

Buzzword



February 2014.

Inside – Microscopy Meeting, Hovering Honeybees, Talk by Bee Inspector and more.



Water, water everywhere. Apiaries sodden underfoot,

and with hives so damp, hefting to check for stores may not give a true indication of the state of affairs inside the nest. Taking a quick look may put minds at rest, and if possible a reasonably calm day is to be preferred. A quick look into the crown board feed-hole may be all that is required, otherwise it will have to be moved, to the annoyance of the bees. If necessary move a frame of honey nearer to the cluster. You may wish to feed with sugar syrup. This is best done in the evening using thick syrup made from 2lbs. sugar to 1 pint water given in a contact feeder. Check for sufficient ventilation; dampness and cold, a combination which bees do not like. Bees also need water and at this time of year may come out during sunny spells at midday. During dry spells this may be problematic as it is still cold and they have to return to the hive with cold water in their honey sacs. If possible provide water nearby in a shallow container of some sort near the hive. Putting twigs or straw for the bees to balance on saves bees drowning. Snowdrops are now appearing, and Crocuses are beginning to show green shoots, so that if any bees do venture out for a cleansing flight, they will be faced with a not altogether barren landscape. I suspect that in the West of Scotland they would soon rush back into the comfort of the hive and coorie in.



AYR AND DISTRICT BEEKEEPERS' ASSOCIATION

MICROSCOPY MEETING ON Wed. 22ND Jan. 2014

About 20 beekeepers attended this meeting to learn more about microscopy. Jane began by giving a presentation on the different types of microscope, their various parts and uses. She explained that microscopes are an important tool in learning more about bees and their anatomy and are invaluable in helping to diagnose diseases in bees. We saw pictures of the bee's internal organs, and tiny pollen grains, magnified to show their features and allowing us to see how beautiful these minute particles are, not to mention their importance in the diet of honeybees and other insects.

Everyone was fascinated with the images of parts of the bee and Jane told us about some of the diseases the bees can encounter, and the way acarine mites and other 'beasties' can be spotted by dissection.

Around the room were a number of microscopes both compound and dissecting and members were then encouraged to have a look through them at the various specimens. Some of us had brought about 30 bees to be analysed for Nosema. We squashed up the dead bees with a little water (ugh!) and then a drop of the resulting liquid was placed on a slide and viewed under the microscope. A few specimens seemed to bear the need for further investigation and were sent off to SASA in Edinburgh where a large-scale Nosema study is currently underway. (see Scottish Beekeepers magazine and website and e-mails to club members about this important research).

Lindsay told us at the start of the evening that she had organised a quiz for everyone so we needed to pay particular attention to what we saw! Indeed she produced several quiz sheets and members were very speedily engrossed in them. Of particular interest were the pictures she showed of parts of the bee's anatomy which included workers ovaries, queen ovaries, spermatheca and the hypopharyngeal gland, all fascinating to see. Whilst we had our usual cup of tea the quiz sheets were checked and prizes were handed out, one to a young schoolboy who had come along with his dad. It's good to know there are some young beekeepers on the horizon!

Ian set up microscopes, had brought slides to view and helped with the sampling and labelling of samples to be sent off to SASA. All present thanked Jane, Lindsay and Ian for an enjoyable and informative evening and the considerable time they had put into preparing it. Maybe this will inspire some of us to buy our own microscope!

Joyce Duncan.

Hovering Honeybees

For the last thirty years I have been very fortunate to be a professional Helicopter Pilot. Learning to fly these unforgiving machines proficiently took some time and I have a number of very patient instructors to thank for imparting some nuggets of wisdom that eventually made it a little less difficult. Unlike the passenger jets that take us on our holidays, helicopters tend to spend their time much closer to the ground engaged in activities more suited to their manoeuvrability and of course, their ability to hover. To that end I have shared the airspace of birds and have learnt, by observation, the secrets of their environment. For example, if a fulmar can use the up drafts from a cliff face to fly without much effort, then I can position my helicopter in a similar fashion using the up drafts to my advantage when I'm hovering during a mountain rescue. It makes flying the helicopter easier and uses considerably less power and fuel.

It is hardly surprising then that bird flight was the inspiration for the pioneers of aviation nearly two centuries ago and their findings were essential reading for me as a teenager when I only aspired to be a pilot. However, it wasn't until my wife started keeping bees a couple of years ago that I began to discover how many similarities of flight they shared with the machines I fly. The more I read into this I found that recent research has sought to copy a number of techniques used by bees for what we pilots consider "Critical Phases of Flight". The downside of this research is that these manoeuvres can be digitally copied into computer code and integrated into autopilot systems making us simple pilots potentially redundant!

The use of remotely controlled Drones, similar to those used by the military for surveillance, is becoming commonplace and the most regular accidents occur during approach and landing. It is relatively easy to land one of these machines if you can see it, much like a model aircraft but if you are flying this from a control room some distance away one can only rely on what the onboard cameras are relaying back to you. This is difficult enough when the conditions are favourable, but in poor visibility, rain or at worse fog, it is nigh on impossible. This has been recognised by the manufacturers and a solution sought. An on board computer and autopilot system needed to be developed, but it had to be simple and pretty much foolproof. To that end the designers looked to bees for the answer.

For us Pilots, landing is a pretty complex evolution and to copy how we do it would use a great deal of computing power. However bees have a very simple brain and seem to be able to get it right time and time again without any problem and they don't spend hours practicing how to get it right. I've spent quite some time watching bees arriving at their hives and not one of them has come close to crashing. That's more than I can say for us humans myself included!

Bees have a very sedate way of landing unlike flies who rely on a pretty fast aerobatic approach, and their sticky feet. So bees seemed like the right insect to copy. Apparently to achieve this more controlled arrival, bees go about managing their approach by monitoring the speed of images moving across their eyes. As they slow down, the speed of the looming landing pad's image on the retina remains constant and they thus manage to control their approach speed and their subsequent landing. By comparison with us a Bee's eyesight is poor but they can still recognise a change in speed very effectively.

The next time you drive try a little experiment for yourself. When you are stationary the image directly in front of you doesn't change, nor does the image in your peripheral vision (out to the side). Then if you accelerate forwards the front image changes a little bit but the peripheral image changes a lot. You will also notice that if you keep looking ahead you will see the forward image in detail but the image to the side is a blur and the faster you go the greater this difference becomes. By placing simple cameras in the Drone that look ahead and to the side the signals from these can be digitally measured in exactly the same way that the simple bee brain recognises them. So once the approach is commenced if the rate of change in the front image and side image can be kept constant, then the Drone will slow down in exactly the same way a bee does.

Research has shown that as a bee flies back from a foraging trip once it has identified its hive it begins to slow down. Recognition of the landing site stimulates a pre-programmed instinct to begin to bring the rate of change of the ahead and side images to be equal. As bees fly at pretty much a constant speed and can see only a set distance this 'auto land' starts at the same place in space in front of the hive and works every time. Deceleration is fairly constant and the bee ends up pretty much in the hover just a few centimetres away from the landing point. I'm no computer expert but the programming to copy this is apparently relatively easy and is likely to be incorporated into drone systems in the very near future, especially those types that have a relatively slow final approach speed.

So when they have perfected automated landing systems for remotely Piloted Drones I guess it won't be that long before we can thank the bees for making some of us Pilots surplus to requirements. Thankfully it's a few years off yet but I suppose the upside is that it'll give me more time for the bees even if it's just watching how they fly.

Roger Stringer. Hopefully Roger will send another article later in the year. Ed.



Bees Hovering and Preparing to land. Photograph by W.Clark.

Feeding Birds in Winter

Each species of garden birds likes a different kind of food, so the more varied a menu you offer, the more bird species you will attract.

Magpies, starlings, tits and crows like scraps of meat and fat, such as bacon rind. Commercial seed mixtures will attract finches, while fruit- preferably apples- is popular with blackbirds and thrushes. Robins are partial to mealworms, which you can buy as angling bait, and with a little patience you can get these most engaging of garden birds to eat out of your hand.

The National Trust Calendar of Garden Lore. Julia Jones and Barbara Deer.

We have no Plan Bee for when we run out of Pollinators.

David Goulson

Biologists have been predicting for years we might be facing a pollination crisis, where there are not enough bees and other flower-visiting insects to go around. If this happens, yields of crops requiring insect pollination will drop, and food prices will rise.

About three-quarters of all crops depend to some extent on pollinators, including most fruit and vegetables – many of them high-value foods that we all love, such as strawberries, coffee, blueberries, tomatoes, chillies and cocoa.

The lovable honeybee has become the face of this disaster scenario. But in truth, pollination depends on thousands of wild insect types, such as bumblebees, flies and beetles.

Until recently, the crisis remained a theoretical possibility. But the recent rise in almond prices is one of several worrying signs that it may be becoming a reality, at least in some parts of the world.

About 1.5m honeybee hives are needed to pollinate the almond crop in Californian, whose production dominates the world market.

Many beekeepers are losing nests faster than they can replace them, and so they are charging ever higher prices for their hives; the cost to almond growers of hiring a hive has tripled in recent years to about \$160.

Elsewhere in the world highly intensive farming with heavy pesticide use has all but eradicated bees. Pear farmers in Szeuchan now hand pollinate their trees, and in Brazil Passion fruit is now often hand pollinated.

We do not know how many pollinators we need to ensure good crop yields and healthy wildflower communities. We do know some species have disappeared and the number of hives has greatly dropped in many countries.

What is happening to our bees? The answer is complicated. A mixture of disease, parasites, loss of forage and a cocktail of pesticides, are all contributing to the problems the bees face.

Recent studies found up to 35 different pesticides in the food stores of honeybees. Many bumblebees in the UK are infected with a gut parasite originally from Asian honeybees, while honeybees are being ravaged by the Asian Varroa mite.

Global food production has been heading in an unsustainable direction for decades. The UN's Food and Agricultural Organisation estimates that we will need to double global food production by 2050 to feed the growing population. Yet we continue to degrade the planet by clearing forests, also creating vast crop monocultures. Agricultural practices are causing soils to be eroded, and washing into the sea or are blowing away in the wind. Some estimates suggest some countries will have little soil left within 60 years. Extreme climate events are likely to cause catastrophic crop failures. Species are going extinct at about 1,000 times the natural rate, many of which have vital roles in recycling nutrients, storing carbon, creating soil, controlling pests and, of course, pollinating crops. Bees may be canaries in the coal mine, warning us that we must find ways to produce food without destroying the environment on which we depend.

David Goulson is Professor of Biology at Sussex University and author of "A Sting in the Tale". This piece was taken from a larger article published in the Financial Times. The original article was provided by **Ian Jamieson**.



Quote of the Day: "I used to think taking part in Strictly Come Dancing in 2005 was the most nerve-racking experience of my life, but it is now number two" - explains TV's **Bill Turnbull**, who arrived to give a talk on beekeeping to Sandringham W1 and found the **Queen** sitting in the front row.

The Herald 25.01.14.

A recent talk given to ADBK Association members in the Carrick Centre by John Smith, Bee Inspector, Higher Agricultural Officer and Beekeeper.

John gave a very broad-based talk on his job as Higher Agricultural Officer. It highlighted the very wide ranging remit he has, and the many areas he is responsible for.

John is one of only eight H.A.O's in Scotland. His main role is in dealing with members of the farming community, but he also liaises with the Police and the SSPCA in relation to wildlife crime, SEPA, FERA, Trading Standards and various government departments, and of course, he inspects the hives of beekeepers.

Some of John's duties in the past year have included:

- Inspecting new buildings and checking grants or claims submitted for buildings.**
- Doing ground water inspections on behalf of SEPA to ensure correct disposal of sheep dip.**
- Travelling to Stornoway to liaise with farmers in the Less Favoured area Scheme.**
- In March, the finding of a dead Buzzard resulted in joint working with the police and SASA (to which the Buzzard was sent for analysis) which resulted in a gamekeeper being fined, and a visit to Arran to consult with farmers following the bad weather there.**
- Visiting a farm with Trading Standards Officers with a view to prosecute a farmer for moving cattle without ear tags, and attending a FERA meeting in York to discuss bee issues with English colleagues.**
- Attending Royal Highland Show and Scottish Government Show in bee tent.**
- Hive surveillance inspecting hives for diseases. Taking sample of comb to include brood, pollen and honey for SASA. Hive floor inserts to be sent to SASA to check for Varroa and 50 bees sent to SASA for Acarine and Nosema checks.**
- The finding of American Foul Brood in the Stranraer area. This hive is subject to the statutory follow up checks.**
- Taking honey samples for traces of various medicaments.**
- A visit to Prague and taking part in an EU initiative on training for Safer Food, also a visit to the bee research institute in Dol.**

Clearly, John's role in the farming and beekeeping community is wide ranging. He plays an important part in liaising, advising, inspecting as well as dealing with the bureaucracy involved in these tasks. A vital role in the wellbeing of the countryside, its wildlife, its farmers and beekeepers.



Thanks to Joyce for the following links to another example of the versatility of the honeybee:

- <http://www.dezeen.com/> "honey bees can be trained to detect cancer in 10 minutes"

Go to the search box and type in " honeybees can be trained to detect cancer."

Article from Glasgow University.

- http://www.gla.ac.uk/about/avenue/55/news/headline_297355_en.html



Jane has sent in these links. Honeybees going about their business as usual with strange results, also stranger than fiction photos. Thanks Jane,

- http://www.bbc.co.uk/iplayer/episode/b03nt1hc/Natures_Weirdest_Events_Series_3_Episode_2/

- <http://www.flickr.com/photos/usgsbiml/>



Beginner's Classes for 2014

Wednesday evening classes commencing at 7.30 in the Carrick Centre, Maybole

- 5th March - Life cycle of the honeybee
- 12th March - Hives & Equipment:
- 19th March - The Beekeeping Year

Saturday morning classes commencing at 11am in the Carrick Centre, Maybole, then lunch followed by visit to ADBKA apiary at Minishant.

- 5th April - Basic need-to-know information.
- 12th April - Swarming
- 26th April - Pests and Diseases

The full Summer Programme is now available on the ADBKA website.



Genetic Secrets of the Royals.

A team of scientists from Michigan State university and Wayne State University have pinpointed a single gene that separates queen honey bees from workers. “This gene is critical in making the hind legs of workers distinct so they have the physical features necessary to carry pollen” explains Zachary Huang, MSU entomologist. Ultrabithorax, the gene responsible, allows attachment of pollen-holding baskets and protrusions known as pollen presses on workers’ hind legs. Furthermore it promotes growth of “pollen combs”, comprising 11 evenly spaced bristles, on the leg. Queen bees do not possess these pollen-related features. By isolating and disabling Ultrabithorax the team inhibited growth of worker bees’ pollen combs and witnessed a reduction in the size of pollen presses. The pollen baskets also disappeared.

Rebecca Gale. The Observer 02.02.14.



Some thoughts on Beekeeping Education and OSR by Willie Robson

I believe it was a retrograde step in the 1970s for the Ministry of Agriculture to dispense with the services of the county beekeeping instructors. Beekeeping instructors gained their knowledge from studying the relative success or failure of those they taught, from novices to professionals. Once knowledge is lost the threads are rarely if ever retrieved. Thus we now have a situation of uncertainty when people are trying to pick up skills, worsened when things go wrong. It may be difficult to avert trouble during the present problems affecting beekeeping, but it would be easier if there was a body of men and women with decades of practical experience to instil some confidence in the profession. This is not to decry the efforts of the people at the beekeeping unit in York and Auchincruive, whose contribution I appreciate. It is very important to look back, but they look forward and have useful information for the present and the future. For 40 years after WW2, Scotland had a beekeeping education facility which would have compared favourably with any in the world. Since then the countryside has been nationalised and the emphasis placed on administration together with suitable legislation. Such is progress! The only bonus for

beekeepers from this situation is that there is now a large acreage of oilseed rape grown, which was a political crop, but is now valued by farmers as a break crop.

Oil Seed Rape.

There were years I remember when the bees had to be fed right into the middle of June before they got any honey, having missed the early flows due to bad weather. This underlines how tough the bees must have been that they could go through nine months of relative confinement and still fill a few supers in July. I remember being at the Highland Show and no-one had seen a queen cell by the 20th June. The oil seed rape has changed that situation. Colonies become much stronger and softer, particularly in the South of the UK. Beekeepers in the west of the UK will find things more difficult without oilseed rape, especially during bad weather. Oilseed rape honey finds a very good market, especially if it is free from taints and not over-heated. I remember Canadian honey being imported into this country called Honey Boy which was a mixture of oilseed rape and clover honey, prepared using the Dyce process. This product was in huge demand. With the right skills and initiative Great Britain could produce far more honey than it does for the home market.

Reflections on Beekeeping. W.S.Robson. Northern Bee Books. 2011.



Please send any articles for Buzzword to www.bees5@btinternet.com . I assure you they will be gratefully received. Thanks to those who contributed to this edition. Suzanne Clark.