

# BBKA News

The newsletter of The British Beekeepers' Association,  
incorporating the **BRITISH BEE JOURNAL**



No: 207 – November 2012  
ISSN: 2051-0624



## Healthy Bees make a Productive Orchard



### Honey Bee Nutrition

Gut flora play a special role in bees' ability to store pollen. Learn more about the functions of gut flora on page 5.



### Skep Beekeeping

Take a closer look at one of the earliest ways of managing bee colonies in a new mini-series starting on page 11.



### Foundationless Frames for the Future?

Find out how bees can be kept on a new design of frame without foundation on page 22.





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# Chairman's Letter



In my last Chairman's letter I mentioned the strong demand for UK honey. Although honey yields vary around the country and from beekeeper to beekeeper the weather this year has meant many beekeepers have not harvested sufficient honey to meet all the needs of their friends, family and other regular customers. Please do not be tempted to buy bulk quantities of foreign honey, jar it and

attempt to sell it as if your own bees had collected it. All honey sold needs to be labelled with the country of origin, and selling foreign honey labelled as 'Produce of UK' is illegal. Continuing with the theme of honey there have been some developments concerning the proposed changes to the Honey Directive. It proposes that pollen should be defined as a natural constituent of honey and not as an ingredient. This will help clarify the situation regarding pollen from GM plants in honey which arose from a European Court of Justice ruling.

The use of pesticides in our society continues to raise concerns about their potential impact on honey bees and other pollinating insects. Such pesticides are not used only by the agricultural and horticultural industries but also by gardeners, local authorities and other land managers. Before these products can be placed on the market a series of risk assessments must be carried out and honey bees are an important consideration in these. The BBKA will continue its efforts to ensure that risk assessments carried out on products before they receive authorisation to be placed on the market are thorough and appropriate. It is now appreciated that risk assessments need to be modified for substances intended to act systemically. New guidance on this is out for consultation and the BBKA will be responding to this. Robust authorisation processes, product stewardship by the suppliers and users of pesticides and adherence to the conditions of approval are all part of minimising the risk to non-target organisms, such as honey bees. As well as such reassurances we need as beekeepers to have a dialogue with all parties to ensure the interests of honey bees and beekeepers are made known.

The first European Beekeeping Congress, held in Agen in early October, had as one of its prime objectives to begin a closer dialogue between beekeepers and farmers. The BBKA participated in this dialogue at the congress, and our contacts with the National Farmers' Union, representatives of the spray contractors and Crop Protection Association mean that we keep the profile of the honey bee high in the minds of the pesticide industry and all users of pesticides.

November is a time to think about Christmas presents so why not give an Adopt a Hive subscription or pay a visit to the BBKA webshop for Christmas gift ideas.

David Aston, BBKA Chairman

**Cover photos:** Main image: Peter Barnfield; Top right: Dr Deborah Delaney; Middle: Chris Park; Bottom: James Slade.

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### PRINT AND DISTRIBUTION

BBKA News incorporating the British Bee Journal is published monthly for its members by BBKA, Reg. Charity No. 212025.

Copyright 2012 BBKA;

ISSN: 2051-0624

**Printed by:** Avenue Print Management, 1 Blighs Road, Sevenoaks, Kent TN13 1DA. Tel: 01732 742397

**Distributed by:** First Move

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# In the Apiary

The nights are long and the days are cold. November is usually the time when colonies of bees can be left alone assuming that there is enough food stored away and the hive is well protected. The first blasts of winter are upon us and the role of the colony changes from producing new young bees to preserving resources. In most places there is very little forage to be gathered by the bees and any hapless bee leaving the nest runs the risk of getting chilled and not being able to fly back to the nest.

Bees do not hibernate, but keep warm by clustering together on the comb and vibrating their indirect muscles in the thorax to generate heat. Clustering on the comb is an efficient way of remaining warm as the surface area of the cluster can be minimised to reduce heat loss and each bee can move from the outside of the cluster where it is coldest to the centre where the bees do not need to work so hard to keep warm. In this way the work is shared and all the bees can keep warm. While there is brood in the nest the workers need to keep the brood temperature at 33°C which

means that the bees need to work hard and cannot necessarily cluster efficiently. There are significant advantages to the colony when the queen stops producing eggs. Firstly, the cluster can be a shape that reduces heat loss and secondly the core temperature of the cluster can drop to about 20°C so making heat loss far lower.

The other factor that affects the bees when clustering is the how much they are disturbed. If a woodpecker comes long and starts hammering on the outside or a keen beekeeper decides to look inside the colony the bees get disturbed and will break the cluster, and the warmth in the cluster will disperse. Similarly, if the days are warm and the nights cold the bees will break the cluster during the day and reform at night. The energy (honey) and effort used by these changes of status can be quite large.

There are various papers on the amount of honey used by a colony in winter under different conditions; as usual they all vary but the general pattern is the same. Here are some averaged figures:

| Colony condition              | Honey consumed per week |
|-------------------------------|-------------------------|
| No brood and no disturbance   | <300 g                  |
| No brood but colony disturbed | ~700g                   |
| Brood and no disturbance      | ~1 kg                   |
| Brood and colony disturbed    | ~1.5 kg                 |

This partially explains why bee colonies seem to fare far better when we have very cold snaps in winter. In effect the bees hunker down and the colony just ticks over until the weather improves. From a bee colony's point of view it is waiting for the end of winter, and winter finishes when there is forage available that is accessible to the bees. 'Winter' is not over until the day temperature is warm

enough for the bees to fly and there are flowers about that are producing nectar and pollen. During the bees' winter the objective of the colony is to use as little stores as possible and survive.

In the 1960s work was done to find the optimal size of a colony in winter. It was done using Smith hives (similar frame size to a National, but with shorter lugs). The outcome was that colonies larger than about 15,000 bees used far more energy than

colonies of about 10,000 bees. Also if the colony was too small it would use more energy and was less likely to survive. Later work has shown that the optimum colony size really relates to the size of the hive. Many of us have found that it is quite possible to overwinter a small colony in a nucleus hive and larger colonies fare well on Commercial, Langstroth and Deep National hives. I now feel convinced that it is the relative dimensions of the hive to the number of bees that matter. This makes some logic, for if you have a small colony in a large hive the heat

generated in the cluster will rise out of the cluster and, by convection, be cooled in the vacant spaces. It is a bit like having a small electric fire in a large church compared with the same fire in a small office. The office feels much more comfortable.

So what has all this to do with us, the beekeepers? When managing your hives over winter ensure that there are plenty of stores to last and for normal sized colonies it is suggested that 20kg of stores is adequate to see the colony through difficult winters (perfect conditions would require far less stores, but none of us could predict the weather for

the next three or four months!). It is also important to minimise any disturbance to the colony over their winter. Keep badgers, woodpeckers and inquisitive beekeepers away from the hive. And finally let us hope we have winters that are short but cold and crisp. It seems our bees are well adapted to these conditions and my experience suggests that the varroa count seems lower after a really cold winter.



Ivy — a good source of late nectar and pollen. Photo by Dr Bee.



Overwintered Nucleus. Photo by Gerry Collins.

Dr Bee

# On the Topic of Honey Bee Nutrition: Part 2

*The importance of adequate nutrition for optimal honey bee health was emphasised last month by Dr Deborah Delaney in her article describing the nutrient groups of importance for bees and their floral sources. In her second article on honey bee nutrition Dr Delaney highlights the microorganisms that live alongside honey bees and have beneficial effects on their ability to assimilate and process nutrients. She also draws our attention to the potential adverse effects of commonly detected chemicals found in our modern foraging environment on bee health, and therefore, on agricultural pollination.*

The accessibility of managed honey bee pollinators and the background pollination by feral colonies has declined over the past ten years due largely to *Varroa destructor* and to other, unknown, causes. The lack of managed colonies for pollination has been a topic of discussion among researchers for some time and this has now reached the public domain.<sup>1</sup> Honey bee loss, approaching 33% of overwintered colonies, has alarmed many individuals and losses in excess of 15% are considered to be above normal loss levels.<sup>2,3</sup> Without intervention honey bee losses may become severe enough to adversely impact the pollination services they provide.

Honey bees are the most widely used pollinator in agriculture. The ease with which large numbers of honey bees can be moved to crops makes them highly desirable pollinators, and therefore their pollination services are a key sector of the beekeeping industry in the USA, where the annual direct value of bees for pollination is estimated to be \$14.6 billion.<sup>4</sup> Honey bees are essential for the pollination of more than ninety fruits and vegetables. However, they are not transferring pollen from flower to flower simply to help with our food supply; instead they gather pollen to make special protein-rich food to feed their developing young or brood.

## Healthy honey bee babies and colonies

A healthy honey bee colony will begin to expand in early spring, when a feedback loop occurs; the foraging bees bring in nectar and pollen, which are cues for the queen to start laying eggs. The eggs develop into larvae and they require carbohydrates in the form of bee milk (a mixture of honey and glandular secretions) and bee bread which serves as the main protein source for developing bee larvae. Bee milk or worker jelly is a mixture of hypopharyngeal secretions. These are clear but contain mostly protein and mandibular gland secretions, which are white and high in lipids. Just as in adult honey bee foragers who prefer nectars with a higher sugar concentration, a higher sugar content in larval food directly correlates with a faster or higher consumption rate. It has been shown that larvae chosen to become queens are fed diets with a higher sugar concentration, which causes their consumption rate

to increase. This higher consumption rate has been implicated as the trigger for hormone release that causes the physiological switch from worker to queen development.

## Symbiotic relationships: mutualisms

We now know that it is in the gut where many health problems begin, humans being no exception. In a healthy human the intestinal tract can be lined with up to 100 trillion bacteria, that is about three pounds in weight! Of these trillions of bacteria there are pathogenic bacteria and beneficial bacteria, and a precious balance of the two is essential to the proper functioning of an organism. Beneficial bacteria function in nutrient absorption, protection, metabolic breakdown and weight reduction. A study published in *The Proceedings of the National Academy of Sciences* in 2011 found that feeding probiotics resulted in reduced stress and depression.<sup>5</sup>

The insect world is also teeming with examples of mutualisms in the form of gut symbionts.<sup>6-9</sup> These internal gut symbionts or microorganisms are provided with nutrients and protective shelter and they, in turn, give the insects usable, absorbable food and resources. An example of this type of obligatory mutualism can be seen in termites. Some species of termite contain protozoans in their hind-gut. These protozoans provide the necessary enzymes required

to break down the wood ingested by the termites and in turn they provide the protozoan with shelter. Neither can live without the other. Another example of gut symbionts can be seen in insects that have diets high in sugars such as phloem-feeding and xylem-feeding insects (aphids, scales and leafhoppers). In their gut are different types of yeasts and bacteria that thrive off of the sugary plant juices and provide the insect with the necessary proteins and vitamins their sugary diets lack. Once again many of these mutualisms are obligatory, meaning that neither the insect nor the microbe could survive without the other. This point is supported by the fact that many insects, after the moulting process, must feed on the faeces of another insect to re-inoculate themselves with the necessary microflora.



*In the Spring forager bees bring in nectar and pollen and set up a positive feedback loop encouraging the queen to lay eggs thus building up the brood. All photos by Dr Deborah Delaney.*

## Mutualisms in honey bee guts

Honey bees, like all living systems, require natural symbiotic microorganisms in order to maintain proper health. It is known that wide arrays of microorganisms are associated with adult honey bees and their food, and that a balance of beneficial microbes is vital in maintaining an organism's health.<sup>10,11</sup>

An organism's natural microbial flora performs many functions, such as nutrient provision and fighting off invading pathogens through production of inhibitory compounds or by simply occupying the space that would be needed by the pathogens. Specifically in honey bees, these natural flora are responsible for fermenting stored pollen into usable 'bee bread' and they may have other, as yet unrecognised, functions. The conversion of pollen to bee bread has been found to occur via fermentation where yeasts are thought to play the most important part from a nutritional standpoint.<sup>12</sup> Yeasts in particular have been shown to provide essential biochemical contributions that help to facilitate nutrient uptake in many insects. Microbes isolated from bee bread are metabolically active, involved in the production of lipids, enzymes, vitamins, and antimicrobial substances. Previous work



*Worker bees keep cells clean and ready for storing nectar and pollen brought in by the foragers. Pollen is fermented by the bees' natural gut flora, particularly yeasts, into the stored protein source known as 'bee bread'.*

isolated between three and twelve different kinds of yeast from pollen collected off the flower to stored bee bread, respectively.<sup>12-15</sup> Of the yeasts that have been isolated from bee bread 80% were found to ferment glucose and sucrose, the main sugars found in bee food and used by immature and adult bees.

## Pollen versus bee bread

Bee bread is actually fermented pollen. Bee bread contains more reducing sugars, vitamin K, lactic acid and unique enzymes than pollen. Little is known about this fermentation process and the microbes involved in making high quality bee bread. However, lactic acid fermentation by bacteria and yeasts was discovered to be involved in this conversion by Chevtchik in 1950.<sup>16</sup> During the course of Chevtchik's studies looking

at the changes occurring from fresh pollen to fermented pollen, he isolated 77 groups of yeasts.

Other work spanning from the 1950s to the 1990s also support conclusions that bacteria and yeasts are the primary microbes involved in the conversion of raw pollen to usable bee bread.<sup>12-15, 17</sup> Three important genera were also identified in the fermentation process: *Lactobacillus*, responsible for the lactic acid fermentation and stability of the nutrients; *Pseudomonas*, for the creation of an anaerobic environment and the degradation of pollen walls, and *Saccharomyces* and yeasts, which were found to increase during and after fermentation.

*“ We now believe that many health problems begin in the gut, humans being no exception. In a healthy human the intestinal tract can be lined with up to 100 trillion bacteria of which some are pathogenic and others are beneficial in terms of nutrient absorption and metabolic breakdown. A delicate balance between pathogenic and beneficial bacteria is essential to the proper functioning of an organism. ”*

Many types of yeast have been isolated from pollen and bee bread and have been cultured and identified, such as: *Cryptococcus albidus*, *Kloeckera apiculata*, *Candida guilliermondii*, *Torulopsis magnoliae* from pollen and *Candida parapsilopsis*, *Candida reukaufii*, *Candida tenuis* *Cryptococcus neoformans*, *Debarymyces disporus*, *Hansenula anomala*, *Saccharomyces heterogenicus*, *Torulopsis globosa* from bee bread. A study by Gilliam (1997) found that eggs, pupae and emerging worker bees are usually free of microbes and acquire microflora from trophallaxis and pollen consumption.<sup>12</sup> Yeasts are thought to be an essential source of proteins, lipids and necessary growth factors, and they specifically form vitamins, mainly B vitamins in bee bread.<sup>18</sup> A study by Pain and Maugenet in 1966<sup>19</sup> discovered that beneficial bacteria found in bee bread lasted six times longer in the presence of yeasts. This lends support to the idea that different types of yeast provide necessary growth factors to beneficial bacteria.

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## Miticides and agrochemicals associated with hive matrices

In a study conducted in 2010 by Mullin and co-workers 121 different pesticides and metabolites were detected within hive matrices.<sup>20</sup> The authors found that 60% of the wax and pollen samples contained systemic pesticide residues and close to 50% had fluvalinate, coumaphos (in hive miticides) and chlorothalonil. Chlorothalonil is a broad-spectrum, commonly used fungicide. It is known to promote oxygen stress and is highly toxic to aquatic organisms at parts per billion (ppb) levels. Not surprisingly, this same study found the pesticide most prevalent in bee pollen was chlorothalonil at levels up to 99 ppb. This fungicide has been linked to entombing behavior, which occurs in stressed, dwindling colonies. Entombed pollen can be differentiated from regular stored pollen and bee bread by the appearance of a thin wax layer over the cell where the pollen is stored. This odd appearance and the avoidance by nurse bees who use bee bread to feed the developing larvae has caused researchers to speculate that this entombing behavior is a defensive strategy that keeps toxic food stores marked and isolated from usable food stores.<sup>21</sup>



*Pesticides have been detected in bee bread, and cells containing chlorothalonil have been found to be covered by a thin wax layer. This is known as entombing and may be a way in which bees ensure toxic food stores are marked and isolated.*

The next obvious question for researchers to tackle is the effect that these chemicals found inside the hive are having on the microbial community associated with the honey bee gut and fermented food stores. Agricultural chemicals, many of which are lipophilic, can find their way into apicultural matrices via workers foraging for nectar, pollen and water either through direct contact of the bee with the compound (a topical application) or through systemic delivery (seed coatings).<sup>22,23</sup> The beeswax and propolis that come into contact with these lipophilic compounds retain residues of them, which is significant since beeswax is the architectural structure that holds developing honey bees from the egg to the pupal stage as well as the food stores for the whole colony. Many of these lipophilic compounds can build up in the wax leading to continuous exposure and possible chronic sub-lethal doses to the members of a colony.

*“ A variety of yeasts have been isolated from pollen and bee bread. Yeasts are thought to be an essential source of proteins, lipids and vitamins. Research suggests that they may also play an important role in providing certain necessary growth factors for beneficial bacteria. Lipid soluble agricultural chemicals are known to accumulate in beeswax and propolis and future studies aimed at ascertaining their effect on yeasts and beneficial bacteria are clearly warranted. ”*

## Synergisms

The definition of the word synergism is ‘the interaction of two or more agents or forces so that their combined effect is greater than the sum of their individual effects’ (Free Online Dictionary). Of the chemicals found in honey bee colonies, in-hive miticides are found in the highest quantities due to their lipophilic nature. Many papers have reported synergisms between the various agricultural pesticides, meaning that when found together the toxicity of some agricultural pesticides can be increased or enhanced, and in certain

circumstances chemicals that pose no problem when applied alone can become toxic in the presence of another compound.<sup>24–27</sup> Research by Johnson and colleagues, published in 2010, identified three main pesticides that were commonly found together in apicultural matrices: coumaphos, fluvalinate (in-hive miticides) and chlorothalonil (broad spectrum fungicide).<sup>26</sup> Together these three chemicals have been shown to synergize and become more toxic to exposed honey bees. This is due to the inability of the bees’ detoxification mechanisms to simultaneously breakdown all three compounds. The additive and synergistic effects of exposure to multiple pesticides have been linked to declining honey bee health.<sup>26</sup>

## Current and future questions

Many questions still need intensive research to provide answers. For example: what functions are yeasts playing in the fermentation process? What is the role of yeasts in the honey bee gut? Is exposure to pesticides affecting the microbial community, and if so, affecting honey bee health and nutrition?

The take home message is: we do not know enough about how bees get the nutrition they require. However, as beekeepers we can make sure our bees have enough food and access to food

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sources that have nutritious pollen and nectars with high sugar contents. Solely feeding bees artificial syrup is not practical economically and these artificial sweets do not contain the diverse nutrients and microbes present in flower-made products. As we are stewards of the bees it is our job to make nutritious forage available to them.

**Dr Deborah Delaney,**  
University of Delaware, Newark, DE

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ISBN: 978-0-9566877-0-8

# Plants for the Beekeeper's Garden

I am often asked by beekeepers what plants I could recommend for them to help their bees in their own gardens, with many being surprised by the answer I give them. Being a professional gardener for twenty years during which time I started beekeeping, I have worked in gardens with and without bees. This has allowed me to notice the difference in the foraging patterns of bees in the two situations.

What I have observed is that when forage is in short supply, in September to early April in my area, bees will work a number of plants near to the hives. In good weather and times of plenty, normally in April to August, my bees ignore everything within a radius of 100–150ft of the hive. This seems to be no matter how good the pollen or nectar is or how much is grown. This strange fact is well known to beekeepers who use their bees to pollinate crops. To pollinate a whole field evenly the bees have to be placed on both sides of the crop, resulting in the bees on one side pollinating the crop close to the hives on the other side of the field. I was even taught this at Writtle Agricultural College, when I studied a HND in Commercial Horticulture back in 1987, though it was in relation to commercial-scale fruit orchards.

So the real answer to the question is that in our own small gardens we need to plant pollen-rich plants that the bees will work during the September to early April season (bees will forage at temperatures of 6°C and above) and forget about trying to supply your bees' needs during the summer, unless you are fortunate to have a garden that is several acres in size and can put down an acre or two to give your bees and other people a treat.

Not all good bee-forage plants make good garden-worthy plants. In many bee books, willow is listed as a good early source, which it is. But it does not make a good garden plant, as it requires lots of water, a good deal of space, has brittle wood which is liable to damage and can suffer from dieback. Its other drawback is that each individual tree only has a short period when pollen and nectar are available.

The plants that I have chosen are all good bee plants and good garden plants providing a long season of interest in the garden and supplying pollen and some nectar over a long period as well.

In drier parts of the UK, a large leaf evergreen shrub called *Eriobotrya japonica* (loquat) will tempt bees away from the ivy with its highly fragrant cream flowers during October and November. The problem is that after a summer like 2012 it just will not flower as it requires a dry, sunny summer to set flower buds. A reliable small hardy tree

leaves most years, like a lot of cherries.

*Mahonia* are evergreen, prickly leaved shrubs, the earliest coming into bloom in my area in September. All types are good for bees with variations in flowering times with some not starting until January. The only one I would not recommend is *M. aquifolium* as it is a suckering sub-shrub which is the last to flower with a short flowering period in April.

There are two winter flowering shrubby honeysuckles (*Lonicera fragrantissima* and *Lonicera x purpusii*) both are excellent and are my favourite winter bee plants. The first flowers start in November, with a good show by Christmas most years, building to a peak in March. The

flowers are highly scented with pollen readily available and irresistible to our bees. They have a long season of interest and are easy to grow and propagate.

Many species of *Viburnum* flower in winter but not all are worked by our bees as the flower tubes are usually too long and the pollen out of reach. *Viburnum Tinus* is the exception with honey scented flowers from August through to April. It does however tend to produce an unpleasant smell from its leaves in summer.

Rosemary is a classic kitchen herb with many different forms. The prostrate forms usually come into flower first (sometimes in the autumn) usually by January and continuing into April. The flowers are highly charged with nectar and some pollen is collected as well.

Winter flowering heathers are tolerant of alkaline soils and some have coloured new growths to extend the interest in the garden. In mild areas the scented European tree heather, *Erica lusitanica* is an excellent choice. All of these are much worked and loved by our bees with both nectar and pollen being collected.

Some bulbs worth mentioning are snowdrops, but not the double forms, which produce an amazing Jaffa orange coloured pollen. Crocuses, especially the early winter flowering species, are great as



Top, left to right: Winter flowering shrubby honeysuckle, Autumn/winter cherry 'Rosea', Hellebore; Bottom: Mahonia.  
All photos by Andy Willis.



is the autumn/winter cherry, *Prunus x subhirtella* 'Autumnalis'. This comes in two forms, a white flowered form and pink one called 'Rosea'. Both have semi-double flowers with pollen and nectar for our bees. The first flowers usually start in November and continue in flushes every mild spell throughout winter, finishing in April. The down side is they can only be propagated by grafting making them expensive to buy and they can take a few years to grow before they come into their best. They also have the benefit of good autumn colour from the



Above, left: Apricot blossom,  
Middle and far right Almond  
blossom.

also the only hellebore that insists on alkaline soils. Try to avoid the newer semi-



once introduced they tend to look after themselves, but are prone to rabbit damage.

Hyacinths are also worked by bees and flower long before the bluebells. They do, however, require a bit of TLC and green fingers, which busy beekeepers do not always have.

Hellebores are generally very good for bees and beekeepers, as they do not require much attention once established and are both rabbit and deer resistant. The exception here is the true Christmas rose, *Hellebores niger* which is prone to slug damage and tends to be short lived. It is

double varieties as they lack nectaries completely but do produce some pollen.

Early flowering fruits worth a try are apricots and the related almonds, both are worked avidly in my own garden here in Southampton. Early cherries and plums also have a great use for our bees in March and the related wild cherry plum of the hedgerows has cultivated forms with coloured leaves and pale pink flowers. These can flower in February. All producing edible fruit for the house as a bonus.

The flowering currant, *Ribes sanguineum* is an early spring flowering ornamental shrub whose flowers are worked well. In a mild winter they can be found in flower as early as the end of February in my area. *Forsythia* is a popular shrub for gardeners, but alas is useless to our bees. There is, however, an exception. The variety 'Beatrix Farrand' has the largest flowers, which are avidly worked by our bees.



The availability of fresh pollen and nectar during the winter and early spring is a real boost to the colonies and helps in the all important early brood cycles.

This in turn means that the colonies get off to a better start. I have often noted that the urban bees with access to all this winter forage often are stronger at the first inspections and can go on to produce the most honey. My own personal record is 227lb from one hive in my back garden, and not a drop was oil seed rape.

Andy Willis, New Forest BKA

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# Skep Beekeeping — The Past: Old Ways and Wisdoms

*This is the first of three articles on skep beekeeping. This article looks to the past to look to the future, the second article focuses on the research and resurgence of skep beekeeping, and the final article looks towards the future and emphasises developing best practice.*

Looking to the past we can see that we inhabit the 'Isle of Honey' and the land of circles. Great ring-shaped enclosures and rotund homesteads, round houses and circular boats, curved earthworks, domed burial chambers, giant circular temples of standing stone and humble circular beehives. Consider the legendary round table ... the word church is rooted in the word circle, reminding us of older sanctuaries like the sacred groves of antiquity. Our horizon is also rounded and a druidic eye can view the domed, starry night sky above us as a giant skep.

The romantic image of a straw skep on a stand has inspired many societies and institutions with its symbolism and allegory. Being a symbol it speaks without words directly to the soul or subconscious. It has a trans-rational charm, but there is also more of benefit than meets the eye and delights the heart. Through experimenting with and practicing skep beekeeping one can know that there was some simple wisdom in the old ways.

## The beginning of 'hiving' bees

So where did it start? Archaeologists are undecided upon a date and even the era that we stopped honey hunting and started 'keeping' bees in this neck of the woods. I provide here a very rough evolution of our relationship with honey bees.

Our ancestors have been stealing honeycomb and brood from bees since they were able to climb trees. These practices became more cunning and developed over time, so that many eons later European forest beekeepers were managing wild colonies high up inside trees, cutting doors to enable access to the comb and leaving their personal mark upon the trunk. In many areas this evolved into keeping colonies in either hollow log hives or bark hives stood on end within special fenced or walled clearings to keep bears and

deer out. The hives were sometimes roofed with straw, wood or slate. These wooded clearings were often found on a south-facing slope and were sometimes called a 'gardd' or 'garth'.

In northern Spain we find the stone walled 'Albariza'. The use of the log hive waned, perhaps because of their weight or a need for a more easily moveable hive? The use of basket hives or skeps then proliferated. Some archaeologists assume the use of pottery hives in this country at some point, however, this may have been more of a Mediterranean practice. The basket hives were predominantly woven out of hazel and willow, and were daubed or 'cloomed' with dung, clay and other materials. They were of varying shapes and sizes. Some conical, some domed. Curiously, the Welsh word for beehive is 'cwch', which also means boat. The coracle-fishing, ancient Britons housed themselves in wicker buildings plastered with daub and topped with a thatched roof. Daub is one of the first composite materials, often a mix of manure, clay, subsoil, straw, hair, blood, oils etc. Essentially some sticky stuff and some plant or animal

derived fibres. The earliest bee baskets were designed on a similar technology, and covered with a straw or reed hat. This new manageable habitat for honey bees was created using the same materials and technology that we used for our own habitat.

It is thought that straw skeps came into fashion during the Anglo-Saxon period, giving us the classical image of a skep on a stand that we know today. This straw craft, called lip work, has survived the test of time, and I am sure many of you have a straw skep handy for swarm collection. Long straw varieties of wheat, rye, moor grasses and rushes were commonly used materials. This was fed into a cow horn to determine and make uniform the thickness of the coils. A grooved bone needle (often of bird bone,



*Skep on a stand. All photos by Chris Park.*



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*Hackled skeps.*

or the cannon bone of a deer) helped to sew up the skep with a piece of lapping made of a traditional split material like willow or bramble (two members of the plant kingdom that bees know well).

The name 'skep' derives from the Anglo-Saxon 'skeppa' meaning basket. Consider the last syllable of the word basket. There are not many skep beekeepers around in this day and age, but some have simply kept a skep going for a season or two out of curiosity. There are more serious enthusiasts around. Like them, I keep a skep apiary, experimenting with various methods of construction, size, shape, materials, shelters and systems of use.

## Harvesting honey

When I mention skep beekeeping to knowledgeable beekeepers two comments usually arise: 'we cannot do that anymore because you have to kill the bees to harvest the honey' and something about 'bee boles', the alcoves set into cottage or garden walls to house skeps. A skep needs some protection from the elements or it will soon rot and decay. Bee boles are just one solution. Others are open sided sheds with shelves for the colonies, single stands with hackles (the straw or reed hats mentioned earlier), skep houses and even old basins or creamers.

Let us dispel the myth that bees need to be sulphured or drowned to be able to harvest honey. Some bee masters did this, but not all. Being the favourite technique of Charles Butler, it gained much press when he published *The Feminine Monarchie* in 1623. There were and are of course other successful and less barbaric methods. The simplest way of harvesting honey from a skep is cutting a piece of honeycomb out from the sides, sometimes called 'castrating' the comb. A cottage beekeeper could simply go and cut some more when the honey pot in the larder was empty. Sometimes an 'eke' (an extra section of about five coils of straw) is added underneath the skep for the bees to draw honey stores down into. Another technique used is to drive the bees from a skep that is full to the brim, no later than midsummer. This involves 'up-turning' the colony and pinning an empty skep to the top with two iron staples and an iron pin (driving irons) or hazel spars and a hazel skewer, then rhythmically drumming the bottom skep. The bees' natural instinct is to walk upwards to a dark place. After about 20–30 minutes all the bees have occupied the top skep, which is placed onto the original stand and they have the rest of the season to build themselves up ready for the winter. From the original skep, honeycomb, wax and brood are harvested. This

may also be done in the autumn, and the bees are united with another colony, the honeycomb removed, any brood comb may be pinned into a new skep and stock introduced. Another system involves multiple layers of skeps, akin to a brood box and supers. The bottom flat-topped skep goes through the winter, and has a hole in the top that is opened when a 'super' skep is placed on top. At the end of the season the top skep is removed and only honeycomb and wax is harvested. There is no queen excluder, but a three inch diameter hole in the top of the brood skep for the bees to travel through and extend the comb. Some drone brood may have been laid in the top skep above the hole, but by the end of the season it will have been replaced with honey stores.

## Some pros and cons

How is skep beekeeping relevant and of value to contemporary beekeeping? Skep beekeeping grew out of fashion when moveable frame hives became popular. Were some babies thrown out with the bathwater? Some obvious disadvantages of skep beekeeping to the contemporary beekeeper are the difficulty in inspecting brood comb, an inability



*Flat-topped skep with hole opened to draw comb upwards.*

to use foundation or reuse drawn-out supers, and swarm management. But here is a list of some of the advantages of beekeeping in skeps:

- They are round to suit the shape of the bee cluster. This eliminates cold corners and enables the vertical, oval shape of the brood to develop naturally, not being forced to expand sideways. Charles Butler preferred slightly egg-shaped skeps to suit the natural shape of the comb.

- They are natural, breathable and well-insulated.
- The bees draw pure virgin comb. Reducing traces of chemicals or miticides from recycled wax foundation that may be affecting the fertility of queens and drones.
- The bees orientate the comb the way they like it to manage the ventilation and logistics of the colony. In my experience



*Working tools. At the top is a piece of cow horn used to make uniform the thickness of the hazel or willow coils when making a skep. At the bottom is a grooved, bone needle used when lashing the willow or hazel together with a length of 'lapping' made of a material such as split willow or bramble so that the basket shape is secured.*

they draw it the cold way, although I have known one colony to draw two small 'windbreak' combs the warm way by the entrance (a rather large entrance on this particular skep).

- The bees decide on their own cell size.
- Minimal inspection means:
  - The colony's scent is disturbed less.
  - The colony's temperature is maintained (consider varroa).
  - There is minimal risk of spreading disease (consider foul broods).
  - Propolis is damaged less (one colony last winter built a curtain of propolis across the entrance with two small holes in. They made their own mouse guard and hygienic entrance.
  - Bees are squashed less (consider Nosema).
  - Bees are smoked less.
  - Comb is broken less.
  - Bees are stressed less.
  - Honey bees are allowed to swarm. This is a natural way of re-queening, and an effective varroa control.

Next month's article will go into more detail about the research and resurgence of skep beekeeping.

**Chris Park,**  
Wiltshire BKA

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# The Biggest Danger to Honey Bees: Part I

*In previous articles in BBKA News I dealt with both bird and mammalian pests to honey bees, but these are not the biggest problem bees face, and are more easily managed and even totally controlled as pests. There is one problem that cannot be removed and that is the beekeeper and all others working with bees. In this article, the first of two, I will highlight the problems caused by man starting with the effect on individual bees and hives. The second article will consider wider-spread problems in apiaries, progressing to planet-wide effects. This article will deal primarily with *Apis mellifera* and will concentrate on beekeeping practice in the UK. As the subject develops in my second article I will include beekeeping practices over a wider geography and other species of *Apis*.*

## History

Both man and *Apis mellifera* are considered to have evolved initially in central Africa, with *Apis mellifera* appearing many millions of years before even the most primitive hominid. As the earliest hominids were probably hunter gatherers it seems likely that man's interaction with honey bees existed from the very start of man's development. The gathering of honey and grubs from colonies would soon have developed to the point where a sustainable balance would have been achieved that has lasted in some areas of Africa and elsewhere to current times.

The first record of such hunting in Europe is normally considered to be cave paintings in southern Spain made around 15,000 years ago and it is probable that both man and bees followed the retreat of ice across Europe. It is known that man was in habitation of northern Europe at various times between the ice ages up to 100,000 years ago but any bees that may have been present at that time left no traces. Modern populations have to be considered after the last ice age. The land bridge between the UK and France disappeared around 8,000 years ago and it is thought likely that honey bees crossed into the British Isles before that time.

It is not known exactly when hive beekeeping, as opposed to honey hunting, started in the British Isles but it was well established by the time the Romans invaded. Skeps are assumed to have come over with the Saxons well after the Romans left in 500 or 600 AD and these were kept in regular use until the 19th or early 20th century. To extract honey from skeps and similar hives the most normal method was to kill the bees and the interaction between man and bees started in earnest. Appreciation of beekeeping as more than a craft skill started in the 17th century with more and more being understood until 'modern' beekeeping started in the mid 19th century. After this time the problems really started for the bees.

## How nature manages

In temperate climates *Apis mellifera* will tend to live in hollow trees at a height of five to ten metres above the ground with a density of around one nest every five hundred metres.

Some of the natural predators that are currently seen as pests are vital to natural nest health. If any colony was abandoned or died out wax moths and mice would enter and destroy any trace of old comb and any diseases that went with it. A new colony of bees would clean out or propolise over the debris and start life with a minimal disease load in the nest. The new comb produced would be disease free and bees in nature prefer to lay in new comb,

using the older comb for honey storage or if there is sufficient space, simply abandon it to wax moth. In this way the disease load would be kept low and disease would be self-managing as colonies dying out would be cleaned free of disease before the space was reoccupied.

Skep beekeeping was little different in that any weak colonies that were unlikely to last the winter would be killed over a sulphur pit and the wax and honey recovered while the skep would be disinfected by the sulphur fumes and a period free of bees. In this way any diseased colony would be destroyed and the spread of disease minimised. The heavy colonies were also killed for honey and in this way about two out of three skeps were disinfected each winter. With modern beekeeping all of this changed for the worse for the species if not the individual colonies of bees.

## Problems at bee level

With a modern moveable frame hive, as pioneered by Langstroth in 1851, the beekeeper has much greater interaction with bees than previously. By opening the hive up, if this is not done well, disturbance to the bees can be significant. With a little smoke and careful handling the colony will barely notice that it has been opened and no defences will come into action. However, if the hive is opened roughly or at the wrong time, the guard bees will try to defend the colony. The first response is to try to scare off the intruder and if this fails, to use their stings to defend the colony.

When a bee stings a beekeeper two major things happen, firstly the sting stays in the beekeeper and the sting apparatus is pulled out of the bee subjecting the bee to death, and secondly alarm pheromone is released attracting other guard bees to the site. The alarm pheromone is very strong and remains active for a long time. If a beekeeper gets stung in clothing the alarm pheromone will stay for several days and any attempt to work on any hive will immediately trigger the guard bees into action resulting in more stings. It should be the aim of all beekeepers to handle bees without getting stung and in all cases to ensure that the alarm pheromone does not stay in clothing. In some cases stings are unavoidable but these are very few. Handling bees in good conditions and keeping all clothing, including gloves, as clean as possible is best for both the bees and the beekeeper. Good handling can be learnt and the best route is to treat every sting as a failure in handling and to constantly work to improve technique.

Careless handling can also lead to a second problem for the bees. If a bee is crushed it will again release some alarm pheromone this will cause disturbance in the colony, but more

importantly the crushing will expose the contents of the gut and the haemolymph which will be cleaned up by house bees. This offers a method of spread of disease around the colony. Diseases that can be spread include nosema, EFB and viruses. Crushing of bees should be avoided by making sure that bees are moved away from any contacting parts when replacing queen excluders and supers, simply putting these down at an angle and gently moving the bees out of the way by rotation will eliminate most crushing. Hives should be correctly constructed with a bee space (either top or bottom bee space), particularly under the frame ends. This will prevent crushing as there is then only minimal contact with the runners and careful placing will avoid crushing. If frames are kept in close contact and moved back after inspection as a whole, there will be few positions at which bees can be crushed. This is much easier if all parts of the hive are clean and free from brace comb.

## Problems at hive level

The colony is the really important consideration as this is the entity that has to be managed. Best results for the colony will only be obtained if it is healthy, correctly fed and correctly housed. In the case of most animals there are laws that ensure that owners have a legal duty of care; unfortunately this is not the case with insects but the same principles apply.

The first consideration should be health, which in bees is also related to feeding and housing. The most obvious first step is ensuring that the colony is well housed. The 'natural' home of the honey bee is a hollow tree in temperate regions; this provides adequate space when chosen by a swarm, is watertight and has sufficient ventilation. The hives we provide are essentially very superior hollow trees, but we do not give the bees a choice so the hive should have sufficient space for the colony and this may vary with race. The space can be altered by either choice of hive type or by adding additional brood boxes and supers to suit the needs of the colony. Space requirements should be among the considerations made when choosing stocks of bees. The hive should be watertight with a sound roof, no gaps between boxes and ventilated, mainly nowadays by an open mesh floor. With a solid floor there should be some venting in the roof of the hive. In nature bees will nest well above the ground but the hive should at least be raised far enough above ground to be free of any moisture. Failure of any of these factors will provide additional stress for the colony and possibly have an adverse effect on health.

The colony has to have sufficient food, both nectar and pollen. In most years the colony will be able to forage and if sufficient space is available will store sufficient honey and pollen to see it through the winter and any short periods of shortage. In a hive, beekeepers manage the space adding supers as required and a colony may store sufficient honey only for this to be removed by the beekeeper. Great care should be taken at any inspection to ensure that sufficient food is present until the next inspection; in summer with weekly inspections this should be around five kilos or two brood frames equivalent. At the end of the summer this should be much more with in excess of twenty kilos needed for a colony to get through a normal winter. Some races of bees are very prolific and will fill a standard national brood box with brood and no stores, so adequate space must be provided for stores. This is a particular problem when removing supers; unless a check is made a colony can starve in a day or so. A colony will always be in a better state when fed on its own stored honey and pollen. So removing all of this and feeding back syrup and pollen substitute can stress the colony and possibly leave it malnourished. Feeding honey from other sources should never be considered as it is a very quick way of spreading disease.

The health of the colony is paramount. This will affect the size of the colony, its capability to collect stores and its capability to over-winter successfully. Many diseases can affect honey bees, but in nature these are largely managed by colonies dying out when diseases are excessive and the disease organisms are removed by wax moths etc. So the natural density of colonies will limit the rate of reuse of any nest site to a sustainable level. Honey bees have achieved this balance over millions of years. However, several factors have changed with managed hives. The density of hives increased as soon as beekeepers got involved and decided that walking five hundred metres between hives was not a practical option. This increased the rate of disease transfer and probably affected the availability of forage. Before movable frame hives most hives in the UK, normally skeps, were emptied of bees and wax very frequently simulating the natural way of nests, and most bees were on newly drawn comb. With movable frame hives the ability to maintain the combs for extended periods became possible and the disease load in colonies could increase.

Many of the disease organisms are transferred throughout the hive either by releasing spores or in faeces deposited in or on the

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combs, thereby building up on the comb. This includes chalk brood, sac brood, EFB, AFB, nosema and others. If combs are kept for extended periods disease load can increase to a level where the disease can have a major effect on the colony. This can all be managed by regular comb changing; to minimise disease load, two to three years should be the maximum period of use for any comb that has contained brood. Some disease organisms will also stay on the boxes, floors and other parts of the hive so regular cleaning of these is necessary for the best health of a colony.

Diseases can only be detected by inspection of the bees and brood at regular intervals, at least twice a season for a full disease inspection of the frames, and every inspection should be considered an opportunity to look for anything other than normal. This implies that the beekeeper can recognise the signs of disease; all beekeepers should know what a healthy colony looks like and should learn to recognise signs of the common diseases and others by their deviation from a healthy colony.

Some infestations and diseases are now endemic, in particular varroa. The assumption must be made that varroa is present in any hive and control of this through integrated pest management should be part of colony management so as to keep the mite at levels that are compatible with a healthy colony. This can only be done by monitoring the levels and treating as and when the levels become excessive. The same rules apply to top bar hives where feeding may be more difficult for colonies that are short of food and disease inspection requires care in handling the combs. Abbé

Warré has methods of managing disease that are akin to the methods applying to skeps.

In all types of hives, if left unmanaged, bees may starve, swarm or harbour disease all of which are detrimental to other colonies in the area. If a colony dies out for any reason the hive will be robbed by other bees and probably repopulated by a swarm. Robbing is a very good way of spreading disease and the swarm may become infected by any disease present. All hives left vacant should be cleared of comb, scorched clean and sealed up. The exception is bait hives which may have a comb of drawn foundation to attract bees and will be inspected regularly. Hives with wild comb are impossible to inspect and can only be detrimental to a healthy colony.

Any hives that are to be taken permanently out of use should be cleaned and scorched and either passed to others who may use them or destroyed by burning; far too many are simply left abandoned.

In this article I have alerted you to some potential causes of declining bee health and explained how best to avoid this at the individual bee and hive level. In the December issue of BBKA News I shall continue my exploration of the dangers posed to honey bees by considering problems caused at and above the level of the apiary.

**Julian Routh,**  
Warwickshire BKA

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# Nosema

November can be a stressful time for beekeepers that have tenderly cared for their hives through the year, and now must wait anxiously until next spring to learn their fate. Yet it is also a great time to sit back, read and enjoy the abundant number of talks taking place around the country.

I am sure that all the essential winter preparations have been covered thoroughly by other sources, so I thought we would turn back to what occurred in mid-November 2006 when 'colony collapse disorder' was first discovered by David Hackenberg. Colony collapse has been given many causes from insecticides, mobile phones, viruses and poor management. However, it is essentially still a mystery. Preparing for the unknown may be impossible yet known causes of hives' demise, such as severe viral burdens and nosema, often still go undiagnosed.

Given the poor UK weather this year colonies may have struggled and had to be fed on various occasions. Already some colonies have not survived through this

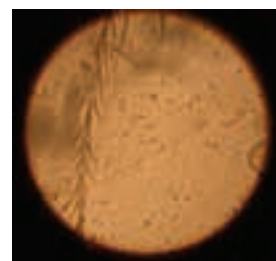
wettest of summers and this does not bode well for winter. Strong colonies going through winter are often able to withstand nosema burdens, as discussed in *Bee Health and Immunity* (BBKA News 2012; 202: 27). A small colony though, without sufficient food stores, or one housed in a poorly insulated hive, stands very little chance. Given the widespread occurrence of *Nosema apis* and *N. ceranae* in the country (around 30–40 % of hives are infected to some degree) this is certainly one of the biggest concerns for beekeepers readying their hives for winter.

The previously favoured treatment, Fumidil B, no longer has a UK license. That said, where there is no licensed treatment for a particular animal disease, a qualified vet may import a suitable product for that disease. This requires a vet to first diagnose that nosema is the problem. The Bee Vet will be exploring options to make Fumidil B and other unavailable products accessible to those UK beekeepers that require them.

Fumidil B is not the only treatment though; certain feed supplements have been

shown to be particularly effective in nosema control, and these may be given in a feed before the hives are completely closed up for winter. They may also be used if emergency winter feeds are necessary.

We would like to encourage beekeepers who sense that they may have weak colony to submit samples of bees for nosema diagnosis to either their local associations, the National Bee Unit or The Bee Vet, and to pursue advice on its control promptly. (The NBU cost is £40. The Bee Vet cost is £12 for nosema screening and £38 for a complete bee post-mortem). This would not only aid the survival of the colony but would help reinforce the need for proper nosema control products to be made available in the UK. A problem can only be solved when we know what and where the problem is in the first place.



*Nosema under the microscope.*  
Photo by Jon Arul.

Jon Arul, The Bee Vet



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# Notes from a Clifftop Apiary

How's this for the loosest, most tenuous connection between beekeeping and the world of literature? Or, Literature. The small wood and canvas folding stool that I sit on when I'm operating the valve on the honey storage tank and filling the jars once belonged to Gilbert Miller. Impressed? Okay, maybe not yet. The Gilbert Miller who produced the plays of T S Eliot in New York, the Gilbert Miller who owned The St James Theatre in London in the post war years, Gilbert Miller producer and theatre impresario. Now you've got him. It's not a flash stool, not like a Director's chair with his name printed on it. In fact, I wonder just when he would have used it. Maybe he took breaks from rehearsals by squatting on his little folding stool and chatting to Eliot. Maybe he offered up the stool to Eliot? Who knows where historically significant bums have parked themselves? I once sat on the ancient settle in the fireplace of Ann Hathaway's cottage. There's not much of it left now, Americans having picked off splinters for decades and taken them back across the Atlantic in order to regale their friends at dinner parties with the story. 'Have you seen this? See that splinter of wood? Shakespeare's ass rested on that. No kidding. Ever seen anything like that before in your life?'

I remember a particular dinner party on this side of the pond which was memorable not for any connection with Shakespeare's bottom, but with a bee sting. Sometimes a sting feels deserved, because you were clumsy. But sometimes it just comes out of the blue. There I was, standing between a couple of hives looking out to sea, admiring the slow ridged waves sweeping powerfully across the bay, when Zap. Right between the eyes. I scraped the barb out, but the venom was in. I felt I'd faced a firing squad, been shot square in the forehead, but survived to feel the pain.

'What's the matter with you?' Wife said when I got home. 'You look like you've got something on your mind.'

'I got stung.'

'You remind me of somebody,' she said, studying me. 'Who is it...? Oh, I know, that actor who played Frankenstein's monster. What was his name?'

'Boris Karloff.'

'That's the one. You look like him. Why are you crossing your eyes?'

'I'm not crossing my eyes. Why would I do that?'

'Well, it looks as if you are. Anyway, have you forgotten we're going out to dinner tonight?'

'Oh?'

'Are you going looking like that?'

'Is it fancy dress? I could go as Boris Karloff?'

'No, you can't. If you turn up looking like that they'll have to keep their children locked in their bedrooms.'

In the end I wore my fishing hat with the brim down and told people I was protecting a wound. After several bottles of wine the company, the wives mostly, demanded that I show them my wound.

'It's a bee sting, actually,' I said, lifting my hat off. Suddenly the jollity stopped. There was an uncomfortable silence. Somebody coughed. Wife said in a small quiet voice, 'I think you'd better put your hat back on.'

We left shortly after.



Swarms came late this year. I did in the end collect two, both had lodged in garden hedges in the village. One in a fellow beekeeper's hedge, and the other in a fellow allotmentee's hedge. This, in a village with many hundreds of gardens, how uncanny is that? C'est mysterieux. Right now, in November, the little blighters are busy hauling ivy pollen and nectar back into the hives. Ivy is one rare instance when the beekeeper knows better than the bees. Ivy is useless. I first heard from a couple of old Devon yeomen what ivy was good for. 'You'm don't want none of that stuff,' they told me, 'tis a right b\*\*\*\*\* for Granny Lies In.' Later the penny dropped. Granule-lizing. Ivy stored in the cells becomes hard and useless. And if you take it off and jar it, it still tastes unpleasant. So, all round, a bit of a curse.



'When is your birthday?' Wife asks.

I tell her. Each year I have to tell her. I never have to ask when hers is.

'I've got you something for your bees.'

'Oh?' I am cautious about this, remembering the time I was given a cardboard box filled with the shredded paper packing that protects consignments in the post. I rootled around in it for some time before Wife said, 'What are you doing? There isn't anything else in there. That's it. That's the present. It's shredding. For your smoker.'

'So ... this present...?' I was picturing a motor-driven eight-frame radial extractor. 'Is it made of stainless steel?'

'No. It's a new queen. From Greece. A Greek queen. Doesn't that sound marvellous? She's flying over from Athens. Not on her own. In an aeroplane.'

'A queen? From Greece?'

'She's been bred on the mountain slopes where the wild thyme and the rosemary and other herbs grow.'

I tell her there is a debate about the wisdom of importing queens from abroad. 'Some people think it's not a good idea.'

'Look,' she says, 'these are hard times for the Greeks. Their economy is going down the toilet. I don't suppose you've noticed, but I've been buying Cretan olive oil from the Co-op.'

'And this queen that you've bought is going to save the Greek economy?'

'We all have to do our bit to help.' She looks thoughtful. 'This queen's already mated. So your drones won't have to do anything. I feel sorry for queens. A lifetime of pushing out babies, and she's only ever had sex on one or two afternoons in her whole life. But then it was with the whole rugby team, so maybe it was pretty memorable.'



Queen bee arrives, by Emma Molony.

Rowland Molony,  
East Devon BKA

# The End of Honey Bee Research at Sheffield

After fifteen years of social insect research at Sheffield University the department has decided as of August 2012 to end all social insect research, and so I was made redundant and my research team was disbanded. This comes at a time when our latest honey bee publication in *Science* generated £67,000 in free advertising for the university, according to the university's media team (More about this in December *BBKA News*).

The social insect research group was established by Prof Francis Ratnieks in the late 1990s, based in the Tapton walled-gardens about a mile from the main campus. He had the old rifle range converted into a series of laboratories and offices, and with a series of successful EU and UK grants established an international group of researchers. I joined his group as a researcher in 2000 and became an integral part of the group. Our research used social insects as model systems to study a wide range of biological issues from the very applied, i.e. methods of increasing queen acceptance, and breeding for hygienic behaviour, to more academic topics, such as chemical ecology and worker policing.

In 2007–2008 unhappy with the lack of support given to him from the department Prof Ratnieks moved to establish a new group at Sussex University. At the same time the Tapton site was closed and a new £4 million building and greenhouses were built to replace the aging Tapton buildings. The idea was that people would move from Tapton to the new site, but this never happened for a variety of reasons, and still the vast majority of laboratories and office space remain empty. At the same time as Francis left, I was awarded two large research grants so I decided to stay at Sheffield and continue to rebuild the social insect group. So, over the past four-to-five years, despite numerous problems with the new site, I established a group of researchers which consisted of a core of four people and which swelled to seven over the summer months with the influx of students from the UK and Brazil.

Those lucky enough to visit the site will know what an excellent place it was to study honey bees with the especially designed flight room and woodland glade where the main university apiary was situated. During the fifteen-year period Francis and I

produced around two hundred scientific publications between us in peer-reviewed journals, eight of which appeared in the top journals of *Nature* or *Science*. This made the subject of social insects

one of the highest impacting academic subjects across the entire university. Almost half of the published papers were on honey bees or used them as model systems to test various hypotheses. The social insect lecture series was very popular with the students, but despite this it was closed down by the new head of department over four years ago, even after the students complained. Again, social insect-based 3rd and 4th year projects were always popular with students, with many of them achieving top honours and various prizes for their work, but again over the past couple of years these were closed down.



*The purpose build AWEC centre that remains largely unused almost four years after opening. All photos by Steve Martin.*

Finally, a long-held ambition of mine was to set up an MSc in beekeeping at Sheffield. This again fell on deaf ears. Despite this lack of support the team continued to produce high quality work and engage with the beekeeping community. Without any warning the rug was pulled this summer, despite appealing the decision.

Currently Ricky Kather who is part-funded by the EARS consortium of beekeepers is looking after the honey bees at Sheffield during the final year of her PhD; a job that she is very capable of. The findings of our *Science* paper produced the highest impact of any paper produced by the university in the past two years and reached an estimated global audience of sixteen million people. So we are certainly going out with a bang and not a whimper.

I would personally like to thank all the beekeepers who over the years have helped both Francis, myself and all our various students. I am sure that I will pop

up again somewhere, as the vast majority of people are not sitting in their ivory towers, and they recognise the true importance of honey bee research. I have been asked to speak at the BBKA Spring Convention in 2013 so it will be great to see you all there.

Many years ago Cardiff University closed down their very successful MSc beekeeping course; again no real reason was given. As they say in Yorkshire 'There's nowt sae queer as folk'.

**Dr Stephen Martin**



*Chesterfield Beekeepers' Association visit the (AWEC) research centre during the summer of 2012.*



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# The Development of a Foundationless Frame

*It is said that there is an inventor in all of us and this is certainly true for James Slade who has been learning about and experimenting with bees' comb-building preferences for some time. After numerous modifications and much patience James has come up with a new frame design that appears to 'guide' bees to create their comb in a reliable manner without the need to supply foundation or starter strips. Here he explains his thinking and processes in developing the new frame.*

I have been playing around with top bar hives and seeing what bees would or would not do under the top bars for some time. My first attempts involved the use of strips of foundation about 1½ inches deep with top bars all abutting. The bees drew out the strips and extended the comb down to fit the shape of the box. The box was eighteen inches across and twelve inches deep with the side angle at 15 degrees. The comb produced was as an inverted truncated triangle. The bees appeared to be very content with the arrangement and required little or no smoke when manipulating.

The temper of the bees was tested when I used them in top bar hives to give demonstrations to visiting school children. The great drawback of top bars with the comb suspended below was manipulation. With a large area of comb hanging from the bar, the pendulum effect took hold; making even turning the bar and comb almost impossible. This problem was overcome by the use of pegs fixed into the centre of the top bar and extending down almost to

when I used a starter strip that protruded only about a ¼ inch, the bees completely ignored the starter strip and produced wild comb starting in one corner, radiating out in arcs and completely filling the available space with wonderful sweeps of comb beautifully braced with other comb at all angles.

It became obvious that the bees required something that would determine where and how they would construct comb with a degree of repetitive certainty. It was at this time that I took a swarm of bees in a cardboard box. Although the long folds that formed the bottom had been taped down I omitted to check the other two folds inside that also formed the bottom. Consequently when I collected the bees in the box and inverted it, the weight of the clinging bees must have caused one of the folds to droop to quite a steep angle such that the bees must then have found themselves on both sides of the now dangling fold. My mistake in not securing the inside folds of the box was exacerbated by leaving the bees in the box overnight. It was not until the following evening that I hived the bees. By this time they had been in the box for about thirty hours.

My normal practice when hiving a swarm is to shake the bees from the collecting box onto a white cloth-covered board set against the front of a hive at an angle, such that the top edge of the board is immediately below the entrance so the bees can crawl up and go straight into the hive. The empty collecting box is then placed close to the board so that any remaining bees can either crawl or fly to join the others on the board.

On this occasion after shaking the bees onto the board and turning the box open side up it was clear that they had not only started to produce comb but had attached it to the edge of the fold of cardboard. The piece of comb that they had produced was pear-shaped extending down about four inches with a length of attachment onto the cardboard of about two inches. When confronted with the marvels of what bees will do even in a cardboard box, my mind turned to the question: 'do the bees need foundation or do they simply need a starting point that they will always use?'

Top bar hives seem to be preferred by bees if their temper is used as an indicator. That being the case then there must be a reason for their good temper. This begs a number of questions with several possible answers, such as:

i Do bees like the material, shape or size of the top bar hives that I have produced?

With regard to material, shape and or size of a hive, there is little doubt that bees have over the millennia, used every form of hole or recess imaginable in rocks, wood or even the open air. Therefore, hive shape and or construction must be of little consequence to them.



*Figure 1. Top bar with full drop of comb from a top bar hive. Note the peg fully embedded by the bees into the comb. The short vertical section at the top of the comb indicates the depth of the starter strip of foundation. All photos by James Slade.*

the full depth of the comb. The top bars by this time had reduced to 7/8 inch (22mm) i.e. the same as a standard frame and I reverted to using crown boards. It was pegged top bars that made it possible for the children to handle the bars and comb. See Figure 1.

Knowing that bees would use a strip of foundation, my next experiment was to see how narrow a strip of foundation I could get away with. The first attempt was with strips protruding about one inch below the top bar; in this instance the bees again produced comb straight down from the starter strip. However,

ii Are bees aware of foreign wax in the hive?

From experience bees do not particularly like wax and/or foundation. This will be born out by any beekeeper that has put too few frames with foundation into a hive only to find the bees have done their own thing in space inadvertently left and totally ignored the foundation.

iii Does bought in wax (foundation) contain harmful contamination?

Yes! It is widely accepted that traded wax is contaminated and in some cases heavily so.



Figure 2. One of the partially filled new frames from the nucleus box and swarm. Bees drawing comb along the upper edge of the aperture in the new frame. A small cluster of bees (left of first drop of comb) are embarking on a new drop of cells on the magic shape.

iv Does wax foreign to the bees affect their temper or performance?

From personal experience bees try to ignore foundation that is darker in colour, old, etc., and that reluctance to use foundation must affect the bees' performance.

v Is wax a primary component of a hive's distinctiveness and/or of colony homogeneity?

This is possibly the most important question of all. The whole essence of a colony of bees lies in its smell, not to us but to them. Bees are the masters of scent and aroma.

When we purchase and open a pack of foundation we are overwhelmed by what we perceive as a beautiful smell. What are the senses of the bees faced with? A bee, that can detect a single flower from hundreds of yards, finds itself confronted with a smell so pungent that it overwhelms even us. This must be horrendous for the bee; the smell of a thousand foreign hives. How long does that foreign smell remain with that foundation? I have foundation several years old and I can still sniff it with pleasure. That means, with the super advanced scent organ of a bee, wax could still smell abhorrent for even longer. Most of us have experienced a visit from a heavy smoker. Within minutes the house is pervaded with an awful smell that even with the use of smell suppressing sprays can take an age to go. But it does not go altogether; to a large extent our inadequate sense organ merely ignores the smell. Perhaps not so for the bee; its nose must be ready to find the next flower etc. Therefore, to it, that lingering, overwhelming smell of foreign wax must always be there to some extent. Bees may assimilate some

of that foreign smell; unfortunately we the beekeepers cannot guarantee that sheet by sheet, foundation comes from exactly the same source and with every new sheet the smell of even more foreigners invades their hive.

Bees have to use the foundation because they have no choice; they occasionally do their best to chew it away and get rid of some of it, but there is no space available to produce comb other than on the supplied foundation. Should we as beekeepers impose our will upon the bees and make them tolerate what might be intolerable to them or offer what bees prefer and is safe for them? As human beings, we are always ready to anthropomorphize those creatures that we come into contact with. This is despite that over thousands of years, bees are no more domesticated than they ever were. Perhaps we should get away from determining what is best for them, and instead start looking at what suits them; let them determine for themselves (or at least in part) a better way.

If the assumption that bees do not want any bee material (wax) that is not wholly their own in their hive is correct, then the development of a means of comb support that does not require the introduction of foreign wax while at the same time permits the beekeeper to do his work becomes essential. So important is the awareness of disease prevention and apiary hygiene now, that the importation of traded wax into the apiary should be avoided at all costs.

Some years ago a Scottish butcher poisoned and killed a number of his customers by virtue of his loose food handling, contaminating cooked food with raw food. Can we, as beekeepers, assume that there is no cross-contamination between the raw wax, being taken in by a wax processor, and that processor's end-



Figure 3. Second new frame was taken from the nucleus box and swarm. Note the construction of the comb following the contour at the top of the new frame aperture, also the bees (top right) building comb on the flat face. Again a cluster of bees can be seen starting a new drop of comb.

product in the form of foundation or other products? To this end I have been attempting to develop a type of comb support that for convenience I will refer to as 'new frames', which might replace conventional frames and foundation. In recent times beekeepers have come up with a whole myriad of ideas that have economised on foundation. They have used strips of cardboard rather than foundation, dangled bits of hinged bamboo, used little sausages of wax rolled between their fingers and pushed onto the underside of frame top rails. The list is almost endless but always centred around the use of conventional frames.



Figure 4. This frame is one removed from a full brood box that had two new frames put in. Note that the bees have not only filled the aperture but have, as hoped, built comb on the flat surface of the new frame.

In the same way that full sheets of foundation in frames is a nearly foolproof way of getting bees to build comb in the right place, a solution that always works and has the same certainty as foundation has to be the goal. However competent or incompetent a beekeeper may be; he or she must know that if they use a particular product it will perform correctly as intended. The 'new frame', for which I have applied for a patent, has therefore, to perform as a real and proper alternative to frames with foundation.

### The new frame

The new frame is in the form of a single, flat, stiff membrane with apertures. The aperture has a land around it; the width of that land

determines the overall strength of the new frame when filled with comb. The new frame can be seen in the photographs below.

I have arbitrarily set the open area of the apertures to be between 60 and 70% of the total new frame area. It is worth noting that because there is no frame in the form of side bars, bottom bars and foundation clamp section on the top rail, the overall area of the new frame is approximately 8% greater than the area of foundation in a conventional frame. The 60% to 70% ratio of open aperture to overall area on the new frame is my nominal guesstimation of area of brood to overall area of foundation on an average brood frame. Others may suggest a different ratio.

I have assumed that using standard spacing the bees can only produce brood in the apertures because the thickness of the membrane reduces the depth of cells, i.e. brood in the aperture/s and stores etc on the flat faces. The apertures in the new frame are not simply holes; their shape and form is very important. It is the upper edges of the apertures that are most important. The shape/form of that upper edge is such that the bees attach themselves to it when comb building commences and draw the comb down from an exact position, and consequently along the full extent of the upper edge. The flat surfaces of the lands around the aperture provide an area on which the bees can build cells to a



Figure 5. An end view of a new frame. Note the bees have drawn the comb equally both sides of the new frame.

shallower depth for the storage of honey and pollen. There are still a few minor wrinkles that need a little more attention but the new frames appear to work remarkably well and the bees construct comb exactly as anticipated.

Because of the success with the new frame I am now extending the scope of its design and furthering investigations to encompass a 'queen cell location facility' so that as part of the comb construction on the new frame the bees will default to a 'locate queen cells here'. It may not be the case that the bees will always restrict queen cell production to just the 'locate queen cells here' place but it could be reliable enough to be able to say that if there are no queen cells in the 'locate queen cells here' place, there will be none elsewhere. This may be an ambition too far but having observed what the bees have done to date with the foundationless new frames then the possibility does exist.

### Testing the new frames

To test the new frames, two approaches were taken. This was either to use the frames:

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- in a 'new hive' role with a swarm, or
- in a 'replacement frames' mode.

In the first case an average size swarm was placed in a nucleus box containing five new frames and 1kg of heavy syrup was put on as feed. In the second case, three hives had two frames removed and two new frames introduced. The new frames were positioned as the third frame from either side of the hive brood box.



Figure 6. A new frame taken from a second hive. Note the brood that almost exclusively fills the aperture in the new frame. The old conventional frames either side of the new frame were not so complete in terms of brood.

With the swarm (in the nucleus box), they were left alone for the first four days and then checked to see what food had been taken down; because they had taken all of the food, an additional 1kg was given. On the eighth day after the swarm had been hived they were examined to see what they had done with the new frames. Two of the new frames had been filled completely with pure white comb and the other three had been partially filled (see Figures 2 and 3). On every new frame the bees had adhered to the plan and had put the comb exactly as hoped.

In the case of the frames that were put in as replacement frames the hives were left for a little over four weeks. This was not by design or planning but because the weather dictated it to be so. On the first suitable day the hives were examined. The bees had not only filled the new frames with comb, but appeared to have completely filled the apertures in the new frames with brood at the expense of putting it in the old existing comb. Having noted this, it is possible that the old foundation frames containing old comb were for the bees less preferential for producing brood than freshly drawn comb.

It must be stressed that no wax or other material was used as an inducement for the bees to build comb. The bees chose to build comb as and how they wanted.

The experimenting/ testing of the new frames took place in the spring of this year, and not a good year at that. From the photographs it can be clearly seen that the bees have concentrated on brood production.

### Pros and cons of a new frame design

If a new frame can be found that eliminates the necessity to use foundation or starter strips it will be a great benefit to the beekeeper. Primarily this is for reasons of hygiene; in that no beekeeper need have any wax product in his/her apiary that derives from bees other than his/her own. Additionally, production of the

new frames would be significantly cheaper than the combined cost of conventional frames and foundation, perhaps by as much as 50%.

“ It became obvious that the bees required something that would determine where and how they would construct comb with a degree of repetitive certainty ... Top bar hives seem to be preferred by bees if their temper is used as an indicator ... After experimentation, I developed a new frame design in the form of a single, flat, stiff membrane with apertures. The aperture has a land around it; the width of that land determines the overall strength of the new frame when filled with comb ... on every new frame the bees had adhered to the plan and had put the comb exactly as hoped ... no wax or other material was used as an inducement for the bees to build comb. The bees chose to build comb as and how they wanted.

”

There could be a negative side that has to be addressed and that is the conservatism of beekeepers. If the new frame proves to be as reliable as a conventional frame and foundation then there will have to be some changes in attitude and the way that bees are kept. We have become accustomed to seeing the comb in a box with wood all the way round. The new frame has the appearance of just a flat sheet of comb with the edges tapering to a point. The new frame does appear to offer a means of comb support that permits easy and safe manipulation, but as stated earlier there is still a little way to go. There are those that will stick to the sausage of wax as a way of foundation economy, but for the majority of beekeepers if there is to be a new system that does away with foundation that system must go beyond what individual beekeepers can do and offer a hassle-free alternative.



Figure 7. A new frame taken from the same hive as Figure 5, again extensively filled with brood.

### Acknowledgement

I would like to thank Rahid Maxwell for his great assistance, forbearance and use of his bees.

J R Slade, Devon BKA

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# From Secret Garden to Apiary at Hughenden Manor

For almost sixty years after coming into the care of National Trust, the Walled Garden at Hughenden Manor, former home of Benjamin Disraeli, Queen Victoria's favourite Prime Minister, retained its secrets. Only in 2006, following a decision not to restore the garden to its former Victorian glory but to create instead a learning space, were visitors invited to 'come into the Secret Garden and grow ...' as part of the Trust's initiative to inspire people to change their lifestyles and live in greater harmony with their environment. From the outset, sustainable aspects of gardening have been energetically promoted, both for visitors and for horticultural students. The garden is the base for the popular 'veg of the month' free seeds scheme, home to 56 heritage apple trees, and it supplies cut flowers for the house and produce for the restaurant. Pollinating insects are encouraged by provision of a bug hotel and bumblebee nests.

It came as no surprise, therefore, two years ago when a founder Walled Garden volunteer, himself a new beekeeper, took the lead in successfully bidding for funds donated to the National Trust to establish an apiary. This was primarily to provide demonstrations

for visitors and offer information on food, environmental and ecological issues, with the production of honey for sale in the National Trust shop as a possibility. It was originally envisaged that the project would be run by a lead volunteer and two assistant volunteer beekeepers.

However, when the notices were put up

that vision changed as a result of the overwhelming response, with more than a dozen people expressing interest.

We recruits were a diverse and enthusiastic bunch, with volunteering and beekeeping experience ranging from nil to a great deal, and a broad spectrum of other skills between us. After a meeting in September 2010, two flat-pack hives were ordered, construction of which commenced at the beginning of November. In addition, the apiary site was fenced off, with our NT Countryside Ranger providing materials and plants to supplement volunteer efforts. Several novices, myself included, enrolled on the excellent High Wycombe BKA Beginners' Course, and benefitted from mentoring by experienced members. I also found their microscopy workshop very informative. By the start of the 2011 season the apiary was ready for occupation and Hughenden Manor's name was put on the HWBKA Swarm List.

The help of HWBKA members in obtaining and installing two colonies in May was invaluable. With everything up and running, we were delighted to welcome the widower of our benefactor, Mrs Jane Wimbury, to the apiary and thrilled to hear that he had



*Hughenden Manor, north front entrance. Photo by Keith Broadey.*

supplemented his wife's legacy to nearby Greys Court by donating them a second beehive.

During the summer we were joined by a master beekeeper from Peru whose knowledge and skills have been a huge asset, encouraging us to observe the bees closely and on occasion, like him, to handle them without gloves. We inspected the colonies and having applied varroa treatments, we gave the bees the first of several winter feeds, our first season having produced no honey harvest. The hives were then protected against mice and woodpeckers; fortunately regular monitoring and hole-filling ensured that the fencing withstood repeated attempts by badgers to dig underneath.

Both colonies overwintered successfully, but quite early this season it became clear that one of our queens was failing so she was killed and superseded; two nucs were set up as insurance, supplemented on Diamond Jubilee day by another swarm. The exceptionally poor weather in May and June necessitated feeding; the weather induced one colony to swarm, but our re-queened and revitalised colony stayed put and has now yielded a small honey harvest. We approach winter with four colonies, having combined the smallest with one of the nucs, and generous new funding from two local NT Associations, Aylesbury and Harrow, has enabled us to expand the apiary by purchasing four more hives for 2013.

In addition to practical beekeeping activities, we discovered that honey bees were important to Disraeli; he mentioned them in his speeches and awarded the 'Order of the B' to favoured lady friends.

More recently during World War II, when Hughenden Manor became 'Hillside' where the maps used by Bomber Command were prepared in great secrecy, the 'Dig for Victory' campaign depended on successful insect pollination.



*Winter apiary, February 2012. Photo by Janet Pascoe.*



'Meet the beekeepers' has proved a hit whatever the weather Photo: Janet Pascoe.



Dr David Aston visiting our stall at the Bucks County Seminar 2012. Photo by Janet Pascoe.

Our visitors show great interest in bees and beekeeping, and real concern for the future of our insect pollinators. On inspection day, the walk in beekeeping suits from the stable yard to the apiary invariably generates quite a crowd, many of whom then follow us in Pied Piper fashion to the apiary fence where they can observe what is going on and ask questions. We will be providing 'interpretation' panels and are working on designs for our honey bee stories as part of Hughenden's drive to improve presentation to visitors. 'Meet the Beekeepers' events have proved a big hit whatever the weather, as have the stalls taken at local fetes; we were also delighted with the interest in our display at this year's excellent Bucks County Beekeepers' Seminar. Getting the message

across is one of our key objectives, so as well as interacting directly with the public, an IT-savvy volunteer has set up a blog, which we have called Hughenden Buzz, and which we do hope you will visit at <http://hughendenbees.wordpress.com/> or scan our QR code opposite to follow our progress.



**Dr Janet Pascoe,**  
Volunteer, Hughenden Bee Project,  
High Wycombe BKA

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(Jul October 2011)

# Learning from Others: European Foul Brood

There was an interesting item giving the history of the development of EFB in the UK in August BBKA News. I hope that any beekeeper reading this will vow to tell fellow beekeepers if he or she is unfortunate enough to experience the disease in a colony. Past

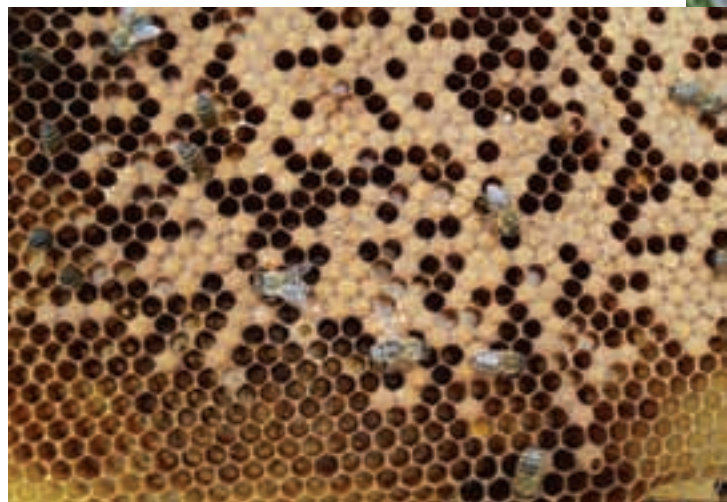
- 'shook swarm' — three times
- 'colony destruction' — twice.

Seeing all the brood consumed by fire is sad enough, but having to suffocate a colony of bees prior to destruction is demoralising.

Also, having standstill orders in force (one issued on 17 May 2006 could not be lifted until 8 May 2007) strictly limits what one can do with both equipment and any harvest, when frames with comb, brood and honey are burned, as happened at my apiary on 6 August (see above). Fortunately I had not exceeded the number of colonies for which I had paid BDI, so easily done when one takes a swarm or splits a colony during the season. I sent off my



*The devastation that EFB causes to a colony, resulting in its eventual demise. All photos by Morag Crawley.*



practice indicates that not everyone is frank in disclosing information, the only way in which we have any hope of identifying the feral source(s) thought to be the cause.

Sadly I have more than a passing interest in this brood disease. I am not alone among beekeepers in the immediate vicinity of Liss/Petersfield in having to cope with this virulent infection. However, David Purchase, as Seasonal bee Inspector (SBI), became far too well-acquainted with my apiary site and now Debbie Park, our current SBI, is dealing with the latest outbreak, the fifth at my apiary since May 2005. Treatment has been:



claim to the BDI Claims Manager and within seven days I received the cheque in compensation; far swifter than one might expect on other insurance claims. I would far rather still have the large colony of bees and their supers but at least the cost of replacement frames and foundation will be covered.

As our SBI reminds us any box of bees counts as a colony, small, medium or large and with or without a queen; something that is worth remembering.

**Morag Crawley,**  
Petersfield BKA

# BBKA Forum 2012

The Forum is a relatively new part of the BBKA's calendar (only about 15 years old!), and, as I understand it, it was set up to improve communications between the member-Associations and the Executive. The only other event that brings together Associations and Executive is the ADM, which is a more formal affair with no time to discuss ideas freely. With the increased membership, the Forum would therefore seem to be more important than ever, which makes the disappointing attendance (only 27 Associations represented) somewhat disquieting.

We were late starting, as things were even more chaotic than usual on the roads around Stoneleigh Park, with a huge Scout jamboree, a dog show and something to do with horses going on at the same time. Some delegates were a little late arriving as a consequence. David Aston briefly welcomed everybody and introduced the arrangements for the day, which included not using the toilets as they had failed to cope with the sudden visits of 50+ people arriving after a long time on the road! Luckily this was soon resolved.

Debate was opened by Penny Learmonth with a plea to move the Spring Convention back to Stoneleigh. The experience of the morning had somewhat undermined her attempts to extol the virtues of Stoneleigh, but her points were received well, and a thorough discussion ensued. Tim Lovett, replying, accepted the points that had been made. He acknowledged that the move had increased the journey time for some people (he reckoned 45 minutes, maximum), but equally this had decreased for others. The consensus was for giving Harper Adams another try (we are in any case already committed for next year).

Karen Courtman from the London BKA gave an account of the recent travails of her Association under the title of 'Urban Beekeeping'. The number of colonies in London have doubled in recent years, with many people taking up beekeeping out of a desire to 'save the bee'. Many had obtained bees elsewhere without much preparation or support with the result that London BKA members had to pick up the pieces.

As a result of all this, London BKA had changed in character. As a bigger organisation it had had to become more organised, and could not be the casual, informal club it had previously been. It had had to widen its approach and was advising people that one did not have to keep bees in order to save them. It handed out seeds for bee-friendly plants, and advised on other things that could be done for bees, and in some cases sought to dissuade people from keeping bees on roofs. Responses from the floor reflected sympathy and recognition of the picture painted, which was not unique to London.

Lea Bayly from Devon introduced questions about the BBKA Swarm Collection system, which turned into another very helpful practical discussion. Jane Moseley assured us that everyone on the BBKA list has been approved by their local association. Some argued that it was impossible to have a single co-ordinator for an area; others explained their method of having a mobile phone for the co-ordinator, which could then be passed around a team of people, thus sharing the workload and covering holidays etc.

Lunch was a very pleasant affair, with warm sunshine attracting most people outside, without that usual nagging feeling (the

beekeeping season being largely over) that you could have been out with the bees in such weather.

After lunch the discussion was on communications within the BBKA, for which we split into smaller groups. In general there was much support for using electronic media — communicating with members by email rather than paper, making *BBKA News* available to members on the website, using Twitter and Facebook to communicate both with members and non-members. Nevertheless, there was unanimous support for the Forum as a means of face-to-face contact. Some favoured moving the Forum so that it came earlier in the year and gave all concerned more time to follow up ideas before the ADM. However, opinion was divided on this, and even more divided as to when to move the Forum to! Jane Moseley responded for BBKA management and told the delegates that a lot of their suggestions were already in the pipeline, but that many ideas required extra manpower and money, and therefore took time to realise.

The next three issues were combined, with brief introductions followed by a question and answer session. I outlined the BBKA's plans to support training via our new national Training Co-ordinator, David Blower. In the ensuing discussion David Blower was able to fill in some detail about our projects.

Mary Hunter from Middlesex, had come with a whole shopping list of things the BBKA could do for its members, the major one being to sponsor a number of Seasonal Bee Inspectors to support local Associations. This was questioned by several speakers (as one put it: this government does little enough for bees and beekeeping and we need to be careful about taking over the one thing it does presently do). However, some of Mary's other suggestions were welcomed; by me, because they coincided with our training plans (web-based training) and by Roger Patterson, because he could announce that he had just produced advice leaflets on how to give up beekeeping and on how to deal with abandoned hives — two of her requests.

Jonathan Coote had some concrete proposals to streamline the administration of the Basic Assessment, which were entirely logical and practical, but which unfortunately did not find favour with the Examinations Board because of the necessity to maintain checks and safeguards. Jonathan also suggested splitting the Basic into two stages and interposing an intermediate stage between Basic and General Husbandry — two ideas which the Exams Board has seriously considered, but rejected for the moment because of the extra demands this would place on the already-stretched force of assessors. The ensuing discussion was wide-ranging, well-informed and constructive, with various suggestions for measuring the success of the training initiative. Proposals that the BBKA should work with schools, and that we should team up with the Soroptomists were both welcomed by Jane Moseley who was happy to announce that these were two initiatives already being actively pursued.

The contentious issue of neonicotinoids was raised as the final topic by Jonathan Coote, who referred to the recent research papers on their sub-lethal effects. He criticised the attitude of the various authorities and was concerned that the BBKA should not again be embroiled in criticism because of its stance on pesticides. He was worried that systemic pesticides were now freely available

to buy for household and garden use, in contravention of previous assurances from Bayer. David Aston responded with a plea for the delegates to support the BBKA policy on this. We were urging the proper authorities to fulfil their responsibilities in this area; either to reassure us that these substances did not pose a risk to honey bees, or to change the licences accordingly. Tim Lovett argued that the BBKA has more clout if it takes a measured stance and remains in dialogue with agricultural interests. Jonathan argued again for pressure to be exerted to make sure that risk assessment procedures were adequate for this new type of pesticide.

This was only the second Forum I have ever attended; most mortals do not get to attend these things, although any member of the BBKA is entitled to attend as a 'visitor'. As always with such events I found it immensely enjoyable to meet beekeepers from all around the country. Even when debate was heated, mutual respect was shown on the basis that we all shared the same motivation: to guarantee the future of beekeeping and the role of the BBKA.

**Peter Sutcliffe**, BBKA Executive

## Exam Talk

- ❑ Now is the time to be preparing for the March Module Exams
- ❑ Get those Exam Books on your Christmas List — Booklist is on the Website

## BBKA Examinations Board Examination Dates 2013

**March 23rd 2013**      **Module 1,2,3,6,8 Examinations**  
(Applications in by 10th February 2013)

**November 9th 2013**      **Module 1,2,3,5,7 Examinations**  
(Applications in by 30th September 2013)

**Advanced Certificate in Beekeeping Husbandry –  
15th/16th June 2013**  
(Applications in by 28th February 2013)

**General Certificate in Beekeeping Husbandry and  
Microscopy**

Date by arrangement with the Examinations Board Secretary  
(Applications in by 28th February 2013. Microscopy Assessment takes place in autumn)

**Basic and Junior Certificate**

Date by arrangement with the County Examinations Secretary  
(Applications 1 month before assessment)

## News in Brief Bees for Development

Bees for Development Trust has announced that Professor Tom Seeley, eminent honey bee biologist, has become a patron of the charity. Professor Seeley has studied the ecology of the honey bee for over thirty years and through his work, the beekeeping community have gained considerable knowledge of how the honey bee behaves in nature.

Tom Seeley's research has involved years of monitoring a population of feral *Apis mellifera* honey bee colonies living in New York State's Arnot Forest showing that honey bees can persist in the presence of varroa mites, and concluding that a stable bee-mite relationship had been achieved within the study population. The most likely explanation is that the varroa mites have become less virulent, rather than the honey bees have developed resistance. This research suggests that beekeepers may yet be able to escape the worst consequences of varroa if beekeeping approaches are adopted to minimise the horizontal spread of pathogens, as horizontal transmission (infectious spread) of pathogens tends to maintain high virulence.

In addition to Professor Seeley, Bees for Development Trust, enjoys the support from four further Patrons: Monty Don, Martha Kearney, Bill Turnbull and Sting. The Trust is currently planning for new projects to achieve their aims of alleviating poverty through sustainable beekeeping and is seeking additional trustees to help. If you are interest to become a trustee of Bees for Development Trust, you can find out more on [www.beesfordevelopment.org](http://www.beesfordevelopment.org)

## BBKA Research Fund Campaign



In support of the BBKA's aim to raise funds for research, Melissa Rose from Chesterfield and District BKA, decided she would take part in a 10k race dressed as a bee! The event, 'Shireoaks Towpath and Trail 10k', took place along the Chesterfield Canal from Shireoaks to Worksop in NE Derbyshire, Nottinghamshire on 20 May 2012. Melissa raised a very impressive £370 which she will forward to the BBKA Research Fund.

**Robin Bagnall**, Chesterfield and District BKA

# International Meeting of Young Beekeepers

In recent months you will have read about the success of the English team in the International Meeting of Young Beekeepers 2012. However, it is likely that this is the first time that you have heard of this competition and this short article is to give some background and hopefully a launch into the future for success in future years.

The competition started in 2010 as a means of bringing together young beekeepers from across Europe to meet and see beekeeping in a wider view. There are both social and competitive aspects to the meeting but all of the young (12 to 16 years old) entrants are expected to have knowledge of bees and beekeeping, be able to handle a colony of bees and make a short national presentation to the other participants.

England has entered teams in 2011 and 2012 who have done

well and were organised locally by determined individuals. The BBKA has provided sponsorship for travelling expenses etc. The participants have enjoyed the events and it is seen as a good experience for young people from more than just a beekeeping point of view. As the age range is narrow there needs to be a method of generating succession both of participants and guardians.

This article is a call to any young beekeepers and their parents or trainers who may have an interest in future years to build up possible teams as and when participants leave the age range and to ensure that lessons learned are passed to new teams to maximise chances of success. If you have an interest please contact the BBKA General Secretary.

Julian Routh, BBKA Executive

## Your Letters

### Alternative View on Queen Clipping

In reply to Bridget Beattie on queen clipping, I am nowhere near as experienced a beekeeper as Bridget and may never be. But I have strong feelings too about clipping and I would like to share them.

After beekeeping for a couple of years and getting very fed up with swarms and controlling them I decided to go down the route of clipping queens as a means of control. I can say now that I will never go back to not clipping. I have found that not only does it mean you do not get caught out and lose half the workforce of a colony, but that there are other effects. Some colonies behave differently after the queen is clipped. Supersedure is now more common. Clipping does not always mean the queen is lost on leaving the hive, sometimes she is found by part of the swarm and they will cover her. Then, it is a simple matter of placing a box over them and they will go up into it. One colony in particular has really improved in behaviour: prior to clipping there were constant swarms several times in a season and queen cells at the expense of all else. Now: no queen cells at all this season on last year's queen. I wait to see if it will be her there in the spring. It has become my best colony; it is very strong.

I have my own theory that the arrival of varroa causes bees to swarm more, and another change in behaviour is bees leaving a colony with little or no brood when swarming. I have talked to other beekeepers about clipping and it is an emotive issue; most that I know do not do it. You know she needs her wings for mating flights; after that the only reason she needs wings is to swarm. To me the queen is the egg-layer; I am really not sentimental over her being entire. I ask you to consider why we neuter our pets. Or, as in my case, keep chickens without cockerels. As for the point about letting them be natural, they are about as natural as they are going to be in a box, and happy to live there until they want to swarm, which they would do if they lived in a hole in a tree.

If you are like Bridget, in constant touch with your hives and have a surplus of equipment and time, then leave your queens entire. If you are like me, with a few hives that I would rather leave to do their own thing (and somehow is not that more natural?)



Dear Ed.

and not have to view them for several hours a week, then try clipping. I would like to add that I work hard to maintain my hives to a high standard of cleanliness, prepare ahead with equipment, and I keep abreast of all issues so please do not think that clipping is an excuse for being sloppy. It actually gives me peace of mind.

Anne Scambler,  
Southport BKA

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## Diary of Events

### 2012

**1 November.** Lincolnshire BKA Autumn Lecture: Apitherapy. Speaker: John Drakes. 7.30pm at Rural Science Centre, Riseholme College, Lincoln LN2 3RS. Advance booking only £3. Contact Mike Beecham 01507 578612, [mike@codemill.eclipse.co.uk](mailto:mike@codemill.eclipse.co.uk) <http://www.bbka.org.uk/local/lincolnshire>

**10 November.** Essex BKA conference 'Beekeeping in the 21st Century', £20, full details <http://www.harlowbees.co.uk/conference/>

**10 November.** Hampshire BKA Autumn Convention, Barton Peveril College, Southampton. Speakers: Henk Tennekes

(Neonicotinoids), Gia Aradottir (GM), Richard Pettifer (Climate Change); workshops, displays, trade-stands. Info <http://www.hampshirebeekeepers.org.uk> or Jan Roper [jan.roper@rya-online.net](mailto:jan.roper@rya-online.net) or Tel: 02380 845875

**23-25 November.** Central Association of Beekeepers' Stratford Conference: Speakers and dinner. Contact Pat Allen tel: 01708 220897, Email: [pat.allen@btconnect.com](mailto:pat.allen@btconnect.com), web: [www.cabk.org.uk](http://www.cabk.org.uk)

### 2013

**12-14 April.** BBKA Spring Convention, Harper Adams University College, Newport, Shropshire.

# Your Letters



## Second-hand Equipment

I was not surprised by the Food Standards Agency's response to Stewart Gould's enquiry about second-hand jars in last month's *BBKA News* (September, 2012, No: 205, page 34). The FSA's caution is understandable; second-hand equipment may not be up to standard — and this does not apply just to jars.

New, purpose-made equipment, from a reputable manufacturer and supplier is the ideal. But, of course there is a thriving market in second-hand equipment; you have only to look at eBay and the thriving association auctions that take place and you will see all sorts of equipment for sale — extractors, settling tanks, strainers, uncapping equipment, honey buckets. It is not just beekeepers who are at it — there is a thriving market in second-hand catering equipment as a quick search on eBay will reveal, and Mr Greenwood's comments would apply equally to all of that.

The food safety legislation does not require that equipment is new. But there are requirements that it is in sound condition and easy to clean, and there are certain specific requirements, such as the types of plastic that are approved for food use; the concern is that food is not harmed by the equipment. So the item, jar, extractor, settling tank etc, has to be suitable for the intended use, and the food producer has to be confident of that. Ultimately it would be for the courts to decide whether the food producer could successfully use the 'due diligence' defence in a dispute.

So the questions are really what hazards could be presented by second-hand equipment, and how can they be controlled. The hazards include bacterial contamination, chemical contamination or physical contamination of the food product. Using honey jars as an example; adequately controlling those hazards ought be possible. Although they are not made specifically to be reused, jars are robust and do not deteriorate if handled sensibly. Mr Greenwood suggests a 'closed loop' as one control, and that could be interpreted by only recycling jars only from trusted sources (your own, family, friends and jars returned by reliable customers, perhaps). Only reusing specifically honey jars, or perhaps very similar jars (made for use with food, with a screw cap that hermetically seals) would help us gain confidence that the jar was suitable to reuse for honey.

Of course, reject anything with a 'dodgy' provenance; jars that have contained strongly flavoured contents are difficult to clean sufficiently. For example, pickle jars retain a faint odour even after they have been washed and dish-washed! Other controls could include:

- A visual check to make sure jars are not chipped or damaged, or the lids rusty.
- Thorough washing both of jars and lids using a food-safe, anti-bacterial washing-up liquid or putting in a dishwasher, (you would do this with new jars, anyway, of course, wouldn't you!), a sanitizing rinse, and air drying.
- Careful storage until they are ready to use.

This ought to put the jars into a condition suitable for use.

One consideration with jars is that removing labels is not easy!

Some adhesives take inordinate effort to remove, and there is a risk that 'label debris' could get inside the jar and so become a contaminant. All this means that recycling jars represents quite a lot of labour to save a relatively small sum of money.

As I say, this does not apply just to jars. Any equipment used in food processing must be suitable for use. Much older equipment is no longer fit for purpose, but regularly, tinplate extractors and ripening tanks appear for sale; some look to be fifty years old or more, some in quite poor condition. A particular concern is that they are likely to have soldered seams; solder being an alloy of lead and tin, prone to attack by acidic honey. Chemical analysis (FSIS 01/07 *Survey of metals in a variety of foods*, FSA, January, 2007) has revealed lead contamination in two out of 25 samples. In general there was a very low lead level found (less than 0.05 mg/kg, but a couple of the samples returned higher levels of 0.13 and 0.28 mg/kg) perhaps because tinplate or galvanised extractor or ripening tanks had been used. They may have been 'state of the art' when they were new, but they are not fit for purpose now. Today, food grade plastic or stainless steel equipment is essential.

**Andy Pedley,**

Member of the Chartered Institute of  
Environmental Health (MCIEH)

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