GMS News

Spring 2015

Weeks 1-9

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Editorial – Norman Lowe

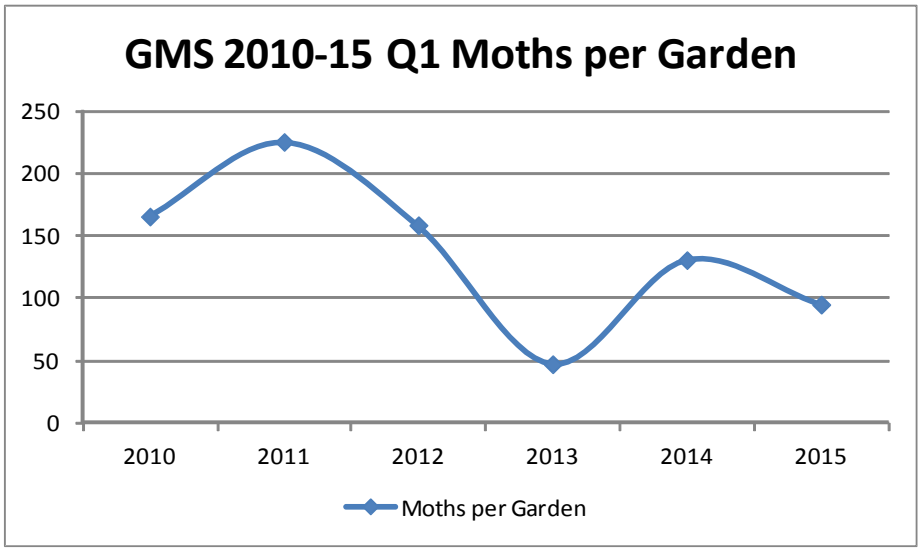
Throughout the time that I have edited the GMS Newsletter, very detailed and comprehensive reviews of catches have been compiled by Angus Tyner and I am very grateful for the hard work that he has put in on this. Now, however, the task has been taken over by Evan Lynn, whose first report can be found below. Evan has evolved his own style of reporting, which I personally find very useful and interesting, but I'd very much like to hear your views. So please let me know what you think.

As usual, we had a very successful Annual Conference in early March and thanks to Janet Cheney and her colleague who put in such a lot of hard work to make it successful. A summary of the talks is reproduced here, produced by Anne and Jim Shaw, to whom our grateful thanks are due. We also have an insight from Steve Lockey, a new GMS recorder, into his first quarter's experiences, and the latest in our series of Crosswords. As usual I have tried it out myself and got all the answers except two. Solution in the next edition.

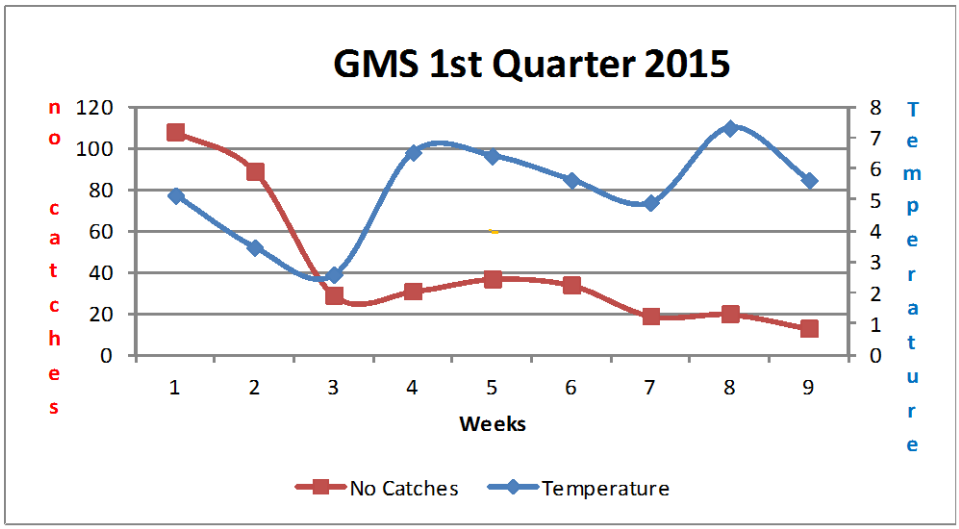
From time to time I am approached, usually by radio producers, to comment on stories in the press about moths. Often these are scare stories about destructive pests such as clothes moths and I make sure that as far as I can, I turn the conversation round to attractive moths, their usefulness, their decline and I also try to squeeze in a mention of GMS. So on 17 June I managed to get most of these messages in on Radio 5live and you can hear how successful or otherwise I was at http://www.bbc.co.uk/programmes/b05yl3vl . My bit starts at 56.30. I failed to mention GMS then but I was more successful with two my follow-up interviews for BBCs Radio London and Berkshire. So if you get the chance to talk about moths either locally or nationally to the press and media, please remember GMS!

Overview GMS 2015 1st Quarter – Evan Lynn

Following on from the paucity of moth numbers recorded in the last GMS Report (2014-15) it is perhaps not surprising that this downward trend continues, as shown in the graph below. Although some records have yet to be received this appears to be a worrying decline long term since the 2011 high. The weather during this quarter has been cold and windy in many parts of the UK with gardeners complaining of the slow start to the season.



When I looked at the reports coming in I found it easy to forget that the columns and rows represent individual moths that have been collected and identified by all of the recorders in the scheme. Many thanks to all of you but especially to those who operate more than one moth trap. It was depressing on opening the records to find the number of empty traps. One can only visualise the disappointment of these morning inspections.



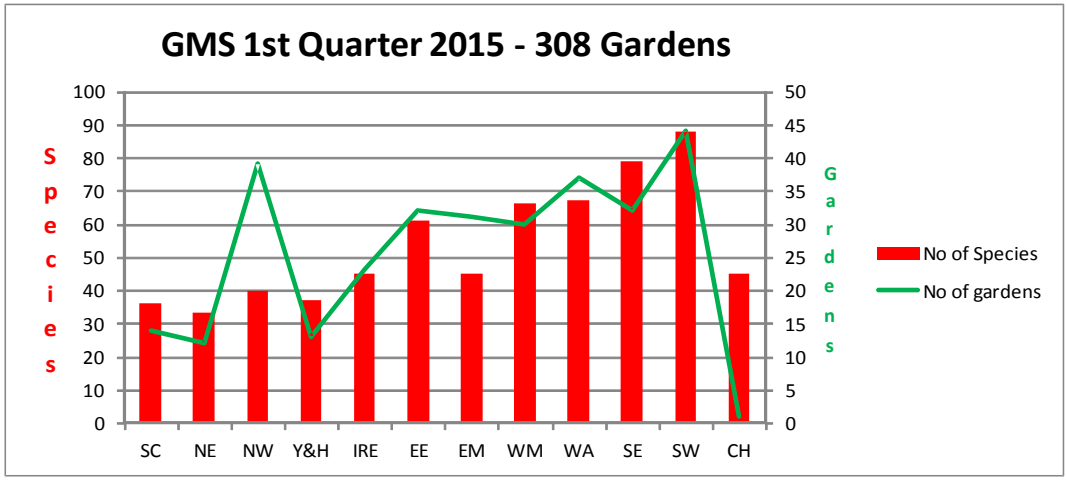
The above graph of recorded minimum night time temperatures and no catches should not be taken at face value as there may be other factors at work. We live in a sheltered valley whereas another site a few miles away on the coast is in a more exposed situation. On the many windy nights we have had this last quarter our trap has caught a consistently small but respectable number while the coastal site has recorded either a “no catch” or a very limited number of moths.

The chart below lists the top 20 moths for this quarter. It shows a significant negative percentage change for most moths. The only two exceptions are the Dotted Border and the newly added *Emmelina monodactyla*.

GMS 1st Quarter – 2015 & 2014 (core species only)						
Position	Species	2015		2014		% change
		Total	Mean per garden	Total	Mean per garden	
1	Hebrew Character	8639	28	13091	36.3	-34%
2	Common Quaker	8031	26.1	11974	33.2	-33%
3	Clouded Drab	2980	9.7	4774	13.2	-38%
4	Early Grey	1597	5.2	2468	6.8	-35%
5	Small Quaker	1374	4.5	3584	9.9	-62%
6	Oak Beauty	418	1.4	577	1.6	-28%
7	March Moth	391	1.3	415	1.1	-6%
8	Double-striped Pug	390	1.3	434	1.2	-10%
9	Twin-spotted Quaker	380	1.2	672	1.9	-43%
10	Brindled Beauty	318	1	555	1.5	-43%
11	Early Thorn	312	1	575	1.6	-46%
12	Chestnut	279	0.9	403	1.1	-31%
13	Dotted Border	226	0.7	212	0.6	7%
14	Powdered Quaker	222	0.7	485	1.3	-54%
15	Light Brown Apple Moth	205	0.7	334	0.9	-39%
16	*Emmelina monodactyla*	170	0.6	132	0.4	29%
17	Shoulder Stripe	167	0.5	175	0.5	-5%
18	Shuttle-shaped Dart	142	0.5	612	1.7	-77%
19	Brimstone Moth	121	0.4	355	1	-66%
20	Muslin Moth	115	0.4	299	0.8	-62%

Footnote 2015 - 308 gardens (received to date) 2014 - 361 gardens

It is interesting to see the different number of species in each region, no doubt showing both the climatic and geographical forces at work. At the time of writing 308 reports had been received from the Regional Co-ordinators.

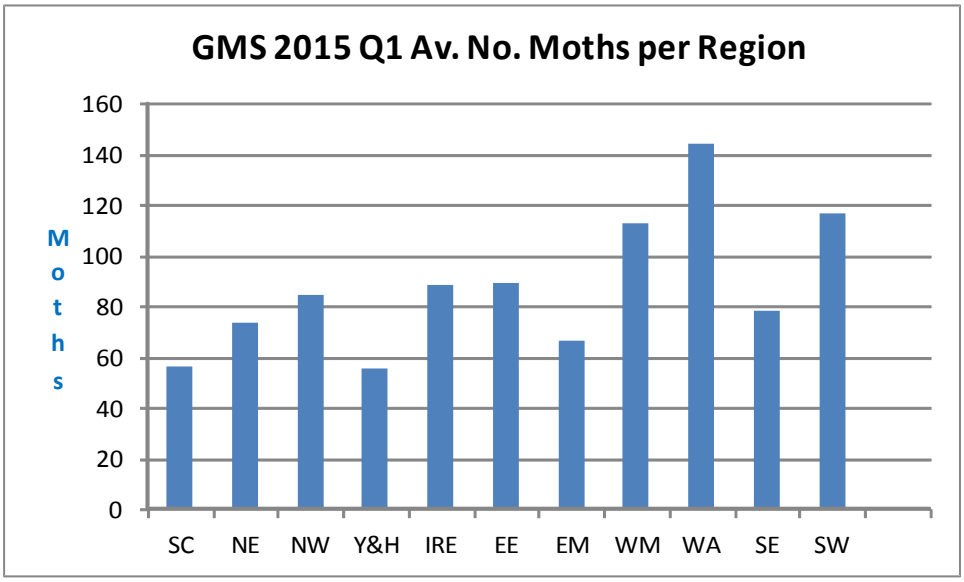


Scotland (14)	Mean	North East (12)	Mean	North West (39)	Mean
Common Quaker	28.6	Hebrew Character	31.1	Common Quaker	29.9
Hebrew Character	27.9	Common Quaker	5.6	Hebrew Character	25.3
Clouded Drab	2.9	Clouded Drab	5.1	Clouded Drab	9.3
Small Quaker	3.9	Early Grey	1.9	Small Quaker	4.2
Early Grey	1.6	Twin-spotted Quaker	0.7	Early Grey	3.8
Emmelina monodactyla	0.4	Small Quaker	0.6	Twin-spotted Quaker	1.3
Early Thorn	0.4	Powdered Quaker	0.6	Oak Beauty	1
Light Brown Apple Moth	0.3	Shoulder Stripe	0.2	March Moth	1
Shoulder Stripe	0.2	Chestnut	0.2	Chestnut	0.9
White-shouldered House Moth	0.2	Oak Beauty	0.1	Double-striped Pug	0.7
Yorks & Humber (13)	**Mean**	**Ireland (23)**	**Mean**	**East England (32)**	Mean
Hebrew Character	21.2	Hebrew Character	32.6	Common Quaker	28.8
Common Quaker	13.2	Common Quaker	21.2	Hebrew Character	24.3
Clouded Drab	7.5	Clouded Drab	12.3	Clouded Drab	9.2
Small Quaker	2.4	Early Grey	4.2	Small Quaker	6
Early Grey	2.2	Early Thorn	1.5	Early Grey	4.3
Brindled Beauty	1.5	March Moth	1.5	Double-striped Pug	1.8
Powdered Quaker	0.8	Oak Beauty	1.3	March Moth	1.5
Early Thorn	0.7	Powdered Quaker	1	Oak Beauty	1.2
Emmelina monodactyla	0.6	Small Quaker	1	*Emmelina monodactyla*	1
Double-striped Pug	0.6	Double-striped Pug	0.8	Twin-spotted Quaker	0.8
East Midlands (31)	**Mean**	**West Midlands (30)**	**Mean**	**Wales (37)**	**Mean**
Hebrew Character	20.8	Hebrew Character	28.9	Hebrew Character	40.2
Common Quaker	18.9	Common Quaker	21.4	Common Quaker	28.1
Clouded Drab	10.2	Clouded Drab	11.3	Clouded Drab	18.6
Early Grey	3.1	Small Quaker	3.9	Small Quaker	10.4
Small Quaker	3	Early Grey	3.5	Early Grey	10.1
Double-striped Pug	1.1	Twin-spotted Quaker	2	Brindled Beauty	3.9
March Moth	0.9	Brindled Beauty	1.6	Oak Beauty	2.9
Lt. Brown Apple Moth	0.9	March Moth	1.5	Twin-spotted Quaker	2.9
Twin-spotted Quaker	0.7	Powdered Quaker	1.2	Chestnut	2.9
Oak Beauty	0.6	Oak Beauty	1	Dotted Border	2.4
South East (32)	**Mean**	**South West (44)**	**Mean**	**Channel Islands (1)**	**Mean**
Common Quaker	23	Common Quaker	34.6	Common Quaker	111
Hebrew Character	21.7	Hebrew Character	32	Hebrew Character	35
Clouded Drab	5.7	Early Grey	8.3	Waved Umber	27
Early Grey	5.2	Clouded Drab	6.5	Twin-spotted Quaker	19
Small Quaker	3.1	Small Quaker	4.8	Double-striped Pug	11
Double-striped Pug	2	Double-striped Pug	2.3	Light Brown Apple Moth	10
Oak Beauty	1.6	Early Thorn	1.9	Early Thorn	10
Twin-spotted Quaker	1.3	Brimstone Moth	1.7	Early Grey	10
March Moth	1.2	Oak Beauty	1.7	Shuttle-shaped Dart	8
Emmelina monodactyla	1.1	Lt. Brown Apple Moth	1.5	Twenty-plume Moth	5

The above table shows the top 10 moths by region, listing the mean numbers of moths/garden. The numbers in brackets refer to the number of gardens. It can be seen that there is some variation between the regions with the Common Quaker and Hebrew Character exchanging between the top two positions. On the Channel Islands there is only one garden where moths have been recorded in every week compared to all the remaining regions where the mean has been lowered by "no catches".

The only two species showing a positive percentage change in the earlier top 20 table were the Dotted Border and *Emmelina monodactyla* . In the Top 10 table, the Dotted Border appears only in Wales whilst *Emmelina monodactyla* is found only in the tables for Scotland, Yorkshire & Humber, East England and South East England.

The histogram below shows the mean number of moths per region. The Channel Islands Region is not included with just one garden recording 332 moths of 23 species. Wales had the highest mean total of moths (144) followed by the South West England (116) and the West Midlands (113).



Finally I should like to thank everyone for their co-operation in sending their reports in promptly and for their help as I take over the writing of this report from Angus, who has been a hard act to follow.

First Quarter, First Time – Steve Lockey

It all started when I began to see day-flying moths when pursuing butterflies. Burnet Companion and Burnets began to make me wonder what I might be missing if only I had a moth trap!. So in the middle of last year I purchased a Skinner and away we went on the great moth adventure.

Within a week an Elephant Hawkmoth turned up and soon I was inundated in Underwings. I started to look forward to the next day, getting up nice and early to see what awaited me. I eventually, reluctantly, put the trap away at the beginning of November.

A new year dawned and it also dawned on me that joining the GMS would make me committed to putting the trap out at least once a week even if the results might be nil. This information would probably be useful even though it can be a little frustrating. So, with the help of all the purchased books, internet web-sites and people to e-mail with queries, away we went.

I'm on a hill six miles east of Oxford and the wind always seems to be blowing!. Over the years the wife has planted up the garden with various trees, shrubs and flowers and if I say "we could have that, it's good for moths", she usually gives me that look, and says "we already have".

One thing I have been thankful for this year has been the confirmation from other web-sites that it has been a slow start to the mothing year because I thought up to then that I must be doing something wrong!

I look forward to the rest of the year and hopefully will need my Abacus ready for the Underwing season. Here's to the next three quarters.

Notes from the 2015 GMS Annual Conference - Anne and Jim Shaw

A summary of the highlights of each presentation to the 2015 GMS Annual Conference

2014 Roundup - Norman Lowe

Following the rapid rise in GMS recorders over the last 9 years the number of the scheme Recorders is levelling at around 350 across the whole of the UK .

- 2014 full report to be issued when analyses is completed -
- Snippets so far :

Top 10 Moths (Mean moths per trap)			
1.Large Yellow Underwing	406.5	6. Lesser BB Yellow Underwing	84.4
2. Heart & dart	211.9	7. Common Quaker	83.8
3. Dark arches	124.7	8. L.B.Apple Moth	75.8
4. Set Hebrew Character	118.4	9. Riband Wave	69.8
5. Hebrew Character	99.8	10. Sq Spot Rustic	69
		10 Common rustic	69

Top 5 by Number Traps recorded	
1. Hebrew Character	467
2. Lge Yellow U/wing	467
3. Dark arches	465
4. Common Quaker	462
5. Brimstone	459

The West Midlands now has a 12 year dataset and it is possible tpo get some interesting information from this. For example for each of the West Midlands VCs, the earliest records for Large Yellow Underwing were :

VC	36	37	38	39	40
Date	11 May	11 May	16 May	22 May	30 May

2015 Updates – Norman Lowe

The core lists have been held stable 5 years since 2010 .However after discussion this year's lists have been issued and a number of changes have been made to the lists, as well as agreement that " Aggregate" (agg.) species will be retained.

Additions include : *Emmelina monodactyla*; December moth ; Oak hook tip ; V Pug; Barred Red ; Rosy Footman ; Cinnabar ; Least Black arches; Heart & Club; Purple clay; Pine Beauty; Merveille du Jour; Uncertain; Straw Underwing .

The Extras list is still provided as a separate section, not mandatory to complete for GMS, however please note, County Recorders are interested in any of these records which is all valuable information . Note: GMS 2014 Extras returns have been reviewed to derive the changes above.

Rothamsted Survey Results - Chris Shortall

This is the longest running survey of Insects in the World, monitoring insect populations over 50 years of change to 2014. A rrief history was given of some of the people and their achievements in the organisation:

Sir John Lawes 1814-1900 Phosphate fertiliser developments /impacts. Continuing today across 50m test land strips at the Rothamsted Research centre.

Carrington Bonsor Williams 1889-1981 - Trap development to 200w Tungsten bulb used in the 80 – 100 permanent traps set up across the UK and Channel Isles today. There were as many as 500 in 1960(many more traps) but expertise /funding and statistical validity have driven numbers down to current level . There are a very small number of traps in International locations eg Johannesburg South Africa . The traps are mainly 5ft off the ground with blacked out canopies and bases to restrict to low level collecting, however a small no. are on rooftops. Moths are an ideal way to study Biodiversity.

Ray Taylor 1924-2007 Insect populations Nationally, particularly related to applications of pesticides (ref the publication of "Silent Spring" by Rachel Carson in the USA).

Up to the end of 2012 the surveys equated to 4.5 million trap nights over 544 traps and 1535 species . Many Ecology papers have been produced including the 2006 Publication of "The State of Britain's Larger Moths " and the follow on for the same study Published in 2013 both produced in conjunction with The Butterfly Conservation Society (Copies issued at meeting and also available as pdf download from www.butterfly-conservation.org)
Overall there is a 28% decrease in the abundance of moths since 2010 and an overall 40% decline in the British Isles below the line South of Lancaster across to York.
Extracts: 124 species declined by 37% over 40 years 1968-2007 and 61 species of larger moths declined by 75% or more

- V Moth down by 99%
- Garden Tiger declined by 92 %
- Mouse Moth declined by 85 %

However one third of the 337 species studied (a substantial minority) increased

- Least Carpet up by 70% in SE&SW 1991-2011 (from the Continent)
- Dwarf Cream wave also upwards .

- Dingy Footman increased by 1850% since 1968 (a lichen feeder, possibly indicating Clean Air Act has worked).

The decline is serious, and the causes are still undetermined. It especially affects moths with restricted ranges eg high altitude; larger moths fare worse than smaller ones; those with short larval periods faring worse. Climate change is a significant factor but very complex depending on the insect life cycle. Eg 6 years of really wet winters 2006-2013 affected all moths with ground dwelling larva on 5 sites in SE England. Garden sites are declining at same rate as all other site.

Chris made the interesting observation that in the future of RIS is uncertain since the problems are not necessarily seen as of National economic interest. He felt that it would be of value to investigate closer links between RIS and GMS.

Insect Pheromones as a Sampling Tool - Joseph Burman, Kent University

The talk was based on research into the development of pheromones. A process has been developed for testing for and then mixing a cocktail of chemical stimulants to gain optimised responses from males. Each developed pheromone cocktail is species specific . The laboratory processes and rigorous field tests were described. Trials were conducted on 6 Spot Burnets and also with New Forest Burnets in Sweden taking into consideration many factors relating to effective distances, heights/placements of lures etc. All proved successful as attractive lures.

The drive for this development and the subsequent field trials is to help in trying to achieve the EU drive to halt biodiversity loss by 2020.

Further trials were then undertaken to use the lures for surveying at a number of different locations. Results were directly compared against visible transect techniques and light trapping returns in the same locations to determine whether it is accurate and whether it is more effective .When numbers were recorded by all methods, similar numbers of the target species were found. However in a significant number of the locations no moths were found by transect/ light trap but were recorded as present and in numbers at the pheromone lures. The range of attraction was up to 135 metres. The process gave a rapid assessment of the presence of species, and could reveal hidden biodiversity.

Further species specific lures are in development. Refinement of the lure techniques used also needs development to ensure that minimum disruption to the breeding populations is caused by the use of lures eg males were contaminated on landing on the lures causing other males to follow and try to mate with them.

New lures being developed (eg Garden Tiger) will eventually need field trials and a number of GMS attendees expressed an interest in becoming involved.

More Conclusions from the GMS Data Base - John Wilson

Data was analysed for the 50 most widespread species, those occupying the most 10 km squares, over the period 2003 -2013 for the English and Welsh Vice counties 1 – 71. Data was not analysed from Scotland, Ireland or Channel Isles. The data was transformed to statistically investigate the impact of influencing factors of

- Climate (Mean temp central England + Rainfall England & Wales + Sunshine hrs England &Wales);
- Sizes of Previous Generation & Current generation;
- Life cycles and

- Migrants.

Of the 50 species investigated, 32 were univoltine, 18 were bivoltine which equated to a review of 68 generations.

Findings:
In 66 of the 68 generations there was a significant association with 1 or more climate variables. Only 2 generations showed no significant association to a climate variable
The effect of climate explained, on average, 70% of the variance in moth abundance between years

The review continued by looking at:

- Variation in the type of climate effect occurring in the different seasons (Spring ie Apr-June; Summer ie July –Oct ; Winter ie Nov –Mar)
- Over wintering stages of moth lifecycle (Ovum, Active Larva, Diapause Larva, Pupa)
- Effect of Spring & summer food plants (grasses, herbs, trees and shrubs)

Findings Summary :
1.Between 2003 and 2013 the range in moth abundance for the 50 most widespread species has varied on average by 102%
2.Climate was the dominant factor in driving these short-term fluctuations in moth abundance explaining 70% of the variance
3.In at least 63% of cases, the effect of climate occurred during non-adult stages of the life cycle
4.In general, moth abundance increased following cold winters, a warm & sunny spring, and wetter summers
5.Species that over-winter as eggs but not as active larvae benefited from colder winters
6.Species using grass as their food plant benefited from a warm and dry spring or summers

The Full Report is posted on GMS Website

Moths to light – David Gardner

This talk was based on 'The Attraction of moths to light and IR' by Henry S Hsiao who was then Assistant Professor at University of North Carolina Chapel Hill: published in 1972. Also used were more modern documents including teaching aids.

There were several scientific experiments using lab bred moths, tethered in various ways and tested with variable light sources and pheromones. These found that the eyes alone were responsible for sight and could not see infrared (IR). The spectrum they see is very similar to our own species except being a little further into the ultraviolet (UV). In addition it was found that moths will look at light they can hardly see.

Since moths cannot see IR it was decided to to film their flight in experiments using IR cameras as this would not disturb their behaviour in more recent research.

In an experiment using a pheromone attractant it was found that after one second the moths flew strongly in a burst of ten seconds. If the level was increased or decreased the flight changed to hunting, side to side movements. Too much pheromone stopped the moths completely

Moths eyes change as it gets dark, so dark adapted moths were used, after 120 minutes or less in the dark. The moths were found to have a pigment envelope surrounding the crystalline thread which migrated vertically according to the given light. This also changed

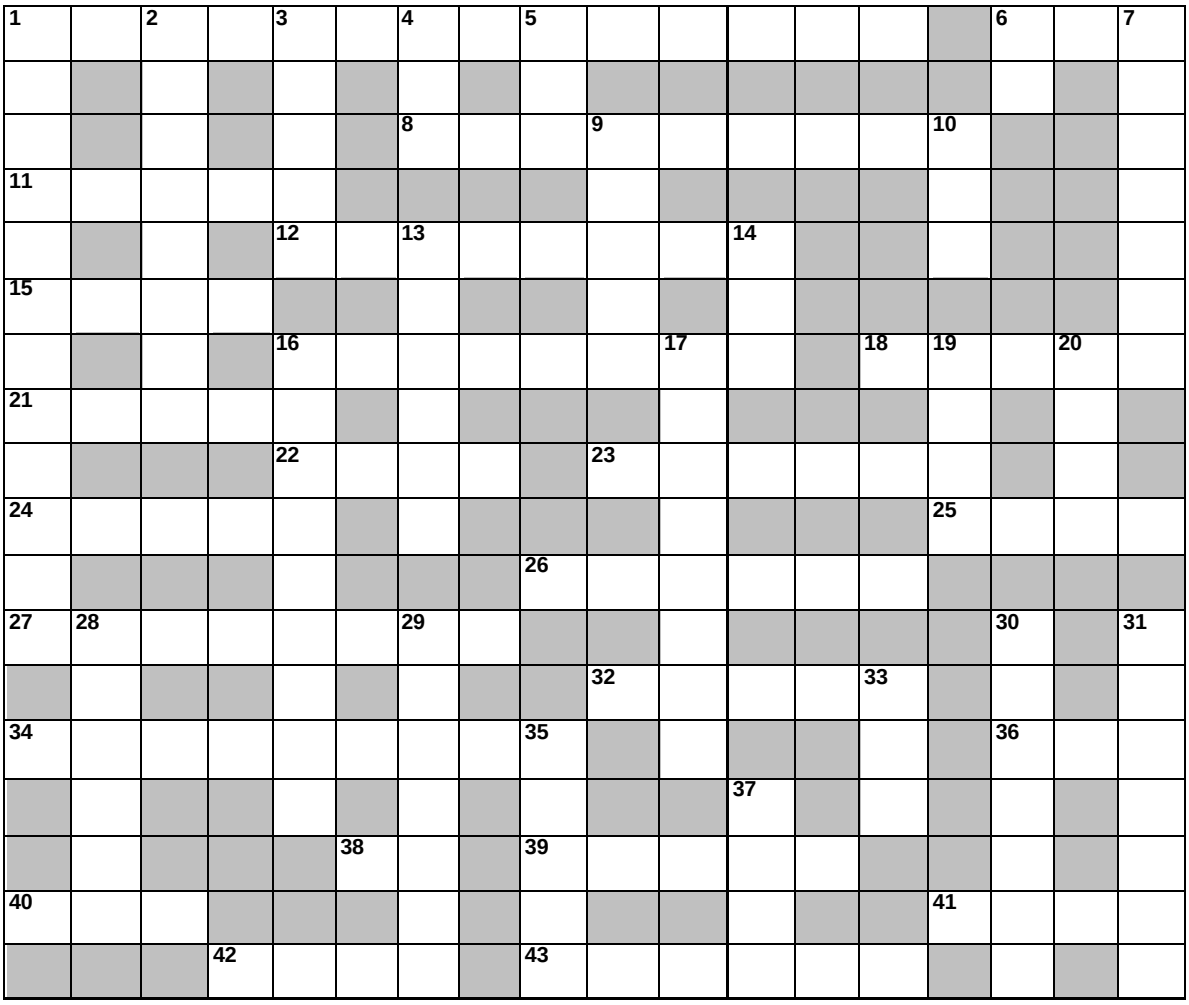
the colours so the main species used, Corn Ear-worm , *Heliothis zea* changed, after one hour of dark, from light green with black centres to pitch black with silver centres.

It has also been discovered that moths use merged vision of maybe up to two seconds while we use 1/8 second stills so at night the moths will be able to see more as the responses to light are held for a longer period. So we stumble about and they can fly.

Like every other group of life that sees that has been tested, moths also use Mach Banding, where the process of creating the image seen enhances the light and dark at a boundary. So a bright light in the dark will be significant and the moths will head for the boundary. They were also observed to fly to and round an actinic source.

Taylor in 1952 discovered that the best light wavelength for attraction was 365 µm and these types of bulbs can be seen widely in locations such as in fish shops cafes and warehouses where the control of insects is important.

Crossword No. 6 - Nonconformist



Clues across

1		Fantastic, that really stands out to me.	5,9,
6	, 41a & 7d	With socket-set u-turn you should enjoy hazel's company.	3,4,7
8		A certificate including unfinished odd detail for this minute moth genera.	9
11		Sounds as a Carrara sculptor carved one of these diggers.	5
12		Seasonal time often followed by a country feature.	8
15		Tomato-loving adventive which Mr Tutu takes along with him.	4
16		Part of a pub, old fruit; you may well be trodden on later……..……..?	8
18		….. as 16, but teacher's special weapon in my school days.	5
21		Mixed up thought with a good many shows of hands.	5
22		Spotted or striped like the unentwined founders of Rome?	4
23	& 42a.	It will be chilly so, next term, on with us to find this late flyer.	6,4
24	& 31d.	May be seen in small Celtic circles?	5,7
25		It would take a bee to spot this micromoth.	4
26		See 35d	
27		Look to the cooler regions to find this bloodless beggar.	8
32		See 34a.	
34	&32a	Needs illumination for wader to split on this moth.	5,4,5
36		Needed to warm up the metabolism.	3
38		Butterfly specifically from Rio de Janeiro.	2
39		Signalled before describing cat or darkness.	5
40		Hide under this to avoid a proper soaking.	3
41		See 6a.	
42		See 23a.	
43		Not let in to the event, leaving us with a shout and painful exclamation.	6

Clues down

1		George is kept away from Ian by European measuring system.	12
2		Small creatures seem unlikely to tie piano down, but….?	8
3		Sounds like a good going over is needed for these geometers.	5
4		Colour of Russian immigrant?	3
5		Miss Ayres returns to find two well marked lepidoptera.	3
6		Moth flying in reverse?	2
7		See 6a	
9		Cyclic period giving markings on several moths.	5
10		Charred remains of a small dog?	3
13		Spin ruthlessly backwards for this, possibly, Scandinavian species.	6
14		Deposition of ova whilst in playful mood.	3
16		Pale, perhaps washed out, immigrant of the south west?	4,5
17		We hired Raz, the keeper, to find this reedbed dweller.	8
19		Some moths would rather be feeding amongst this culinary plant.	4
20		The third man would be leading this large flier.	4
28		Generically speaking this group contains 11a.	6
29		Bare northern expanse, certainly we find no ranch there.	7
30		Japanese? Maybe, but comes without a marked drinking aid.	7
31		See 24a.	
33		Vi could be spotted or striped, you can count on it being old Roman.	3
35	and 26a	This perplexing moth has stern way when found on open ground.	5,6
37		Close cousin to 16d, and not imaginary.	4

Tailpiece - Norman Lowe

Mark Tunmore, of Atropos Books, one of our valued sponsors, is looking for articles for Atropos magazine He tells us:

" I am thinking more specifically about research papers by those involved at the top end of the scheme, although of course contributions from members are also welcomed if they are of interest to readers. I am sure that as the amount of data you are holding increases that you will want to publish the results of analysing this data to report your findings."

If you are able to contribute anything along these lines, please let Mark know – his contact details are to be found below in our Sponsors section. By doing so you will both support our sponsor and help to get across the message about GMS.

As you all know, records in each region are dealt with by our Area Coordinators, without whom GMS would not function. There have been a few changes recently so I thought it best to show them all here, but I would like to mention that we now have a dedicated East England coordinator, Graham Geen from Norfolk, and I hope you will all make him welcome and offer any support and advice needed. Graham is new to the GMS, but an experienced moth recorder, and I'm sure he will do a great job. His email address is grahamgeen@btinternet.com. The full list is:

Area	Subarea	Contact	Email
UK overall		Heather Young	invert_ecology@yahoo.co.uk
1. Ireland	-	Don Hodgers	hedesore@gmail.com
2. Scotland	-	Audrey Turner	unicorn64@btinternet.com
3. Wales - GMS-Cymru	-	Norman Lowe	norman@enviro-consulting.com
4. South West England	-	George Davis	g.davis140@btinternet.com
5. South East England	Overall	D Gardner	davidcgardner@farming.co.uk
	Surrey, Berkshire, Buckinghamshire and Oxfordshire		janet.cheney@btinternet.com
	Sussex, Hampshire, Isle of Wight		martin.ellis29@yahoo.co.uk
	Kent	Ade Jupp	ade_jupp@hotmail.com
6. East of England		Graham Geen	grahamgeen@btinternet.com
7. West Midlands	Warks & Worcs	Stephen Howarth	stephen.howarth4@virgin.net
	Staffs & Shrops	Mark Shaw,	markshaw7@btinternet.com
	Herefs	Robin Hemming	robinhemming@btinternet.com
8. East Midlands	-	Roger Freestone	rogerf500@sky.com
9. North West England	-	Steve Orridge	steve@orridge2002.fsnet.co.uk
13. Isle of Man	-		
10. Yorkshire and Humberside	-	David Baker	d.baker99@mypostoffice.co.uk
11. North East England	-	Mike Cook	michael_j_cook@btinternet.com

Communications & Links

Garden Moth Scheme website:
http://www.gardenmoths.org.uk/
For all your GMS contact information; download section for forms, instructions, newsletters and identification guides; links to UKMoths for individual GMS species.

Garden Moth Scheme Facebook Page
https://www.facebook.com/GardenMothScheme
More than 500 'Likes'; shares general information on the GMS and other moth-related topics.

Garden Moth Scheme Facebook Group
https://www.facebook.com/groups/438806469608527/
Currently 467 members (not all active GMS participants); the best place to post your messages and photos; files section containing forms, instructions, newsletters and identification guides.

Garden Moth Scheme Yahoo Group
https://groups.yahoo.com/neo/groups/Gardenmoths/info
Members-only forum for discussion; files section containing forms, instructions, newsletters and identification guides.

GMS Sponsors

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Atropos Books
Online book store and publication of Atropos, the journal for butterfly, moth and dragonfly enthusiasts. Special offers available on the website.
www.atroposbooks.co.uk
The Boat House, Church Cove, Lizard, Cornwall, TR12 7PH
01326 290287
enquiries@atropos.info

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www.mapmate.co.uk