LUNE VALLEY COMMUNITY BEEKEEPERS

NEWSLETTER JULY 2018

Club News

Long hive on site

We now have a Lune Valley Long Hive set up at the apiary and introduced a package of bees on 9th June. So far, they seem to be settling in well despite the cool weather.

Meadow day

National Coronation Meadow day falls on Saturday, 7th July this year and we have been invited to have a stand at Bell Sykes meadow. We intend to take a display, observation hive and long hive and also to organise two photographic sessions of pollinators in the meadow. Everyone is welcome to come along.

Working Party

We shall be holding a working party on the morning of Friday, 13th July to erect the marquee for Open Day and generally set things up. Starting at 9-30am, if there are enough of us we should be finished by lunch time. If you can spare a few hours to help, you will be very welcome.

RHS Flower Show at Tatton Park

We have been asked to provide a speaker on alternative approaches to beekeeping to speak at the RHS Flower Show, Tatton Park, which runs from 18th -22nd July 2018. Our slot will be at 12-00 noon on Thur8sday, 19th July.

Ernest Cook Trust

We have received a grant of £2340 from the Ernest Cook Trust, £1140 of which is for our new educational display and £1200 to purchase bee suits for children.

Open Day

This year our Open Day will be on Saturday, 14th July from 11-00am to 4-00pm, when hopefully our wildflower meadow will be looking its best. We plan to have a number of stalls including:

- Cakes and refreshments
- Barbecue
- Club information etc
- Pollinator patch information
- Club Sales
- Long hive
- Honey Sales
- Wax products
- Observation hive

If you can help us by volunteering to help out with any of these stalls, baking a cake for us or helping with other activities such as car parking, for the day or even a few hours, **would you please let me know as soon as possible.**

Volunteer Web Master

We still need a volunteer to act as Web Master for the Club's web site. The main task is to upload the monthly newsletter to our web site, together with updates to other pages from time to time. Whilst the new Web Master will need to be generally IT literate, specific training for the tasks involved can be provided. If you are interested, please give me a call – 01524 811978.

Our meadow is coming into bloom

Club Meeting Programme 2018 – 2019

Sat **7th July**	**National Coronation Meadow Day** **Belle Sykes Meadow**	**10-00am to 4-00pm**
Fri **13th Jul**	**Working Party** Preparatory work for the Open Day.	**Club Apiary 10-00am**
Sat **14th July**	**Apiary Open Day** See notices for details	**Club Apiary, 11-00am to 4-00pm**
Sun **16th Sept**	**Preparing for winter** There will be a short, explanatory talk followed by practical inspections.	**Club Apiary, 10-00am to 2-00pm**
29nd Sept	**Scything course** The course will cater for beginners and improvers. See the notice for more information.	**Club Apiary, 10-00am to 4-30pm**
Wed **10th Oct**	**Speaker meeting** **Topic: Pollinating insects and the effectiveness of pollinator patches**	**Scarthwaite Hotel, 7-30pm**
Wed **14th Nov**	**Speaker meeting** **Topic: conserving bees, breeding our own local stocks and discouraging imports**.	**Scarthwaite Hotel, 7-30pm**
2019 **Wed** **9th Jan**	**Social Evening** Wine and cheese evening and auction of members' surplus equipment. We shall also be showing a short film "More than Honey".	**Scarthwaite Hotel, 7-30pm**
Wed **13th Feb**	**Speaker meeting** **Topic: Keeping bees in long hives**	**Scarthwaite Hotel, 7-30pm**

Pseudoscorpions

Despite their name, and the fact that they look like scorpions, *Pseudoscorpions* are, in fact, harmless spiders ranging in size from 2mm to 18mm, often found in the debris at the bottom of the nesting cavity of wild and feral bees.

Although *Pseudoscorpions* are known to eat varroa, there is no evidence, yet, to suggest that they actually groom varroa off bees.

Scientists Find Evidence of 27 New Viruses in Bees

The scientists developed a novel high-throughput sequencing technique that efficiently detected in bees both previously identified and 27 never-seen-before viruses belonging to at least six new families in a single experiment. ***Credit: Jeff Kerby, National Geographic***

We have all heard of Deformed Wing Virus and most of you can probably list another 3 or 4 honey bee viruses, but what other viruses still lurk undiscovered? An international team of researchers uncovered evidence of 27 previously unknown viruses in bees. The finding could help scientists design strategies to prevent the spread of viral pathogens among these important pollinators. "Populations of bees around the world are declining, and viruses are known to contribute to these declines," said David Galbraith, research scientist at Bristol Myers Squibb and a recent Penn State graduate. "Despite the importance of bees as pollinators of flowering plants in agricultural and natural landscapes and the importance of viruses to bee health, our understanding of bee viruses is surprisingly limited."

To investigate viruses in bees, the team collected samples of DNA and RNA, which is responsible for the synthesis of proteins, from 12 bee species in nine countries across the world. Next, they developed a novel high-throughput sequencing technique that efficiently detected both previously identified and 27 never-seen-before viruses belonging to at least six new families in a single experiment. The results appear in the June 11, 2018, issue of *Scientific Reports*. "Typically, researchers would have to develop labour-intensive molecular assays to test for the presence of specific viruses," said Zachary Fuller, postdoctoral fellow at Columbia University and a recent Penn State graduate. "With our method, they can sequence all the viruses present in a sample without having any prior knowledge about what might be there."

Fuller noted that because the cost of high-throughput sequencing continues to decrease, the team's approach provides an inexpensive and efficient technique for other researchers to identify additional unknown viruses in bee populations around the world. "Although our study nearly doubles the number of described bee-associated viruses, there are undoubtedly many more viruses yet to be uncovered, both in well-studied regions and in understudied countries," he said.

Among the new viruses the team identified was one that is similar to a virus that infects plants. "It is possible that bees may acquire viruses from plants, and could then spread these viruses to other plants, posing a risk to agricultural crops," said Christina Grozinger, distinguished professor of entomology and director of the Centre for Pollinator Research at Penn State. "We need to do more experiments to see if the viruses are actively infecting the bees, because the viruses could be on the pollen they eat, but not directly infecting the bees and then determine if they are having negative effects on the bees and crops. Some viruses may not cause symptoms or only cause symptoms if the bees are stressed in other ways."

Beyond identifying the new viruses, the team also found that some of the viruses exist in multiple bee species -- such as in honey bees and in bumble bees suggesting that these viruses may freely circulate within different bee populations. "This finding highlights the importance of monitoring bee populations brought into the United States due to the potential for these species to transmit viruses to local pollinator populations," said Galbraith. "We have identified several novel viruses that can now be used in screening processes to monitor bee health across the world."

According to Galbraith, the study represents the largest effort to identify novel pathogens in global bee samples and greatly expands our understanding of the diversity of viruses found in bee communities around the world. "Our protocol has provided a foundation for future studies to continue to identify novel pathogens that infect global bee populations using an inexpensive method for the detection of novel viruses," he said.

To read the open access article, visit: **http://dx.doi.org/10.1038/s41598-018-27164-z**

Manuka Honey Fraud Uncovered

New Zealand's NZ$120-million Manuka honey sector is in crisis as tests around the world find the product often has nothing but price to set it apart from other honey. All Manuka honey comes from New Zealand and Unique Manuka Factor Honey Association research shows 1,700 tonnes produced each year. However, 1,800 tonnes of "Manuka" honey is sold in Britain alone each year with as much as 10,000 tonnes sold worldwide.

Of the 73 samples of honey tested by the Association, 41 failed to show the non-peroxide activity (NPA) claimed for Manuka honey. Hong Kong authorities found 14 of 55 Manuka honey samples tested were adulterated with syrup. Other tests found some of the honey was not even Manuka.

The 'New Zealand Herald' reports that the UK's Food and Environment Research Agency (FERA) tested a small sample of five brands of Manuka honey from shop shelves. Only one, made by the biggest Manuka honey producer, was up to standard. The other four showed no detectable non-peroxide activity, the anti-bacterial properties special to

Manuka honey. FERA then issued a nationwide warning about misleading claims on the labels of Manuka honey jars.

Manuka honey can command prices many times higher than other types of honey because of its enhanced anti-bacterial properties and the New Zealand Food Safety Minister warned that the NZ Government and the honey industry need to move quickly to set an international labelling standard. A spokesperson for the NZ Honey Association said "There is a huge fraud with ever-increasing volumes of honey labelled as Manuka which are not Manuka. We knew we sold more 'Manuka' overseas than has ever been produced . . . we've been spending everything we've got to work out how to stop this fraud. We should have done it sooner."

The Ministry for Primary Industries (MPI) has now released a scientific definition to authenticate New Zealand Manuka honey, which is the first step leading to a standard. It follows damaging claims that consumers are being misled over what they are buying and at vastly inflated prices.

The UK trade magazine The Grocer recently said unscrupulous operators were making millions from the sale of jars of fake Manuka honey.

The New Zealand honey industry currently earns $242 million in exports a year, of which Manuka makes up about 80 per cent. A target has been set of $1.2 billion export revenue for Manuka honey alone by 2028.

The chief executive of the UMF Honey Association, John Rawcliffe, said it was "very positive" that at an official level a standard was being developed.

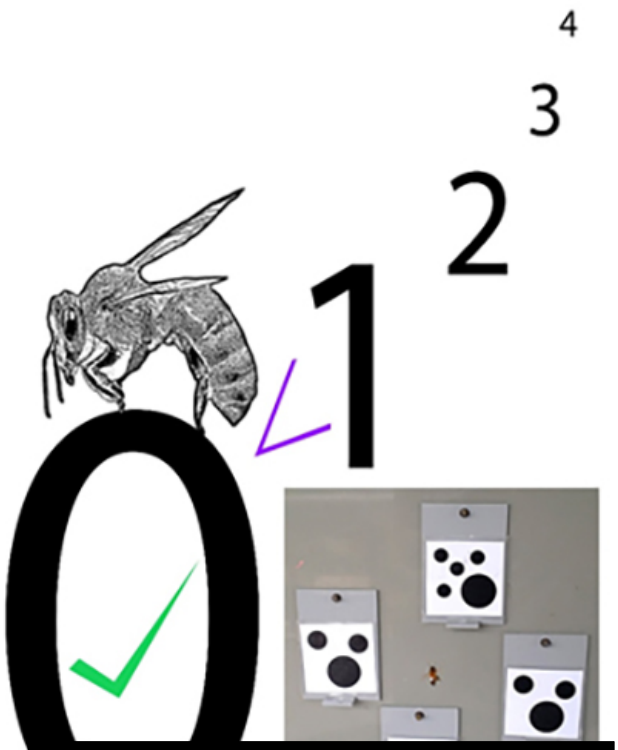
MPI has spent three years arriving at the definition. "The proposed definition and export requirements are important for the continued growth of our important export honey industry," deputy director-general, Bryan Wilson, said.

Honey Bees Can Zero In On the Advanced Concept of Zero

Understanding the concept of zero is surprisingly difficult. The honey bee has joined the ranks of dolphins, parrots, primates and preschool children, in demonstrating the ability to distinguish zero on the numerical spectrum. This finding raises questions of how a species that differs so much from humans - with fewer than one million neurons in its brain, compared to a human's 86,000 million neurons - can share such a complex skill, and how it benefits the tiny insect in its environment. By demonstrating that even tiny brains can comprehend complex, abstract concepts, the surprise finding opens possibilities for new, simpler approaches to developing Artificial Intelligence.

While intuitive to modern humans, the full understanding of zero is an advanced numerical concept that's challenging to grasp; several ancient human civilizations lacked the full understanding of zero in their numeric systems. Recently, scientists have shown that some vertebrates can understand the concept, and now, Scarlett Howard and colleagues present evidence that honey bees - though remote from the mammalian branch of evolution - are also part of this "elite club." Turns out that honey bees can rank numerical quantities and understand that zero belongs at the lower end of a sequence of numbers.

Free-flying bees were lured to a wall containing white squares each with a different number (from two to five) of black shapes. The bees were trained on "greater than" and "less than" concepts with food rewards, (the "less than" group was rewarded for flying toward the display with fewer items, for example). The researchers then introduced two numbers the bees hadn't yet seen in their training - one and zero. The bees were consistently able to distinguish zero as lower than one. Interestingly, they were more accurate when zero was presented with a more distant number choice - a trait also seen in humans.



Schematic representation of how over a period of time bees learn to choose between combinations of numbers such that the lower number is correct, and then when presented with a problem of zero elements versus the higher numbers bees understand that zero is at the lower end of a numerical sequence.

Associate Professor Adrian Dyer, from RMIT University in Melbourne, Australia, said the number zero was the backbone of modern mathematics and technological advancements. "Zero is a difficult concept to understand and a mathematical skill that doesn't come easily - it takes children a few years to learn," Dyer said. "We've long believed only humans had the intelligence to get the concept, but recent research has shown monkeys and birds have the brains for it as well. What we haven't known - until now - is whether insects can also understand zero." As well as being a critical pollinator, the honey bee is an exceptional model species for investigating insect cognition, with previous research showing they can learn intricate skills from other bees and even understand abstract concepts like sameness and difference.

PhD researcher Scarlett Howard set out to test the honey bee on its understanding, marking individual honey bees for easy identification and luring them to a specially-designed testing apparatus. The bees were trained to choose an image with the lowest number of elements in order to receive a reward of sugar solution. For example, the bees learned to choose three elements when presented with three vs. four; or two elements when presented with two vs. three. When Howard periodically tested the bees with an image that contained no elements versus an image that had one or more, the bees understood that the set of zero was the lower number - despite never having been exposed to an "empty set".

Dyer, a researcher in the Bio Inspired Digital Sensing-Lab (BIDS-Lab), said the findings opened the door to new understandings of how different brains could

represent zero. "This is a tricky neuroscience problem," he said. "It is relatively easy for neurons to respond to stimuli such as light or the presence of an object but how do we, or even an insect, understand what nothing is? "How does a brain represent nothing? Could bees and other animals that collect lots of food items, have evolved special neural mechanisms to enable the perception of zero? "If bees can learn such a seemingly advanced maths skill that we don't even find in some ancient human cultures, perhaps this opens the door to considering the mechanism that allows animals and ourselves to understand the concept of nothing."

One of the problems in the development of artificial Intelligence is enabling robots to operate in very complex environments, Dyer said. "Crossing a road is simple for adult humans, we understand if there are no approaching cars, no bikes or trams, then it is probably okay to cross," he said. "But what is zero, how do we represent this for so many complex object classes to make decisions in complex environments? If bees can perceive zero with a brain of less than a million neurons, it suggests there are simple efficient ways to teach AI new tricks."

The research was conducted in both Australia and France and involved many control experiments to validate the findings. Study co-author, Dr Aurore Avarguès-Weber from the University of Toulouse in France, said: "The discovery that bees can show such elaborated understanding of numbers was really surprising given their tiny brain. Large brains are thus not necessary to play with numbers. This capacity is therefore probably shared by many other animals.

Trained to pick the lowest number out of a series of options, a honey bee chooses a blank image, revealing an understanding of the concept of zero.

Clever Bees Can Identify Different Flowers by Patterns of Scent

Certain aromas trigger memories in humans, transporting us back in time. But how well do bees understand scent? And can they translate scent cues into a visual imprint? New research led by scientists from the University of Bristol and Queen Mary University of London demonstrates that bumble bees have keen sniffers, letting them tell flowers apart by patterns of scent.

Flowers have lots of different patterns on their surfaces that help to guide bees and other pollinators towards the flower's nectar, speeding up pollination. These patterns include visual signals like lines pointing to the centre of the flower, or colour differences. Flowers are also known to have different patterns of scent across their surface, and so a visiting bee might find that the centre of the flower smells differently to the edge of the petals.

Bumble bees can tell flowers apart simply by how scent is arranged on their surface according to new research published in the ***Proceedings of the Royal Society B***. Lead author Dr. Dave Lawson, from the University of Bristol's School of Biological Sciences, said: "If you look at a flower with a microscope, you can often see that the cells that produce the flower's scent are arranged in patterns.

"By creating artificial flowers that have identical scents arranged in different patterns, we are able to show that this patterning might be a signal to a bee. For a flower, it's not just smelling nice that's important, but also where you put the scent in the first place."

A captive bumble bee walks across the surface of an artificial flower, working out the pattern of scent that has been made by placing peppermint oil in some of the holes. *Credit: Dave Lawson, University of Bristol*

The study also shows that once bees had learnt how a pattern of scent was arranged on a flower, they then preferred to visit unscented flowers that had a similar arrangement of visual spots on their surface. Dr. Lawson added: "This is the equivalent of a human putting her hand in a bag to feel the shape of a novel object which she can't see, and then picking out a picture of that object. Being able to mentally switch between different senses is something we take for granted, but it's exciting that a small animal like a bee is also able to do something this abstract."

Professor Lars Chittka, from Queen Mary's School of Biological and Chemical Sciences, said: "We already knew that bees were clever, but we were really surprised by the fact that bees could learn invisible patterns on flowers - patterns that were just made of scent. "The scent glands on our flowers were either arranged in a circle or a cross, and bees had to figure out these patterns by using their feelers. But the most exciting finding was that, if these patterns are suddenly made visible by the experimenter, bees can instantly recognise the image that formerly was just an ephemeral pattern of volatiles in the air."

Senior author, Dr. Sean Rands, also from Bristol, added: "Flowers often advertise to their pollinators in lots of different ways at once, using a mixture of colour, shape, texture, and enticing smells. "If bees can learn patterns using one sense (smell) and then transfer this to a different sense (vision), it makes sense that flowers advertise in lots of ways at the same time, as learning one signal will mean that the bee is primed to respond positively to different signals that they have never encountered. "Advertising agencies would be very excited if the same thing happened in humans."

Around 75 percent of all food grown globally relies on flowers being pollinated by animals such as bees. The work published today is part of ongoing research at the University of Bristol that explores the many different ways in which plants communicate with their pollinators, using different innovative techniques to explore how bees perceive the flowers that they visit.

http://rspb.royalsocietypublishing.org/content/285/1880/20180661

The Protection of Pollinators Bill

This Private Member's Bill, introduced by MP Ben Bradley, the Conservative MP for Bradley, passed its first House of Commons reading on 8th May and is scheduled to have its second reading on 26th October 2018. If passed, its aim is to encourage councils, landowners and the public to cultivate wildflower corridors to enable insects to spread freely throughout the country.

The text of the Bill is not yet available but reading through the debate shows that the thinking behind it has been strongly influenced by Buglife and its B-lines concept.

Fred Ayres, Editor & Chairman, July 2018

The Lune Valley Long Hive

An innovative but simple long hive

Only £295

Only obtainable from Lune Valley Community Beekeepers

Essential features:

- Designed by bee-centric beekeepers for bee-centric beekeepers
- Comfortably houses one colony of bees without the needs for additional supers or brood boxes
- Can be used with 14 x 12 frames (recommended), standard brood frames or top bars
- Has a removable floor tray which can act as a biological sump or a debris board for varroa counts
- Has 2” thick wooden walls which provide five times more insulation than a standard hive
- Roof space is ventilated and has space for a jumbo feeder
- Has a metal roof
- Is manufactured locally, especially for LVCB
- Is constructed from pine wood to reduce the cost but will need an external preservative
- Despite its high specification, it is economically priced whilst offering exceptional value for money.

Open Courses Programme 2018

It would be very helpful if members could print off the following notices and put them on local notice boards.

LUNE VALLEY COMMUNITY BEEKEEPERS

OPEN DAY

Saturday, 14th July 2018

The Apiary, Nazareth House,
Ashton Road, Lancaster, LA1 5AQ

11-00am to 4-00pm

Free admittance and car parking

- **Observation hive**
- **Bee hives**
- **Wildflower meadow**
- **Honey**
- **Wax products**
- **Barbecue**
- **Refreshments**
- **Spinning demonstration**
- **Information**

Lune Valley Community Beekeepers

LEARN TO SCYTHE

Scything course by Steve Tomlin

All equipment provided

The Apiary, Nazareth House, Ashton Road, Lancaster LA1 5AQ

Saturday 29th September

BOOKING ESSENTIAL AS PLACES ARE LIMITED TO EIGHT

For further information:

visit www.lunevalleybeekeepers.co.uk

or email: fred@lunevalleybeekeepers.co.uk