# Friends of the Roman Road and Fleam Dyke

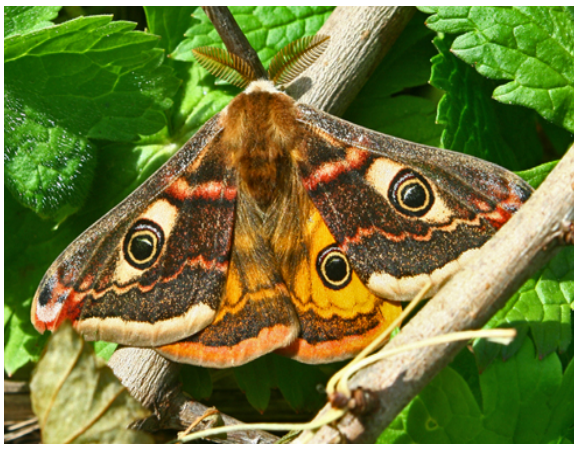
## July 2013
## Newsletter 41

## Survival and Scents in Butterflies and Moths

### A talk given at our AGM by Professor Paul Brakefield, Director of the Cambridge University Department of Zoology and of the Museum of Zoology

There is a common notion that butterflies are diurnal and moths nocturnal. This is roughly true but they have much in common. For example, both butterflies and moths can have eye spots. A study of the diversity of wing patterns raises many questions. Why is there this diversity? How does it come about? Eye spots are, in fact, just one of the many defences that these fragile insects have developed. (right.*Bycyclus anynana,* African Brown*)*

Many butterflies and moths live for only a few weeks, but some live for many months and may survive over the winter. When at rest or hibernating, they need to hide from predators. There are many moths which rest with closed wings whose patterning matches their surroundings so well that it is as difficult for us to detect them as it presumably would be for potential predators. However, camouflage is not always sufficient. Butterflies and moths have a second line of defence techniques, including the sudden opening and flapping of their wings to display the markings on the upper side. This can startle a predator just long enough for the butterfly to escape. Some insects, like the Peacock, have prominent eye-spots which play a part in protective behaviour, as shown experimentally by studying the effect of painting them out. In some species the flapping of the wings generates a supersonic noise that also serves as a deterrent.



Male Emperor Moth, photo by Christine Newell

Peacock, with thanks to Butterfly Conservation

Another protective mechanism that can be observed in some species comes from their ability, while in the caterpillar stage, to concentrate in their bodies noxious plant substances which are toxic to predators. For this to be effective, it is necessary for the predators to recognise the butterflies as noxious and it is therefore desirable for butterflies that are protected in this way to be prominently patterned. The monarch is a good example of this and is also interesting because other species, whose bodies are not toxic to predators, have evolved to have very similar wing markings, thereby deceiving their predators and achieving the same protection. Professor Brakefield showed a famous series of photographs in which an American Blue Jay found a delicious, fat, hairy caterpillar, settled down to eat it, disliked it a lot, spat it out, and cleaned its beak furiously against its perch. It then sat looking thoughtful, 'a bit like a student'.

## How wing eyespots are formed

Most caterpillars go through 5 larval states, or instars. The basic colour of the moth or butterfly comes from the last two instars, but remarkably, the colour pattern of the insect is made in the last few days in the existence of the chrysalis or pupa. Much of this knowledge has been discovered in experiments by Paul Brakefield's group in Leiden on an African brown Bicyclus species with prominent eye spots and a rapid generation time: 8 – 10 generations per year. By moving or removing primordial wing cells in the pupae of these butterflies, it was possible to show that the cells from which the eyespots are ultimately derived are already determined at a very early pupal stage by their expression of the *distal-less* gene which switches on the development of insect limbs, or an eye-spot. A primordial wing cell can be removed from its normal position and implanted in the back of the pupa. Insects have no immune reaction, so the wing continues to grow, producing a three-winged butterfly. Similarly, the white centre of the eye of a butterfly can be removed and inserted in another part of the wing. The surrounding cells will produce the characteristic eye-spot ring.

Photo: Paul Brakefield

### The importance of butterfly and moth pheromones ("scents") for mating.

In moths it is the females that release pheromones to attract the males, the males have feathery antennae which have sensors that are specific for the particular pheromones produced by females of the same species. These sensors are incredibly sensitive and the males can be attracted over very long distances. On the other hand, in butterflies it is the male that has androconia ("brushes") on wings or body to produce a pheromone that serves not only to attract the female but to make her more responsive to the overture of the male and facilitate the transfer of material (in experimental studies it appears as a fluorescent powder) from male to female.

Among common British butterflies, this is most obvious in the Gatekeeper or Hedge Brown, (above,) and the Small, Essex and Large Skippers (below).

Photos: Christine Newell

**Our twelfth Annual General Meeting** was held in Six Bells in Fulbourn at 7.30 p.m. on 8th May 2013.

The Chairman, Dr Edmund Tanner summarized our achievements in the last year. Currently, there are 230 Friends paying £10 a year, or more, often as an extra donation. The money from subscriptions and small fund-raising events was used for various things such as the newsletters, extra management of the sites by Bernard Hunt, our skilled contractor, and a bench on Mutlow Hill. The Fleam Dyke leaflet was reprinted using a legacy from Ann Bicknell, who used to come scrub clearing with her husband, John, and left £500 'for wildlife'. A new leaflet, **The Flora of the Roman Road and Fleam Dyke**, was paid for by donations made at the family funeral of Dr David Clark, combined with the surplus from subscriptions.

Two social events took place during the past year. On 1st July 2012, a party of Friends visited Chilford Hall where they compiled a list of flora and saw a remarkable display of bee orchids. We are most grateful to Mrs Fiona Alper, who had offered us a free event in the old barn, and paid for the tea. Despite the recent catastrophic fire, she welcomed us to the wildlife friendly garden and meadow. On 30th September, about fifteen walkers did half or all of the shorter version of the Fleam Dyke Roman Road walk, starting or finishing at the Black Bull at Balsham.

Management of the sites had been complicated by changes at the Cambridge County Council, resulting from 'the cuts'. A much reduced Countryside Access team now come under Transport and Highways division. However, for the moment, Grassland Management will remain in the care of the same officer, Kate Day. The new Conservation Enhancement Scheme has over-ridden the expensive 2006 Management Plan without explanation or consultation with the Friends although we always attend the Linear Sites committee meetings. See Newsletter 39, page 7.

**Iain Webb, Green Belt Project Officer,** showed photographs illustrating the work of the Mid-Week Volunteers on our sites, amounting to 50 'person-days'. Unfortunately, there were fewer work parties from the Friends than in other years, but the grant of £1,500 given to us by Plantlife, paid for the clearing and treating of clematis and scrub regrowth on the Fleam Dyke.

**Noteworthy sightings**:

The Marsh Harriers, which nest in Wilbraham Fen frequently hunt in the wooded area around Worsted Lodge interchange. A Barn Owl was seen from the Fleam Dyke. Turtle Doves can be heard on both sites. A Small Scabious, *Scabiosa columbaria,* turned up at the Fulbourn end of the Fleam Dyke, the first for perhaps 30 years, and a Devil's Bit Scabious was reported by Steve Hartley on the southern half of the Fleam Dyke. Some of the ten Juniper seedlings reported last year have disappeared, but several others have appeared. The diminutive Fairy Flax, first noted by Julia in 2010 near the Pumping Station, has spread steadily along the edge of the east bank and is spreading along the middle of the narrow track! A grass snake basking near the Pumping Station was killed by a swift and silent cyclist, who should not have been there. Two Lizards were seen mating.

Graham Easy: Juniper

Richard Townley of Fulbourn Manor, who was in the audience, added that the old farm building at the Fulbourn end of Fleam Dyke has been converted so that it can be used by Barn Owls. It is hoped to have sheep grazing on the Fulbourn Estate section of the Dyke quite soon. The existing foot paths will, of course, be maintained.

### Flora of the Roman Road and Fleam Dyke, by Christine Newell

Our newest leaflet is dedicated to the memory of Dr David Clark. All the photographs were taken by Christine on these sites during 2012 . Of particular interest were the ones showing the different cones of male and female junipers, the Purple Milk-vetch and the semi-parasitic Bastard Toad Flax. Christine also showed pages from the revamped website (www.frrfd.org.uk) and the very considerable amount of information and many pictures that it now includes. Members received the leaflet with the February newsletter, but it is available to all for 50p. Send a stamped addressed C4 envelope with two second class stamps to Julia Napier at 30a Hinton Avenue, CB1 7AS. A small, or large, donation for our work would also be very welcome indeed. See page 7.

### An Update on the butterflies of the Roman Road and Fleam Dyke.

**Roger Lemon** summarized results of the 2012 transects. (Recorders needed, please.) 26 species have been recorded on both the Roman Road and Fleam Dyke, 25 species being common to both sites. However, 2012 was not a good year for butterflies, far smaller numbers being recorded than in the peak year of 2009. This is generally agreed to be the result of the dismal weather in 2012. Despite this, there has been an impressive increase in the number of Chalkhill blues over the period from 2007-2012, mainly on the Fleam Dyke. Also notable on Fleam Dyke are the Green Hair-streaks, although not so many were recorded in 2012 as in 2011. Of particular interest was the 12 sightings in 2012 of Dark Green Fritillaries, a species that had made its appearance (a single sighting) in 2010. Details of the butterfly monitoring scheme and the results of the 2012 and previous transects are available on our website: www.frrfd.org.uk

### Treasurer's Report

With his usual efficiency, Mike Albutt provided the meeting with copies of the Income and Expenditure Account for the year ended on 31st December. He said the situation was satisfactory, with all the figures in black and none in red. He added that Julia would now proceed to spend it. Too true. The report is available from 30a Hinton Avenue, CB1 7AS. s.a.e. please

The Committee was re-elected in a swift if rather undemocratic manner, and it was time for a break, with tea or coffee, but not the promised bar. Apologies.

## The Cambridge Bryophyte Group

### Report from Mark Hill,

The publication of The Atlas of Bryophytes of Britain and Ireland, (Hill et al. l991 – 94) was the result of 30 years work by the British Bryophyte Society. The BBS now plans to work towards a revised version. The Cambridge group visited the Fleam Dyke on 15th January 2012, looking at the section from Dungate Farm to the A11. We were pleased to find a number of species that we had not seen there for some years, and in particular *Thuidium abietinum* (now *Abietinella abietina*), which we had not seen there since 1984. This is one of the chalk grassland specialists that has seriously declined in recent years and has also not been seen on the Devil's Dyke since 1988. It has recently turned up on an old railway cutting intersecting the DD near Reach, and now on the FD itself. The only other post-2000 Cambridgeshire occurrences were Coploe Pit (we accidentally had lunch on it in 2003) and on a chalky roadside near Babraham Corner, last seen in 2005.

There was a medium-small amount of the *Thuidium* on Fleam, where it was confined to the path. We also saw several other chalk specialists, which I have marked in bold. Some of these such as *Dicranella varia* and *Homalothecium lutescens* are quite widespread in other habitats such as

churchyards. However, *Campylium chrysophyllum*, *Fissidens dubius*, *Microbryum rectum*, *Seligeria calycina* and *Tortella inflexa* are pretty good chalk grassland specialists in Cambridgeshire and accordingly rare.

These records have been added to the existing Bryophyte records on our website. www.frrfd.org. They are, of course, lodged with the Cambridgeshire & Peterborough Environmental Records Centre.

**Contact**: Mark Hill, 11 Chaucer Road, Cambridge CB2 7EB.
tel: 01223 571574. email: moh@ceh.ac.uk

## Tax Payers Money Wasted on Pointless Clearance

In January and February, a mile of the wide northern verge of the Roman Road which runs between the Balsham to Linton road and the Balsham to Hildersham road was totally cleared with heavy machinery. Formerly a pleasant if slightly overgrown woodland path, it needed to be cleared to a width of about 4 metres. It has been cleared right back to the trees of the overgrown hedge, which were slashed back to fit. Most of the cleared bushes and small trees were burned in huge bonfires, which were then raked out and are now fertilizing surrounding areas. Look for the tallest Mugwort in the Western World. Some of the brash was laid down as chippings.

This work was planned and paid for by Natural England in collaboration with the County Council Countryside Access Department at, I estimate, a cost of £25,000. The officers concerned believe that the Roman Road must be maintained at a width of 40ft, which is true, and must be cleared to that width, which is not true. (Buglife, legal opinion.) This section is not an SSSI. When about half of it changed hands in the early l980s, it was a wooded cart track a few yards wide. It has been cleared in the entirely erroneous belief that if you clear scrub you will get chalk grassland. A great deal of research was done on this from the 1970s onwards, much of it led by Dr. now Professor Emeritus, Peter Grubb. Reports were published in the British Journal of Ecology, Nature in Cambridgeshire, The Ecology of English Chalk by C J Smith in 1980, and elsewhere. Dr Margaret Stanier published a succinct account of the position up to 1992 in Nature in Cambridgeshire, l993.

Moreover, the evidence is clear for anyone to see. If you clear thick scrub you get a mass of beautiful ruderal weeds, followed relentlessly by rank grasses, brambles and wild clematis. Mowing and raking off will produce rough grassland, but the soil under cleared trees is too full of nitrates and phosphates for calcareous flora. In any case, without an adjoining area of flower rich grassland nothing better can be expected. The occasional Small Scabious or Carline Thistle is not enough. There is a way to restore chalk grassland along a path in an area of overgrown hedges and it is summarized in Alison Kew's 1990 Management Plan for the Roman Road. Paragraph 4.2. "Overgrown hedges adjacent to chalk grassland to be cut back by about 1 metre, and reprofiled with a slope towards the grassland of about sixty degrees or less." The key words are 'adjacent to'. I hope to provide more information to support my opinion in the autumn newsletter.JN

## Hemlock, The Thing from the Swamp

(It is not, of course, but it makes a good sub-title.)

I first noticed it on the Roman Road several years ago. It was growing on a pile of rubble and hard core, which the tenant farmer, Richard Barnes, must have dumped in order to repel 4 x 4 drivers before the County Council finally found the money to put in heavy steel gates. For some years now Iain has included Hemlock eradication in his list of work to be covered by the Mid-week volunteers on the Roman Road. This spring they took out everything they could see, but by the end of June a great deal more had developed and there was a handsome stand of plants at the top of the first hill.

Our contractor, Bernard Hunt, was keen to dig it out before it seeded. He came and worked evening after evening until it was almost too dark to see. He dug out the plants on the Babraham Farms side because the Land Manager, Peter Bennet was away. To my astonishment, Mr Bennet rang from France to say that he was very sorry not to be able to deal with the problem, but there were only two men working on the farm, and they were watering the potato crop. The garden of Mount Farm house was edged by Hemlock, which Robert Todd paid Bernard to dig out. Mr Todd pointed out how bad the Hemlock was in the field margin of the adjoining farm, which belongs to the County. The tenant farmer, Mr Richard Barnes, was contacted by Sarah Shepherd for the County Council. The story got a bit complicated and ended with Mr Barnes shouting down the telephone at me, "Hemlock isn't a problem. It has always been here. It's a native plant. You can pay for the work with some charity money if you want. Just don't damage the crop!"

So Bernard did another three hours of digging rock-hard clay in the heat, and the total is £700. This, and a shortfall in subscriptions, means that we will have to cut some of the work which needs to be done this winter, or have a

# Fund Raising Event on Wednesday, 20th November, 2013

# Anstey Hall, Trumpington

## 6.0pm – 8.30pm

**Tickets**: £15 each; £25 for a couple,

**Members:** £12 50; £20 for a couple, children under 16 free.
Tickets: Elfrida Heath, 1st October – 16th November. **Please send s.a.e.**
69 Humberstone Road, Cambridge, CB4 1JD,
tel: 01223 562360 email: elfrida.heath@ntlworld.com

### Programme:

**A glass of sparkling wine** in the 18th century hall. (free)
Upstairs in the big Salon, bar open. Brief speeches by our Patron, **Professor Emeritus Peter Grubb** and the person who spends the money, **Julia Napier.**
**John de Bruyne**, will lead tours of the remarkable family portraits.
**The Little Choir of the Cambridge Philharmonic Society** will sing for us.

**8.30 or so, Goodnight**, and many, many thanks to John de Bruyne for letting us have an event in his beautiful house at no charge.

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## Reminder

Since April 2011 subscriptions have been **£10 or a bit more if you can afford** it. Could you check that you have adjusted your Standing Order, and instruct the bank to cancel the existing one!

### New Membership Secretary

Cheques should now be sent to
**Christine Newell, 82 The Lane, Hauxton, Cambridge,CB22 5HP**
Tel: 01223 872681 email:Christinenewell647@btinternet.com

**Email addresses.** Have we got your email address? Would you like to receive occasional emails with news about our sites? For example, the flowers on the Fleam Dyke are looking wonderful; Dark Green Fritillaries back again; don't miss the Chalkhill Blues.

## Hemlock

**Conium maculatum** is the tallest of the lovely sequence of Umbellifers, (now called Apiaceae) which are to be found on the Roman Road and the Fleam Dyke. It begins with Cow Parsley and continues with Rough Chervil, Upright Hedge Parsley, Burnet Saxifrage, Pignut and, these days Hemlock. Lovely Hemlock? Well, yes. Tall, with delicate white flowers and shining leaves in fern-like fronds, it creates a tent under which nothing much grows, and where its own seeds then thrive. Hemlock is totally poisonous. Think Socrates and Seneca. If you are dealing with a lot, you need to wear long sleeves, long trousers, gloves and protective glasses. As you cut it, the juice can spray out and give you a burning rash which lasts several days, and inflammation of the lungs. It thrives on piles of loose earth along road works and large building sites, and road side hedgs. It can be treated with 2,4-D, but not on an SSSI. It is not, yet, a notifiable weed.

Bernard Hunt, doing battle with Hemlock. He should have been wearing long sleeves and a mask, but it was one of the hottest days of the year, and still stiflingly hot at five o'clock in the evening when he began work, so he hoped for the best and suffered the consequences.

In the photo above, the purple flowers are on a clump of Greater Knapweed which was at least 2ft high. Hemlock can grow uo to 8 ft. (1.5 – 2.5m)

**Unexpected item in a hedge area.**
"What idiot threw a paper bag into the hedge?" But it wasn't. It was another marvel from the insect world, the thick protective tent spun by the little caterpillars of the Small Eggar moth, (nationally scarce) which emerge at night to feed on Hawthorn or Sloe, as here. When almost mature, they disperse and spin an individual protective tent in which they will overwinter.
Seen near the Pumping Station. June 30th

**Pointless Clearance at Tax payers' Expense**. See page 5.

The yellow umbellifer is Wild Parsnip. It is a chalk loving species, here erupting after clearance because the soil under thick scrub is full of nitrates and phosphates. The large green leaves in the picture below are those of Garlic Mustard: seeds distributed by the heavy machinery used during this work. A minimal flora had survived at the edge of the wooded track, and now flourishes there: Cinque-foil, Common Knapweed, some White Campion, Agrimony.

All the usual wind-borne 'weeds' are present and a range of rough grasses. This mile long stretch of the Roman Road will now be mowed and baled twice a year, at an extra cost, of course. I could not see any chalk grassland flora remain, except where a gap in the hedge has allowed Lady's Bedstraw and Restharrow to spread from the south facing side of the old hedgerow. The result in a few years time will be rough grassland, which, though every habitat has a certain value, is not worth paying thousands of pounds to achieve.

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## A huge thank you to Dr Jane Robson

Jane has been our Membership Secretary since 2007. Because she was already fairly busy, she offered to take on the job of receiving, recording and banking cheques and cash, and sending me details of new members and regular lists of payment. This essential job has now been taken on by Christine Newell, whose details are given below, and who has already done so much for us.

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With Best Wishes, Julia Napier, 5th August, 2013

30a, Hinton Avenue, CB1 7AS frrfdjin@freebie.net 01223 213152