeninae - eg Pale-shouldered Brocade

Small Quaker



& Smoky Wainscot



15c) Silver and Gold Ys & Brasses - Plusiinae - eg Silver Y



, Gold Spot



15d) Snouts - Hypeninae - eg Snout



There are other moths - apparently a strange group with huge variation which Douglas referred to as the 'Misfits'!

Lunchtime was spent in and out of Jane and Robin's house, enjoying the sunshine, as were several butterflies over the wildflower meadow and surrounding areas. We were all appreciative of Joan's cake, made especially for the day, and accompanied by butterfly serviettes! Thanks too to all the other folk who kindly brought cakes and biscuits - all very much enjoyed!



After lunch, it was time to put the morning's theory into practice!

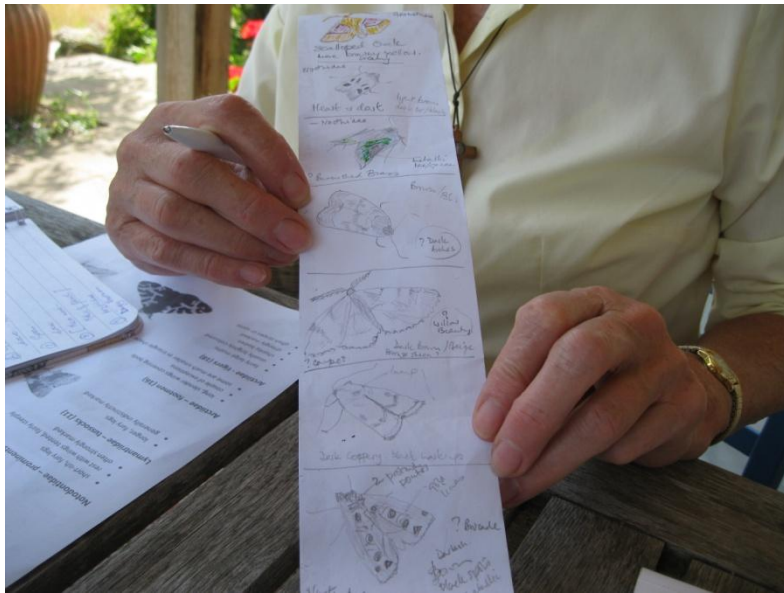
We split up into groups of about 4, and worked either inside or out, studying and trying to identify macro moths which Douglas had caught in a moth trap the previous evening. The morning's guide to families proved useful in trying to determine which section of the reference book to start looking in - but we were all relieved to know that Douglas was on hand to give us encouragement, and quite often to point us in the right direction!

Each group looked at a different selection, which included Noctuidae eg Miller, Plain Golden Y, Burnished Brass, Smoky Wainscot, Straw Dot, Dark Arches and Gothic, Geometridae such as Clouded Border, Brimstone Moth, Barred Straw and Common Marbled Carpet, and Notodontidae such as Buff-tip, which closely resembled a broken birch twig. Next month there will be other moths flying, and we all agreed that plenty of ID practice in subsequent training sessions will be the key to consolidating our learning and widening the range of species we can recognise.

2nd session - Friday 25th July, 2014

We met again at Jane and Robin's, on another sunny day. Joan had been so inspired by last month's training day, that she'd made herself a moth trap and caught several moths in it.





Not only did she trap the moths – she drew them as well! We were all impressed.

But today the emphasis was to be on butterflies, and particularly those to be found in Montgomeryshire, of which there are about 40 different species.

Douglas, our County Butterfly Recorder, has produced a comprehensive review of the Butterflies of Montgomeryshire (2014), which can be found in the Articles and Reports section of the Montgomeryshire Moth Group website. It outlines the butterfly species recorded in Montgomeryshire, focusing on the county status of each species as well as their basic biology, ID tips, photos and distribution maps.

Douglas explained that the county is relatively under-recorded in terms of butterflies, with large areas of the countryside almost completely unexplored and lots of areas lacking records of even our commonest butterflies. He encouraged us to note down any we see, and to submit any records to him. The species richness maps in his article show how many species have been recorded in each 2km and 5km square across the county, but he made the point that areas appearing to have the greatest diversity may simply be the squares where there has been focused recording, rather than particularly good habitats. Another map shows the 2km squares where a butterfly has NEVER been recorded – and there are lots of them! Plenty of scope for us, in all areas of the county, to reduce the number squares with no records.

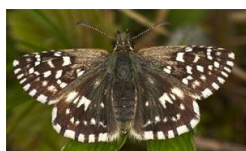


As we all have access to this excellent document, it doesn't make sense to reproduce it here, but we were pleased that Douglas took us through it, and found the descriptions of each species particularly useful – each one includes the National and County status, larval foodplants, flight time, vc 47 confusion species (always useful!), a distribution map, and a colour photo.

In brief, the document works through the butterflies in taxonomic order, and starts with the skippers. Dingy and Grizzled Skipper both breed only at Llanymynech Rocks, Small Skipper is relatively common, Large Skipper is moderately common, and Essex Skipper has not yet been recorded in the county, but has been seen over the Shropshire border!



Dingy Skipper



Grizzled Skipper



Small Skipper



Large Skipper



Essex Skipper – be the first to record this!

Next are the 'Whites' – more familiar to most of us, and all common in Mont - comprising Orange-tip, Large white, Small White and Green-veined White. It was useful to look at the differences between them though, especially as the Small and Large Whites are similar in size!



Orange-tip



Large White



Small White



Green-veined White

The Clouded Yellow, a migrant, is not seen every year, but in good migrant years is seen in small numbers, and could turn up almost anywhere.



Clouded Yellow

The Brimstone is not uncommon on the eastern edge of the county



Brimstone

Next, a large group – the 'Browns', of which some eg Speckled Wood, Small Heath, Ringlet and Meadow Brown are all quite common across the county, whereas Wall and Gatekeeper are only moderately common, and Grayling is uncommon and recorded from only a handful of sites, mainly in the east of the county – it seems to favour hills with bare ground eg Middletown and Roundton Hills, and is a species of concern. The status of the Large Heath is unknown – it was last seen in 1999 at Drum Ddu, and is possibly extinct now, although as its habitat is often inaccessible there are hopes that it may still occur, and is just difficult to access.



Wall



Speckled Wood



Small Heath



Ringlet



Meadow Brown



Gatekeeper



Grayling -concern



The Large Heath may now be extinct in Mont –it's found only in Northern Britain, where it tends to exist in distinct colonies. It prefers level boggy areas, including raised bogs and damp moorland, where the adults nectar on cross-leaved heath. The larvae feed on hare's tail cotton grass.

We must keep our eyes open, especially in June and July!!

We then looked at the 4 Fritillaries found in the county, none of which are common. In each case, the larvae feed on violets. All four can be found on Llanymynech Hill, thanks to sensitive management and a wonderful habitat. The first two, Pearl-bordered and Small Pearl-bordered, are easily confused, especially as

they can both occur in the same type of habitat (fridd) and at the same time of year..... but Douglas assured us they can be separated with care – it's just a case of knowing the ID clues! :

Pearl-bordered Fritillary



- 2 distinct pearls
- Late Apr-early June
- Fairly 'plain' underside
- 'floating' 758'
- Grassland, lower
- All sites in NE corner of county

Small Pearl-bordered Fritillary



- * colour mosaic
- * May - July
- * Much more colourful underside
- * 730
- * upland, damper
- * seems to prefer western side of county

There are very few records of the Silver-washed Fritillary, and it appears to be in decline, bucking the national trend. Most recent records are from the eastern side, particularly woodland near Middletown. It is easy to confuse this with the Dark green fritillary, so we were grateful for Douglas' tips re ID again.



black streaks



no black streaks

Silver-washed Fritillary

Dark Green Fritillary

until 2004, Montgomeryshire was home to a single colony of High Brown Fritillary, at allt Dolanog, but this species is now thought to be extinct in the county, and only occurs in one place in Wales, in the South. It looks very similar to the Dark Green Fritillary.

High Brown Fritillary – now thought to be extinct in Mont



Back in 1979, in Llangadfan, 2 records of another fritillary, the Marsh Fritillary, were reported, but this butterfly too is thought to be extinct in the county now, probably owing to habitat loss through increased agriculture.



Marsh Fritillary

It was interesting to note that although the next 6 butterflies are all common in Mont, and more familiar to us, there was still plenty to learn about them!



Red Admiral - many of those we see are migrants.



Painted Lady - can't survive our winters.



Peacock



Small Tortoiseshell- in steep decline in Southern Britain.



Comma - can be seen in almost any month.



Small Copper- occasionally seen in gardens

All 3 Hairstreaks to be found in the county are probably under-recorded. The Green and White-letter Hairstreaks can both be seen at Llanymynech Rocks, the Green flying low, but the White-letter high up in elms. The Purple Hairstreak spends most of its time in the tops of oak trees. Binoculars are useful when trying to spot these tree-top dwellers! - the best time is late afternoon and evening.



Purple Hairstreak - small, whizzes in and out of canopy



Green Hairstreak - looks grey in flight



White-letter Hairstreak- least common hairstreak in Mont

Finally, we looked at the 2 blues to be found in the county - Holly Blue and Common Blue. Again, Douglas gave us helpful tips to make ID easier:



Holly Blue

- * Wide habitat range
- * Often high, fast
- * uniformly blue underwing, with small black spots



Common Blue

- * Flowery, grassy habitat
- * Tends to flutter low down
- * white dots on underside wing edge (male, blue underside, female brown)



It became very clear that habitat management is crucial if we are to keep such a range of butterflies in Montgomeryshire, especially calcareous grassland, which is only to be found at Llanymynech Rocks. In 1993 and 1997 there were 2 records of Brown Argus from this site - they probably bred here, but have not been seen since. They can easily be confused with the female Common Blue - but the upperwing tends to lack blue colouration, whilst there is usually a scattering of blue scales near the abdomen on the female Common Blue. Also the orange patches on the upperwing are more prominent in the Brown Argus.



Brown Argus



Female Common Blue

So, when we set off on our walk around Roundton next time, we are now well equipped with butterfly ID know-how. All we have to do now is to remember it!!



After a feast of refreshments, kindly provided by various members of the group, we spent the afternoon identifying moths trapped last night by Douglas, which gave us a chance to look at different species, some of which wouldn't have been on the wing last month, including Clay, Slender Brindle, September Thorn and Light Knot Grass. We all agreed that practice is the key to recognising species in the long term.

As you can see, it was serious business!



3rd session – Roundton Hill – Monday 18th August 2014

Fourteen of us met at the car park at Roundton Hill MWT Reserve, and just had time to sign a Congratulations card for Douglas before he too arrived – his excellent grades have ensured he can take up his place at Brasenose College, Oxford, to read Biology, and we all agreed they were fully deserved.

Early morning catch-up chats revealed that since the last session, various mothning activities had been taking place – Lizzie had rescued an Old Lady from a shop doorway in Welshpool, and Sylvia had discovered a Peach Blossom in the public loos in Llanfair (moth, not handwash!) Also several eager 'students' came armed with home-made butterfly nets, of varying shapes and sizes, eager to try their hand at butterfly and moth catching.



The ingenuity shown in designing these nets was impressive – everything from a fisherman's keep-net, to a child's fishing net (as Sheila delightfully put it, for micro moths!); from a litter grab mechanism on the handle to an old jelly-straining bag, and from the more orthodox fine net fabrics to Joan's glamorous evening 'number' with its wonderful sheen and 'floatiness' – a brilliant effort by all concerned!

Time to set off, and as the weather was dry, if a little windy, we kept our fingers crossed for a productive morning. Some folk seemed a little confused as to what they were actually aiming to catch.....



.....but in general most people had fun, and considerable success, in netting a good range of butterflies. These were mostly to be found in the more sheltered grassy areas, and included a Small Copper, caught by Jeny, Gatekeepers (Sylvia and Lizzie), Common Blues (Sheila and Shenagh), Meadow Brown (Lizzie) Speckled Wood (Steve caught it, it escaped, and it was then impressively recaptured by Sylvia!), a Small Skipper (Colin), Wall, Comma and Large White. Jeny spotted a Small Heath, and Douglas and Sue netted Green-veined Whites. We hoped that there was enough sun to warm the rocky areas sufficiently for Grayling, but only Douglas caught a tantalising glimpse of one, before the skies clouded over, and we had some quite heavy showers.



This did not deter everyone from their endeavours! - Lizzie netted our first macro moth of the day, a Shaded Broad-bar, whilst Sue had three micromoths (*Bactra lancealana*, and the grass moths *Agriphila stramineella* and *Agriphila tristella* - all identified by Douglas!), and a Wall butterfly which was basking on a scree patch.

Lunch was eaten in the shelter of our cars, as the rain became quite persistent for a while, but the afternoon dried up, and we set off again through the lower, more wooded area, having first admired the Cinnabar moth caterpillar on ragwort in the car park.



We were now transported to a magical world in miniature - in the form of leaf mines. We were fascinated by the gallery and blotch mines which Douglas spotted, and we were soon eagerly searching for our own examples. A hand lens made the whole thing even more amazing, and it was possible to see where the egg had been laid on a leaf edge, and then the larva, on hatching, had eaten its way between the surfaces of the leaf, creating a 'tunnel' or mine which grew wider as the caterpillar's girth increased! Its frass (or droppings) was sometimes the only thing left in the mine, but on other examples the larva was still in residence!



We saw examples of leaf mines, all made by the larvae of micro moths, on Wild Rose (*Stigmella anomalella*), Hazel (*Phyllonorycter coryli* and later *Parornix devoniella*), Alder (*Phyllonorycter rajella*), Bramble (difficult to ID apparently), Rosebay Willowherb (*Mompha raschkiella*) and Wych Elm (*Phyllonorycter tristrigella*). Each species of micro moth is restricted to certain host plants, so its ID is facilitated by the use of a key which works through different plant species. Douglas will forward a copy of the key for our use, although this is maybe something for the future for most of us!



He now introduced us to another lepidopterist's technique - the stick and beating tray, which resulted in a shower of leaves, miniscule snails and amongst them, a variety of caterpillars, mainly geometers, or loopers (inchworms in America). The willows were particularly productive, and we learned that the caterpillars are very difficult to ID, as caterpillars grow in stages called instars, each time splitting and shedding the old skin to allow the body to expand. Most ID books only show the last instar,

and the caterpillars of many different species all look identical - green!! By dangling from their silken threads, and 'ballooning' as it is called, they are able to move off into another tree to feed.

Most of us were pretty surprised to discover that what looked like a thorn piercing a hawthorn leaf was actually the portable case of the larva of another micro moth - *Coleophora serratella*. The larva moves around (head down, bottom up!) from leaf to leaf, feeding as it goes.



Back at the car park, we had a last look at the butterflies we'd netted, and added Small White to our list, which now totalled 13 butterflies, and 13 moths if we included caterpillars and leaf mines.



Small Copper



Wall



Common Blue



Common Blue



Gatekeeper & Meadow Brown

We were all agreed that it had been an excellent day, and to finish it in style we headed down to Tuffins cafe, where we drank tea, ate cake, and identified (with Douglas' help) some moths he'd trapped last night and brought along.- Flounced Rustic, September Thorn, Spectacle, Setaceous Hebrew Character, to name but a few.

What a lot there is to learn!

Final Session – 18th September 2014 – “Filling in the Gaps”!

Fifteen of us met at Jane and Robin's for our last training session with Douglas. He was eager to include areas only touched upon in recent weeks, and had prepared another excellent Powerpoint presentation, covering aspects such as where butterflies and moths are found, their lifecycles, anti-predation and overwintering strategies, as well as ways of catching them and recording results, both nationally and as 'citizen scientists'. He also elaborated on our introduction (in the field at Roundton) to leaf miners, and spoke of the status of our butterflies and moths, and some of the conservation efforts currently in place.

Where butterflies and moths are found

- In every habitat across the UK
- There's generally a higher diversity in the South
- 500+ species of macro moth in Montgomeryshire, not including rare migrants
- The rarest species tend to be in the most specialised habitats eg shingle, saltmarsh etc
- Many species need specific habitats, others are generalists and are found in several different habitats (distribution)
- The greater the flora diversity, the greater the number of moths, particularly if broadleaved trees are included
- Woodland is probably the best habitat for biodiversity
- Moorland produces far fewer species, but numbers of individual moths can be very high (abundance) eg True Lovers Knot

Lifecycles

Egg

Once the female butterfly or moth has mated, eggs are laid, usually on the larval foodplant. There's great variation in the numbers of eggs laid, often linked to the size of the eggs – some eg White-letter Hairstreak lay eggs singly, whereas the Large Yellow Underwing lays thousands of eggs, which may coat an entire twig. This may enable a species to bounce back if its numbers have been reduced previously. Some species eg the Swifts, spread the eggs over a wider area by laying in flight!

Caterpillar/larva

The eggs usually hatch after a week or so, the larvae eating a hole in the shell, or the whole shell, and then feeding on the foodplant. The caterpillar is the only stage of the life-cycle which grows, and as it does so it forms a new soft skin under the old one, which then splits and moults to allow the body to expand. These different larval stages are called instars, and there are usually 5 or 6 instars. Each instar has slightly different markings, which makes identification tricky, especially as most books only illustrate the last instar! The newly hatched caterpillars often disperse to feed, and if eggs are hatched in a jar, the caterpillars may run round and round for a while trying to spread out before they settle down! When they have reached full size, which could take from a few weeks to a few years depending on the species, they then pupate, to form pupae (the lifestage). In butterflies the outer case containing the pupa is known as a chrysalis, and in moths a cocoon. The caterpillars have several ways of avoiding predation, including feeding at night, feeding within a leaf (leaf miners), camouflage, warning colouration eg Magpie moth larva, or unpleasant hairs/bristles.

Pupa

Inside the pupa, the caterpillar's body is reorganised to become a butterfly or moth. This can take from a few weeks to a year, depending on the species, and completes the metamorphosis, which is termed complete metamorphosis (as compared with the incomplete metamorphosis of eg grasshoppers) Many caterpillars burrow into the soil or hide under dead leaves to pupate, but others pupate on plants.

Adult

When the adults emerge, they inflate their wings, which may take a couple of hours. It is important not to touch them at this stage. Interestingly, female moths release pheromones to attract males, even before their wings are fully inflated. These 'scents' can apparently be detected up to 5 miles away, and the male moths will mate very quickly once they've located a female. Butterflies do not use pheromones, but perform a 'mating dance' which can often be seen on sunny days.

Most adult moths live for short periods, from a few days to a few weeks, depending on species, although those that hibernate through the winter live for months. Many moths feed on nectar, as do butterflies, but some species of short-lived moths do not feed at all.

Like larvae, the adults have a range of anti-predation techniques, including camouflage eg Buff-tip, or warning colouration eg adult Garden Tiger.

Amazingly, some moths can emit ultrasonic clicks at the same frequency as bats, which confuse, startle or warn a predator bat. Others have evolved 'ears' on the sides of their abdomen which detect the echolocation sounds produced by hunting bats - when the moths 'hear' bats coming, they take evasive action eg dropping to the ground, changing direction or flying in loops and spirals.

The Death's Head Hawk-moth also uses sound, but rather differently. It produces squeaks which apparently resemble those made by a queen bee, allowing the moth to feed on honey in the hive without being attacked by the bees!!

Overwintering

Moths and butterflies survive the winter in several ways, according to species:

- As an egg, which hatches the following spring
- As a caterpillar - some species remain dormant until spring, others feed during mild spells
- As a pupa - sheltered under the soil
- As an adult - either in hibernation eg Herald, or flying and reproducing eg Winter Moth

Finding / observing butterflies and moths

At night -

- Moths are attracted by light, although it's not clear why - possibly connected with the moon, or dazzlement / confusion
- Flowers and rotting fruit (which also attract butterflies)
- Sugaring - painting a sugary solution onto tree trunk etc may attract species which tend not to enter trap eg Old Lady. Recipes containing beer, dark sugar and treacle are popular, and can be found on the Internet.
- Netting - moths by night. 'Dusking' (netting at dusk) can be productive for moths in the winter, especially for moths which don't readily enter traps

By day -

- Netting - butterflies and day-flying moths
- Observation
- Leaf mines
- Beating - for caterpillars, using a beating tray

3 main commercially produced Moth traps

Electric lights which emit part of their output as ultra-violet light work best at attracting moths - either mercury vapour or actinic (fluorescent) bulbs. The traps utilise these, and are based on the lobster-pot principle:

1. Robinson trap - expensive, not very portable, but very good at attracting large numbers of moths
2. Skinner - cheaper, more portable, but generally a lower catch of moths
3. Heath - very portable, great for 'in the field' trapping



Robinson trap



Heath trap



Skinner trap

Leaf mines

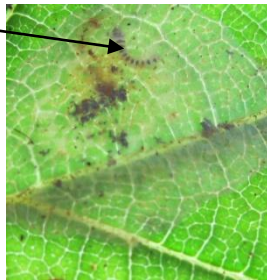
Many families of micro moths leaf-mine i.e. burrow into a leaf, leaving behind characteristic traces of feeding and frass. The form of the mine, together with the plant species, can often be diagnostic when identifying a species. Some species lay their eggs on top of a leaf, others on the underside.

The larvae of some flies and beetles also make mines, but Lepidoptera tend to make full depth galleries or blotches with single lines of frass, whereas Diptera (fly) larvae are maggots which characteristically make twin trails of frass.

Douglas described some 'easy' leaf mines to us, and encouraged us to look out for them, particularly as some plants are host to only a few leaf mining moths.

An example of this is hazel - silvery blotches on the upper side of the leaf are almost certainly produced by the larva of Phyllonorycter coryli or Nut Blister Moth. I was lucky enough to find a leaf with just such a blotch, containing a live larva:

blotch mine



adult *Phyllonorycta coryli*

Any leaf mine found on Horse Chestnut will be evidence of *Cameraria ohridella* - this was first discovered in Macedonia in 1985, and has rapidly spread across Europe. It is gaining a rapid foothold in the UK, since its discovery in 2002, and as there can be many mines on a leaf, it can cause serious

defoliation. Apparently though, the latest research suggests it probably doesn't kill the Horse Chestnuts, as the leaves tend to be going brown anyway – although a fungus may be a problem!

A good example of a gallery mine is that produced by *Stigmella aurella* – a common micro moth



Recording – National Scientific Schemes vs Citizen Science – ie us!

National Schemes – use set methodology to calculate the changing abundance.

Moths

Rothamsted Research in Hertfordshire, the world's oldest agricultural research station, has been co-ordinating a national network of moth light-traps since 1968. All the traps are of a standard design, and are operated by volunteers at over 430 sites in all sorts of habitats, making direct comparison possible between sites and over time. The traps operate every night of the year and all moths are identified and counted. Rothamsted traps catch small but representative numbers of moths, which ensures that the monitoring is effective without damaging the moth populations being studied. The Rothamsted Insect Survey has generated one of the longest-running and geographically extensive data sets on insect populations anywhere in the world. There are over 10 million moth records in the Rothamsted database, some dating back to the 1930s when the first traps were developed.



A Rothamsted trap

Butterflies

The United Kingdom Butterfly Monitoring Scheme (UKBMS) has monitored changes in the abundance of butterflies throughout the United Kingdom since 1976.

A fixed-route walk (transect) is established at a number of sites, covering a range of habitat types, and butterflies are recorded along the route on a weekly basis, under reasonable weather conditions, for a number of years, between April and September. Transects are typically about 2-4km long, taking between 45 minutes and two hours to walk, and are divided into sections corresponding to different habitat or management units.

Since 1976, recorders have made around a quarter of a million weekly visits to more than 1,500 separate sites, walking over half a million kilometres and counting over 16.4 million butterflies! Llanymynech Rocks is one of the Montgomeryshire sites studied, and the '2 Sues' have helped record on this transect before now.

Citizen Science

Many people interested in butterflies and moths keep their own records on a more ad hoc basis – these tend to show distribution changes rather than abundance changes, but are all very much welcomed by

county recorders, who then forward them to the appropriate National bodies.

In Montgomeryshire, as in other counties, both moths and butterflies are recorded. In the case of moths, Peter Williams (County Recorder) encourages the following data to accompany each record:

- species
- lifestage (e.g. adult, caterpillar etc)
- quantity
- date
- OS Grid Ref (or place name)
- Name of recorder

In the case of butterflies, Douglas Boyes (County Butterfly Recorder) is less concerned about the actual date species are recorded, but the year is important.

These days recorders may use Excel, recording software, Smartphone apps, or good old pencil and paper / lists!

NRspeciesrecorder (I think devised by Mike Haigh) is an easy way of recording sightings of both Montgomeryshire butterflies and moths, and Douglas demonstrated its main features. He will forward details as to how to download this onto members' computer systems, for anyone interested.

The state of our butterflies and moths

Butterflies -

- Some species doing well eg generalists such as Speckled Wood and Comma, and specialists like the Adonis Blue
- But many species are in a major decline, especially specialists. This is probably mainly due to habitat change or loss, and possibly climate change too.

Moths -

- Between 1968 and 2007, of the 337 common species looked at, 2/3 were in decline
- Total abundance decline of 28% overall (40% in the South)
- This has major knock-on effects on birds and bats
- 62 moths became extinct in the UK in 20th century, but there were also 89 previously unrecorded species
- Recently there have been more migrants eg Hummingbird Hawkmoth and Vestal - possibly a case of climate change working in the opposite way
- Other reasons for the decline may include the eutrophication of grassland, and light pollution, although there is not much concrete evidence for this yet.

Conservation

Douglas described a number of ways in which conservationists are working to improve habitats for butterflies and moths, including:

- Habitat restoration / agri-environment schemes
- Targeted work for individual species - eg MWT on Llanymynech Rocks for Pearl-bordered Fritillary - Scrub and bracken have to be managed so that they do not become too dense, but still maintain a warm micro-climate, whilst at the same time allowing the growth of flowering plants for nectar, and violets for the PBF caterpillars to thrive on without being shaded out.
- More general habitat work

Useful websites/ email addresses

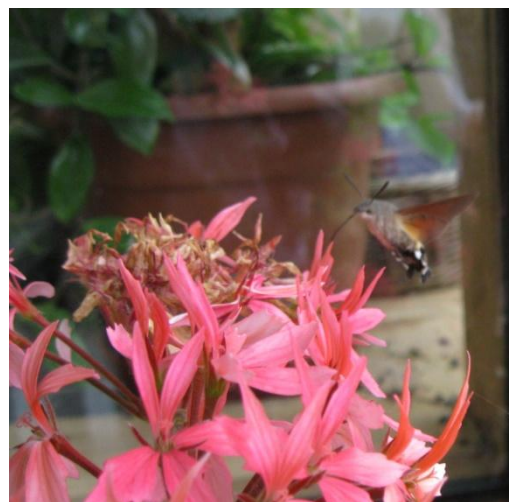
Douglas gave us both his and Peter William's email addresses, emphasising that they are both very grateful for records, and also happy to answer any queries, identify photos etc. – invaluable, especially for beginners:

douglasboyes@gmail.com

peterwilliams526@btinternet.com

His handout, covering useful websites, was also much appreciated. He showed us the Montgomeryshire Moth Group website, which is especially useful for looking at moths likely to be seen in a given month of the year, and has info about all the moths found in the county, and lots of colour photos. It also advertises events in the county, and has useful articles, particularly in relation to similar species which may be difficult to ID. We are lucky in Montgomeryshire to have such a comprehensive and useful website – not every county is as fortunate!

Whilst we listened and appreciated all this information, our attention was drawn, by Jeny, to a Hummingbird Hawkmoth she'd spotted outside on Jane's geraniums! Needless to say, most of us were up and out almost immediately, and were rewarded with several good views of this very attractive immigrant hawkmoth, as it flitted rapidly between flowers, hovering to probe each flower with its long proboscis. It is certainly well-named!



In addition to this welcome visitor, a Small Copper butterfly was spotted, and Douglas saw a Lesser Broad-bordered Yellow Underwing in the garden – an unlikely sighting in the daytime.



After lunch, we looked at several moths trapped last night, which again gave us a chance to look at different species from the ones we've seen previously. As usual, Douglas was keen for us to practise our identification skills, but ever-willing to guide us in the right direction and make sure we got there in the end! It was good to see species we might not usually expect to see, including Small Wainscot and Devon Carpet, both of which had been trapped by Douglas at Llyn Mawr.

And so we completed our training sessions for this year. All that remained for us to do, was to thank Jane and Robin (and Ruby, their 1 year old Labrador bitch, who only moved into her new home yesterday, but who seemed to have been part of their family forever, and even appeared to be taking in some of the morning's Powerpoint presentation!) for opening their home to us all on 3 out of our 4 days training this summer.

Also of course, to thank Douglas for his professionalism, his enthusiasm, his patience and his friendly, easy-going approach to what we all agreed had been a really informative and above all enjoyable series of Butterfly and Moth days. We wished him well, as he starts the next chapter of his life studying Biology at Oxford, and presented him with a book token – jokingly threatening to travel down there – a coachload of 'old biddies' – to catch up with him at some point!!

We truly have been privileged and very fortunate to have had him as the provider of our training, and are sure he will go on to even greater things. We will certainly watch with interest over the coming years.

Thanks also to Montgomeryshire Field Society, for subsidising our training – this has given any member of the Society the opportunity to further their knowledge at little cost to themselves, and is very much appreciated. We are lucky that the MFS is keen to promote this type of project, especially as it enables us to widen the areas of natural history that we can then feel more confident to survey and record, not as experts but as enthusiastic and willing amateurs.

