Apis-UK The Electronic Beekeeping Newsletter

Apis-UK Issue No.45 October 2006

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So after many months of turmoil in Apis UK, which naturally occurs after staff changes, we now have finally got a clearer vision of the future. With Steve Loughborough and Rod Earp working exceptionally hard on the production side and myself occupying the easy slot we are pulling out all the stops to get Apis UK to your computer in or very near the first week of each month. This of course means that any copy sent in by correspondents and readers should be with me by the 15th of the month preceding, at the latest.

This month we take a look at several fascinating research items and it always amazes me what new research uncovers. Two bee algorithms start off our research section, one which tells companies how to maximise their results by changing their processes and the other helps the development of more useful robots. We never cease to learn from bees. Bees store honey, but how do some ants solve the problems of periods of dearth. Read below. And did you know that plants can literally count. Having been involved in the pollination game I know how vital it is to get the timing right. Climate change is badly affecting this timing by natural pollinators as the plants and the insects go out of sync. And how do wild bees help honey bees become better pollinators. Some observations below tell you just how this happens.
Ian Rumsey's current series, of which we have part 4 of 5 below, is one of the most interesting pieces of experimentation I've seen – and just imagine the patience involved in the experiments.

Our recipe of the month comes from an article in the Times, but I feel justified in sharing it with you as I had tried this several years ago in Spain or a very close version which I give you here), and it is truly delicious. Try it! And our other regular features will I hope interest and fascinate you.

Recently, I have been trying to find out if beekeeping is on the rise in the UK, US and Europe. I get the feeling that it is but trying to obtain actual facts is like trying to grasp hold of a cloud. However, again the press comes to the rescue in an article saying that beekeeping is indeed on the up at least in the UK and by 25%, and further, that the average age is going down. This is excellent news and I hope that the newcomers stick with it and of course that they read Apis UK. If any of our correspondents abroad know of any similar information in their own countries, please let us know at Apis.

On this point, if you have any information on bees and beekeeping that you wish to share, or any short stories that you have painstakingly written, do send them in. Apis relies on contributions from a great many knowledgeable people and any input from you can only improve the magazine.

So with that good news in mind I hope that you enjoy this edition of Apis UK and tell all those new beekeepers about it.

One of the many new, younger beekeepers!

David Cramp. Editor

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UK NEWS

Beekeeping going up; age coming down.

The Times reported last month that whilst wild bees are in decline, with many British species under threat beekeeping, is on the up, particularly in urban areas: the number of apiarists has risen by 25 per cent in the past three years to 10,671, the British Beekeepers Association says. The average age is falling, too.

“Many people are getting into it to boost their green credentials and to get closer to nature,” says John Chapple, the chairman of the London Beekeepers’ Association. But there are other benefits: beekeeping is physical — you have to be strong to harvest a 20lb (9kg) box of honey.

WORLD NEWS

Not all bad in Ethiopia as beekeepers show the way
The Ethiopian Herald (Addis Ababa) June 8, 2006 WIC Awassa The production of honey in the Southern Nations, Nationalities and Peoples State (SNNPS) is showing a marked increase, the state Agriculture and Rural Development Bureau said. Animal Husbandry and Fodder Development Senior Expert with the Bureau, Ergete Wolde-Semayat, told WIC yesterday that 8,300 tonnes of honey was collected in the past nine months as farmers in the state are utilizing modern beehives.The honey that used to be collected annually two years ago did not exceed 5,000 tonnes, he added. The senior expert attributed the rise to the series of awareness raising training which enabled the farmers to shift from using traditional beehives to modern ones, thus collecting seven kilograms of honey on average from a single beehive against the earlier five kilograms. Some 339,956 improved traditional beehives,3,893 transitional beehives and 1,170 modern beehives were distributed this Ethiopian year to the farmers, according to the expert.

Information sheet no. 4

Melbourne, Australia 9 – 14 September, 2007

There has been a lot of new information added to our website in the past few weeks. There is now provision for registration, the accommodation venues are shown, the world honey show is there showing the different classes you can enter and the popular Apimondia contests are listed.

The scientific program is now listed as well as the keynote speakers. Provision for sending in abstracts is on the website.

There is a short section on Australian beekeeping and some notes about Australia.

The social tours are shown as well as the social functions and pre and post congress tours.

There will be extra information added from time to time. Check on the Latest News section to see what has been added.

Check out all the new information at www.apimondia2007.com

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It is pleasing to report that our Organising Committee has had enquiries from several countries wishing to bring beekeeping tour groups to Australia for Apimondia. If you need some help in planning a tour down under to Australia, let our Organising Committee know. We want you to have a memorable time in Australia. We can help with visits to beekeepers, tourist venue suggestions or cultural activities.

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It may seem a long way off but for those coming to Australia from overseas please visit the website and look at the Travel Information. You will need to obtain a visa to come to Australia and, except for New Zealand residents, this visa must be obtained before leaving home. Secure your visa early to avoid any delays.

Trevor Weatherhead (Organising Committee) queenbee@gil.com.au

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Pollinating Insects may give us clues to the spread of diseases

It may seem obvious to the untrained, but now there is research to back it up. Insects tend to transmit diseases in the course of feeding on plants, and their movement between plants is influenced by plant quality (how good of a meal they'll get) and the distance between plants, or, how far they'll have to travel to get to the next meal, explain Matthew Ferrari, Jessica Partain, Janis Antonovics, and Ottar Bjornstad. "It turns out insects are more likely to move shorter distances between better plants, so the better the plant or the more flowers it has could lead to its earlier demise than for its poorer relatives. The researchers found that the probability of disease being passed between two plants goes up if they are closer and/or better, which parallels the stronger gravity between closer and larger planets.

They tracked a fungal disease spread by bees and moths in the course of pollinating and feeding on nectar from white campion flowers at the University of Virginia's Mountain Lake Biological Station. As predicted by the behaviour of insects, the disease was more likely to spread shorter distances between plants that had many flowers. "This implies that knowledge of insect behaviour can lead to better prediction of where disease will spread," explain the authors. In fact, these patterns are not limited to diseases of plants or diseases carried by insects. Bjornstad and colleagues have previously shown that similar patterns describe the spread of measles in cities, because people tend to travel more between large towns or only short distances.

(A lesson for Bird Flu?). Ed.

HOW TO PROTECT YOURSELF FROM LADYBIRDS? AVOID THEIR SMELLY FEET.

Parasitic Wasps tell us how.

Scientists at Rothamsted Research have identified how aphid parasitic wasps prevent their offspring being eaten by ladybirds. The tiny wasps implant their offspring parasitically into aphid pests, but should the aphid get eaten by a ladybird, the growing wasp would be consumed as well. The researchers, supported by the Biotechnology and Biological Sciences Research Council (BBSRC), have found that to protect their offspring, adult wasps have evolved to avoid the smell of a short-lived blend of chemicals that ladybirds deposit with each footprint they make. The scientists have identified the particular cocktail of chemicals.

Ladybirds have smelly feet!

Both wasps and ladybirds are predators of aphids but they have evolved techniques to enable them avoid each other and maximise their own success. As aphids are significant pests for gardeners and farmers the natural mechanisms that have developed help these two predators to interact efficiently to help control aphid numbers.

The scientists at Rothamsted Research, Professor Wilf Powell and Dr Mike Birkett, together with visiting Japanese scientist Dr Yoshitaka Nakashima, have identified the chemicals involved and have also shown that the smell of different ladybird species repels different parasitic wasp species to various degrees. Dr Wilf Powell explained that parasitic wasps attacking aphids living in a wooded area responded most strongly to the chemical footprints of woodland-dwelling ladybirds and similarly for those found more often in fields of crops. This suggests that these two aphid predators have evolved mutually beneficial avoidance techniques to maximise their own chances of success.

"A better understanding of the natural interactions between parasitic wasps, insect predators and their prey has the potential to help us to use them more effectively to control garden and agricultural pests and reduce the amount of pesticides we spray."

The research is was displayed to the public for the first time at an open weekend at Rothamsted Research next weekend (30 September-1 October). The Rothamsted scientists worked in collaboration with a visiting researcher from the University of Agriculture and Veterinary Medicine, Obihoro, Japan who was supported by the Japanese Society for the Promotion of Science. Some aspects of the work were also supported by the Department for Food, Environment and Rural Affairs (Defra).

Cardiff's bee algorithm will help boost industry

We have read in many recent issues of Apis UK about how bees can help humans by sniffing out land mines and acting as recce platforms and so on, well now, an ingenious new mathematical procedure based on the behaviour of honey bees is delivering sweet results for industry.

Researchers at Cardiff University's Manufacturing Engineering Centre (MEC) developed the procedure, or algorithm, after observing the "waggle dance" of bees foraging for nectar. The algorithm enables companies to maximise results by changing basic elements of their processes.

As readers will know, when a bee finds a source of nectar, it returns to the hive and performs its dance to show other bees the direction, richness and distance of the flower patch The other workers then decide how many of them will fly off to find the new source, depending on its distance and quality.

The MEC team's Bees Algorithm mimics this behaviour. A computer can be set up to calculate the results of different settings on a manufacturing process. More computing power is then devoted to searching around the most successful settings, in the same way as more bees are sent to the most promising flower patches.

The Algorithm has been shown to cope with up to 3,000 variables and is faster than existing calculations. By entering basic data about all or part of a company, or even just one machine, the MEC team can calculate the best outcome for a wide range of business processes. They have already used the Bees Algorithm to work out the most efficient settings on welding systems and for the design of springs.

Bees know what they are doing!

The Algorithm was unveiled by PhD student Afshin Ghanbarzadeh and his team at the recent internet-based Innovative Production and Machines Conference hosted by MEC as part of its work with the EU-funded Network of Excellence in this field. The team's research was one of 110 papers presented to 4,000 delegates from 73 countries at the conference, which was held entirely on-line.

MEC director Professor D T Pham OBE said: "We had some highly imaginative ideas at the conference and this is one of the most innovative. This Algorithm can help business work out the most effective way to set up their machines, and save them a lot of money through running their processes as efficiently as possible."

So if you want to buck up your workers, commercial enquiries about the Algorithm can be addressed to Roy Fretwell or James Spenceley at the MEC on 02920 874641 or by e-mail at manufacturing@cf.ac.uk .

Perhaps I should forward this to No 10! Ed.

Another helpful honeybee inspired algorithm

Copying the foraging methods of honey bees could give robots better 3D vision, researchers say. Robot explorers could identify points of interest by mimicking the way bees alert others of promising foraging spots.
Explorer bees report the location of a new food source, like an inviting flowerbed, by dancing on a special area of honeycomb when they return to the hive (see How vibes from dancing honeybees create a buzz on the dance floor).
A new type of stereoscopic computer vision system takes inspiration from this trick. It was developed by two Mexican.

A computer can generate 3D information using two cameras by comparing the view captured from different angles. It is, however, computationally intensive to do this for large scenes. Complicated statistical techniques can be used to pick out important features of a scene for further analysis, but this is still time-consuming.

The system developed is far simpler, they claim. It uses virtual honeybees to home in on potential points of interest, which can then be rendered in 3D. Simulated "explorer" bees are programmed to seek out features of potential interest in a 2D picture, based on criteria such as texture and edges.

This can, for example, lead them to focus on a person or a prominent object in an otherwise empty room.

The honey bee software starts by randomly assigning explorer bees to different parts of an image. After identifying features of potential interest, these explorers recruit other virtual bees, known as "harvesters", to investigate in more detail. The explorers recruit harvesters in proportion to their interest in an area, meaning the most promising areas get the most attention.
If the harvesters also find the area interesting, they focus on it too. The system can then render it in 3D, based on all the bees' movements. This could eventually help a robot navigate or interact with its surrounding more efficiently.

"This algorithm can save time," Olague told New Scientist . "The harvesters are targeted by the explorers to look only at promising areas."
In testing, Olague and Puente used up to 8000 virtual explorer bees and 32,000 virtual harvesters. Before the end of 2006 they hope to use the honeybee vision system to help a mobile robot avoid obstacles.

Toby Breckon, a computer vision researcher at Cranfield University in the UK, says the approach has promise. "One of the big problems for stereo vision is that you have to search through the features in front of you," he says. "Bees have this almost built-in search algorithm that has the potential to help." Breckon adds that the number of virtual bees could be adjusted for different situations. "A robot could use a small number of bees if it just needed to know where the walls of a corridor are, and then put in more bees to collect more detailed information," he says.

The research was presented at the 8th European Workshop on Evolutionary Computation in Image Analysis and Signal Processing in Budapest, Hungary, in April 2006, where it won the award for best paper.

Carpenter Ants Store Food for times of dearth

Just as honey bees have evolved a method of storing food for periods of dearth, so certain species of ants have managed to do the same. Worker Ants Store Fat To Share with their fellows in times of dearth. In a fascinating new study from the September/October 2006 issue of Physiological and Biochemical Zoology, Daniel A. Hahn (University of Florida) explores the ability of ants to store excess fat and pass it to colony members through lipid-rich oral secretions or unfertilized eggs through lipid-rich oral secretions or unfertilized eggs.

The clever carpenter ant.

Understanding the regulation of nutrient reserves, particularly fat storage, at the individual and colony levels is critical to understanding both the division of labour characteristics of social insect colonies and the evolution of important colony life-history traits such as the timing of reproduction, founding mode, and over-wintering behaviour," explains Hahn.

In order to better understand how individual fat storage tactics translated into colony-level resources, Hahn captured queens of different species and reared colonies under controlled laboratory conditions in nests for two years, feeding the ants a combination of frozen cockroach and moth eggs, mixed with honey, vitamins, and salt. He then sampled five colonies each of the two different species, and found that, despite similar environments, darker workers and soldiers stored more fat per unit of lean mass than lighter ants did, but the lighter colony involved a greater proportion of soldiers in storage.

"Storing more fat per unit lean mass has been well documented as a tactic for increasing fat storage during ontogeny among colonies of a number of ant species, and now has been shown to contribute to between-species differences as well," Hahn writes. "Differences in individual-level storage tactics between the two desert species could lead to significant behavioural differences, perhaps in the rate that individuals progress through behavioural development, or in their motivation to forage or defend their nests."

Plants count the days to flowering. Literally!

We have all waited and waited and counted the days and waited more for spring to arrive and for our plants to flower. Well plants are doing just the same thing. They are literally counting the days new research shows. Research has begun to peel back some of the mystery of how plants pace the seasons to bloom at the optimal time of year. Richard Amasino, Howard Hughes Medical Institute Professor and UW-Madison professor of biochemistry tells us that, "Flowering at the right time is all about competition."

He and his colleagues have studied, in particular, the behaviours of biennial plants, which require long periods of exposure to the cold to initiate flowering in the spring. What they have found reveals some of the complex interplay of genes and environment and provides hints that, one day, it may be possible to exert precise control over flowering, a process essential for plant reproduction and fruiting and that has enormous implications for agriculture.

Flowers are the reproductive organs of plants and are responsible for forming seeds and fruit. As their name implies, biennials complete their life cycles in two years, germinating, growing and overwintering the first year. In the second year, the plants flower in the spring and die back in the autumn.

That biennial strategy, Amasino explains, arose as flowering plants, which first evolved some 100 million years ago during the age of the dinosaurs, spread to fill the niches of nature. Spring blooming confers numerous advantages, not the least of which is leafing out and flowering before the competition.

But how do the plants know when to flower? "If you carve out that niche, you need to get established in the autumn, but you need to make darn sure you don't flower in the autumn," Amasino says. In the case of biennials, "the plants can somehow measure how much cold they've been exposed to, and then they can flower rapidly in the spring niche."

Exposure to the cold triggers a process in plants known as vernalization, where the meristem - a region on the growing point of a plant where rapidly dividing cells differentiate into shoots, roots and flowers - is rendered competent to flower.
In a series of studies of Arabidopsis, a small mustard plant commonly used to study plant genetics, Amasino and his colleagues have found there are certain critical genes that repress flowering.

"The plants we've studied, primarily Arabidopsis, don't flower in the autumn season because they possess a gene that blocks flowering," Amasino explains. "The meristem is where the repressor (gene) is expressed and is where it is shut off."

The key to initiating flowering, according to the Wisconsin group's studies, is the ability of plants to switch those flower-blocking genes off, so that they can bloom and complete their pre-ordained life cycles. But how that gene was turned off was a mystery until Amasino and his group found that exposure to prolonged cold triggered a molecular process that effectively silenced the genes that repress flowering. Another processes known as bud dormancy, which is similar to vernalization, occurs in many plants that grow in temperate climates. "Bud dormancy is not broken until the plant has 'counted' a sufficient number of days of cold to ensure that anysubsequent warm weather actually indicates that spring has arrived," Amasino says. The Wisconsin team led by Amasino has worked out much of the process of vernalization, and their hope is to add to knowledge of other cold-regulated processes such as the regulation of bud dormancy in trees. Bud dormancy may be similar to vernalization or, the Wisconsin scientists adds, it may be controlled by a completely different mechanism.
"But our study of vernalization may help us get our foot in the door.It gives us a basis to test whether there are similarities."

Knowing the genes that control flowering and how they work provides a much more detailed working knowledge of plants, many that are useful to humans and some of great economic importance, Amasino explains. "This is important agriculturally," he notes. "There are many crops - cabbage, beets - that we don't want to flower. Many of the cultivated varieties we use are never exposed to cold in a typical farmer's field growing season."

When that is the case, a cold snap can fool sugar beets, for example, into flowering, a process that can ruin the crop by redirecting nutrients from the valuable root to the production of seeds and flowers. And although Amasino and his group have demystified some of the molecular underpinning of the familiar process of flowering, the biochemist emphasizes that much of the fine biochemical detail remains to be worked out.

Climate Change Threatens Pollination Timing

In addition to the more obvious effects of climate change, such as rising sea levels and increasing storm activity, there is the potential to dramatically alter ecological communities. Dr. David Inouye, director of University of Maryland's graduate program in Sustainable Development and Conservation Biology, reports that global warming could disrupt the timing of pollination in alpine environments, with serious negative impacts to both plants and pollinators.

University of Maryland's Dr. David Inouye presents three decades of data, much of it gathered with the patient help of Earthwatch volunteers, suggesting climate change impacts on pollination ecology in mountain environments.

At a session at this week's Ecological Society of America (ESA) meeting titled "Climate change and timing in ecological communities." Inouye presented more than three decades of data on pollination ecology in the Rocky Mountains, supported in part by Earthwatch Institute, The session drew attention to many climate-dependent changes in the timing of ecological events that will disrupt ecological communities.

Inouye, one of the pioneers in this area, said that high altitudes are one of the habitats where it seems that climate change is having dramatic effects and that the long-term research that carried out at the Rocky Mountain Biological Laboratory (RMBL) since 1973, has allowed him to document some of the changes going on in flowering. The timing of flowering has become earlier, particularly since 1998, the abundance of some flowers has changed, and the synchrony of plants and pollinators may be changing." Inouye reports that flowering time for plants in the Colorado Rocky Mountains is determined by when the snow melts, which is likely to change in response to regional and global climate change. There is some evidence that plants and pollinators are responding differently to climate change, potentially resulting in reduced reproductive success for both groups and possible extinctions.

Climate change seems to affect different species differently. Trees especially are slow to adapt.

The research was carried out with the indispensable assistance and hard leg work of Earthwatch volunteers who contributed the financial assistance and labour that made it possible to continue this long-term project. They helped to monitor flowering and the population biology of wildflowers, and also assisted many of the graduate students in their dissertation research."

The ESA session Inouye co-organized focused on the impact of global warming on "phenology," or the timing of climate-sensitive ecological events, including leaf-out, insect emergence, and bird feeding behavior. Scientists presented the latest evidence of ecological impacts of climate change as well as new techniques for monitoring these changes, such as remote sensing and networks of ground observers. They also reported predictions of how time-sensitive ecological relationships will change in response to global warming.

Earthwatch volunteers in the Rocky Mountains helped Inouye document that global warming affects lower altitudes differently than higher ones. As a result, animals exposed to earlier warm weather may exit hibernation earlier and birds responding to earlier spring weather in their wintering grounds may flock north while there are several feet of snow on the ground, risking starvation.

"Already the difference in timing between seasonal events at low and high altitudes has negatively influenced migratory pollinators, such as hummingbirds, which overwinter at lower altitudes and latitudes," said Inouye. He added that, "If climate change disturbs the timing between flowering and pollinators that overwinter in place, such as butterflies, bumblebees, flies, and even mosquitoes, the intimate relationships between plants and pollinators that have co-evolved over the past thousands of years will be irrevocably altered."

Scientists at the session reported that this kind of ecological disruption from climate change has become commonplace in ecosystems around the world. Only through long-term monitoring, such as that supported by Earthwatch, and advances in monitoring technology can these conservation managers be more proactive about these changes.

Earthwatch Institute is a global volunteer organization that supports scientific field research by offering members of the public unique opportunities to work alongside leading field scientists and researchers. Earthwatch's mission is to engage people worldwide in scientific field research and education to promote the understanding and action necessary for a sustainable environment. The year 2006 marks Earthwatch's 35th anniversary.

You can find out more about Earthwatch at www.earthwatch.org (Ed).

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Bees and Rotating Hives Part 4 of 5.

Ian Rumsey continues his look at bees and rotating hives in part 4 of the series and concludes that the bees in solving the puzzle set, are displaying original thought required for intelligent design. I must say that this series is for me one of the most interesting series of experiments on bees that I have seen. I hope that Ian continues with his research. Ed.

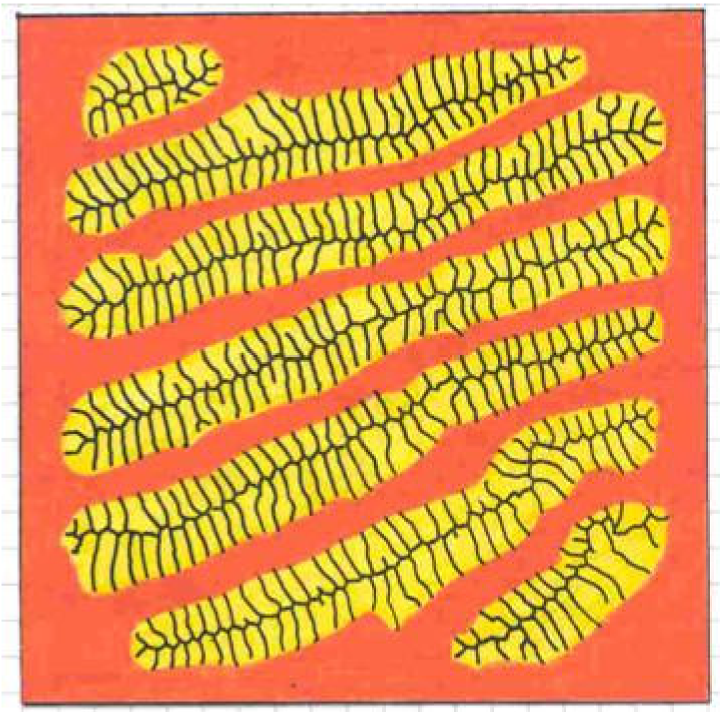
Not having observed at this time the results of rotating a hive by 10 degree increments on a daily basis in a clockwise direction, an identical experiment was commenced in hive 8-5 with an anti-clockwise rotation. This, one hoped, would depict a mirror image of the initial experiment showing the effect rotation has on comb construction.

We have already demonstrated the influence vertical magnetic fields have on comb alignment and the considerable distance over which this field may be able to operate.

It is therefore impracticable to conduct a rotating hive experiment and a vertical magnetic field experiment at the same time.
As another swarm was collected to commence a further series of vertical magnetic field experiments, this second rotational hive experiment was not abandoned but rather modified to now include the introduction of a vertical magnetic field at the end of day 2.

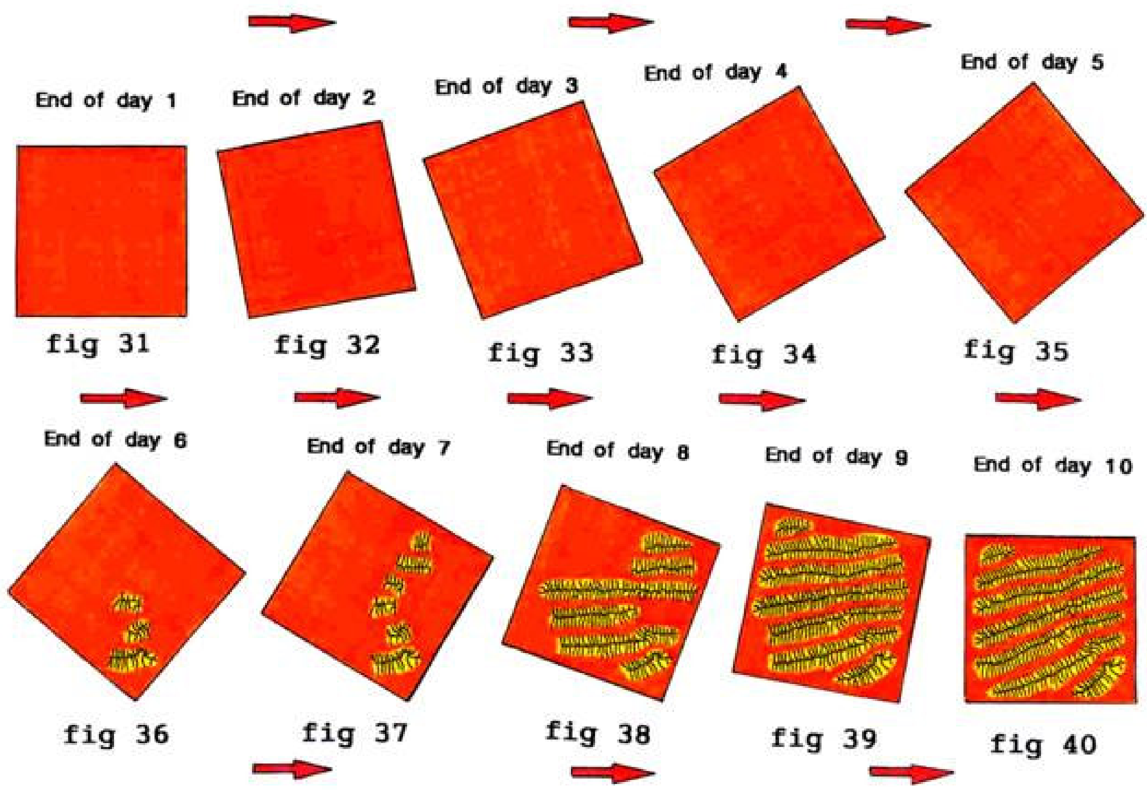
This would effectively turn the hive a further 70 degrees in an anti-clockwise direction if our results from the previous experiment were to be believed.

The resultant comb alignment after a 10 degree anti-clockwise movement at the end of nine consecutive days, plus the introduction of a vertical magnetic field at the end of day 2, is shown below.



Again a unique alignment has been produced and the construction over the nine day period has some striking similarities to its clockwise cousin, if one allows the gravitomagnetic field to be realigned 90 degrees instead of the 70 degrees by the introduction of the vertical magnetic field.

From the diagrams below, figs 31 - 40, it may be seen that if the gravitomagnet field, indicated by the arrows in red, run horizontally, a change in direction of 90 degrees, and if comb construction follows the lines of this force, there is a direct correlation between figs 21 - 30, and figs 31 – 40:



The bees are solving the same puzzle in a similar fashion in each case, namely days 1 - 5, solving the puzzle and days 6 - 10, building the comb.
Therefore it would seem that we have two colonies being set the same problem, taking the same time, coming to the same conclusion, under slightly different circumstances, never ever met before.

I believe this indicates that these bees have each had original thoughts: the ability of an intelligent life form, capable of intelligent design.

Ian Rumsey

Killer Bees!!

Many beekeepers in Europe who thankfully do not (yet) need to worry about Africanised bees have at one time or another wondered about the differences between their own comparatively docile European honey bees (except the ibericas, Ed). The information for this abridged article comes from Elizabeth Sears's site offers a quick compendium of information. http://www.earthlife.net/insects/afr-bees.html

Behaviour Characteristics of the Africanized Bees, Apis mellifera scutellata … Africanised? Or just bad tempered?

Tropical vs Temperate

Tropical Africanized honey bees vs. temperate European honey bees: some individual characteristics European honey bees are temperate bees while Africanized honey bees are tropical bees and their behaviours differ in several ways. European honey bees are adapted to withstand cold winters and periods of no foraging. They do this by storing honey to use to as food to generate heat throughout winters. During this time hive activity slows and there is no brood rearing and no foraging. The thrust of European honey bees is to produce and store honey for these times. They build colonies in large nests inside of cavities to provide winter protection. These nests are rarely abandoned. In contrast, Africanized honey bees are tropical bees which have no need of winter honey storage. Their main energies go into honey production for reproduction. Their nests are smaller and often external to cavities. They can easily survive outside of their nests, and frequently hang on the outsides of the nests. When Africanized honey bees developed in African Savannahs, they were constantly faced with the threat of destruction from predators. By selection, they succeeded in developing ways to survive these threats, both as individuals and as colonies. They have evolved three traits, in particular which have done much to further their survival First, many of the returning foragers approach the hive and fly through the entrance at a high rate of speed. Entrances are very critical areas which render foragers quite vulnerable. By crossing this area quickly, they lessen the threat of being intercepted.

Second, Africanized workers, while foraging, move in quick, furtive patterns, rather than the more steady, systematic movements of European bees. Their course is composed of quick darting movements which resemble those of yellow jackets, more than European honey bees. This pattern of movements makes their courses much less predictable and the chances of their being intercepted in flight become less.

The third evolutionary advantage is the individual trait of immediately charging at a source of disturbance or threat. European honey bees, in contrast, will tend to cluster together and remain in the nest more than actively retaliate. This makes them easy targets for hungry predators. Not so Africanized bees. They immediately take flight and fly at the threat. Even queens involved in egg-laying are able to take flight. Workers gather around queens in swarms, and either attempt to repel the intruder or opt to leave the hive and abscond to a new nest site. Small nests are more easily defended from predators, and in the event of nest invasion, not so much is lost by a small colony which can leave the site and start a new nest somewhere else.

Africanized honey bees reproduce frequently and rapidly. Eggs hatch into larvae in three days in contrast to European honey bees which can take over a week to hatch. Larvae increase tremendously in size (900 times the weight of the egg in only four to five days), fuelled by copious quantities of nectar and pollen supplied by adult workers Crucially, queens emerge earlier than European queens. Mature Africanized honey bees are 10% smaller than their European counterparts

Africanized honey bees have become legendary for their aggressive, stinging, nest defence behaviour which has won them the media title of "Killer Bees".

A study in Venezuela by the Entomology Department of Louisiana State University and the U.S.D.A showed several distinct defence behaviours and reactions in response to a disturbance of the colony. Enormously sensitive to the slightest disturbance, especially a jolt, an alarm was spread throughout the colony by a worker who immediately ran into the nest to recruit others by opening her sting chamber and extending her sting. This released alarm chemicals which communicated the alert to other bees, particularly guard bees, who, in turn, spread the alarm to others and throughout the hive. Africanized bees have 5 times the number of guards in their nests as European honey bees. Approximately three times as many Africanized honey bees responded to the alarm chemicals as with European bees. The result was the colony suddenly erupting, with angry bees pouring out to defend the nest and attacking anything that moved near it. The object of the disturbance was stung with a frequency eight to ten times more than European honey bees.

Excessive swarming.

Africanized honey bees swarm at a rate far greater than European honey bees. Unlike the European bees who construct large nests for winter protection and storage of food resources, seldom abandoning them, Africanized honey bees, not needing winter storage, construct smaller nests. Most of their resources go toward reproduction and the rearing of young. Africanized bees are smaller than European honey bees and swarm at a younger age. 100% of bees as young as eight days old will swarm in Africanized colonies, as contrasted to only 70% swarming of bees at the same age in European Colonies. Their numbers increase very rapidly and they soon outgrow the small nests. They typically produce six to twelve swarms per year. The record number of swarms in one year for European bees during one particularly favourable growing season was 3.6 swarms with an average of 1.0 to 2.6 swarms annually. One starting colony in French Guiana reportedly produced 60 new colonies (including offspring colonies) in one year. The annual growth rate of Africanized colonies is 16-fold per year compared with 3-fold for European honey bees. Excessive swarming creates serious problems for bee keepers who are left with smaller, weaker colonies which do not collect as much honey. This is the single most undesirable trait resulting from the takeover and Africanization for bee keepers of managed European honey bee colonies, although resource consumption by Africanized honey bees for production of bees rather than stockpiles of honey is also a problem.

Absconding.

Absconding differs from swarming in that colonies which abscond, do not leave behind a young queen, resources or workers. The absconding colonies take everything with them and simply leave to establish new nests elsewhere. Primarily a tactic of tropical races absconding has two forms, disturbance-induced and resource-induced. Africanized honey bee colonies are very sensitive to disturbances and absconding is an immediate response to a sudden deterioration within the nest cavity. Colonies will leave within a day to a week following the disturbance. The disturbance can be brought about by predation, fire, pest invasion or overheating. The most susceptible time for absconding occurs as colonies establish recent nests. As colonies establish brood nests, the chances of distrubance-induced absconding is greatly reduced. It is believed that absconding due to resource shortages takes place on a seasonal basis during distinct times of the year primarily when pollen and nectar flows stop or are greatly reduced. Factors influencing seasonal absconding are often unclear, however.

Foraging behaviour.

Africanized honey bees are opportunistic foragers, in contrast to European honey bees, who participate in more group-type foraging with waggle dancers communicating locations of pollen and nectar sources. Although they too receive messages about the location of desirable foraging sites, Africanized bees are more solitary foragers. They start foraging earlier in the day than European bees, and will sometimes forage late into the evening. One researcher noted an instance in which a worker was seen to return to the hive at 3:30 A.M. by the light of a moon that was less than half full. Africanized bees will be found foraging on cloudy, overcast days, in the cold and even with light rain falling. In conditions of plentiful nectar and pollen supplies, European honey bees with their group foraging techniques are better adapted. Africanized bees are more solitary foragers, however, and excel, when pollen and nectar are scarce and conditions adverse.

Below, we show a summary chart of the main differences between the European and the Africanised honey bee.

Characteristics of the Africanized honey bee compared with the European honey bee	
AFRICAN HONEY BEE (AHB)	**EUROPEAN HONEY BEE (EHB)**
Defensiveness Typically 10 x more stings then EHB Quicker response time Persistent (following upto1/4 mile) May not respond to smoke	Usually gentle Defensiveness is manageable with smoke
Swarming 16 times per year Longer swarming season	1 to 2 times per year Distinct swarming season
Absconding Common after disturbance and period of dearth/poor resources Up to 16 times a year	Unusual (and not conductive to survival)
Robbing Can be excessive at times	Usually only occurs during dearth and is beekeeper caused
Nest site Smaller cavity acceptable allowing for easier establishment in urban environment	Require relatively large nesting cavity (> 40 L)
Wintering ability Poorly adapted to cold winters (but becomes adapted with time)	Highly adapted to cold winter
Population density High colony density	Low colony density
Colony takeover	

Queen usurpation common Drone parasitism of European colonies common	Exceedingly rare
Calmness on the comb Bees extremely nervous running and festooning on frames making management difficult	Usually calm on the comb

RECIPIE OF THE MONTH Back to top

Lavender or Rosemary Pears with White Wine

I read of this recipe in the Times last July but had come across a very similar version in the South of Spain where the chef used a vino del Condado, a Huelva wine. Outside of Huelva I don't think you would find it so I advise the use of a Riesling or other slightly sweeter wine. I tried it and it worked. My advice is to use a strong honey and you can substitute rosemary for the lavender. For each person use 1 pear. So for a party of 6 you will need:

½ Cup Lavender flower heads or less of rosemary flowers
About 600ml of white wine
1tbsp runny honey
1 unwaxed lemon
6 even-sized firm but ripe pears
Thick cream to serve

METHOD

Place the lavender or rosemary flower heads and a small amount of stalk in a pan that can hold the pears comfortably in one layer.
Add the wine and honey.
Take zest from the lemon. Add to the pan. Place it over a medium-low heat and gently bring to the boil stirring until the honey melts.
Carefully peel the pears, removing all the skin, leaving the stalk intact.
Remove the core with a knife.
Place the pears in the pan and cover and cook for about 20 minutes, turning the pears once halfway through cooking.
Remove the pears to a serving dish, standing them up and leave to cool.
Remove the lavender and lemon zest from the pan and cook the liquid at a steady simmer until reduced to a quarter of the original quantity.
It will turn to a syrup like consistency.
Pour the liquid over the pears and serve with cream. The pears should still be hot/warm and the cream cold.

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The humming of insects

Most of us are well aware that in one way or another, bees can make sounds and the 'hum' of the honey bee is no longer thought of as song. But in days gone by, there were other explanations. For Sir John Browne in the early 1800s, the matter was an insolvable mystery. He quotes Aristotle, but doesn't quite believe him.

'That Flies, Bees etc doe make that noise or humming sound by their mouth, or, as many believe, with their wings only, would be more warily asserted, if we consulted the determination of Aristotle, who, as in sundry other places, so more expressly in his book of Respiration, affirmeth this sound to be made by the allision of an inward spirit upon a pellicle or little membrane about the precinct or pectoral division of their body.

Sir John is sceptical though and asks how we can believe this to be the only way that a bee can make a humming sound when they can still hum if their wings are cut off and even at times when the head 'of big and lively ones' is removed! Sir John concludes as follows:

'The humming of insects seems still involved in mystery, nor do I clearly see what experiments can be made to clear it up'.

POEM OF THE MONTH Back to top

This month we feature another poem from my favourite poet, the American Emily Dickinson (1830-1886), who in her strange reclusive life wrote so much of nature and beauty. As is often the case with so many artists of genius, very little if any fame was hers in her lifetime. I am still never sure if Americans themselves realise what a treasure they have in her poetry.

Fame is a bee.
It has a song—
It has a sting—
Ah, too, it has a wing.

READERS' LETTERS Back to top

So who said this and why?...

Wherever the bees advanced, the Indians and buffalos retreated.

Dear David,

Sounds like Mark Twain

Regards, John Burgess, Welsh Beekeepers Assn.

FREE SWARM COLLECTION SERVICE

Are you available to collect swarms out of the York area? I am trying to collate a swarm collection service please telephone me on York 01904 438929, your name and phone number will be on my list and not available to public viewing, the public or council call me I then inform you of the offending swarm you decide if you are available or not.

This service is free no charge to be made ALSO YOU WILL NOT BE PAID FOR ANY COLLECTION BY THE PROPERTY OWNER its a free service, you must in your favour inform the public that damage may occur while taking a swarm.
I look forward to hearing from you.
Thanks

David

DATES FOR YOUR DIARY Back to top

Saturday 3rd March 2007 - West Sussex Beekeepers Association
BeekeepingConvention. Venue: Lodge Hill Conference Centre, Watersfield, Pulborough, West Sussex. Main Speakers, Rev Stephen Palmer, Michael Badger and Richard Ball plus a choice of attending four from a total of ten workshops. Further details from John Hunt on 01903 815655 or email john_bateman_hunt@hotmail.com

Tuesday 24th, Wednesday 25th and Thursday 26th July 2007 New Forest & Hampshire County Show

The New Forest & Hampshire County Show is the highlight of Hampshire's social calendar featuring all the attractions that have made it so popular for the best part of a century, bringing traditional country pursuits, new exhibitions and demonstrations to this unique event. Put the dates in your diary now.

There is a full range of horse and livestock competitions plus a rabbit section, cage birds, and honey bees. The Countryside area features woodland activities and demonstrations of rural sports, plus terrier and ferret racing. Other favourites include the horticultural marquee featuring many nationally acclaimed flower entries, and the Southern National Vegetable Association Championships.

With over 600 trade stands there is a wide choice of stalls to visit many offering goods never to be found in the shops, including antiques, crafts, and the best of Hampshire food and produce.

We also have the Forest Fun Factory arena, a haven for children with all day entertainment. These are just a few of the many attractions you will find at this year's show – you will be spoilt for choice.

A pay as you go shuttle bus service runs from Brockenhurst mainline station right into the showground, so let the train take the strain.

Discounted tickets available on line at www.newforestshow.co.uk or on the credit card hotline 01590 622409 from June 1st 2007

Additional information

Show opens 08.15 to 1800
Web site full of information – www.newforestshow.co.uk
Full Title is New Forest & Hampshire County Show

Please do not hesitate to contact me if you would like more information – on 02380 292887 or 07767 252531

Regards

Jackie Neylon
Press Officer
New Forest & Hampshire County Show

QUOTE OF THE MONTH Back to top

Last month's quote about the advance of bees in the USA as the white man advanced west came from the father of American literature, the brilliant **Washington Irving.** Probably his most well known writing was the popular novel Rip Van Winkel but of course his works spanned a far greater field than just popular novels, perhaps my favourite being 'The Alhambra'.

This month we feature a quote from another well know literary figure. Who said this;

'The busy bee has no time for sorrow.'