Apis-UK The Electronic Beekeeping Newsletter

Apis-UK Issue No.55 March 2008

Contents: Editorial; Beekeeping News: Obituary. John Atkinson, Australian Honey Industry Threatened, US HONEY FIGURES 2007. National Agricultural Statistics Service, POISON HONEY IN THE COROMANDEL, Could it be an answer to CCD?; Research News: Honey Bee Invaders, Can wasps tell us the answer?, What can Honey Bees, Hummingbirds and Bats do that Bumble bees can't?, HOW QUEEN BEES ARE MADE. DO ENVIRONMENTAL FACTORS COUNT?; Articles:: The Hive, PAINTING BEES By Chad; Recipe of the Month: Honey-Tea Grilled Shrimp; Historical Note; Poem of the Month: PURPLE CLOVER By Emily Dickinson (1830-1886); Readers' letters; Diary of Events; Quote of the Month and more.

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In a month when I discovered that critical measurements of the rocket boosters attached to the Space Shuttle were based on those of two horses' rear ends pulling a war chariot used by the Ancient Britons, I also discovered the news about MegaBee, a new food for bees that may even counteract the effects of Colony Collapse Disorder. Now far from sneering at these ideas, I decided to investigate them and found the first to be true – evidently the Ancient Brits' war chariot measurements did determine the size of the Shuttle's booster rockets (I knew British ingenuity came into it somewhere), but as for the bee food, I remain (at the moment) rather sceptical, but I intend to find out more. Read about this feed in this month's Apis below.

It has also been quite a month here in NZ. Quite a few people have been poisoned by beekeepers in the Coromandel selling comb honey taken from the Tutu bush. In fact, it is the honeydew from the leaf hoppers that build up on the bush during drought periods that is the problem, but it is a reminder to all beekeepers that they should know what flora exists in a sizeable radius around their bee hives. The effects of even a tiny amount of the honeydew are truly awful and can be fatal. Unfortunately for some of the sufferers, they treated their early symptoms of stomach ache by eating more of the poison comb honey which they thought – being honey - might be efficacious!

A Well Earned Break

For the rest of the month – March, I and my beekeeping colleague (I don't like using the word partner any more) have been squeezing the last splits of the year out of our hives in order to build up our stocks. Now of course, at the end of the season for us in NZ, those splits and the rest of the hives need feeding and I wish I could get hold of some of this MegaBee to test its efficacy. Perhaps next year will have to do.

In this issue, we take a look at bats again and also investigate and learn how honey bees invade new territories and more on how queen bees are formed. This transformation from a larva into either a queen bee or a worker bee – two very different animals – cuts to the heart of the matter as far as beekeeping is concerned. The recipe is especially delicious and yet again features prawns, only because they happen to be one of my favourite foods, and the poem is another by that peerless poet Emily Dickinson. Our historical note is a defence of the practice of killing bees at the end of the season indicating how difficult it would have been in those days to educate beekeepers in more modern ways.

We also take a look at a hive designed for Africa by Oliver Field and being deployed by the very worthwhile British beekeeping charity 'Hives Save Lives.' I may be wrong but I have always wondered about the necessity of using 'appropriate technology' hives for African beekeepers when we in the developed world use Langstroths and Dadants and similar hives which we claim are the best! Oliver Filed has designed a Langstroth for African conditions which to my mind combines the requirements of African conditions and the use of modern ideas that we in the west wouldn't part with. It seems to me a good idea.

On a sadder note we learn of the death of John Atkinson and I've included my thoughts on this excellent man and beekeeper in the obituary. He is a very sad loss to beekeeping.

All the best
David Cramp. Editor

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Obituary. John Atkinson.

I was very sad to hear of the death of John H Atkinson who died on 28th March of this year. I knew John from my research days in the Cardiff University Bee Research Unit when I had to decide upon a topic for my thesis. I'd got some fanciful idea about queen bees which I thought I could research but then I met John at the 1992 Honey Show in London and in discussion he suggested the much under researched topic of Drone Congregation Areas as a better alternative. With his initial guidance, and using Karl Showler's knowledge and hospitality in Hay-on-Wye, I spent many days with my balloons, fishing rod and reel and my artificial queen, testing the various parameters of a DCA every 15 minutes. It got me a Distinction from the university and launched me into the world of beekeeping science and for that alone I will always be grateful for his guidance.

His work on explaining the very difficult subject (to me at any rate) of honey bee genetics and queen improvement was important for not only did he work out new procedures and methods but he had the ability to explain this complex knowledge to people like myself who had previously put it all in the 'too difficult' basket. Reading his work and taking to him, I actually began to understand it – and that was quite something! His book, 'Background to Bee Breeding explains it all.

John kept going right until the end, working diligently with and writing about his McBean hive barrow and his Jordan Pollard insemination kit (I have one) and producing articles of huge interest to beekeepers around the world. He was even producing copy for the Beekeepers Quarterly until very recently and I guess that if you are going to take the journey we all must take then that's the way to do it. He won't be forgotten in a hurry and I was glad to have known him.

Australian Honey Industry Threatened

THE Australian honey industry says it is under threat from contaminated Chinese imports which contain a potentially deadly carcinogenic and are being sold overseas as Australian-made.

The Australian Honey Bee Industry Council says the contaminated honey is being relabelled as made in Australia then exported to Europe. The council says the scam is putting the industry's international reputation at risk and it wants the Federal Government to take action to stop it. The council's executive director, Stephen Ware, said chloramphenicol had recently been detected overseas in royal jelly labelled Australian-made. Chloramphenicol is used to control disease in prawns and bees and is an antibiotic used to treat serious diseases in humans, including typhoid fever. It has rare but potentially life-threatening side effects. Mr Ware said it was not practical to expect quarantine officers to check every batch of Chinese honey.

Some Australian health food distributors were importing contaminated royal jelly and propolis (a resin that bees collect from trees) from China and re-labelling the products as made in Australia or product of Australia, then exporting them. Mr Ware said apiarists had repeatedly warned importers about the contaminated royal jelly.

"It's not good for Australia's image. We're copping the blame when it's not actually us," he said.

Mr Ware said importers were getting around labelling laws by blending a filler in Australia, mainly wheat gluten, with the contaminated royal jelly. Melbourne beekeeper Graham Grigson said Australia's testing facilities for contaminated food were inadequate. "Any honey that is diseased has to go straight back where it came from," he said.

In a submission to a federal parliamentary inquiry into the future of Australia's $80 million honey bee industry, the industry council urged the Government "to better enforce the regulations associated with product labelling of honey bee products".

US HONEY FIGURES 2007. National Agricultural Statistics Service
USDA Washington, D.C.

These figures were released February 29, 2008, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture.

United States Honey Production was Down 4 Percent over the year.

Honey production in 2007 from producers with five or more colonies totaled 148 million pounds, down 4 percent from 2006. There were 2.44 million colonies producing honey in 2007, up 2 percent from 2006. Yield per colony averaged 60.8 pounds, down 6 percent from the 64.7 pounds in 2006. Colonies which produced honey in more than one State were counted in each State where the honey was produced. Therefore, yields per colony may be understated, but total production would not be impacted. Colonies were not included if honey was not harvested. Producer honey stocks were 52.5 million pounds on December 15, 2007, down 13 percent from a year earlier. Stocks held by producers exclude stocks held under the commodity loan program.

Honey Price Down Slightly

The 2007 all honey price was 103.2 cents, down slightly from 103.6 cents in 2006. U.S. and State level prices reflect the portions of honey sold through retail, cooperatives, and private channels. Prices for each color class are derived by weighting the quantities sold for each marketing channel.
Prices for the 2006 crop reflect honey sold in 2006 and 2007.

POISON HONEY IN THE COROMANDEL

Holidaymakers stricken by toxic honey in New Zealand,

A 70-year-old Hamilton woman has become the fourth person to become ill after eating honeycomb purchased while holidaying in the North Island near Whangamata. Health authorities have issued a warning about comb honey sold in the Coromandel (a peninsula in the North Island) in recent days after two holidaymakers became violently ill and a child nearly died.

The toxic honey was sold at a roadside stall and it is understood it was made by a Whangamata hobbyist. Now authorities are arranging drop-off points for people with honey they fear may be contaminated so it can be collected and disposed of. Bees would otherwise find it and return the toxins to their hives.

Wellington mother Jo Whittle, her three-year-old son Daniel and eight-month-old baby were holidaying in Onemana with her parents, her sister and her sister's partner, Joseph Reynolds, when they bought the honey on Thursday, the last day of their four-day break. It was in a plastic box with a transparent lid. Reynolds, who is visiting from London with Whittle's sister, ate a honey sandwich that night. He said it had no odour and tasted fine. Hours later he felt nauseous and disorientated. He made himself throw up and went to bed.

While asleep he had a seizure and his family called the emergency services number. Reynolds says the next thing he knew he woke up in an ambulance. "At that point I couldn't even remember what country I was in." Thames Hospital doctors initially thought Reynolds had suffered a diabetic attack but when Whittle and her son also became ill they suspected food poisoning.

At 4am Daniel started throwing up and two hours later he had a seizure. By that stage Whittle was also vomiting and weak, so her mother was looking after the boy.

Whittle said she heard her mother cry out and when she raced to the lounge she found her son had turned blue and had stopped breathing. "I was extremely frightened and thought my son was going to die... He was on the couch and his back was arched, he was shaking up and down." She laid him on the floor and he started breathing. The family called the emergency services again. Ten minutes later Onemana volunteer firefighters arrived and gave Daniel oxygen until ambulance staff arrived to take over.

The poison honey is produced by bees feeding on a native bush known as tutu. When they gather honeydew produced by the sap-sucking vine hopper insect feeding on the plants, they can introduce the poison tutin into honey. The New Zealand National Beekeepers Association CEO Jim Edwards said suspect honey should not be thrown out, as that would return the poison to the food chain. "Bees will actively seek out honey, they'll find it anywhere," he said. "If they access it, they'll just quietly take it back to their hives." A Health Board spokeswoman Mary Ann Gill said the honey producer had voluntarily withdrawn it from sale when told about the incident and has given the honey to the health board for analysis. Food Safety Authority spokeswoman Trish Pearce said the producer would face charges under the Food Act if it was found they had sold unsafe honey. Whittle said it was "incredible" how little honey they had eaten Daniel had a scraping on a bun and Reynolds had about two teaspoons' worth. Whittle had even less, which was possibly why she was less sick.

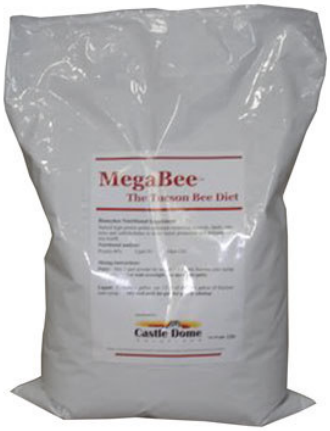
Tutu

The small tree tutu (*Coriaria arborea*) is found throughout the country, especially on bush margins and alongside streams. Except for its swollen petals, all parts of the plant are poisonous.

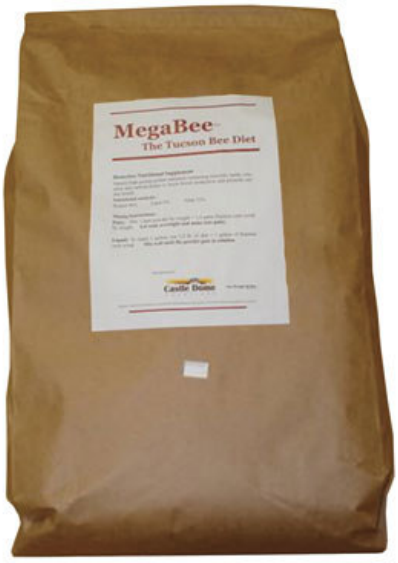
Coriaria Arborea

Around 1900, New Zealand chemists identified tutin as the poison in this plant. This acts on the central nervous system, causing convulsions and breathing problems that may lead to death. Previously There have been few cases of human poisoning by tutu since 1900, although one man died in 1989.

Could it be an answer to CCD?



5LB Bag



40LB Bag

Agricultural Research Service (ARS) entomologist Gloria DeGrandi-Hoffman created the research and development agreement that led to this new, convenient source of proteins, vitamins and minerals that bees need for good health. Bees can eat MegaBee as a meal or snack when forage is unavailable either due to time of year or bad weather.

Better nutrition might be a key to reversing the decline of honey bees, Apis mellifera, in the United States. Colony Collapse Disorder is blamed for losses of once-thriving colonies, as are problems caused by mites, beetles, Africanized honey bees, diseases and pesticides. DeGrandi-Hoffman, at the ARS Carl Hayden Bee Research Center in Tucson, Ariz., sought the expertise of Gordon I. Wardell, entomologist and owner of S.A.F.E. R & D, LLC, in Tucson, to develop a new, nutritious food for bees. The resulting MegaBee has now been on the market for about six months. It's manufactured by Castle Dome Solutions, LLC, in Yuma, Ariz., and sold by Dadant & Sons. Tests conducted in California by Wardell and ARS scientists in the winter of 2007 showed that bees ate MegaBee at about the same rate as natural pollen. But MegaBee-fed bees helped produce more brood, or young, than did their pollen-fed hive mates.

Ongoing research, in orchards and in laboratories at the Carl Hayden centre, should reveal even more about bees' year-round nutrition needs. Nutrition investigations, a special emphasis at the Carl Hayden laboratory, are part of a new, nationwide program of ARS-led scientific research on honey bee health.

Adapted from materials provided by US Department of Agriculture.

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Honey Bee Invaders.

In some interesting new research, scientists have found the first evidence that honey bees, (Apis mellifera) invade new territories in repeated assaults. A new study demonstrates that when these honey bees arrive in a place that has already been invaded, the newcomers benefit from the genetic endowment of their predecessors by exploiting the genetic resources of their predecessors

The researchers from the University of Illinois in the USA, analyzed specific markers of change in the genes of honey bees in Africa, Europe, Asia, and the Americas. They also focused on geographic regions—such as Brazil in South America—where multiple honey bee invasions had occurred. They were looking for tiny variations in the sequences of nucleotides that make up all genes. Certain versions of these single nucleotide polymorphisms (SNPs, or "snips") are more common to African honey bees, while others occur more frequently in honey bees in western Europe, eastern Europe, or Asia.

By comparing these SNPs in bees from different geographic territories, and by looking at the frequency at which particular alleles, or variants, occur in functional and nonfunctional parts of the honey bee genome, the researchers were able to determine that the invading bees were not just randomly acquiring genetic material from their predecessors by interbreeding with them, but that certain genes from the previously introduced bees were giving the newcomers an advantage.

(An earlier study led by the same researchers and published in Science in 2006 showed that A. mellifera originated in Africa and not Asia, as some had previously hypothesized).

That study revealed that the honey bee had expanded its territory into Eurasia at least twice, resulting in populations in Eastern and Western Europe that were quite different from one another.

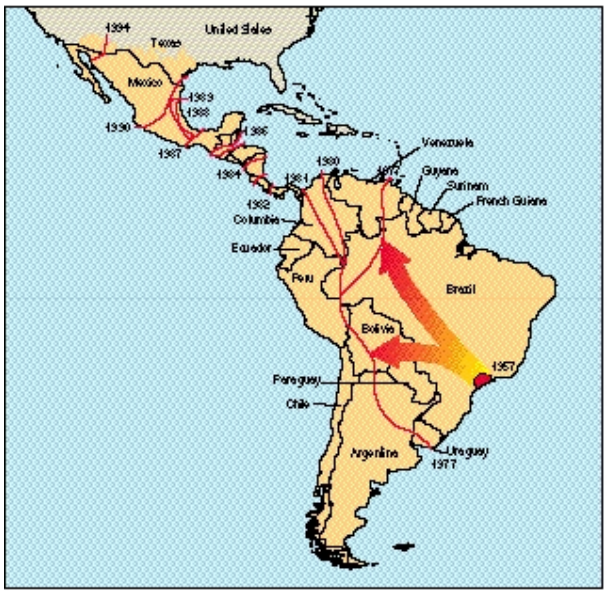
The earlier analysis also confirmed and extended results of previous studies showing that African honey bees had mixed with but largely displaced their predecessors in the New World, which were primarily of western European stock. When the European old-timers mixed with the African newcomers, their offspring looked, and in most respects behaved, like the African honey bees. These more aggressive, "Africanized" bees (so-called "killer bees") received a lot of media attention in the U.S. as they moved north from South America. According to the U.S. Department of Agriculture, the first Africanized honey bees appeared in Texas in 1990. In less than a decade they had also spread to southern California, Arizona, Nevada and New Mexico. The researchers wanted to understand the evolutionary mechanism that allowed the African honey bees to move into these new territories and dominate the bees that had arrived in the New World centuries earlier from eastern and western Europe.

Their analysis of about 440 SNPs selected randomly from throughout the Africanized honey bee genome showed that most of the alleles were common to African honey bees. But of the alleles common to European bees, those found in functional parts of the genome (in genes) were showing up more frequently than those in nonfunctional regions (between genes).

They asked the question: Is hybridization an essentially random process? When the African honey bees mated with the western European honey bees that had been in South America for centuries, one might expect that the hybrid offspring would randomly pick up both the functional and nonfunctional parts of the genome, but what they found was there was a preference for picking up functional parts of the western European genome over the nonfunctional parts. It appeared that the Africanized bees that kept some of the functional western European genes were gaining an advantage, Whitfield said. Those African bees are doing better because there were western

European honey bees there for them to mix with. Now they have a signature for evolution in the genome."

While the researchers do not yet know how these European honey bee genes are enhancing the survival and fitness of the Africanized bees in the Americas, it may be that specific traits from Western Europe are beneficial, or it may be that being a hybrid is, in and of itself, a good thing for these bees.



Invading bees. Are they being helped by their predecessors?

In a separate finding, the researchers also discovered a genome-wide signature of evolution associated with the ancient expansion of honey bees from Africa into temperate regions of western and northern Europe. In this expansion, functional parts of the genome have changed more than nonfunctional parts. They think that these changes may involve social adaptations to survive the hard winters.

It appears that the way the honey bees survive in temperate regions is similar to the way humans do. They have a shelter and they store resources. Not needing to survive in such cold weather, African bees store less food and reproduce more.

So how does an animal that's basically tropical make it? How does it expand its territory and thrive in very harsh winter conditions in this temperate region? Asked the scientists. Humans did it, and Apis mellifera did it in some interestingly parallel ways."

The findings appear online the week of Feb. 25 in Proceedings of the National Academy of Sciences. The researchers were University of Illinois entomology professor Charles Whitfield and postdoctoral researcher Amro Zayed. Whitfield is also an affiliate of the Institute for Genomic Biology.

Adapted from materials provided by University of Illinois at Urbana-Champaign, USA.

Can wasps tell us the answer?

Sociality and dominance are subjects that have long been researched by scientists and beekeepers have been interested in this aspect of insect science because they deal with one of natures most social insects. So what do you need to be socially dominant? There's new evidence supporting the idea that bigger brains are better. A study of a tropical wasp suggests that the brainpower required to be dominant drives brain capacity.

University of Washington researchers have found that key processing regions in the brains of both males and females of one wasp species not only increased in size with

age but were also associated with being dominant. The study also showed different patterns of brain development in males and females. Certain sub-regions were larger in males and others were larger in females. This matched expectations based on males' greater use of vision and females' greater reliance on their antennae.

UW researchers Sean O'Donnell and Yamile Molina found increased brain growth in areas of the insects' brains called the mushroom bodies, which vaguely resemble the cerebrum in humans and other vertebrates. A mushroom body sits atop each hemisphere of the wasp brain. The mushroom bodies process input from the eyes and antennae, and are involved in learning and memory. The social paper wasp that was studied, Mischocyttarus mastigorphorus, is unusual because males are dominant over females, a rarity among social insects, said O'Donnell, a UW associate professor of psychology. Most social insect societies—bees, ants and wasps—are predominantly female, with males short-lived and subordinate.

Paper wasp

O'Donnell and Molina, a UW doctoral student, focused on a part of the insects' mushroom body, called the calyx, where neural connections are made. While the overall size of the calyces did not differ between the males and females, specific sub-regions were larger in each sex. Males rely on vision when they leave the nest for mating opportunities, and the part of the calyx that receives visual input was larger. In contrast, most female interaction takes place on the nest, where tactile and odour senses are important and the part of the calyx that received input from the antennae was bigger among the females. "When you are dominant among insects you get more food," O'Donnell said, "and in this case it gives males more energy to leave the nest and mate. The fact that the males are dominant and long-lived makes this species interesting from a neurobiological standpoint. We think they have pretty sophisticated cognition compared to males of other wasp species."

The researchers studied five wasp colonies in a tropical cloud forest near Monteverde, Costa Rica. They first marked all resident adult wasps on the nests and these individuals were excluded from further analyses. Newly emerged wasps then were captured and marked over the next several days and returned to their nest. Each colony then was observed in the morning and afternoon every three days over the course of more than a month. Behavioural data such as giving and receiving aggression were collected, as well as time spent on and off the nest. After this observation period, sections of the wasps' brains were examined under a microscope.

Among the unanswered questions stemming from this study include how long these wasps live and how long these patterns of brain growth continued. The scientists only followed them for 42 days, so they don't know how long they live or if their brain development is similar to humans in terms of if and when they start to decline cognitively. They say that an exciting new idea—the social challenge hypothesis—suggests that large human brains evolved in response to the demands of complex social interactions. The wasp work extends this idea to individual brain variation. The question is, Do you get to be dominant because of a big brain or does being dominant drive brain size? That's still an open question and the researchers admit that they don't know which comes first, This study suggests the high cognitive demands of being dominant drive brain capacity and supports the social brain hypothesis. The next step is to broaden the scope of the research by looking at more species of paper wasps. They are interested in how brains evolve in concert with social evolution. There is the intriguing possibility that there are similar patterns across wide spans of evolutionary time. The goal is to get a bigger sample of social wasp species and examine this.

The researchers say that we are looking at super-distant animals when you compare wasps and people. Yet there may be an interesting commonality between them. Increased brainpower may be part of being social, no matter who you are. What makes this exciting is we see some common patterns in how brains change as societies evolve. As we see changes in social complexity, there are changes in brain structure. If it is good for people it should be good for wolves, dolphins and paper wasps.

This research, funded by the National Science Foundation, has been published in the online edition of the journal Developmental Neurobiology. This article was adapted from materials provided by University of Washington.

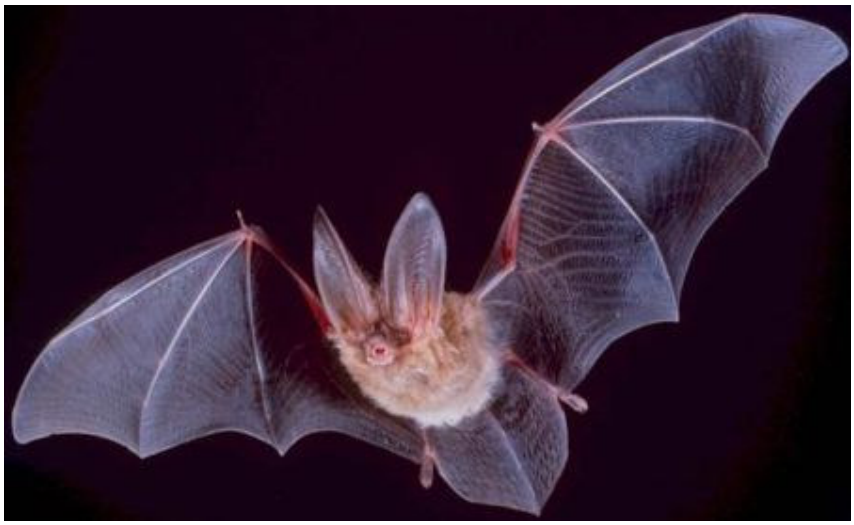
What can Honey Bees, Hummingbirds and Bats do that Bumble bees can't?

Honey bees and hummingbirds can hover like helicopters for minutes at a time, sucking the juice from their favourite blossoms while staying aloft in a swirl of vortices. But the unsteady air flows they create for mid-air suspension – which hold the secrets to tiny robotic flying machines—have also been observed for the first time in the flight of larger and heavier animals, according to scientists from the Department of Aerospace and Mechanical Engineering at the University of Southern California and his colleagues at Lund University, Sweden. In a follow-up study of bat aerodynamics, appearing in the February 29, 2008 issue of Science researchers were able to measure the velocity field immediately above the flapping wings of a small, nectar-eating bat as it fed freely from a feeder in a low-turbulence wind tunnel. They used a wind tunnel at Lund University specially crafted for research on bird flight on bats. Birds fly "at the spot" against a headwind, allowing detailed investigation of wing movements using high speed video cameras. It's also possible to visualize the vortices around the wings and in the wake using fog as tracer particles.

Thanks to a very reliable behaviour pattern where bats learned to feed at a thin, sugar-filled tube in the wind tunnel, using the same flight path to get there every time, and the construction of side flaps on the feeder tube, scientists could make observations with bright laser flashes right at mid-wing without harming the bats. Before this, they had no direct evidence of how the air moved over the wing itself in these small vertebrates.

The researchers' findings challenge quasi-steady state aerodynamic theory, which suggests that slow-flying vertebrates should not be able to generate enough lift to stay above ground, said Spedding, a professor of aerospace and mechanical engineering in the USC Viterbi School of Engineering. Using digital particle image

velocimetry, the researchers discovered that Pallas' long-tongued bat, Glossophaga soricina, increased its lift by as much as 40 percent using a giant and apparently stable, re-circulating zone, known as a leading-edge vortex (LEV), which completely changed the effective airfoil shape.



How can the bats generate such high lift? One of the team members and lead author of the new study, Florian Muijres, explains: "The high lift arises because the bats can actively change the shape (curvature) by their elongated fingers and by muscle fibres in their membranous wing. A bumblebee cannot do this; its wings are stiff. This is compensated for by the wing-beat frequency. Bats beat their wings up to 17 times per second while the bumblebee can approach 200 wing-beats per second."

"The air flow passing over the LEV of a flapping wing left an amazingly smooth and ordered laminar disturbance at the trailing edge of the wing, and the LEV itself accounted for at least a 40 percent increment in lift," Spedding noted in his commentary, "Leading Edge Vortex Improves Lift in Slow-Flying Bats." The LEV makes a strong lift force, but it may be equally important that the smooth flow behind it may be associated with low, or at least not increased, drag. "The sharp leading edge of the bat wing generates the LEV," Spedding said, "while the bat's ability to actively change its wing shape and wing curvatures may contribute to control and stability in the leading-edge vortex." Spedding and his colleagues believe observations of LEVs in active, unrestricted bat flight have important implications for overall aerodynamic theory and for the design of miniature robotic flight vehicles, which have been undergoing dramatic modifications in recent years.

"There's much to be learned from bat flight about unsteady flows and forces on small bodies," Spedding said. "We have suspected for a while that insects weren't the only creatures affected by highly unsteady viscous air flows, but now we know that larger animals adapted for slow and hovering flight, such as these nectar-feeding bats, can – and perhaps must – use LEVs to enhance flight performance. So, if we wish to build a highly manoeuvrable, slow-flying surveillance plane, maybe it should flap its wings like a bat?"

The paper in Science is: Leading-Edge Vortex Improves Lift in Slow-Flying Bats, authors are F T Muijres, L C Johansson, R Barfield, M Wolf, G R Spedding and A Hedenström.

Adapted from materials provided by University of Southern California.

HOW QUEEN BEES ARE MADE. DO ENVIRONMENTAL FACTORS COUNT?

Most beekeepers realise that diet is the key to causing fertilised larvae to develop into queens or worker bees but New research by scientists at the Australian National University may explain why eating royal jelly causes honeybee larvae to become queens instead of workers – and in the process adds new weight to the role of environmental factors in the nature/nurture divide.

The queen bee. Does nurture have an effect on their formation?

Scientists from the Research School of Biological Sciences at the university have discovered that a copious diet of royal jelly flicks a genetic switch in young bees that determines whether they'll become a queen, or live a life of drudgery. Their findings are published in the latest edition of the journal Science. "Royal jelly seems to chemically modify the bee's genome by a process called DNA methylation and disrupts the expression of genes that turn young bees into workers," explain the researchers.

When they 'silenced' a gene controlling DNA methylation without recourse to royal jelly, they discovered that the larvae began to develop as queens with the associated fertility, rather than as infertile workers. They believe this is the first time that DNA methylation has been functionally implicated in insects. The molecular process is common in vertebrates – including humans.

Dr Richard Maleszka, of the university explains that if you have identical human twins, and one develops schizophrenia, then you need another mechanism to explain how this can occur when they have the same genetic blueprint.

He goes on to say that DNA methylation links genomes to environmental factors like nutrition and modifies how genes express themselves. Discovering this in bees, which are a much simpler biological model than humans, means we have a better opportunity of understanding more about how this process occurs. The researchers will continue to study how DNA methylation affects bees, as they suspect that the process could also be responsible for how the insects' brains develop, and may thus be connected to bee behaviour and even social organisation. The research suggests that environmental factors, such as how organisms are nurtured, can have a major influence on how they develop.

The current work grew out of the honeybee genome project, which mapped the entire genetic blueprint of bees.

This item was adapted from materials provided by The Australian National University.

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The Hive

I have included this article by Oliver Field with the permission of Hives Save Lives, a British beekeeping Charity the details of which can be found on www.hivessavelives.com The charity is taking Oliver's advice and producing a modern hive for use in Africa, but a hive with a difference. See what you think.

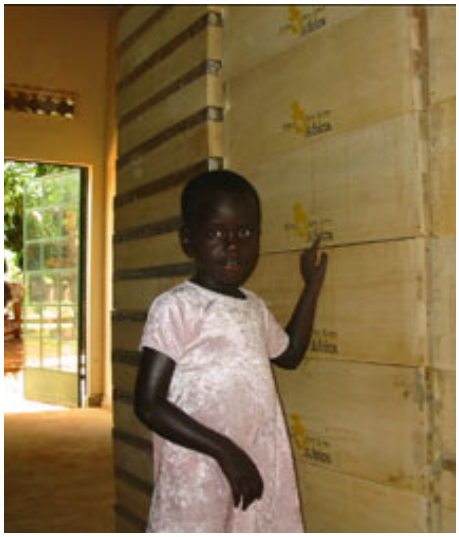
The hive which is being manufactured by Hives Save Lives in Uganda was designed by Oliver Field, author of 'Honey by the Ton'.

Buy Honey By The Ton from the Amazon website and earn money for Hives Save Lives - Africa.

Hives on stands.

About Oliver Field

Mr Field has over twenty years of experience as a consultant on development projects in Africa and Asia involving apiculture and the honey industry, including beekeeping and queen rearing, honey production, preparation and running of training courses both in the UK and overseas, beeswax production and producing cosmetics from beeswax. He has also been a successful commercial beekeeper in the south of England for over 30 years.


Mercy and the hives stacked up.

The case for a modern hive in Africa

The need for a different approach to hive design in some parts of Africa is best summed up by Oliver himself:

The honey produced by the African bee is just as good as honey from any other part of the world. The only difference is how it is produced and the quality of that honey. The reason for some of the poor quality is that almost all the honey is taken in a wild comb form and pressed from the combs. The resulting product is often full of impurities, such as excess pollen, dead bees and old comb.

To take a huge step forward, we have to use a modern hive for the production of honey. We have to leave behind the smoking out and hand pressing of the honey and change to a movable type of frame which will allow for the centrifugal extraction of the honey. This honey will now be marketable in any part of the world.

This will be done by the use of what I would like to call the 'long Langstroth' Hive. This hive will have sixteen Langstroth frames in a horizontal plane, and will have no supers in the vertical plane (as in a European hive). The excluder needed to keep the Queen away from the honey combs will be introduced vertically and not horizontally. The point here is that the African bee needs to keep cool so the Queen will expand her brood nest outwards, whereas the European bee needs to keep warm and these bees will build a brood nest in a vertical direction.

For many years this fundamental truth was poorly understood, and a great deal of African Aid Funding was put into European hives, which did not serve the purpose of the African Bee. If we can harness the African Bee properly, its production of honey will be greatly increased and the quality of that honey, once it has been centrifugally extracted, will be much greater and so the earning power of each hive unit will be increased. Not only this, but the hives will become far more manageable. Increase will cease to be by unmanageable swarming when too often that swarm is lost, but by manageable increase. This will mean increasing the number of hives by splitting colonies and not losing the stock by unexpected swarming.

So we will achieve a greater control of the bees and the honey. We will also be able to see which hives will need food to take them through long dry spells and losses through starvation or absonding will be limited to a minimum.

The African bee is a truly wild creature and does not have the disease problems of the interbred European strains used throughout most of the world. For this reason, the use of antibiotics will not be necessary and the honey will be far more acceptable when it is produced in a cleaner and more manageable fashion. In fact, I think that African honey could become a leading organic brand once the production problems are put right.

Oliver Field

In this short article from Chad he brings a new perspective to using bees – this time as artists. This time they are outlining Chad's local beekeeping magazine BeeLines. It seems easy enough so why not give it a go and as Chad suggests try Mick Jagger.

PAINTING BEES
By Chad

It is very important to maintain good relations with your local scrap yard. They will, on occasion, come by something they think you might like and call you. This is how I came by my three Portakabins from which Chad s Honey business is run. One is fitted-out for bottling; another for extraction and the third is for storage. The good thing about scrap yard Portakabins is that they are cheap. They cost just a little over the cost of delivery. The bad thing is they might be a little leaky. On Thursday I got up at 7.30am but my bees must have been up at 5am.When I got to my extraction Portakabin at 8am most of the flying bees from the thirty hives I have on the farm were in it waiting to greet me. The sound was tremendous, thirty swarms in a confined space, wow. You should have seen them explode out like pressurised steam when I opened the door! I spent an hour trying to remove all the bees from the room and found that as they like to fly towards the strongest source of light, using a combination of turning on the strip lights with the windows darkened and opening the main door I could channel them out. I then spent another hour fitting sponge to the ill-fitting door frame. Having done this I found that the bees were still getting in somehow. Then I found them pouring in through the keyhole. I had been extracting honey in the Portakabin the day before and the smell of fresh honey must have been irresistible.

Whilst extracting honey I had made rather a mess andwent to bed wondering how I was going to clean the floor where some large pools of honey had developed, however I noticed the following morning that in under three hours the bees had stripped the whole floor of honey; all the drips, dribbles, smears and stains were gone. Using my new Apimelter toy I had prepared a large block of wax; this had a sticky layer of debris still attached to it. I decided to place this outside for the bees to clean up.

Seeing all of the bees clustering over the block of wax gave me an idea. John Chamberlain called around on Thursday afternoon to find me and Ceri experimenting with honey pictures. I told him it was Ephemeral Art , and that I was a pioneer in this field. He told me that I had too much time on my hands. I told him he didn't seem too rushed off his feet himself and we went in for tea totalk about my art work. Honey art is great, you draw in honey on a light background and the bees feeding on the honey behave like pixels. For a canvas I prefer to use old toilet-cubicle doors, their off-white colour shows off the bees nicely. Those of you worrying about me wasting my good honey will be relieved to hear that I used a jar of John Whitford s honey, I won it in a raffle, it s fairly ropey stuff but the bees didn t seem to mind. I had planned to take a series of time-lapse shots to show how the bees growing number and enhance the image but after 6 shots my camera batteries died and I ran out of John s honey. Being an artist is a struggle. Hopefully, in the next edition of Beelines, I will have more examples of my art work which is being prepared for an exhibition touring most of the top London galleries in late November.

Ceri the artist.

Within a short time the painters assembled. Unfortunately the camera battery ran flat after this picture was taken so we are unable to see the canvas when the maximum number of bees was present. All photos by Chad and Ceri Cryer. How about a picture of Mick Jagger for a future project?

RECIPIE OF THE MONTH Back to top

Prawns and shrimps are one of my favourite foods which is the reason I have included another prawn recipe this month. I like them particularly with an ice cold manzanilla from San Lucar de Barrameda in Spain. (The dry sherry, not the herbal tea bag of the same name). These are particularly delicious.

Honey-Tea Grilled Shrimp

1 1/2 lb medium shrimps peeled, de-veined
Salt to taste
2 x green onions thinly sliced
1 cup brewed double-strength orange spice tea cooled
1/4 cup honey
1/4 cup rice vinegar
1/4 cup soy sauce
1 tbl finely-chopped peeled fresh ginger
1/2 tsp freshly-ground black pepper

Combine the tea, honey, vinegar, soy sauce, ginger and pepper, to make marinade.

Remove 1/2 cup marinade; set aside for dipping sauce. Add the shrimps to marinade and stir them well into the mixture. Marinate in the refrigerator for 30 minutes or up to 12 hours. (Best overnight).

Remove the shrimps from the marinade which can be discarded. Thread the shrimps onto 8 skewers, dividing evenly. Grill over medium hot coals 4 to 6 minutes or until the shrimps turn pink and are just firm to the touch, turning once. Season with salt to taste.

Meanwhile, prepare the dipping sauce by placing reserved 1/2 cup marinade in small saucepan. Bring to a boil over medium-high heat. Boil 3 to 5 minutes or until slightly reduced. Stir in green onions.

This recipe is for 4 servings.

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It took until the end of the 19th Century or thereabouts to convince all beekeepers of the stupidity of killing off all their bees at the end of the season so as to extract the honey. In this historical note we see why, when arguments for the practice were both persuasive and seemingly logical. This argument was put forward by John Levett in 1634.

'Hath not God given all creatures unto us for our benefit, and to be used accordingly as may seem good unto us for our good? We see that many other creatures of greater account are daily killed in infinite numbers for our sustenance and often for our pleasure, and is it not lawful for us, to use these silly creatures in such sort as they may be most for our benefit, which I take to be the right use of them and the very end of their creation.'

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PURPLE CLOVER

By Emily Dickinson (1830-1886)

There is a flower that bees prefer,
And butterflies desire;
To gain the purple democrat
The humming-birds aspire.

And whatsoever insect pass,
A honey bears away
Proportioned to his several dearth
And her capacity.

Her face is rounder than the moon,
And ruddier than the gown
Of orchis in the pasture,
Or rhododendron worn.

She doth not wait for June;
Before the world is green

Her sturdy little countenance
Against the wind is seen,

Contending with the grass,
Near kinsman to herself,
For privilege of sod and sun,
Sweet litigants for life.

And when the hills are full,
And newer fashions blow,
Doth not retract a single spice
For pang of jealousy.

Her public is the noon,
Her providence the sun,
Her progress by the bee proclaimed
In sovereign, swerveless tune.

The bravest of the host,
Surrendering the last,
Nor even of defeat aware
When cancelled by the frost.

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Dear David,
Your editorial in the last Apis-UK is the first time I have read/heard anyone confirm my thoughts on CCD, or Colony Compromise Disorder, as I prefer to call it. I may be wrong but I do not think it is some mysterious new disease as the Americans suggest and there are certainly plenty of examples of it in this country although CSL seem to be in denial over this. I have friends who have experienced it and a recent survey of 100 Scottish beekeepers shows that 48% of losses over an 18 month period, 2004-06, show "Marie-Celeste" symptoms, as they call them. One of these beekeepers witnessed the bees actually leaving the hive, something my former colleague at Rothamsted, Norman Carreck, also observed.

I think the "mystery" is compounded by the fact that some of the viruses kill bees in under 5 days and the whole colony, strong or not, can disappear very quickly.
I think "CCD" could be another "Isle of Wight" disease.

I have viewed several American videos on the subject and one thing that stood out to me was the terrible state of combs in lost colonies, from dark brown to jet black, and apparently it has been common practice to put boxes from colonies that have died onto surviving ones with the intention of splitting them at a later date. On top of this there are unreasonable numbers of colonies on any one site, together with, as you suggest, the stress caused by moving bees up to EIGHT times a year, has, I believe simply tipped the balance in favour of the pathogens.
NATURAL SELECTION STRIKES BACK!!

Congratulations on a very interesting issue.
Best wishes,
Peter Tomkins.

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Which very well known figure said the following, and what beekeeping item was he talking about?:

*"Exactly ********. Here is the fruit of my leisured ease, the magnum opus of my latter years!"*

*I have starred the name in the quote otherwise you would know it straightaway. Ed.

Editor: *David Cramp*