THE BUG CLUB MAGAZINE

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The BUG CLUB

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For young entomologists

The Bug Club is run by the Amateur Entomologists' Society (AES) as a joint venture with the British Entomological and Natural History Society (BENHS)

"Starting Small, Thinking ~~Big~~ BUG"

Editorial

www.amentsoc.org/bug-club

Dear Bug Clubbers,

This is Part 6 (2014) of your magazine! (Yes, you don't need to look twice at your calendar, we are well into 2015 - we apologise for the delay in sending out this issue. Everyone who subscribed last year will receive this issue, along with everyone who is a member in 2015).
If you haven't already renewed your membership for 2015, please do so now, either by post or online via the online shop on the AES website www.amentsoc.org.

Because of the delay, we might make the next issue a larger than usual, double issue, so that we can catch up with ourselves - but only if we have enough articles, so please do send us your pictures and articles! As you will see on page 13, there are prizes for articles published in the Magazine each year!

We hope that you enjoy the articles in this issue, and that they will interest you to think about insects and the natural world as spring approaches.

Dafydd

Front Cover: 5th instar nymph of the Spiny Flower Mantis, *Pseudocreobotra wahlbergi*. Image: Andrew Mitchell. (For more great photos see Andrew's website: http://www.unseen-universe.co.uk/)

Notices for Bug Club Members

Bug Club Sleepover

Saturday 30th May 2015
Perivale Wood Nature Reserve
Perivale, Middlesex

For one of our events next year we thought it would be fun to have a sleepover, and our friends the Selborne Society have the ideal place for it!

The Selborne Society was set up to commemorate the Rev. Gilbert White, of Selborne, in Hampshire, who wrote a famous book called 'The Natural History of Selborne'. This was first published in 1789, and has never been out of print since! Gilbert White is regarded as the first **ecologist** - the name given to someone who observes nature, and studies how plants and animals inter-relate.

The Selborne Society today owns its own private nature reserve. They are in the process of building a new education centre there, and the first part to be built is the toilets! So, that will be enough to allow us to have a sleepover there, in May!

Further details of what will happen at the sleepover will be provided and kept up to date on the event website:
http://www.amentsoc.org/events/listings/0787/

BUG CLUB EVENTS 2015

As usual, we plan our Bug Club events 'as we go along' and publish details in the *Bug Club Magazine*, and on our website.

One of our events for Bug Clubbers later thisyear will be held at the Dinton Pastures Country Park, near Reading. That will be on June 27th and will be as follows:

10 am: meet a moth

After that: Lunch, and a soil diversity workshop (not necessarily in that order, and possibly at the same time!)

2 pm: Bug Walk though the Country Park.

We will also have access to the specimens and microscopes of the British Entomological Society, which is based at that site.

We are in the process of organising other events. One that you might like very much will be the **Annual Members' Day,** which this year will be held at the Liverpool Museum, **on 25th April.** The Liverpool Museum has one of the largest collections of insects in the country, and there will be lots of other things going on too.

To keep aware of further details as the event is arranged, this is the event website:

http://www.amentsoc.org/events/listings/0786/

Life inside a gall

by David Lonsdale

Many years have passed since I first attended an AES Exhibition at the age of sixteen, but I still remember how nice it was to discover that other people shared my interest in insects. I was given a few stick insects at that exhibition and I still keep various kinds, including the many-many-times great-grandchildren of the few that I started with all those years ago.

Bramble is the favourite food of various kinds of stick insect, and so I allow some to grow in my garden. Whenever I cut bramble for my stick insects, I have to be careful to avoid scratching my hands on its needle-sharp prickles. I sometimes wish that it was not so prickly, and I expect that you wish the same if you also feed it to stick insects. On the other hand, it is a nice surprise when I find interesting insects that I accidentally bring indoors with the bramble. By the way, I expect that you have guessed that my garden is not very tidy. A garden that is too tidy is not a very good home for insects, except for a few common kinds.

One of the insects that feeds on bramble (or rather, in bramble) is the Bramble Gall wasp (*Diastrophus rubi*). The adult wasp is very small and not easy to find but you can sometimes find bramble stems that have weird swellings, as shown in my first photograph. These swellings, or stem galls as they are called,

start to form after an adult female gall wasp female visits a young shoot before it has become a fully grown stem. She lays a lot of eggs on the shoot, while also injecting a chemical that makes it grow fatter and juicer than if it were developing into a normal stem. The eggs hatch into tiny larvae (grubs), which burrow inside the soft, juicy swelling, feeding all the time and growing bigger. This means that larvae use the gall as both their home and their food.

Bramble gall caused by *Diastrophus rubi*

Imagine how it would be to live in a home that built itself by growing on a plant! Then imagine that you could eat your home from inside, while also sheltering in it! This seems all very strange to us humans but it is perfectly normal for the young Bramble Gall wasps. The gall remains soft and juicy while the larvae are growing but it becomes hard and dry in the winter, by which time they have pupated, rather like caterpillars that are on the way to becoming adult moths or butterflies.

The next photo (on the next page) was taken after the adult wasps emerged from a hard, dry gall in the spring or early summer of the next year. Each wasp made a hole as it emerged, as you can see in the photo.

The bramble gall after the wasps have emerged

Although the bramble stem gall looks weird, you can see that it is really just a swelling on a stem. You can, however, find other kinds of gall that have the most amazing shapes; completely unlike the original plant. For example there is one called the Bedeguar gall or robin's pincushion. It is created by another kind of tiny wasp, called the Bedeguar Gall wasp (*Diplolepis rosae*) and it occurs mostly on wild roses. As you can see in the photo, on the next page, it looks rather like a clump of moss. It starts forming after the female wasp has injected a chemical and laid her eggs into a bud that would otherwise have grown into a normal shoot. The mossy-looking growth is the outer part of the gall. There is a swelling in the centre, where the wasp larvae live.

Bedeguar gall photographed at the Bug Club camp, 2014

Bedeguar gall on wild rose, after emergence of the gall wasp *Diplolepis rosae*.

Above: *Diplolepis rosae*, the wasp that causes the bedeguar gall on wild rose

Some galls, like the oak currant gall in the next photo, look rather like fruits. These are of course not real currants. They develop on the catkins of an oak tree after these have been visited by another tiny wasp with a very long name: *Neuroterus quercusbaccharum*.

There is also the Knopper gall wasp (*Andricus quercuscalicis*), which makes an oak tree produce galls where there ought to be acorns (the seeds of oak). The leaves of oak trees can also bear different kinds of gall. These include spangle galls, which look like tiny buttons on the underside of a leaf. Each of the spangle galls shown here is the home of a single larva of a very tiny wasp

called the Silk Button Spangle gall wasp *Neuroterus numismalis*.

Knopper gall wasp gall

Silk Button Spangle Gall

Image: Beentree CC BY-SA 3.0

So far, I have mentioned only a few kinds of tiny wasp that make plants form galls. There are many other kinds of insect that can also do the same sort of thing, such as the Picture Wing Fly (*Urophora cardui*) that makes a thistle stem swell into a gall. There are many other things, as well as insects, that can cause galls to form. They include mites, microscopic fungi, bacteria and viruses. Also, galls can be found on almost any part of a plant, including leaves, buds, shoots, stems, roots, flowers or fruits.

The gall-causing picture-winged fly *Urophora cardui*

Image: Malcolm Storey

Once you start looking, you can easily find galls and I hope that you will find them really interesting. Perhaps you could send us some photographs or drawings of galls, which we could publish in this magazine! Or, you might wish to look for some of the insects that cause galls to form. It can be difficult to find them outdoors but you might have more luck by keeping a gall in a container until the adult insects emerge. You should make sure that you know what sort of gall it is (for example a bramble stem gall), so that you know what to expect.

If you choose the bramble stem gall, you may be able to find a suitable one in March or perhaps later in the spring. Do not choose one that has holes in it, since the adult wasps will already have emerged. Also, take care not to prick yourself on the bramble and make sure that you tell an adult if this accidentally happens. It is probably safest to ask an adult to help you when you are searching brambles for a gall and to collect the gall for you, by cutting it from the stem with secateurs. Fingers must, of course, be kept well away from the blades of the secateurs!

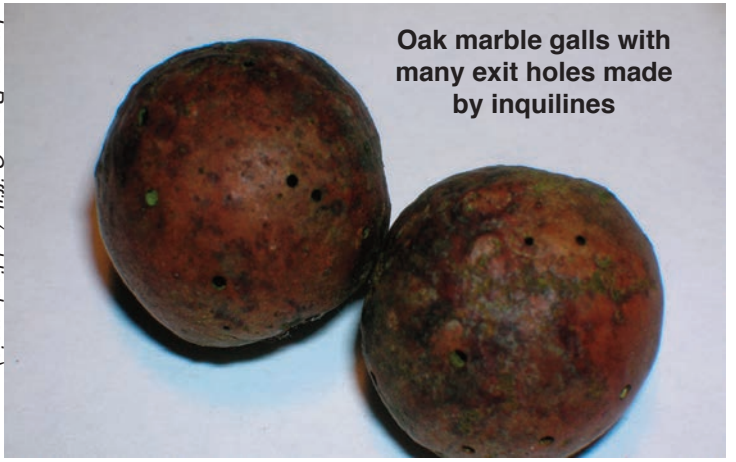
Image: Miroslav Fiala

Some photos of gall wasps (*Diplolepis rosae* and an *Andricus* wasp)

If you are lucky enough to find a bramble stem gall, either by searching or perhaps by finding one on bramble that you use for stick insect fodder, then you could keep it in an escape-proof container until perhaps some insects emerge from it. The container needs to be kept in an unheated place, away from direct sunlight, so as not to alter the living conditions of the insects inside the gall. You might, however, need to wait a long time, since they could emerge at any time from April to June. Also, you need to look inside the container very often – every day if possible. Otherwise, the insects might emerge and then all die for lack of the right conditions. When they emerge, you could try to photograph some of them, if you have a camera. Or, you could look at one or two under a magnifying glass and try to make a drawing.

I need to tell you that the insects that emerge from a gall might not be the kind of insect that caused the gall to form. Instead, they could be **parasitic** insects, which have grown inside the bodies of the gall-making insects. Or they might be **inquilines**, which means that they were living inside someone else's gall, getting free food and lodgings! These 'lodgers' are just as interesting as the gall-forming insects. But anyway, please try to make sure that you release any insects back into the area where you found the gall, after you have studied them.

Images for this article: David Lonsdale unless otherwise noted



Oak marble galls with many exit holes made by inquilines

Image: Roger Griffith (public domain)

David

Gardiner Award Winners 2014

The Gardiner Awards are prizes for the best contributions to the Bug Club Magazine by Bug Clubbers.

This year's winners are:

Benjamin Gubb (for his wildlife diaries)
Hayden Pitts (article on Scarlet Tiger moth)
Imogen Robertson (article on pond skaters)
St Catherine's School, Twickenham Bug Club (article on Lavender beetles)

Many congratulations!The winners will receive their prizes at the Members' Day on 25th April, or through the post immediately afterwards if they cannot attend.

The Fly Trap Competition!

During the year we ran a competition to design an effective fly trap. The winner of this competition is:

Benjamin Gubb

Benjamin designed a baited trap, consisting of a transparent plastic box that he made some holes in, so that the smell of the bait would waft out. He cut a door in the lid of the box so that the flies could enter, and placed some netting over the entrance, cut in the middle so that the flies could push through it. He then put some wire strips on the outside of the netting, so the flies would not be able to push their way out again! Brilliant!

Caves: breeding ground for the strangest creatures

by Zach Fitzner

Caves are dark, and seemingly barren.

Without sunlight no plants grow deep in caves, there is either silence or the echoing drip of water or perhaps the soft whir of bat wings. How could something possibly live in a place like this all the time? Even bats leave caves to hunt, only utilising them to sleep in during the day.

A large cave entrance in Colorado, USA.

There are many strange organisms that spend their entire lives underground. For example, there is the pseudoscorpion, an animal very similar to the scorpion, but without the tail, and so small you'd rarely see it.

The pseudoscorpion *Cryptogreagris steinmanni*, from Glenwood Caverns, Colorado.
(Pseudoscorpions can be found in Britain too).

A lot of cave arthropods have no eyes, living in the dark where they don't need them, and no colours, living where nothing can see them. A lot of cave arthropods have long antennae to find their way through the dark. Explorers and biologists who squeeze into these dark, forbidding places often find new species, living only in one cave. Caves can separate organisms for very long periods, driving the evolution of new and strange animals adapted to life under ground.

A new species of springtail (Collembola) from Glenwood Caverns, Colorado

Cave insects (and other animals) live in environments without the sunlight that we surface dwellers take for granted. Scientists are starting to see parallels between cave insects and what life may look like (if it's there) on other planets like Mars.

Caves and their insects are strange and largely unknown, places of new exploration and perhaps a window into life on other planets, and a natural laboratory to study biodiversity here on earth.

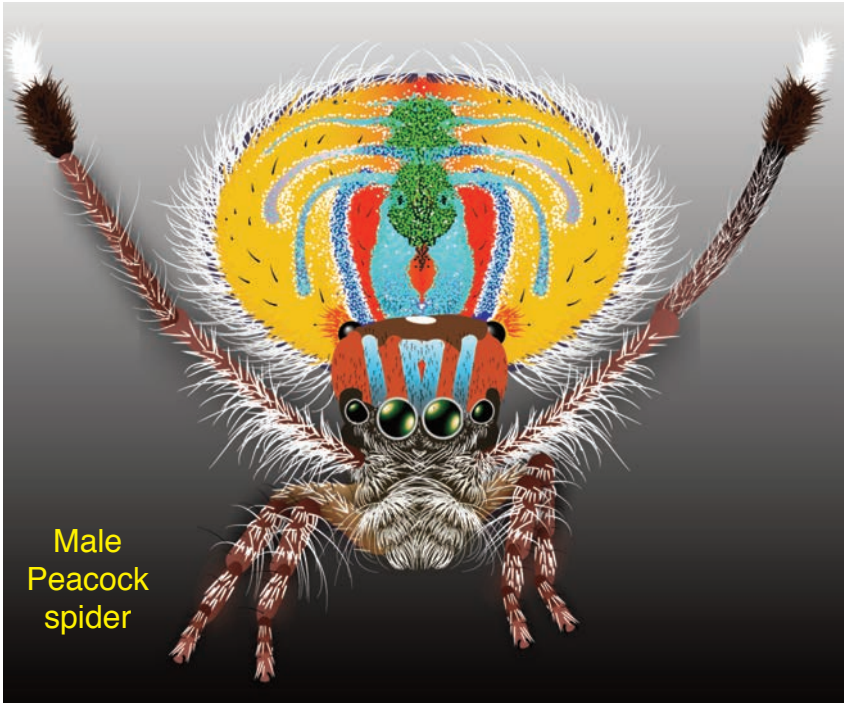
***Arrhopalites hubbardi*, from Glenwood Caves**

All images in this article by David Steinmann

Zach

Are all colourful spiders show-offs?

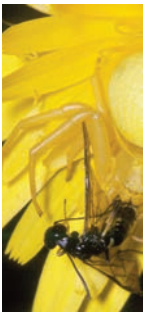
by Geoff Oxford
British Arachnological Society



Drawing: K.D. SchroederCC-BY-SA 3.0 viaWikimedia Commons

If anyone mentions to me that they really don't like spiders (the proper name for a fear of spiders is 'arachnophobia') I suggest they look at the wonderful film clips of Australian Peacock spiders on YouTube – just put 'Peacock spider' into Google. Here beautifully-coloured, male jumping spiders (there are several species) dance in front of females using their 'boxing glove' palps, legs and

flattened 'tails'. Who could not be absolutely fascinated by their antics? The 'tails' are flaps of the abdomen covered with colourful scales and are designed to impress the female and persuade her that he is the best one to choose. They do, indeed, look like miniature peacocks in full display. The colours here are to dazzle females and, perhaps, to make sure that she is mating with a male of her own species. Unlike the males, female Peacock spiders are a rather boring brown.



Crab s
Image: Ma

Male British jumping spiders are dull in comparison to the Peacock spider, but they too wave coloured legs and palps to signal to the female. Watch out for the common Zebra jumping spider (*Salticus scenicus*) on hot walls and fences during the summer. If you're lucky, you could follow their complicated courtship behaviour in your own back garden.

So, attracting a mate is just one reason why spiders are colourful, but not many spider families have good enough eyesight for this show-off's trick to work. Another use of colour is to make a spider less obvious on the background on which it rests. Spiders don't want to be spotted by their insect prey, nor do they want to be seen by their own enemies, such as birds. Colour-matching your background does both at once. For example, many spiders that live on tree trunks are brown and mottled and closely resemble their bark and lichen backgrounds. Some are more adaptable.

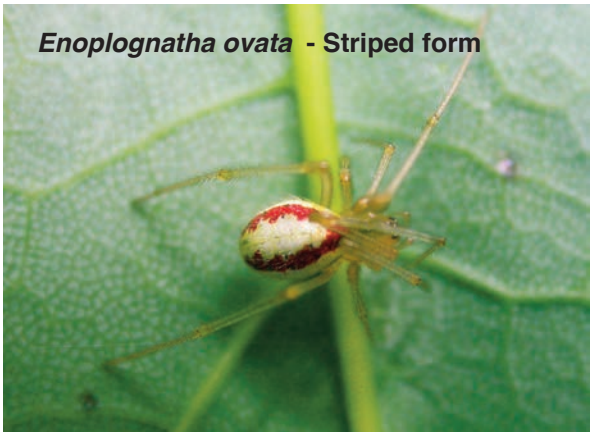
Image: Jurgen Otto. CC BY-SA 2.0 via Wikimedia Commons.

spider.
rtin Harvey

The crab spider *Misumena vatia* waits for its prey on flowers, usually white or yellow ones. It can change its colour from white to yellow and back again so as to match the flower on which it is sitting. It has to be patient though, changing colour can take several days. Only the female hunts on flowers and can change colour, mature males are much smaller with brownish markings, and tend to lurk down at ground level. Some of our bigger orb-weaving spiders can also change colour but we don't know much about their ability to do this. For example, the Four-spot Garden spider (*Araneus quadratus*) can range in colour from straw-yellow through reds and greens to dark brown and, to some extent, seems to match the colour of its leaf retreat. The even more common Garden spider (*Araneus diadematus*) can also change colour. Try looking for these spiders in late summer and keep one or two of them as pets for a few days. Put them in a plastic container surrounded by coloured paper. Do they change colour to match the paper?

In some spiders there are a number of different colour forms within a species that are not caused by individuals changing colour to match their background. For example, the Candy-striped spider (*Enoplognatha ovata*) has three abdominal colour patterns, plain yellow, yellow with two red stripes and yellow with a solid oval of red.

***Enoplognatha ovata* - Yellow form**



These patterns are genetic and are inherited from their parents, just like eye colour is in humans. In late July and through August females of this species can easily be found inside rolled-up leaves guarding a bright blue egg sac. Check out your local bramble clump. If you gently unroll a number of leaves you are sure to find at least the yellow and striped varieties; the red form is less common. By-the-way, don't worry about disturbing the spider, she'll soon silk up the leaf again. Why species like this have different colour forms is a mystery. It may be that bird predators like to eat familiar prey and so if, say, yellow spiders are very common birds get the idea that yellow = food and go looking for them, missing the striped forms. If, as a result, striped spiders become very common the birds might switch and now striped = food, and they miss the yellows. In this way, both forms will be kept in the population. However, we really don't know if this is the correct answer or not.

If you do try putting orb-weaving spiders on different coloured backgrounds, do write in and let us know the results.

Geoff

Images: Geoff Oxford unless otherwise specified

Thoughts of an old Bug Hunter

by David Keen
El Saucejo, Sevilla, Spain

Let's look for Butterflies - in December!

This can be a silly idea, even here in southern Spain, but let me tell you about my walk in the local countryside on 21 December. I left home at 11am and was in the countryside ten minutes later, on a beautiful morning with a completely clear sky, but it was a bit breezy. Would I see any butterflies? As I walked away from the main road I was hoping to see possibly four or five species, but after thirty minutes the only insect I had seen was a small hoverfly.

I was beginning to think that I would not see any butterflies when, as I turned a corner and came along a path below a south facing bank, something flew up in front of me. Could it be a Painted Lady, one of the species that I thought I might see? No, the flight was wrong, more fluttery. With care I walked along the path to where I thought the butterfly had landed. There it was, sunning itself in a sheltered spot - a brown. But wait a moment, this was a species that I had not previously seen in December... it was a male Wall Brown. Certainly worth a special mention. That was a start, so I decided to continue with the walk and turned further down the slope

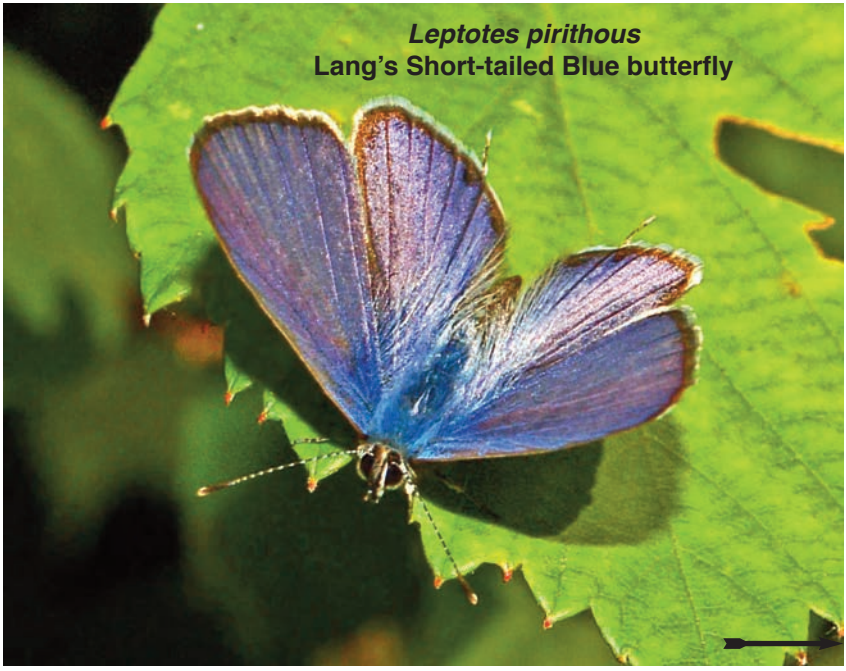
along the edge of a field that has been sown with wheat towards a field that has not been cultivated in the ten years that I have lived here. Along the top edge the field is lined with gorse bushes, some of which were in flower, and from one of these a small blue butterfly flew up but was immediately picked up by a gust of wind and disappeared. Perhaps it was a Lang's Short-tailed Blue, but I could not be certain.

There was nothing else flying in the otherwise bare field so I retraced my steps before heading out further into the countryside between fields of olive trees - some of the locals were actively harvesting their crops on the slopes below the track I was on. Another ten minutes and not an insect to be seen. Now I was near a huge bramble bush - fifty metre long and climbing well over twenty metres up a slope. There used to be paths through this, but now it is impenetrable. I nearly always see a Small White, or two, or three, here and sure enough there flitting along the edge of the bramble was the morning's first specimen - a male. No sooner had I noted this in my notebook that I glimpsed another little blue to my right. It settled on a bramble leaf with its wings closed above its body. Yes, clearly a female Lang's Short-tailed Blue. This is a common species here which I have found flying several times in this month in previous years and confirms my earlier sighting. This species is similar to your very rare migrant, the Long-tailed Blue, but lacks the broad white stripe on the underside of the wings. Now I had three species for the morning.

I walked on, seeing several more Small Whites, both males and females and came to a spot where a stream runs across the main track. To my right is a small area of waste land on a steep slope with plenty of orange and

olive trees and also bamboo which combine to give plenty of dappled shade - an ideal spot for the Speckled Wood. Once again, as expected, I saw a male sunning itself on the bare earth, in the partial shade of an orange tree which was covered in fruit.

Further on and into another field but this one is flatter and is sometimes partially cultivated by a local who I know well. More Speckled Woods were seen, both males and females - all either flitting about or sitting on leaves or the earth. Also more Small Whites looking for somewhere to rest. Then, suddenly, something flew towards me - larger than a Speckled Wood and a much stronger flier. It sped past but I saw it clearly enough to confirm its identity - this was a Painted Lady. In next to no time the daily count has risen to five - more species than I really expected to see in late December. It was now early afternoon but I still had further spots to visit - I walked on.



Leptotes pirithous
Lang's Short-tailed Blue butterfly

Image: Hectonichus. CC BY-SA 3.0

More Small Whites and the odd Speckled Wood were seen but the breeze was getting stronger now and some clouds were building by from the west. I had better start to think about returning home and decided to retrace my steps before the breeze became a wind. No sooner had I started back when a bright yellow butterfly flew towards me on the main track. I thought knew what it was but wanted to be sure before adding its name in my notebook. Luckily it settled long enough on a bunch of small yellow flowers of wild rape - yes, species number six, a male Clouded Yellow. Some of you will have seen this migrant species in the south of England. It is very common down here in Spain, and is found more or less throughout the year.

Before I have even managed to write the name in the notebook another small white butterfly appears. This one is flying differently to the Small Whites - very close to the ground - and it somehow looks darker. It keeps resting on the rape flowers but not long enough for me to check its identity. Then, just as I was thinking that it would fly too far up a bank for me to follow, it flew down and settled on another flower at my feet. It was another species and one that I expect will interest quite a few of you. It was a Bath White - another of your very rare migrant species.

Yet again I have to tell you that it is a common species down here and is found in most months of the year. It is, however, important for me to check the identity of the small whites as there several other species that are about the same size as the Small and Bath Whites - the Green-striped White and two species of Dappled White are very common here, but not in December!

The wind was stronger now and the cloud was building further and it was nearly 1pm. Within another ten minutes there was no sign of the Small Whites or the Speckled Woods, even where they had been so common earlier in the day. I was well on my way back home and thinking that seven was a very good species count for December, when I saw the shadow of a pretty large butterfly on the track in front of me. What could this be?

As it glided past my feet, I could see white and red patches on its dark wings. Yes, you have guessed it - species number eight and another that you will be familiar with - a Red Admiral. Taken by the wind, it was gone in a flash up over the olive trees. It is worth mentioning that the Red Admiral is never a really common species here, and I have not seen clouds of them as I do Painted Ladies.

Now seeing eight species in two hours in late December is something that I have not done before, even down here is Spain. I hope very much that you have enjoyed this walk in the countryside with me. Perhaps we can take another walk in the Spring, when I know we will be able to see even more species.

Until the next time,

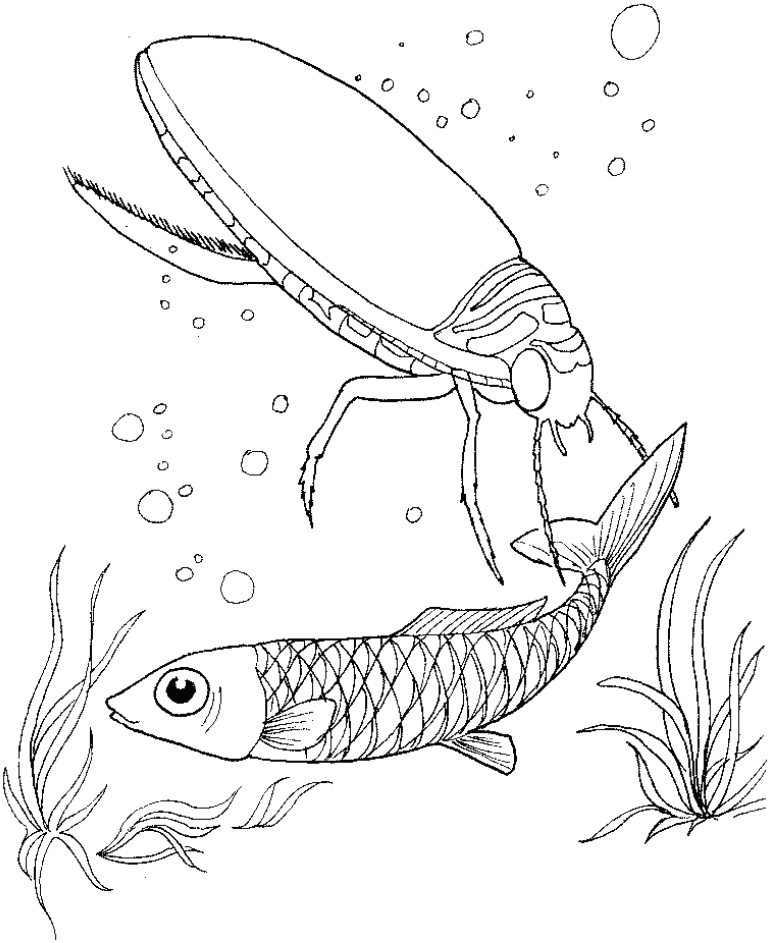
Happy Bugging,

David

Clouded Yellow butterfly, *Colias croceus*

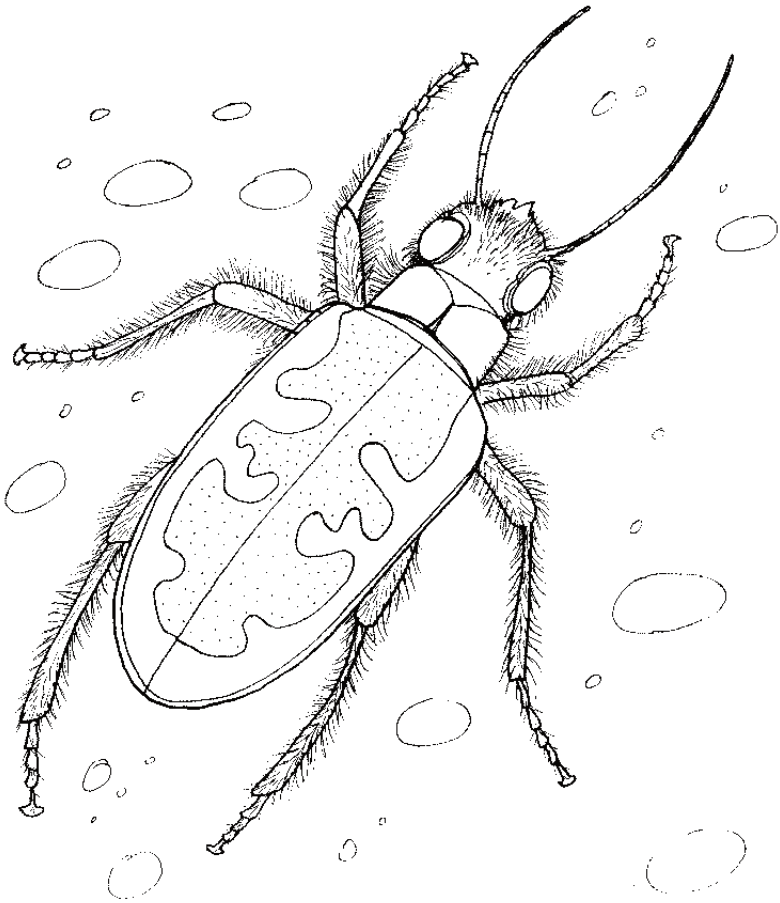
Drawings t

Great Diving Beetle



o Colour In

A colourful Tiger Beetle



Use your imagination to decide which colours to use!

Bug Club Membership

The Bug Club is for young entomologists, and for anyone interested in insects, minibeasts and natural history.

If you are not yet a member, you can sign up below (or provide your details in a letter, or join online at www.amentsoc.org). Bug Club members receive six issues of the *Bug Club Magazine* each year, and are informed about events organised for them. These include an annual Young Entomologists' Day, which involves insect based activities, including the opportunity for those who wish to give a talk about their insect interests. There is also an Open Day each autumn at the Oxford University Museum of Natural History, where we can see the famous Hope Entomological Collections and take part in fun entomological activities. And every two years we run a 4-day summer residential camp, led by expert entomologists, where we 'get down and dirty' with insects!

The Bug Club is part of the Amateur Entomologists' Society, a registered charity founded in 1935 with the aim of engaging people, especially young people, with insects, which represent 80% of all life on earth. The Society is run by volunteers, and depends entirely on subscriptions and donations; we receive no government funding. Many professional entomologists began their development with the Society, and many others who pursued alternative careers remain active, expert amateur members.

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DATE OF BIRTH:.....
MAIN "BUG" INTERESTS:-

UK Bug Club Membership: £12.00
Adult Bug Club Membership: £20.00
Family Membership: £28.00
(Includes AES Bulletin and Bug Club newsletter)

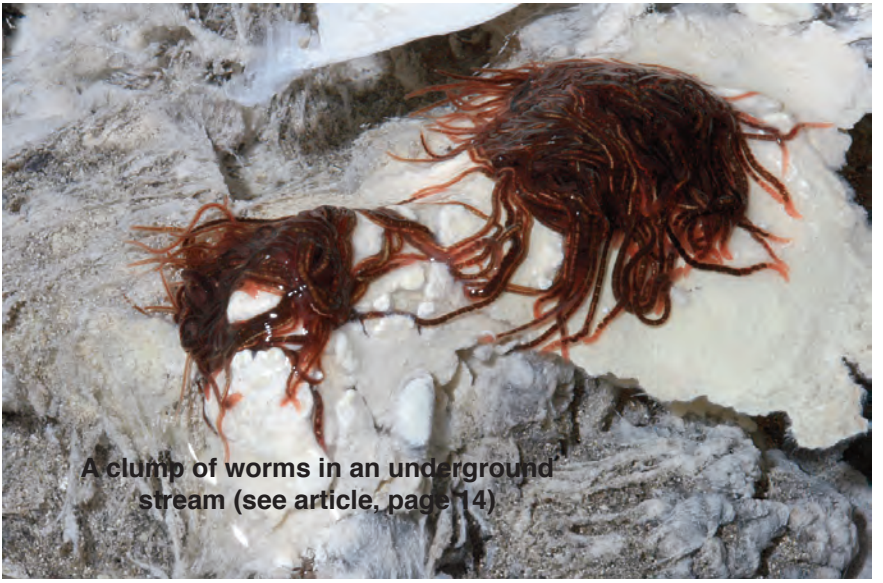
Overseas BC Membership: £20.00
Overseas Family Membership: £38.00

Cheques should be made payable to:
Amateur Entomologists' Society

For family membership please provide names of adults and children.

More membership options are now available - see details on our website.

Send your completed form to:
The Bug Club, P.O. Box 8774, London, SW7 5ZG



A clump of worms in an underground stream (see article, page 14)

Contents

The Bug Club Magazine is printed and packaged using responsibly sourced paper and fully biodegradable packaging by Lavenham Press, Suffolk, England.

"Be naturalists, and be proud to be naturalists.

Learn and think about the natural world, and be vocal when you see things being done wrongly. Help in any way that you can. And, when, as I hope happens, many of you become rich and famous and powerful, remember that you are naturalists, and make all your decisions, whether trivial or globally far-reaching, in a way that is sympathetic to all life on earth."

The Late Professor Mike Majerus, AES President 2005-2009,

concluding the Inaugural Leonard Tesch Lecture at the

AES Members' Day, 2008

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