

BBKA News

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



No: 197 – January 2012

National Honey Show



The culmination of the season's beekeeping at last year's National Honey Show exceeded all expectations. Our 80th Show has travelled a long way since its days at the Crystal Palace — over 75 years and about 30 miles!

Among the prestigious speakers and topical subjects covered, Professor Tom Seeley, from Cornell University, packed our lecture hall to overflowing with his talks that included 'The Beehive as Honey Factory' and 'The Design and Use of Bait Hives'. Also drawing the crowds Erik Osterlund covered the fight against varroa in Sweden, and Dr Nigel Raine talked about 'Learning to Forage in the Foral Supermarket'. Similarly, seats were at a premium for Professor Robert Pickard's talk on 'Honey Bees and Humans: Our place in the Universe'. In the trade and education hall, in addition to our favourite stands from whom advance orders could be collected at the show, and the popular raffle and honey for sale, there was an array of new trade stands.

On the Saturday we were highly entertained to see the arrival of a small theatre company, part of the travelling display from the Co-op. Visitors were invited to dress up as a flower, and another as a honey bee with a strap-on wings and nose/proboscis. As the honey bee took a run (with great hilarity) at the flower, her wings flapped and her false nose simulated the collection of nectar and scattering of pollen for dusting the next flower.

The quality and quantity of entries in the competitive National Honey Show classes kept the judges very busy. In fact, having seen some of the entries, we should all be inspired to spend these long winter evenings planning and making our craft entries to sweep the board at the 2012 National Honey Show at St George's College, Weybridge on Thurs 25–Sat 27 October. Hope to see you there!

Val Rhenius, National Honey Show Publicity Officer



Defender of the City?
Propolis may be the beekeepers' *bête noire*, but it is highly useful both to bees and man. Read why on page 11.



'Wild' gardening for bees:
A new series to help you garden with bees in mind, packed with information, tips and plant know-how for garden lovers, page 14.



Cooking with honey:
A new series bringing you scrumptious treats to tempt all tastebuds. For this month's yummy recipes turn to page 26.





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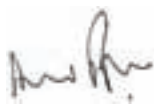
Chairman's Letter

In my final report I would highlight changes to the BBKA during my time both as a Trustee and lately as Chairman. When I became a Trustee the main talking point was the need to improve/update the Constitution of the Charity and while this did not capture my imagination it was necessary to have a road map that we all could agree represented the charity's aims. Membership was not very high and money was extremely tight and every decision that needed expenditure, a new leaflet etc, was subject to much heart searching; frustrating when as Chairman of Promotion and Publicity I was trying to complete projects.

Lack of interest from Government in the plight of honey bees, [remember Lord Rooker's statement in parliament 'We do not deny that bee health is at risk. Frankly, if nothing is done about it, the honey bee population could be wiped out in ten years'] forced the BBKA and its members, under the lead of Tim Lovett to force a change of heart from Government, which saw investment under the Insect Pollinator Initiative. This highlighting of honey bee plight to Government raised the profile of bees and beekeeping, and associations have seen a surge in members with all of the associated problems of the 'training load' which has been managed extremely well; something for which we can all be extremely proud. Of course the membership surge has increased the pace of change within the BBKA, the following being some that will continue to benefit members for years to come:

- ❑ BBKA's return to the Healthy Bee Project Board, has ensured we have an important voice when it comes to shaping policy.
- ❑ The introduction of a monthly edition of *BBKA News*, has been well received by members and advertisers.
- ❑ Introduction of the Course in a Case Series (CiC), brings standardisation to beekeeping teaching.
- ❑ Train the Trainer courses, took CiC to the associations and will be enhanced by the introduction of Education Coordinators
- ❑ Development of a forward looking strategy that seeks to develop an income not totally reliant upon capitation has been achieved by finding supporters of the BBKA in industry and among the general public who have supported our aims and ambitions.
- ❑ The employment of a fulltime Operations Director/General Secretary has had a major impact on BBKA's ability to develop.

For many Trustees the November meeting was their last with Martin Smith President, Chris Deaves Chairman of Education and Husbandry and Brian Dennis Chairman of the Stoneleigh Shows Committee all standing down. Additionally John Hendrie has decided to leave, David Bancalari has been forced to resign through ill health, and Michael Young MBE left earlier in the year when work and travel timetables clashed. I would like to thank them and all BBKA staff and volunteers for their work for the BBKA; without good people the BBKA would not be able to serve your interests. The first meeting in 2012 allows the election of a new Chairman, and I wish him well.



Brian Ripley, Chairman, BBKA

Cover photos: National Honey Show 2011 images Steve Turner and Christine Knott; right-hand panel: top, Ben Heaf; middle, Christine Knott; bottom, Mary Hill.

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In the Apiary

In this series I hope to guide you through the year's work and consider what the bees are doing at this time of year. Because of printing and mailing requirements the articles are written about six weeks before you see them, so if the weather does not act as predicted some of the actions may be out of time. Let us hope the coming year's weather is more 'normal' than last year when we had a fantastic spring followed by a poor summer, especially in the north of the country.

January is a time of awakening in the apiary, if the queen stopped laying eggs during the coldest part of the winter, she will be starting again sometime in this month. Significant changes occur and the workers will be very active. Even on cold or wet days the workers will be required to keep the centre of the nest at around 33°C rather than letting it drop to about 20°C, the temperature required to ensure that the workers remain warm enough to stay active and not become torpid. The outside temperature will be about zero so the bees will be generating a lot of heat and using a lot of honey stores to generate that heat.



Salix aegyptiaca. Photo by Dr Bee.

Now is the time when the remaining stores in the hive will be used rapidly and we must ensure that the colony does not run out. Hefting the hive will identify the weak ones and those where we did not leave enough food for the bees. If very light then the best food is a pad of candy placed immediately over the brood on the top bars.

January is a good time to treat the bees with oxalic acid as a control for varroa. When there is no brood in the nest all the mites are in the phoretic stage i.e. existing on the adult bees. This is where they are most vulnerable to oxalic acid. Two key points here are to:

- use a properly formulated medicine and follow the instructions; do not over- or under-dose the colony
- apply the solution when there is a minimum quantity of sealed brood in the colony.

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Please remember that mites will stay on the bees until just before the fresh larvae are sealed in their cells with brood cappings. For this reason the time chosen to apply oxalic acid should be within a week of the end of a particularly cold snap. If you leave it too late the mites will be safe in sealed cells and will not be affected by oxalic acid. If possible apply oxalic acid on a warm and sunny day; this is not always possible but the ideal situation is when the bees inside the hive have broken the cluster and are moving freely. This helps the acid to get distributed through the nest and onto all the bees.



Bees on Crocus. Photo by Dr Bee.

Once the queen starts to raise new brood, workers will need to get out and find fresh pollen. If your bees are in your garden, then it is good to have plants that flower in January. Willows are a good source of pollen and there is one called *Salix aegyptiaca*, a musk willow that under the right conditions will flower in January. Other plants that are useful are crocus, winter flowering honeysuckle and viburnum tynus. The bees seem to recognise that fresh pollen is better for the brood than pollen stored in the hive over winter.

Watching at the entrance of the hive will help to confirm that the queen is still present and laying eggs. If all is well the workers will take every opportunity to fly to collect pollen and they can be seen returning with pollen loads on their corbiculae. No fresh pollen intake can mean that there are problems in the hive and the queen may have died or the number of bees in the colony is fewer than required to build the colony successfully once winter is over.

January is a good time to look at your spare equipment and ensure it is clean, bee-tight and ready for use. Scrape all the burr comb off hive parts and queen excluders etc. and then use a blowtorch or equivalent electrical paint scraper to lightly scorch the inside of all the components. It is a good time to paint the outside with a wood preservative or water soluble microporous paint so that the hive parts have time to breathe and dry before they are used. If this is not done in winter, spring suddenly comes along and the hive parts need to be used in their old, dirty state.

Dr Bee

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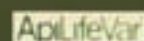
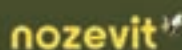
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Beekeeping Notes for Beginners



Happy New Year to you and your bees. This month may be a quiet one in the apiary, but if your bees have high levels of varroa do not delay in treating with oxalic acid. Soon the queen will begin laying and this cannot be done with brood present. If all is well in your hive and you have planned ahead for the next season why not give some thought to improving your beekeeping knowledge? You could begin by taking the 'Basic' as Chris Deaves explains.

Urgent action may be needed NOW

There is very little to do in the apiary at present, but soon the bees will be starting their annual growth cycle. Last time, we talked about possible treatments for varroa, if needed. NOW is the time to do it, the end of January is TOO LATE for using oxalic acid.

What else should I be thinking about?

You may be using an external stack of supers to try and control wax moth. If not, and a hard frost over a couple of days is forecast, there is no harm in placing empty supers in a stack outside, with a clean floorboard and roof. This will kill a lot of wax moth eggs and larvae. Remember to bring them back into a bee-tight environment before it warms up again.

While the bees are clustered in their hives, the grass is short and the ground is hard (unless the UK winter reverts to type and becomes wet again) it is a good time to think about your apiary layout and make some changes without hitting the 'three feet or three miles' rule, which usually governs colony moves. In deep winter there is less risk of bees losing orientation because, firstly, the majority of bees in the hive now will not last very long into spring and secondly, most of the foraging bees will be 'new' in the spring and will learn their new location anyway.

Points to ponder and improve:

- ❑ Did you suffer from drifting of bees from one hive to another?
- ❑ Did you have enough space between hives to work comfortably?
- ❑ If you had more than one hive open at once, did you see signs of colony robbing?
- ❑ Did you have room to conduct your preferred swarm management techniques?
- ❑ Would you have had room if you needed to do this to two adjacent hives at once?
- ❑ Does your apiary have more hives and nuclei than you expected to have at this time of year?
- ❑ Where will you put this year's new hives?
- ❑ Was all your equipment easily to hand and stored in a bee-tight place?
- ❑ Was it easy to mix feed and transport feeders?
- ❑ Was it easy to remove, wrap and store supers before extraction?
- ❑ Was it easy to empty, fill and clean your solar or other wax processing equipment?
- ❑ What have the neighbours (human or livestock) had to say about your bees over the last year?

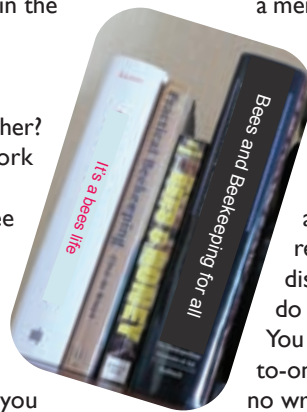
Finally, if you have had a good crop, you will have understood how heavy supers can be. At this time of year the hives are at their lightest. It is sensible to look at each hive position, temporarily move the hive to one side and re-level bases and hive stands. Also, now is a good time to repair or replace uneven stands; you can work on one stand at a time through the apiary.

The 'Basic'

By now, you will have gathered that there is more to beekeeping than you first thought. You will probably also have gathered that the BBKA operates a system of Examinations and Assessments — please keep reading! The BBKA qualification structure is well established and extensive. There are both theoretical and practical routes through this, together with some other topics such as more advanced microscopy techniques and honey judging. However, this is all for the future ... The entry point to all these more advanced qualifications is the 'Basic Assessment', commonly called the 'Basic'. Without this you cannot proceed to more advanced qualifications, but that is not its main purpose.

The real role of the 'Basic' is to allow the novice beekeeper to have their skills and competence assessed to encourage them to continue and develop their beekeeping. In this sense it is exactly like the driving test. Taking your driving test does not mean that you are the world's best driver (although you may think that at the time!) but it does mean that you have been assessed as being safe enough to go out on the road on your own and improve your driving skills through experience without being too much of a menace to others. So it is with the 'Basic'. If you

have kept your bees for a full year (spring to spring, not March to September) then you are eligible to take the 'Basic'. Your local association will organise this for you. The 'Basic' can be taken at any time (usually after the main honey crop). It is a practical assessment of beekeeping skills, simple recognition of the elements of a colony, basic disease and problem recognition and what to do about it, and general beekeeping knowledge. You work with a hive with the assessor on a one-to-one basis and are assessed by oral questioning; no writing!



Why take the basic?

There are many advantages to taking the 'Basic'. Firstly, you get a great looking certificate to hang on the wall and a badge to put on your bee suit. More seriously, the 'Basic' is often used by allotment and other land managers and produce market operators as an expression of competence and may be required by them. Taking a larger perspective, the fact that there is any system of beekeeping qualifications is a surprise to most people. By taking the 'Basic' you are adding, bit by bit, to the perception of beekeeping as a responsible and 'professional' craft. This is important in these days of 'Heath & Safety' and a litigation-minded society.

Lastly, the assessor will teach you something as well. I have never known a 'Basic' candidate who did not find the assessment instructive. Please think about it seriously in the dark winter months.

Chris Deaves, Chairman, Education and Husbandry Committee

Bee Welfare and Europe

For some time now I have been campaigning in the UK and EU for greater awareness of the plight of honey bees and for action to be taken to prevent their decline. My 'Save the Bee' campaign is something that has really resonated with many of my constituents who understand that bees are indispensable for food production, and that urgent action is needed to identify the causes of their decline and to reverse it.



*Above: Julie Girling, MEP for South West England and Gibraltar.
Right: Julie meeting with a local beekeeper.*

Regulations governing pesticide use

A recurring theme when discussing bees is the impact of pesticides. Under European legislation, pesticide-active substances are first evaluated at Community level. A key part of this process is an assessment of the risks to wildlife, including bees. If an active substance meets the EU safety requirements then products containing that active substance can be authorised at member state level, taking into account the member country's individual agronomic, climatic and dietary requirements. Many people are opposed to the use of chemicals on principle and while I respect their point of view I also believe that becoming hysterical about chemicals does not get anyone anywhere, so in addition to talking with beekeepers I have had discussions with the Crop Protection Industry. It is important to be able to see both sides of the story when listening to arguments around bee decline, and to discuss the issue in a sensible manner, especially when looking at regulation. Behavioural and sub-lethal effects are notoriously difficult to study, especially in the case of highly mobile species such as honey bees. The Crop Protection Industry therefore advocates that future research is

needed before further regulation is considered.

Ensuring best use of EU funds

I am concerned to ensure that when money is allocated by the EU to the UK for the protection of bees, this money is used effectively. Defra decides on behalf of the Government how to spend this money and I understand that many British beekeepers are unhappy with their decisions and level of transparency. I have put some questions to Defra and will be happy to share the answers when I receive them. There are calls for the continuation of existing funding programmes for apiculture, and for the current system of co-financing to be compatible with measures possible under Article 68 of the Common Agriculture Policy (CAP), which calls for more agri-



environment programmes in Pillar 2 of the CAP for apiculture.

In the UK, pesticide products can only be sold or used after they have been authorised. As part of this process, the Chemicals Regulation Directorate (CRD) of the Health and Safety Executive (the Government body responsible for regulating pesticides) undertakes an assessment of the toxicity of each product, and the ways in which spray operators, the public or environment (in particular honey bees), may be exposed. The purpose of this is to ensure that the use of the product poses no unacceptable risks. The current availability of honey bee medications is limited. However, companies such as Bayer and BASF are investing in bringing new bee health medications to the European market.

The controls extend to the use of products, and CRD routinely restricts the way they can be used, e.g. specifying dose rates, timing and place of application to

ensure protection of human health and the environment. Users are also legally obliged to take all reasonable precautions to protect the health of human beings, creatures and plants.

In recent talks, the Commission has pushed for further encouragement of Integrated Pest Management methods, and has called for increased support from the EU 8th Framework Programme (FP8) for research into disease prevention and other factors which are causing declines in bee populations.

Bee health monitoring and research

BEE DOC (Bees in Europe and the Decline Of honeybee Colonies) and STEP (Status and Trends of European Pollinators), both EU pollinator protection projects, have already achieved positive results and the EU Reference Laboratory for bee health is an excellent step forward. The BEE DOC programme has its own website which you may find of interest at www.bee-doc.eu/index.php and details of the STEP programme can be found at www.step-project.net/. In addition to further research it is important for national surveillance systems to be developed to allow comparison at EU level, and for uniform registration and identification of bee hives at national level, as this would lead to greater information sharing at all levels. Bees should be incorporated into European veterinary policy and animal health law, and there have been calls for improved risk-assessment for pesticides that could pose a risk to colony development, and for appropriate access to be made available to the findings of such assessments.

With 76% of food production and 84% of plant species dependent on pollination by bees, it is essential that we fight for their protection and survival. Without bees, food production will become a real issue. I will continue to campaign for the protection of our bees and push to ensure Governments encourage sustainable, pollinator-friendly farming practices.

For more information about the campaign to 'Save the Bee' visit: www.juliegirling.com or follow Julie on Twitter @juliegirling.

Julie Girling,
MEP for the South West of England
and Gibraltar

Honey Bee Anatomy — The Sting

In this, my final article in the series covering honey bee anatomy, we turn our attention to the sting. Beekeepers are only too aware of how effective the bee's sting is as a defence mechanism. Fortunately for the beekeeper, the sting is the bee's weapon of last resort and so careful manipulation and handling of colonies greatly reduces the number of stings received.

Located in the end of the abdomen inside segment seven, the sting mechanism is attached to several other components. Foremost among these is the acid or venom gland that produces the venom that is injected into the victim when the sting is used. Venom from this gland flows into a large transparent bag, the poison sac, where it is stored until needed (Figure 1). From the poison sac the venom flows into the sting mechanism.

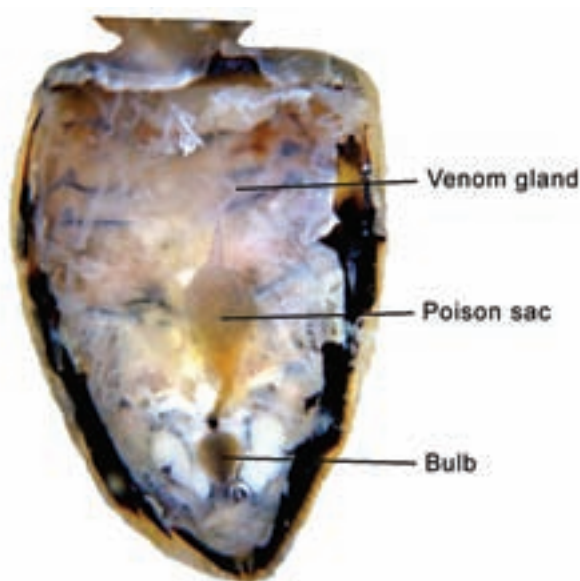


Figure 1. Interior of a worker abdomen showing the venom gland, poison sac and bulb of the sting. Photo by Graham Royle.

Young bees, just emerged from their cells, do not have any venom in the poison sac. Venom is produced and stored during the first two weeks of the bee's life.¹ The venom gland then degenerates and no more venom is produced. This explains why bees do not become guard bees until they are around eighteen days old. Without venom the sting is not such an effective defence.

The sting mechanism itself is a complex structure comprising many parts including moveable plates and powerful muscles. The structure has evolved from abdominal segments eight and nine, the

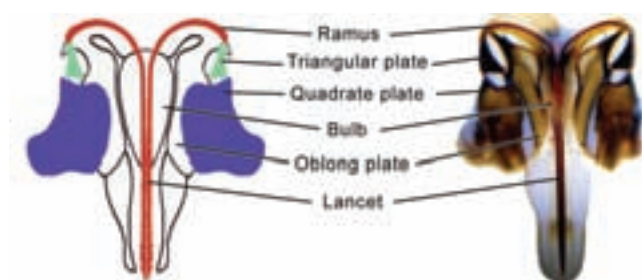


Figure 2. Drawing and photo of the sting structure. Photo by Graham Royle.

plates of the mechanism being modified sclerites of these body segments.² The structure is symmetrical about a central line running through the shaft (see Figure 2).

The shaft, which tapers to a fine point, comprises three components, two barbed lancets and the stylet (Figure 3). The lancets slide on the stylet, each being held in place by a groove in the lancet which fits over a ridge in the stylet.

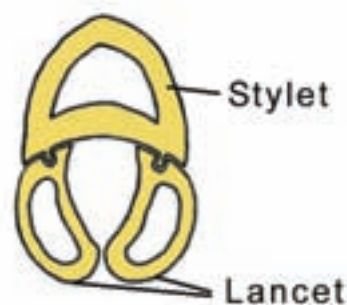


Figure 3. Cross section of the shaft showing stylet and lancets. Drawing by Graham Royle.

Either side of the shaft, each half of the mechanism comprises three distinct plates. The oblong plate forms the foundation of the structure. The quadrate plate is attached to the oblong plate by two opposing muscles. As these muscles contract alternately the effect is to move the quadrate plate back and forth relative to the



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oblong plate. One corner of the quadrate plate presses on a corner of the triangular plate and so as the quadrate plate moves back and forth it causes the triangular plate to rotate about a pivot point on the oblong plate.

“The sting mechanism is attached to the poison sac, which stores the venom that a worker bee produces during its first two weeks of life. The mechanism comprises a stylet and two barbed lancets that penetrate and embed within the victim’s skin with the aid of paired, opposing, contracting muscles and robust moveable plates. As the worker bee flies off the sting mechanism is left behind and continues to pump venom.”

Attached to the third corner of the triangular plate is the ramus, a flexible extension to the sharp ‘business end’ of the sting, the lancet. As the triangular plate pivots to and fro, the ramus is pulled and pushed causing the lancet to move forwards and backwards. Both sides of the sting mechanism work in this way, but in opposite phase, so as one lancet is moving forwards, the other is moving backwards (illustrated in Figure 4). This alternate sawing motion ensures that the sting drives deeper into the victim. The barbs on the two lancets and on the stylet assist with this by preventing each lancet from being withdrawn on the backwards stroke.

In the centre of the sting mechanism is a bulb which surrounds the two lancets. The bulb is connected to the poison sac and is full of venom. Where it passes through the bulb, each lancet has a small structure attached to it known as the umbrella valve. As each lancet moves forwards, the umbrella valve scoops up venom and forces it into a channel between the lancets and the stylet. This

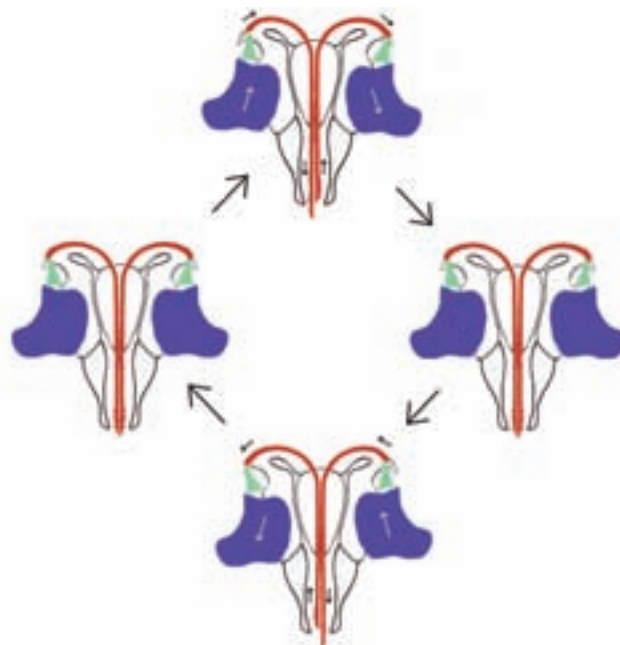


Figure 4. Cyclic operation of the sting mechanism. Drawing by Graham Royle.

venom is driven along the channel and released into the victim at the sharp end of the lancets.

When the bee feels sufficiently threatened that it needs to use its sting, it arches its abdomen and forces the tip of the lancets into the victim. The mechanics of the sting then take over, alternately driving the lancets deeper into the victim and injecting venom. The sting is only loosely attached inside the abdomen such that the bee, in its panic to get away, tears the sting from its body. This is a mortal wound for the bee, but the sting continues to operate in the absence of the bee making the deterrent even more effective.

The sting has evolved from an ovipositor or egg-laying mechanism and there are still many similarities between the sting and the ovipositor from which it evolved. An insect that clearly demonstrates this similarity is the ichneumon wasp, which lays its eggs in or on another insect; the wasp’s ovipositor has structures equivalent to the lancets in the bee which are driven alternately to pierce the body of the host allowing eggs to be laid inside the host’s body.³ The altruistic behaviour of worker honey bees, whereby they have evolved to rear the young of their queen rather than produce their own offspring, made the ovipositor redundant and it evolved to provide a very effective defensive mechanism.

Next time you get stung just think about the complexity of this amazing mechanism as it injects its venom into you. It might help distract you from thinking about the pain. Without such an efficient defence mechanism to fend off predators, honey bees would no doubt have become extinct long ago.

Graham Royle, NDB

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Defender of the City

Introduction

The phrase 'defender of the city' or 'before the city' is reputed to have been coined by the Greek, Aristotle, in using the word propolis to describe the sticky resin that *Apis mellifera* (honey bee) uses to make its home as hygienic as it can. In the wild, bee colonies can often be found with a winding tunnel of propolis leading to the combs. This ensures all creatures entering the nest have to brush against the propolis on their way in.

Some reports suggest that there are two types of propolis in a hive; one for hygiene and one for structural use. This was first suggested by the Roman, Pliny, who in fact describes three types of propolis in his 35-volume *Natural History*.

The use of propolis in modern medicine is being re-evaluated. This is due to the growing trend of antibiotic-resistant organisms and because it has been found that the flavonoid components of propolis prevent the activation of viruses by 'protecting' the viral protein coats. This prevents the virus from releasing its payload

Propolis consists of at least 150 components and on average it is made up of 55% resins and balsam, 30% beeswax, 10% aromatic oils and 4% bee pollen, the rest being bioflavonoids, phenolic acids and minerals. Artificial propolis has failed to mimic natural propolis in its anti-bacterial and anti-fungal properties.

The quality and type of resin varies from location to location depending on the foraging area. When made into propolis, it can be modified by the bees themselves when they chew the resin. It is the enzymes in the bees' saliva that modify the properties of the resin and this is mixed with varying proportions of pollen and wax, depending on its end use.

A Cuban study in 1990¹ showed that resins collected by bees are partly metabolised by them. Also Greenaway and colleagues² in 1997 showed that the chemical structure of bioflavonoids in the resin collected by bees is changed through the addition of enzymes in bee saliva which metabolises the resin by the time it appears in propolis.

Functions of propolis in the hive

Propolis can be used to line the inside of cells before the queen lays her eggs; she will not lay eggs in unlined cells. It not only makes the cell hygienic, but acts rather like carbon fibre in reinforcing the strength of the cell to take the added weight of a developing offspring. It is also used to raise the softening temperature of the wax at the rim of the cell; the rims are used by the bees to communicate sounds and vibrations to each other. Softened wax is not a good transmitter of sound, neither is comb surrounded by wood.

The most well known use of propolis is its architectural use in blocking holes and sticking everything together (bee glue). This form is the one most beekeepers dislike as it locks the frames together preventing easy inspection and manipulation.

Pliny found three uses of propolis. The first he named *Commosis*, from which the word 'cosmetic' comes. This is the thin, almost liquid propolis used to line the cells and paint all over the hive to keep it hygienic. It is also mixed with wax to cap the cells so making them hygienic. The propolis incorporated into the cells acts as a natural inhibitor of foul brood and other diseases. The second he called *Pissoceros*. This is thicker and used to fill holes and cracks and to reinforce the rims of the cells. It is also used to control air circulation and ventilation. Hence frames and top boards are propolised to control air flow and ventilation. The third he called *Propolis*, the thickest of all, in fact solid at normal hive temperatures, and was used mainly for making the entrance tunnel into the hive. It still appears on the floors of hives today, just inside the entrance, so is still used to protect the hive and clean the bees when they enter the hive; providing it is not continually removed.

Propolis acts as a deterrent to all forms of microbes and bacteria and even larger creatures. Bumblebees, mice, frogs and snails have been found in hives covered in propolis. This stops their decomposition and hence stops infections spreading through the hive. Research has also shown that *Bacillus larvae*, the cause of AFB, succumbs to propolis.^{3,4}

Research published in a university thesis in which a 7.5% propolis tincture (in ethanol) was sprayed directly onto bees to



Propolis in a hive. Photo by Ben Heaf.

and hence there is no harm to beneficial organisms within the body. Bioflavonoids can also boost the body's natural defences by encouraging the production of interferon and antibodies from the spleen, (reviewed by James Fearnley in *Bee Propolis*) rather than using antibiotics, which are more destructive and can have some side-effects such as killing friendly bacteria in our intestines. Throughout history propolis has been used by mankind to help with numerous illnesses. From ancient Egypt to the modern day, propolis has been 'defending the city'.

What is propolis?

Over the millennia some bees, not all bees, have found that the resins from certain trees and plants were useful to them. *Apis mellifera* in particular makes propolis from a combination of resin, wax and pollen, and possibly saliva and some enzymes produced by the bee. The result is the red/orange/green/brown/black sticky substance called propolis. The resin that becomes part of propolis is produced by a tree or plant to protect it against damage arising from various events. For example, it protects buds from severe UV damage and external mould in damp conditions, and it protects against infection when exuded into wounds on tree trunks and branches.

treat varroa showed 100% death of the varroa and no apparent ill effects on the bees. But the long-term effect on the bees of this treatment is not known. I have used this treatment myself this year and it does increase varroa drop, but I have not done this in a controlled way; I just sprayed down between the frames and monitored the numbers on the varroa board.

So what should we do about propolis in the hive?

Personally, I feel it is essential to the continued health of the bee. It is an inconvenience to framed hive beekeepers I admit, but by leaving it in the hive and not continually removing it at each inspection, it leaves the bees with their hygienic surroundings intact and will reduce or eliminate the chances of infection. Perhaps good research questions would be to ask if the amount/volume of propolis in a hive is correlated to the incidence of infection and what effect propolis has on varroa.

Use by man

Propolis has been used by man for thousands of years. The ancient Egyptians used propolis in the mummification of their dead. In Culpeper's herbal book he recommends using propolis for reducing fevers and inflammation, as a tincture in broth for internal ulcers and as a topical application to cuts and abrasions.

The bioflavonoid content has been shown to block the production of prostaglandins, which cause pain and fever in man. Bioflavonoids operate similarly to aspirin but have no side-effects. They also stimulate the production of interferon, our body's natural disease fighter.

In various Russian, Romanian and Bulgarian research studies

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Propolis 'three ways': (1) dried propolis and royal jelly capsules used for gastric and intestinal upsets, (2) pipette with tincture of propolis used for sore throats, bleeding gums and skin wounds/abrasions and (3) untreated propolis, which when chewed can boost the immune system and can be added to wine or spirits to 'give it a boost.' Photo by Stewart Bell.

into the uses of propolis benefits were found to include: reducing the effects of radiation; reducing the activity of herpes; antiviral properties; inhibiting cancer cells; liver protection; stimulation of the immune system; reduction in gastrointestinal and urinary tract infections, and improved healing and bone growth. It has also been found to have antioxidant properties.

Well, with all this going for propolis, no wonder the bees would like to keep it for themselves. After ten million years they know what they need to keep themselves healthy. As much propolis as possible should be left with the bees to maintain their health. Inside their hygienic warm cocoon, they have the control and organisation to maintain the environment needed for the continuation of their vital species. We, as guardians, should be letting the bees do this, through allowing them to keep their propolis and not be removing it. At present, with all the diseases and vanishing colonies their need is greater than ours.

NB: Medical uses of propolis should be after consultation with your GP.

Stewart Bell, Blackpool and Fylde BKA
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Notes From a Clifftop Apiary

January. Feet-up time for the beekeeper is coming to an end. The new book on bee keeping that you got for Christmas will have to be put aside. The bee equipment catalogues are interesting again. Things are looking up. Any sunny day now when you go and look at your bees it's possible you'll see some bright orange crocus pollen being trousered up the landing board. These are your stout little winter bees. They have endured a long life on low fat and high protein, with added constipation. These are the ancestors to thousands who are to pass this way throughout the long summer-to-come. There's a thought for any society bent on perpetual self-gratification. Every born worker bee flies and forages itself to death for the succour of populations yet to come, bringing home pollen-protein and nectar-sugars for the multitudes unborn. How's that for an example of the selfless life?



Spotting early pollen in January may well be a phenomenon only experienced by us softies down here in the balmy southern lip of the country, where the flowering season is long and plants wake early. When do the beekeepers of Stromness see their first flowers? Here, my bees huddle in their winter group-hug within earshot of the wash of the sea, the tangled cries of gulls and in sight of a winter sun bouncing off the Channel waters. They're sensitised to the first crack in the winter cloud sheet, the first whiff of warmer salty airs. The great Wessex poet Thomas Hardy pondered on these things in his poem *The Year's Awakening*:

*How do you know, deep underground,
Hid in your bed from sight and sound,
Without a turn in temperature,
With weather life can scarce endure,
That light has won a fraction's strength,
And day put on some moments' length,
Whereof in merest rote will come,
Weeks hence, mild airs that do not numb;
O crocus root, how do you know,
How do you know?*



I am on my way through the village up to the allotment when Wife collars me outside the church. 'Can we have a jar of your honey? We need some honey for a window display.' Apparently there is to be a service with the theme of Nature in Our Village.

'Of course', I say. But I wonder aloud how long it's going to remain there, innocently on a ledge in the church window? 'Isn't it likely to get pinched?'

Wife gives me a look. This is church we're talking about, not some car boot table. Also, we want you to give us a talk. 'What about?' 'Bees. And honey. It's a service to do with Our Natural World.'

This strikes me as a rather big subject. I give a cautious agreement. 'Who am I talking to, and how long must it be?' 'It's the usual church congregation. About a minute.'

It's my turn to give her a look. 'You want me to say something interesting and important about bees in one minute?'

'Alright, a minute and a half.'

On the morning of the service the pot of honey is still there in the window which now also has a nuc box on display, a frame of raised comb, and a bee suit dangling from a nail. This looks disturbingly like a dead figure hanging.

I know when it's my turn to come up to the lectern because Wife gives me one of her steely-eyed looks from the choir stalls.

The congregation appears to be doing everything except sitting still and looking attentive. They're fidgeting, glancing off to left and right, passing things to each other. It looks as if some of them are whispering jokes. Is this what it's like for the vicar every Sunday, holding forth to a group of people who are otherwise engaged in entertaining matters of their own making? And why are they

all bunched up in the rear six pews, as far away from the business end of things as possible? Why aren't they sitting here at the front? I hold up a pot of honey and turn it in the sunlight from the windows. An English, no a Devon, summer — right here, distilled in a jar, I say. There are grins in the congregation from those people who regularly buy my honey. I say that a magical interaction has been going on between sunlight and flowers and insects and man to produce this jar of liquid gold. I mention insecticides and the loss of hedges and wild flower meadows. I say that our actions today have consequences tomorrow, and I leave them imagining a world where gardens are silent bee-less spaces, a possible future where supermarket shelves no longer hold honey jars.



'That was a bit sad,' says Wife a little later. 'I think they were rather shocked.' 'Not at all,' I say. 'They were touched. The verger even asked me to repeat a part of it so he could write it down, because it was so moving.'

'Which part?' 'When I said about how beekeepers are precious, and anyone lucky enough to live with or near one needs to really look after them and be very loving and affectionate.'

'You better take that bee suit off the hook,' she says. 'It's scaring the children.'

Rowland Molony,
East Devon DBKA

Why We Need to Go Wild in Our Gardens

If anyone is still unsure about the cause of the worrying trend of major pollinator decline all over the developed world, including the UK, please take a few minutes to digest these few facts:

- ❑ Since 1945 and the Second World War, and with the advent of industrialised, intensive, chemical farming, in the UK we have lost 98% of our wildflower meadows and wild spaces, and 50% of hedgerows.
- ❑ *"We are witnessing an ecological collapse in all the wildlife that used to live in fields, hedgerows, ponds and streams. All the common species we knew as children are being wiped from the face of the countryside"* says Graham White, environmental author and beekeeper on the Scottish Borders.
- ❑ *"Hedgehogs and many other indigenous species could disappear from Britain within fifteen years. If there was one [issue] above all others that needs to be addressed, I would say it is habitat loss"* says Dr Toni Bunnell, retired zoology lecturer, August 2011.
- ❑ In the Big Bug Count of 2004 in the UK it was concluded that on average, only one bug would end up 'splatted' to your windscreen every five miles driven, whereas 30 years ago windscreens and bonnets would have become encrusted with tiny bodies. *The Independent*, September 2004.

Our countryside is now, sadly, not the vast, wildlife-friendly haven it once was. In the post-war frenzy farmers were actively encouraged to produce higher yields (with pressure of EU imports and supermarket price wars) from virtually every acre of agricultural land, using more fuel and more chemicals.

Inconceivable as it may seem in this frenzy, one simple, yet crucial, fact seemed to have been forgotten: the interconnectedness of habitat, wild plants and pollinators, and our almost total dependence on all of them. Bumblebees and honey bees, our number one insect pollinators, had simply been taken for granted.

Not all gloom and doom

We can avert environmental disaster, and it is not too late. Just as a flock of starlings switch direction, individually, yet together, we can all change. And our gardens are the perfect places to start. What we grow could potentially be visited by literally thousands of insects; while we work, or play, go on holiday or even while we sleep pollinators will be hard at work. But are we growing plants that benefit from or are even recognised by the pollinators? Unfortunately there has also been much plant hybridising and fads that have not taken into consideration pollinator-plant symbiosis because plants' roles in the natural environment have been traded for their agricultural usefulness. For example, some modern clover cultivars cannot provide pollen or nectar, yet wild red clovers are the major source for bumblebees. Similarly, many plants have been

bred for their 'eye-candy' rating in our gardens (many gaudy or double blooms are hybridised artificially without insects, but produce no food for them).

Our gardens are now probably the best environment that our wildlife has got. So it has fallen on gardeners' shoulders to provide pollinators with their favourite foods. Can we take on this challenge? Absolutely! And by taking this simple decision to 'turf out' (pun intended) unbeneficial plants and replace them with ones that reward our little friends, we will have as much, if not so much more, to gain as they will.

So, what can YOU do to help?

It could not be simpler. Plants that provide the ideal in terms of pollen and nectar are ones that have evolved with bees over many millions of years. And this is lucky for us, since they, like ourselves, have migrated far from our original points of evolution, so we have a plethora of beautiful wild plants to choose from across the world. The one thing they all have in common, is that they are 'species', that is, have not been altered by man. There are also many 'open-pollinated' cultivars that are equally good for bees that have been carefully bred over time; especially fruits and vegetables.



Bumble on Chives, which like many other plants you can even grow in a pot. Photo by Christine Knott.

If we grow 'species' or heritage varieties, we can save our own seed. That is, and should be, every grower's right. And let me spell this out: If we do not all keep on saving our own seed, that 'right' could also disappear; because nearly all agricultural varieties are now either F1, sterile, non-insect-pollinated or genetically modified (GM seed is patented) and because large scale growers scarcely use heritage varieties or wild species anymore, they too are disappearing. So unless we grow them in our allotments and gardens for our own use (and our pollinators' benefit) they will go extinct like many wild plants already have.

Over the coming months I look forward to sharing with you some exciting and wild ideas that could turn the most out-dated, silent gardens into enchanting, productive, semi-wild havens, which will start positively humming with contented bees, and furthermore, will provide you with an amazing abundance of flowers, fruits, herbs, vegetables and — most precious of all gifts — viable seed. Thanks to bees and other pollinators.

A glimpse of things to come

Here are a few of the ideas I will explore:

- ❑ Finding the best sources of pollen and nectar for times of dearth.



Agastache and Solidago. Photo by Sarah Holdsworth.

- ❑ Creating mini-wildflower meadows to replace sterile lawns.
- ❑ Crowding out pernicious weeds with productive ground covers.
- ❑ Looking at fruiting trees and shrubs for small gardens.
- ❑ How to create a perfect balance with pests, diseases, fungi and beneficial insects — yes, they are all interconnected.

Sarah Holdsworth,
sarahs.beegarden@btinternet.com

January in the garden

And for jobs to do this month, you could start planning your own garden make-over and purchase some top bee plant seeds. Here are some ideal choices which are easy to propagate:

- ❑ *Allium schoenoprasum* — Chives
- ❑ *Agastache foeniculum* — Anis Hyssop
- ❑ *Borago officinalis* — Borage
- ❑ Vegetable — Purple Sprouting Broccoli, Early or Late
- ❑ *Coriandrum sativum* 'Moroccan' — Coriander
- ❑ Vegetable — Courgettes 'Nero Di Milan'
- ❑ Vegetable — Squash 'Butternut'
- ❑ *Echium vulgare* — Viper's Bugloss
- ❑ *Helianthus annuus* 'Russian Mammoth' — Sunflower
- ❑ *Geranium pratense* — Meadow Crane's Bill
- ❑ *Phacelia tanacetifolia* — Phacelia
- ❑ *Solidago virgaurea* — Woundwort
- ❑ *Viola tricolor* — Wild Pansy
- ❑ Vegetable — Broad Bean 'Super Aquadulce'
- ❑ Vegetable — Runner Bean 'Scarlet Emperor'

These are all fully hardy. The vegetables are excellent old favourite varieties, and you can save the seed of all these must-have bee plants (remembering to leave some chives, coriander and broccoli to flower for bees) and they all have good disease resistance.



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Jars of Honey for Sale?

If you sell your honey then the jars should be labelled and the information on that label should conform to and meet all the regulations. Gerry Collins, honey judge and honey producer, gives you the low-down on how to correctly label your jars along with some tips for impressing judges at honey shows.

The labelling and composition of honey for sale is controlled by:

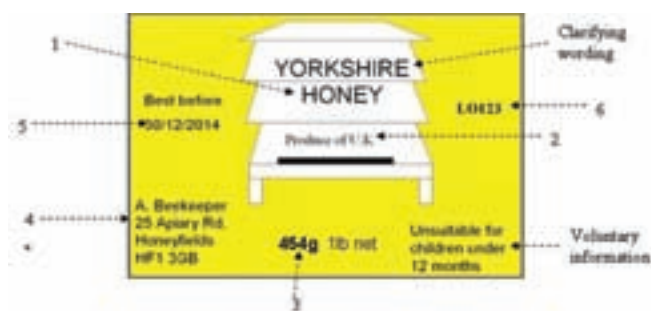
- ❑ The Honey (England) Regulations 2003.
- ❑ The Food Labelling Regulations 1996.
- ❑ The Weights and Measures Act 1985.
- ❑ The Weights and Measures (Packaged goods).

Goods Regulations 2006

Failure to comply with these requirements is a criminal offence with the maximum penalty on conviction of a fine of £5,000. The above legislation applies to England, but other parts of the UK (and countries within the EC) have similar legislation e.g. The Honey (Scotland) Regulations 2003. Make sure your labels meet the following six mandatory requirements:*

1. The reserved description: Honey.
2. The country of origin: where the honey has been harvested.
3. A metric weight indication.
4. The name and address of packer or supplier within the EC.
5. Durability indication: Best before date.
6. Lot mark.

**If you sell from your home direct to the customer you can omit 4–6.*



The required and voluntary honey label items. Drawing by Gerry Collins.

The reserved description, the durability indication (or information stating where it can be found e.g. see lid) and the weight indication must all be in the same field of view.

If you purchase your labels from major beekeeping suppliers or companies that specialise in honey label production they will overprint a selected label with your information and you can normally assume the label generated will meet all the requirements. However, it is your responsibility to check that the completed labels are fit for purpose. Today, in this age of home computers and colour printers, many beekeepers like to design, personalise and print their own labels. It is essential to ensure that this label design and wording are legal.

As a honey judge, I regularly have to judge the 'Six jars of honey,

labelled as for sale' class. Although the cleanliness and quality of the honey in the jars is very important, so is the presentation. The attractiveness and appeal of the label and whether the information on it meets the legal requirements are all taken into consideration. Most judges prefer to see unique personalised 'designer' labels produced by the exhibitors themselves rather than 'off-the-shelf' labels from the suppliers that most beekeepers, including myself, apply to their jars.



Jarred honey for sale entries judged as meeting the required standards. All photos by Gerry Collins.

Honey is the reserved description

You need to identify a packed food product with a *reserved description*. You can choose one of the following: 'blossom honey', 'nectar honey', 'honeydew honey', 'drained honey' and 'pressed honey'. You can, and most beekeepers do, simply use the word 'honey'. Your honey must, of course, meet this description under the 2003 Honey Regulations e.g. the moisture content must be no more than 20% (Ling heather honey is allowed 3% more), hydroxymethylfurfural (HMF) no more than 40mg/kg, insoluble contents no more than 0.1g/100g and, of course, it should not be fermenting. In the regulations there are also upper limits specified for sucrose content, free acid and electrical conductivity as well as minimum levels for diastase enzyme content.

Measuring the water content is well within the capability of the beekeeper using a refractometer. Beekeepers should seriously consider investing in one now that they are reasonably affordable. Few beekeepers have access to the equipment or the necessary skills to measure the other variables mentioned in the regulations and paying an analyst to do it is likely to be prohibitively expensive. The common sense approach is to make sure you do not overheat your honey (which raises HMF and lowers diastase levels), that you avoid feeding sugar syrup at times when it could be stored in the supers and to always use a suitably fine mesh to strain your honey to remove visible pieces of wax and other debris. If your honey is overheated, or in other ways only meets the lower standards of the reserved description of 'baker's honey', then you must indicate on the label that the honey is only suitable for cooking purposes.

Weight of honey in the jar

The metric weight of the contents must be on the label e.g. 454g (although individual portions of 25g or less are exempt from compulsory weight declarations). The word 'Net' after the weight is allowed (although the word cannot be abbreviated to N) but it is not obligatory, as a weight indication on a container is assumed to be net weight.

There is a minimum size specified for the lettering which, for most packs, should be at least 4mm in height. You can, if you wish, also display the imperial equivalent weight, but this should always follow the metric weight. The lettering of the imperial weight cannot be made more prominent than the metric lettering i.e. not be in a bolder print or expressed in a larger font.

Traditionally in the UK honey has been packed in prescribed quantities e.g. the 454g jar. Since April 2009 we have been allowed to pack honey in any metric quantity of our choice. However, you will probably find the cost and availability of suitable containers limits you to the more common jar sizes. Most beekeepers still sell their honey in 340g (12 oz) and 454g (1 lb) jars.

The contents of the jar must, of course, meet the weight indicated on the label. Many beekeepers say they check the weight using digital scales and that their scales read to the nearest gram. However, scales sold for domestic use are not suitable for this purpose. Also, how does anyone know that their scales are reading accurately unless they regularly check and calibrate them against a series of legally stamped weights? If you bought anything by weight from a shop or market stall you would expect them to use accurate and tested scales so you cannot expect honey to be treated any differently. Scales used for determining the weight of honey in the jars must be ones tested or approved for trade use and the dates when the scales are checked and the outcomes of these checks should be recorded. Electronic scales used by the retail trade do not have to be 'stamped' by a 'weights and measures' inspector these days but they do have to bear a green sticker with the letter 'M' on it in black, together with the approved verifier's identification sticker and other markings, including the mark 'CE', to indicate their suitability. Perhaps it is time our associations invested in some stamped weights to enable their members to calibrate their scales — or better still invested in a set of approved trade scales.

Jars can be filled with honey either to 'Minimum Quantity' or to 'Average Weight'. For Minimum Quantity, all jars should contain at least the declared net weight. Each jar must be individually weighed as the weight of glass jars varies. The net weight of the honey content is determined by taking away the weight of the jar and lid (the tare weight) from the total (gross) weight. For small producers, which includes most beekeepers, they could comply by filling every jar by eye and checking (and recording) the weights to make sure that the weights are all at or above the weight declared (and, of course, topping up those found to be below it). For some reason underweight jars of honey exhibited at shows are described by judges as Yorkshire lbs!!

For Average Weight, the packer's rules should be followed. This procedure is more suitable for the beekeeper who bottles a lot of

honey as only a sample number of jars are checked. It allows for some limited variation in weight provided that average weight of the sample is equal to or above the minimum net weight. The e mark can follow the weight indication (although this is not obligatory) to indicate that the honey has been packed under the EC average weight rules e.g. 454g e.

“When judging jarred honey labelled for sale the cleanliness and quality of the honey, the presentation, the attractiveness and appeal of the label and whether the information on it meets the legal requirements are all taken into consideration.”

It is good practice to weigh several empty jars of the same manufacture e.g. ten jars (plus lids) and then to use the weight of the heaviest jar as the tare weight. The sample number of jars that need to be checked varies with the batch size. It has been suggested that three jars are randomly selected out of a batch of fifty jars, five out of a batch between fifty and one hundred jars, and for larger batches that eight jars are checked out of every hundred jars. The time and date of the weighing, the tare weight used and the lot numbers of the batch should all be recorded and these records should be available for at least twelve months.

Indication of durability (best before date)

Beekeepers know that good quality honey kept in sealed containers at low temperatures still retains its flavour and aroma for decades. However, it is a legal requirement that there must be a 'best before' or 'best before end' date on the label. The 'best before date' must indicate the day, month and year e.g. Best before 31-12-2012. However, because honey is a product with a shelf life in excess of eighteen months we are allowed to use the alternative 'Best before end' date expressed in terms of the month and year e.g. Best before end Dec 2012 or in terms of the year only e.g. Best before end 2012.

The period starts from the date of packing not the date of extraction. Most supermarkets sell honey with a best before date of two years from packing, but this has more to do with managing stock turnover. Given the choice, customers will often choose the jars with the longest 'best before date' and will go searching to the back of the shop shelf to find them! Some beekeepers opt for longer periods such as five years, but they should bear in mind that if they pack liquid honey and it starts to granulate on the shop shelf or in the customer's home then the honey could then be regarded as past its best.

The name and address of packer or supplier within the EC

If you sell honey then your name and address should be on the label in enough detail that you can be found from that information. This does have the advantage that if people like your honey they will come back directly to you for further supplies. Home sales generally generate better margins than selling your honey through a third party as the shopkeeper needs to take their 'cut'.



The country of origin

This must be present on the label e.g. Produce of UK. Do not assume that your address is sufficient to indicate the country of origin. Also describing your honey by the county name e.g. Yorkshire Honey is not regarded as sufficient to indicate the country of origin (Yorkshire folk might be surprised to find that in the US there is a Yorkshire in New York, another in Ohio and a third one in Virginia).

Clarifying words

You are allowed to add clarifying words such as 'clear', 'set', etc before the word honey, provided they do not mislead. It is unlikely you would be allowed to use the word 'organic' to describe your honey as there are few areas in the UK where bees would only be able to visit flowers not exposed to inorganic fertilisers, weed killers or fungicides etc. You must avoid any wording that suggests that your honey has health benefits. It is also best not to use the word 'pure' as this word is difficult to define.

Many people seem to prefer to buy local honey collected from flowers in their own town or county rather than honey simply labelled as from the UK. If you wish to indicate the area or county where the honey is produced then you can e.g. Yorkshire Honey. The honey should, of course, be from bees that foraged in that area.

People are prepared to pay a premium for some monofloral honeys. If you declare on the label that the honey is from a specific flower source e.g. Ling Heather Honey or Borage Honey then the honey must be wholly or mainly from that source. Unless you placed your hives on hectares of a specific crop with little or no other competing nectar sources nearby I would avoid labelling honey as from a specific flower. If someone complains (often another beekeeper!) that your honey does not taste or look like the honey indicated in the label then the authorities can have it checked by a mellissopalynologist. The frequency and identity of the pollen present in the honey will be measured along with other tests such as electrical conductivity. If the honey does not meet the criteria associated with that monofloral honey then you are likely to be prosecuted. With the resultant publicity, other beekeepers in the area may then fall under suspicion by the honey buying public and their honey sales could be adversely affected.

An attractive label enhances the sales appeal of your jar and adding an image does make the label stand out. However, you should avoid using pictures of flowers on

your label. If you illustrate your label with an image of a readily identifiable flower then this could be interpreted as indicating that the honey in the jar is wholly or mainly of this flower type. If the contents of the jar do not meet this 'visual' description you can be prosecuted for misrepresentation. Another point is that while we as beekeepers love our bees we must not assume the general public likes to see lifelike pictures of 'creepy crawlies with lots of legs' on the jar label.

Lot mark/ number

If you are selling the honey through a third party like a shop, market stall or garden centre you must have a lot number/ batch number on the label beginning with the prefix L (e.g. L0045). You must keep records of the number of jars in the batch with specific lot marks together with the address of the shop etc., you sold them through. This is to enable the jars to be recovered in the unlikely event of something going wrong e.g. faulty jars where glass fragments have fallen into the honey or if the honey is later found to be contaminated with harmful residues of some sort. If you use a specific best before date (showing day, month and year) for each batch then a Lot number is not necessary as this date can be used for the same purpose in identifying the jars that need to be found. However, if you use a 'best before end' date on your label then a lot number is required.

Voluntary labelling:

Granulation labels

If you pack liquid honey for sale then it will, with time, begin to cloud up with incipient granulation, or possibly crystals may start to form on the bottom of the jar. Some beekeepers attach 'granulation labels' to the back of the jar to explain the granulation process with advice on how to restore the honey back to the liquid condition. These can be purchased from major beekeeping suppliers or you can generate your own.

Advice for parents of infants

The Food Standards Agency on 2 June 2010 issued a press release reminding parents not to feed honey to babies under one year old. This follows a few cases of infant botulism where honey had been given to babies and where the honey was found to contain spores of the causative agent *Clostridium botulinum* (see page 24 for further information). The British Honey Importers'

and Packers' Association (BHIPA) have for many years adhered to a voluntary labelling code whereby all honey on retail sale includes a warning statement on the label that 'Honey should not be given to infants under 12 months of age' or includes the alternative shorter wording 'Unsuitable for children under 12 months'. Although this is not a statutory requirement, I think beekeepers' associations, should recommend to their members that they include such a statement as a precautionary measure on their honey labels. If there is insufficient room for it on the main label then it could be on a separate label (like the granulation labels).

Tamper-evident seals

The use of tamper seals is not mandatory, but highly recommended if you sell through a retail outlet. They reassure your potential customers that malicious people have not opened the jars and interfered with the contents since you packed it. It also allows



Tamper-evident seals need not be boring — they can be decorated with your local association's logo, as shown here, or other imaginative designs or useful information.

you to 'add value' by adding print and images to the seal that the main label has no room for. As a member of Yorkshire BKA, I purchase and use tamper seals decorated by the YBKA logo which I think enhances the appeal of the jar.

The topic of what wording we have on our honey jar labels may not be the most scintillating topic on offer in this newsletter but it is an aspect of beekeeping that we must get right.

**Gerry Collins, M.Sc, NDB,
Chairman of Doncaster BKA**

Microscopy Adds Value to Beekeeping

Steve Mynard considers the role that microscopes can play in helping beekeepers to learn more about their stock and meet the needs of bees more effectively.

Returning to beekeeping after a break of fifteen years one of the first meetings I attended of my local association was a talk by Ron Hoskins of Swindon Honeybee Conservation Group. Ron and his colleagues are working to breed a hygienic honey bee with higher levels of grooming. Ron's investigations show that their strain of bees is better at ridding themselves of varroa mites. The part of Ron's talk that particularly interested me was the role that microscopes have played. Ron has examined the carapaces of thousands of varroa mites and presented photographic evidence to show the damage inflicted by the selected grooming technique.

First steps

Inspired by Ron Hoskins I looked into the subject of microscopy further and found that there are several ways in which microscopes can help to make us better beekeepers:

- understanding bee anatomy can help us to be more sensitive to the needs of our stock
- disease identification and infection level measurement can help with medication and treatment decisions
- accurate identification of pollen can help us understand forage patterns and market our honey more clearly.

One of the first publications I came across as I Googled my way around the internet was *Microscopy for Beekeepers* by Pete Jewell of the University of Bath. Pete ran a course for Bath Beekeepers' Association in 2001 and the booklet contains his notes from that course. I still did not have a microscope at this point and, to be honest, was a little put off by the cost. I needed some hands-on experience before investing. I contacted Pete who invited me to the university for a one-to-one taster.

I took along a couple of sacrificial bees from my own hives and spent an enjoyable hour and a half with Pete looking in what can only be described as wonder at the surfaces of their eyes, their pollen baskets, the hooks on their wing edges and many other aspects of bee anatomy. I was hooked. Pete gave me ample information on the structure and workings of microscopes to feel confident about buying one myself.

As well as having a microscopy expert within easy distance, I am lucky enough to have one of the country's leading dealers in microscopes just a short drive away. I visited Brunel Microscopes in Chippenham and again received one-to-one attention for over an hour as Helen demonstrated the models that would suit me. Brunel Microscopes are very experienced in supplying beekeepers. I came away with a BMX4 dissecting microscope. Beekeeping microscopists require two microscopes — a dissecting model with magnifications of around X20 to X40 for anatomy and dissection and a high power microscope magnifying X200 to X1000 for work on pollen and disease.

Getting serious

I took a look at the syllabus for the BBKA Microscopy Exam. While it looked daunting I thought it would be well worth the challenge and would give a necessary structure as I learned how to use microscopes. I was keen not to learn alone. I knew I needed some expert help and some other beekeepers to learn with. I

approached Pete Jewell about the University of Bath hosting a taster session for beekeepers. Pete was keen and we arranged a Saturday afternoon session called 'An introduction to microscopy for beekeepers.' I sent out information to all the beekeeping divisions in Somerset, Avon, Wiltshire and Gloucestershire hoping we might scrape together the ten participants Pete had suggested as a minimum to make it cost-effective for the university.



I was overwhelmed with the response. On Saturday 8 October 2011 thirty beekeepers spent a thoroughly enjoyable and informative afternoon learning the basic principles of microscopy from Pete and his colleague Karen Croker and getting to know the intricacies of bee anatomy for themselves. Alan Potter of Brunel Microscopes came along with demonstration models. Alan kindly paid for the refreshments for the afternoon and generously provided a dissecting microscope for us to raffle.

Towards qualification

Building on the success of this initial session Pete, Karen and I have constructed a three-part course that will prepare participants to take the BBKA Microscopy Exam. We will use the university's equipment and Pete's and Karen's expertise in teaching undergraduates how to make the most of microscopes and how to correctly prepare slides. We will bring in expert beekeeping microscopists from around our region to teach pollen identification and the necessary dissection and preparation of specimens to identify disease.

This promises to be a great course. It will run over three Saturday afternoons in late January, February and March this year. Each session will last for three hours. The cost of the course is £100. My thinking is that divisions might like to help individual beekeepers towards the cost as a way of getting their own qualified, local beekeeping microscopist. Such an individual would be invaluable to an association and could provide Nosema and Acarine identification as well as education on bee anatomy and pollen for other members.

And finally

There are over 20,000 registered beekeepers in this country. There are various small teams of scientific researchers and experts trying to get to the bottom of the problems that the honey bee faces in the modern world. Somewhere in between are people like me and the other participants at our taster session on beekeeping and microscopy; enthusiastic amateur scientists who want to put science to the service of the honey bee. With some training we can use our microscopy skills at a grassroots level to support the work of local beekeepers. I firmly believe that microscopes will help us save the honey bee.

Steve Mynard, Frome BKA

For further details of the course email stevemynard@sky.com

How the WI helped the Honey Bee

All over England and Wales, hives are being nurtured, buzzing gardens tended and honey-sweetened cakes baked as WI members help out the honey bee. Since 2009 the organisation's 210,000 members have been working to raise awareness of the dramatic declines in honey bee populations and the threats to their survival from habitat-loss, poor nutrition and pesticides.

As the largest voluntary women's organisation in the UK, the National Federation of Women's Institutes has campaigned on a variety of issues throughout its 96-year history. Protecting our environment has always been important to the organisation, with resolutions on issues such as water pollution and the loss of wildflowers dating back to the 1930s. As with all WI campaigns, SOS for Honey Bees was sparked by members' concerns, when members of Hindon and Fonthill Bishop WI in Wiltshire put forward a resolution on the decline of honey bees to be adopted by the organisation. After a year-long debate and discussion process the resolution 'SOS for Honey Bees', which called for more funding for research into bee health, was passed with an overwhelming majority at the 2009 WI AGM.

The campaign was put into practice with a two-pronged strategy combining grassroots member campaigning with national activity to get the issue on the Government's agenda. The valuable partnership with the British Beekeepers' Association enabled WI groups to link up with local branches, inviting beekeepers to talk to their local WI so they could learn more about beekeeping, and also allowed the two organisations to work together nationally to keep the issue in the public eye. Following adoption of the resolution, WI members took honey bees to their hearts and began to make waves at the grassroots level. The first clarion call of the campaign was for WI members to create a buzz about bees in their own communities. Members took this on with gusto: creating honey bee themed carnival floats, stalls at village fetes and even donning bee costume to spread the word.

A 'Bee Aware Action Week' in October 2009 saw WI members pledging to eat only bee-pollinated food for a day, and holding bee-themed coffee mornings to raise awareness of the plight of the honey bee. NFWI Chair Ruth Bond also attended a roundtable on the issue hosted by Sarah Brown, who had planted bee-friendly plants in the Downing Street garden.

Nationally, the campaign focused on

ensuring that the Insect Pollinators Initiative research funding adequately reflected the importance of honey bees as pollinators and the central role of honey bees in the food chain. Members wrote to their MPs to push for honey bees to be at the centre of research funding, a call that was ultimately successful when the research projects were published. MPs also tabled questions and debated the issue of honey bee declines in Parliament both in the UK and in Europe. Julie Girling, MEP for the South West referred to the WI's campaign when she held a debate in the European Parliament on the fight to protect honey bees. WI members got a chance to question the then Defra Minister, Lord Davies of Oldham at the Bee Ambassadors Conference, held in March 2010 at the WI's Denman College, which is home to its own bee hives. Over fifty WI members attended to hear from



Professor Francis Ratnieks and Martin Smith from the BBKA, and to press the Government for more action. Bee Ambassadors also saw the work of the National Bee Unit firsthand on a visit to the Food and Environment Research Agency.

The next stage of the campaign saw bee-friendly plants beginning to spring up in back gardens all over England and Wales, with WIs working with other organisations to create bee-friendly havens in their own communities. Whitley WI members in Cheshire held a fundraising afternoon tea to kick-start their project to create a buzzing garden. WI members and volunteers cleared a patch of ground in a corner of the village that was then

transformed into a bee-friendly garden. Leenside (Hucknall) WI joined forces with their local school, Ashfield District Council and local gardener John Stirland to create their bee haven on an area of wasteland. Upper Clatford WI in Hampshire fundraised for their garden with a three-course bee-themed lunch.

Many WI members also joined the burgeoning ranks of the BBKA by becoming beekeepers themselves. Members of Liverpool Central WI matched a passion for bees with a strong head for heights when



Above: Cottenham WI bee aware day
Feast Parade float.
Left: Llanstephan WI carnival.

they installed 40,000 bees on the roof of their headquarters. The bees weathered last winter's snow, and the WI beekeepers hope to have jars of 'Hope Street Honey' for sale soon. Ramsey WI in

Cambridgeshire sold fabulous WI cakes to purchase a hive and beekeeping equipment, and to send a volunteer WI member on a beekeeping course. With the hive ready and waiting, a swarm was found in May 2010 and the bees were soon settled in. After a successful honey harvest, members were presented with jars of honey at the end of the summer. All in all, a real buzz of activity. This campaign has captured the imagination of members and seen WIs of all sizes rise to the challenge with verve and innovation. The support of BBKA has been much appreciated and the WI promises to be a long-term champion of the honey bee.



Emma Lindsay, NFWI
Campaigns & Research Officer

Inspecting Alternative Hive Types

In recent months we have reviewed various hive designs and materials. We know there are avid beekeeper protagonists for different hives, but we wondered what challenges the range of hives pose to vital inspections for pests and diseases. So we asked our regional bee inspector, Nigel Semmence, for his opinion.

I am a Regional Bee Inspector for the FERA National Bee Unit which is responsible for the control of bee pests and disease in England and Wales. I have been asked to write this article as a follow on from the articles on alternative hive types published in recent *BBKA News*. We also provide beekeeper education and training, and carry out research and commercial services. Further information on all our activities is available on our website www.nationalbeeunit.com.

Our major function is to run a targeted statutory disease inspection programme for Defra and the Welsh Assembly Government and this function is also enshrined as a key objective of the ten-year healthy bees plan. There are two notifiable diseases and two notifiable pests under legislation in England and Wales (the Bee Diseases and Pests Control Order 2006). The two diseases are American foul brood (AFB) and European foul brood (EFB), and the two notifiable pests are the Small Hive Beetle (SHB) and the *Tropilaelaps* mites. Both AFB and EFB are present in the UK but currently SHB and *Tropilaelaps* are not. For this article I have used the term inspection to refer to one done by an Appointed Bee Inspector for the purpose of determining the presence of notifiable diseases and exotic pests and not the routine inspection done by the beekeeper for bee husbandry reasons. This type of inspection requires the examination of all brood combs for symptoms of infection by EFB or AFB.

The National Bee Unit uses a risk-based system to prioritise inspections in England and Wales. This is necessary for us to comply with the statutory regulations required for inspection agencies. There are many criteria; below is a simplified version of the categories of apiary visit showing the highest priorities with those at the top having higher priority than those at the bottom.

Apiary visit categories

- 1 Apiaries where notifiable disease or exotic pests have been found and a treatment or follow-up visit is required.
- 2 Other apiaries owned by beekeepers that have notifiable disease or exotic pests where inspection is now needed.
- 3 Apiaries within three km of notifiable disease or exotic pests.
- 4 Apiaries where disease has been found in previous two years.
- 5 Apiaries within three km of risk points for the entry of exotic pests, (ports, harbours, airports etc).
- 6 Apiaries within three km of notifiable disease or exotic pests found in previous two years.

These inspections are carried out with the dual aims of preventing the spread of EFB and AFB, providing comprehensive advice on reducing recurrence of disease and for the purpose of detecting the arrival of SHB and *Tropilaelaps*. Having worked for

the NBU for over two years I have seen the devastating effect that EFB and AFB can have and would point out that these inspections aid us in catching and treating these diseases early before they spread through a beekeeper's apiaries and subsequently to neighbouring beekeeper's apiaries.

The old adage 'prevention is better than cure' applies as once established in the beekeeper's equipment EFB and AFB can only be eliminated by hard work, determination and expense. Therefore when apiaries fall within the above high risk categories the colonies present must be inspected regardless of the hive type.

Moveable frame versus top bar hives

As beekeepers we are all familiar with the standard box-like moveable frame hives such as National, Commercial, Langstroth, Dadant, WBC, Smith, and Rose. There are other types with variations on this theme, such as the Dartington and ZEST hives. Traditionally most are made in wood, but plastic and polystyrene hives are now available in the most popular styles. All of these can be inspected by inspectors with ease and the presence of visual symptoms of notifiable disease or the presence of notifiable pests determined with confidence.

Over recent years there has been an increase in the number of beekeepers who have moved away from moveable frame hives and have started using top bar hives. There is a wide variety of what are called 'top bar' hives so please excuse my generalisation. The majority use only a top bar for the bees to build their combs from; there are no side bars or bottom bars as in moveable frame hives. In

this article I am going to split them into two classifications: horizontal and vertical. Horizontal top bar hives are long and coffin-like, usually with sloping side walls, and the combs are built side-by-side gradually moving along the box. Vertical top bar hives use boxes of top bars stacked one on top of each other in a similar fashion to moveable frame hives.

Horizontal top bar hives can be inspected relatively easily depending on the design and the involvement taken by the beekeeper. I have managed a horizontal top bar hive this season and the bees have developed nicely in it. The key is to ensure that the combs are built along the top bars, and this can be encouraged by the use of starter strips of foundation or the use of a wax guide (wax poured into a groove along the centre of the top bar), and by regular inspections to correct any bending of the comb. Because of the sloping side walls of a horizontal top bar hive the combs are not usually attached to the walls; if they are attached it should not prove too difficult because you can lift the top bars at the end away from the bees, and will be able to free each comb as you proceed along the box.



L shaped cutting tool and nails being freed from the top bars of a Warré hive. Photo by Nigel Semmence, FERA National Bee Unit.



*Inspecting a comb from a Warré hive using a U shaped top bar holder.
Photo by Nigel Semmence, FERA National Bee Unit.*

Vertical top bar hives such as Warré or Stewerton are harder to inspect. Consideration has to be taken of the Warré principles and cover cloths can be used to reduce the loss of nest smell and warmth. As the boxes have vertical sides the bees will attach the combs to the side and over a long enough period may attach the bottom of the combs to the top bars of the box below. Cheese wire can be gently slid between the boxes and a sawing action applied and the boxes separated, then an L shaped cutting tool (which has been issued to all Regional Bee Inspectors) inserted between the top bars, gently lowered until the cutting edge is beneath the comb, twisted through ninety degrees and then lifted cutting the comb from the side walls. This is repeated for the other end of the comb then the nails holding the top bar in place can be

freed and the top bar with comb attached lifted from the box.

In all top bar hives, because there are not any side or bottom bars on the frames, the combs have to be kept vertical and handled with care to avoid them breaking off the bar. To free your hands a U shaped top bar holder can be used. When inspecting hives with moveable frames for the presence of disease, the frames are usually shaken to remove the bees and enable the inspector to clearly view the cells and larvae. This cannot be done with combs on top bars so the bees are gently stroked with the back of the hand to encourage them to move out of the way.

The difficulty comes for inspection of all types of top bar hive when combs are built across the bars subsequently, meaning that an inspection for disease will not be possible without un-attaching the combs from the top bars and leaving the beekeeper with a very difficult management task. This is not new to the NBU inspectorate as there have always been colonies that prove a challenge to bee inspectors, like skeps or wild comb in hives where frames were not used, that have had to be inspected as they were near to other confirmed diseased colonies and at potential risk of infection.



Abandoned hive with wild comb. Photo by Diane Steele, FERA National Bee Unit.



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The International Bee Health Symposium will feature roundtable discussions between beekeepers and leading scientists with the aim of transferring knowledge between the two groups, creating practical solutions to dramatically reduce colony loss.

The topics of discussion will include the following:

➤ Varroa and Viruses ➤ Nosema Species ➤ Foulbrood ➤ Bee Behaviour and Hygienic Behaviour	➤ Disease Diagnostics ➤ Pesticide Residues ➤ Colony Losses ➤ Veterinary Regulations of Treatments
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The programme will consist of 3 state-of-the-art plenary lectures, (open to all), delivered by invited experts followed by 3 concurrent roundtable discussions led by the experts and facilitated by beekeepers and researchers. This format will be repeated in the afternoon with 3 further topics. The meeting will conclude with a short plenary discussion session.

To find out more and to register for the meeting online, go to the Symposium website
www.beehealth2012.ie
 Or
 Contact the Symposium Secretariat
 Email: beehealth2012@mcigroup.com or Telephone: +353 (0)1 2602641

All beekeepers regardless of whatever the type of hive we use have a responsibility to reduce the chance of the spread of notifiable pests and diseases and we can all go a long way towards that by maintaining our colonies in a manner that enables inspection to a level that allows the determination of their presence. It is important to understand and appreciate that the requirement for inspection outlined earlier must take precedence over the 'leave alone' or 'natural' beekeepers reluctance to open the hive. Our recent inspection data does show that bees kept in these hives are susceptible to disease including foul brood.

Also please can I encourage all beekeepers to sign up to BeeBase so that if the worst should happen and notifiable pests or disease does turn up close to you then we can inspect if necessary. Without knowing who is keeping bees, finding out where the bees are can prove very difficult. Many beginners believe that because they have joined a local beekeeping association their details have been passed to the National Bee Unit; that is not the case unless this has been specifically mentioned on your membership form.

Nigel Semmence,
Regional Bee Inspector, National Bee Unit

A View of Bees: More on Language

Earlier in this discourse, language was considered, and the bee dance was used as an example of a bee passing information about the quality and location of forage she found to others; all contained in a dance. The foregone suggests that opening the hive for inspection is harmful to a colony. It disturbs the tenor of the hive to no good purpose. Perhaps it would be better for the hive if the number of checks were reduced. How then would swarms be predicted and stopped? At this time there is no way other than opening the hive and searching for queen cells. A swarm monitoring device is needed; one that will fit to the hive and catch the bees as they attempt to leave in swarm.

Many types of catcher have been made but few remain in general use. Most of them attempt to exploit the difference in size of the queen and worker bee. To this end they use a filter; a piece of queen excluder of a gauge that allows workers to pass but stops the queen and drones. To use this type of device, one would need to fit the device just before a swarm, and that can only be known by colony inspection. So, whatever is made and fitted to the hive has to be better than that.

The colony must in no way be hindered in their normal activities in the hive until a swarm takes place. This requires that someone, or something, shall monitor their actions and respond when they change behaviour. Who is there to do this task? Who then, would close the door to contain the bees? There is only the bees themselves.



Honey bee comings and goings. Next time you are in the apiary look carefully at your hive entrance — above bees can be seen at the mesh ready to launch into flight and just beginning to fly from the hive entrance. Photo by David Wootton.

Using clues the bees leave us

It has been noticed that bees walk up the front of the hive. In your mind's eye, follow a bee as it heads for the great outdoors. It drops down to the floor and walks to the threshold of light; there, it engages its wings and goes.

Another bee may take a different route on its way out. It walks along the top of the frames and down the inside of the hive front wall and then, upside down, to the light. It is most unlikely that the bee's wing will give it lift in that posture. If it were on a flower, it would drop off and turn over as it fell; there is not enough room for a bee to drop off and turn over at the hive entrance. It would fall upon the bees below, leaving the hive on the floor. This does not happen; bees turn up the front of the hive, engage their wings, and go; using the wings in the normal way.

Could bees stop themselves from swarming?

The swarming bees on the front of their hive could be our agents; they know why they are leaving the hive and their number could tell us. However, we are not there to see that number; and the door must be 'closed' to avoid swarming. Can they do this for us? Why not? They have number enough and weight enough to release a catch. The door must cause no hindrance to the bees until they,

themselves, close it. To do that, they must land on it, so adding their weight to it.

How could a swarm 'close the door'?

The door must hang on a hinge, a wire passing through its side members, at its top, near its front; this allows the weight of the door to produce a torque so to hold it closed. The door's frame would need to be built lightly of wood and fitted with a wire gauze panel; this gauze with edges turned down, inserted and glued into the frame would give the door rigidity. It would also add more weight in the right place and allow light to pass through to attract the bees on their way out.

As such, the door would hang closed, but in its waiting state it needs to be open. This could be achieved by having longer door frame side members say another half-door height. Then at its top, to its rear, a wire rail could be fitted upon which a weight, just

enough to hold the door open against a stop, could be hung. The stop would need to be set to leave a gap for the bees to pass through when running up the hive front. This would allow the door to be open when bees are not swarming. Wishing to leave the hive the swarming bees would land on the gauze of the door and their weight would then close it.

This door is now a bi-stable structure; stable when open, set to the stop with weight and stable when closed by the weight of swarming bees. Closure

happens quickly and as when the door begins to close it starts to catch bees leaving by the floor. The change-over point, between open and closed states, is about mid-way between the two; this makes the door stable in the winds of the field.

Pros and cons of the swarm catcher door design

There is argument against this design. One would need to visit the hive every day to monitor its current state. However, using a switch: a battery and solenoid, it could be arranged to cause a flag to fly when a catcher door closes. If necessary, you could ask neighbours to phone your number when they see the flag. They would, most probably, be pleased to be part of the game; especially if you arrived each time with jars of honey in your hand.

Now what?

The swarm is caught and contained in the catcher; now what to do? Do as one normally does; hive them. But I can not resist thinking that there must be more that one could do. Perhaps one could cause them to hive themselves. But not this time, I have no time at the moment to explore this thought!

Ivor Clayton, Bournemouth and Dorset South BKA

Honey Should not be Given to Infants Younger than Twelve Months

Infant botulism is a relatively rare disease that affects infants under one year of age. In older children and adults an established gut microflora usually prevents colonisation by *Clostridium botulinum*. In infants under one year old a protective gut microflora has not yet developed, permitting colonisation and neurotoxin formation by *C. botulinum*. The botulinum neurotoxin then enters the blood stream, reaches nerve cells and blocks transmission of signals from peripheral nerves resulting in general muscle weakness, and in extreme cases paralysis and respiratory impairment. Treatment may involve ventilator support and nasogastric feeding and recovery may take from weeks to months, but without complications there may be no long-term consequences. There can be a delay before the condition is diagnosed correctly. For example, the first case reported in Finland in 2002 was initially classified as sudden infant death syndrome (SIDS).

Five unlinked cases of infant botulism were reported in the UK between August 2009 and July 2011; all five were associated with honey consumption. In two of these cases the same toxin type of *C. botulinum* was isolated from faeces of the infant and from the honey implicated.^{1,2} These cases brought the total number reported in the UK to thirteen, seven of which were associated with honey ingestion. The Food Standards Agency has recently issued a reminder that honey should not be given to infants under twelve months old and stated that 'Members of the Honey Association have a voluntary code of practice of stating on product labels that honey should not be given to infants under twelve months. The Agency supports this responsible initiative and recommends that any other packers and suppliers of honey should follow this precautionary labelling approach.'³ The WHO and agencies in Europe and the USA make similar recommendations.

Infant botulism was first recognised in the USA in 1976, and the first European case was reported in the UK in 1978. Cases have now been reported in many countries, with the greatest number in the USA⁴ (see examples in Table 1). In Europe many of the cases had a history of honey consumption. In most cases honey samples were not available for microbiological testing, but in several cases where samples were available *C. botulinum* of the same toxin type was isolated from the infant and from honey.

Honey is the only proven food source of the spores linked to cases of infant botulism, and heating honey sufficiently to inactivate the spores would damage the product. Dust in the environment can also be a source of infection. Surveys of honey in the USA,

Argentina, Brazil, Finland, Denmark, Norway, Sweden, Italy and Japan reported *C. botulinum* spores in 2–24% of samples.⁴ Honey produced in the UK accounts for about 20% of the honey consumed. A high sugar content prevents growth and neurotoxin formation in honey, but spores can probably survive for several years. In Finland, *C. botulinum* was detected in 23% of beeswax samples, in 24% of comb

honey samples, in 10% of extracted honey samples and in 31% of soil samples (Table 2)⁵, suggesting that soil-derived spores of *C. botulinum* carried into the hive by bees may accumulate in beeswax, or possibly, honey may be contaminated directly during extraction.

Table 2. Prevalence of *C. botulinum* in 1168 apiary and soil samples collected in 2001–2003 in Finland*

Sample	Number (%) positive samples
Bees	14/146 (10)
Beeswax	40/176 (23)
Comb honey	43/180 (24)
Extracted honey	10/100 (10)
Pollen grains	4/61 (7)
Pollen from bee bread	26/173 (15)
Soil	73/235 (31)

*modified from reference 5

In conclusion

- Infant botulism is rare but a serious and sometimes fatal disease.
- Honey is the only proven food source of spores linked to cases of infant botulism.
- *C. botulinum* has been found in samples of honey from many parts of the world.
- In view of this information, labels should state clearly that honey should not be given to infants under 12 months old.

References

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Barbara Lund, Clare Aldus, Andrew Carter & Michael Peck
Institute of Food Research, Norwich Research Park, Norwich

Table 1. Infant botulism reports*

Country	Time period	No. cases
USA	1976–2006	2419
Argentina	1982–2006	410
Australia	1978–2006	32
Italy	1984–2008	29
Canada	1979–2006	27
Japan	1986–2007	24
UK	1978–2011	13
Spain	1985–2007	11
France	1983–2009	7

*modified from reference 4



APIARY MANAGEMENT Share and Learn Workshop

An opportunity to share and learn from experiences of building and managing a club apiary

Saturday, 11th February 2012, 9.30am to 4.30pm
Truckhaven Conference Centre, Junction 35, M6

Workshop Programme

- Visit to Lancaster Beekeepers' apiary
- Facilitated workshops on:
 - Raising funds
 - Construction
 - Improving forage
 - Engaging members

For more information or to book go to:
www.lancaster-beekeepers.org.uk

Some Tips on Fundraising

There are over 4,500 grant making trusts within the UK who each year give away around £3.9 billion. This is in addition to the £1.4 billion given away by the National Lottery and the innumerable billions given as grants by the European Union and British Government. With all this funding floating around it ought to be easy to get a grant, but as many have found it can be a daunting task.

Who to approach?

The first challenge is to find out who is giving grants and for what. Almost all of the 4,500 grant-making trusts have their own website, but as you will not have heard of most of them, trying to track them down by name is not always practical. There are, however, a number of free directories, both hardback and on-line, that list these bodies. Few are complete and it is a tedious job going through them one by one. For those who can afford it, there are some excellent on-line directories, but all require a subscription of around £300 a year. The National Lottery, however, has an easily found, free and comprehensive website that clearly provides all the information you might need on their current objectives. Government grants are more difficult to track down as there are so many of them, covering a vastly diverse range of subjects and often camouflaged by bureaucracy. The economic or rural development officer of your local authority could be a good starting point.

What you need to know

Having found a grant-making body it is essential that you clearly identify:

- their exact funding objectives
- the status of organisations they will fund
- what conditions are attached
- geographical conditions or restrictions
- social conditions or restrictions.

The funders' aims must be met

While smaller grant-making trusts might be flexible, the majority have very clearly defined objectives and will only support organisations that can demonstrate that their activities support these objectives. This often requires some lateral thinking. When we sought a grant to plant a 100 metre long and three metre wide hedge to act as a wind break around our apiary, the grant we successfully applied for was to improve the habitat for declining woodland birds. On another occasion we applied for a grant to purchase a generator to power some lighting, a computer and a projector at our apiary. This was turned down but

another application to install solar panels so that we did not have to purchase a generator was approved under the National Carbon Reduction scheme! It is worth bearing in mind that although beekeeping in the UK is largely a hobbyist pursuit, it does make a significant contribution to the agricultural economy and is not debarred from seeking support in this direction.

Eligibility to apply for a grant may depend on your organisational status. While some grant-making bodies will make grants to individuals and informal groups others require the recipients to have a defined legal status, such as being a registered charity. We experienced difficulties with some grant-making bodies when we were only a branch of an Area Association that spanned three counties and were deemed not to be local. One possibility we explored was to set our club apiary up as a social enterprise. Although this proved to be perfectly feasible, we elected to become a charitable company limited by guarantee.

If you do not have a recognised legal status, i.e. a registered charity or a charitable company, the people who sign the grant application form should take care to ensure that they fully understand the extent of any personal liability.

Very few grant-making bodies will provide 100% of the project costs, many requiring a contribution from the applicant.

Contributions generally range from 20% to 50% but may be up to two thirds. Although some bodies require the contribution to be in cash, most will accept that the contribution will be made in kind. As an example, we obtained a grant for twenty new national hives at a cost of around £2,400 when made up. We received an 80% grant and bought them flat pack for £2,000, the difference being our contribution in kind. Similarly, when we plant our windbreak hedge in the autumn our contribution will be to provide the labour.

In addition there will inevitably be a requirement to demonstrate that the grant has been spent solely and exclusively on the purposes for which the grant was made. While this might not sound onerous, it is surprising how often circumstances change through the life of a project. While reasons for deviating from the original plan might appear reasonable to you, grant-making bodies often take a dim view of this if they have not been informed before the money was spent.

Geographical limitations may apply. A number of grant-makers will only fund organisations based in, or operating in, specific areas. This is the case with many government grants. Sometimes these areas can be quite large, such as Scotland or the North West of England, but some can be quite narrow, such as specific cities or even post code areas.

Social conditions often apply. Many grant-making bodies require the projects they support to contribute towards improving one or more of these areas: education, social conditions, community life or the environment. Some will target very specific groups such as ethnic groups, pre-school children or the elderly. If you cannot make a good case as to how you meet these criteria it is rarely worth applying.

General conditions. Where a grant is for equipment or other assets there will certainly be restrictions on how they might be sold or otherwise disposed of within a specified time, usually three years. Most grants will require you to demonstrate that the stated outcomes of the project have been met within a prescribed time. Thought should be given to how this might be done at the time of the application and incorporated into it.

Tips on making applications

There are two critically important points to remember when completing a grant application form. The first is to clearly show how giving a grant to you will help the grant-making body to achieve its stated objectives. If what you want to do cannot be aligned to one or more of the objectives it is unlikely that your application will succeed. The second is to ensure that your application contains all the information requested, and complies with and conforms to any specified requirements. Most grant-making bodies receive more applications than they can support; weeding some out on the grounds of incompleteness or non-compliance is an easy way for them to reduce or even eliminate this problem.

Note: Since its incorporation as a charitable company limited by guarantee in March 2009 and admittance as an Area Association of BBKA in January 2010, Lancaster Beekeepers has raised over £45,000 in grants to create its new club apiary and is hopeful of raising a further £25,000 over the coming year.

Fred Ayres, Chairman,
Lancaster Beekeepers

Cooking with Honey

This month we start a series of tried and tested honey recipes sent in by BBKA members, which over the year will range from sweet to savoury, including cakes, preserves and main courses. For many of these the origin of the recipe has long since been forgotten but we shall endeavour to bring you tasty treats to make and enjoy. This month's recipes were kindly provided by Mary Hill of Canterbury BKA.

Nut Chocolate Layers

Ingredients

8 oz ground almonds
2 tsp honey
8 oz white chocolate
1 tbsp Cointreau
4 oz caster sugar
1 lb plain chocolate
1 ½ tbsp Kirsch



Method

Mix nuts, sugar and honey in blender until a soft paste. Chop half the plain chocolate and melt. Melt white chocolate separately.

Beat half the nut paste into each bowl of chocolate.

Add Kirsch to plain chocolate and Cointreau to white.

Divide each into half and roll out between cling film, then chill.

Stack in alternate layers. Trim edges and cut into strips.

Melt remaining chocolate and spread over strips.

Leave to cool and then cut into pieces about one inch square and enjoy as petit fours.

Makes 50–60 1 inch square petit-fours.

Raspberry, white chocolate and honey cheesecake

Ingredients

6 oz plain chocolate digestive biscuits
3 oz butter, melted
12oz raspberries
2 oz caster sugar
2 oz honey
4 oz white chocolate, melted
1 lb cream cheese
1 tblsp icing sugar
½ teasp vanilla essence
1 sachet gelatine



Method

Crush biscuits and mix into melted butter. Line small moulds with cling film and press biscuit mix into them. Cool for 20mins.

Cook raspberries with the caster sugar and honey until jammy. Add gelatine as instructed on the packet, then cool.

Mix the melted chocolate with cream cheese, icing sugar and vanilla essence. Add raspberry mix and stir until lightly marbled. Spoon on top of biscuit bases. Chill. Devour!

Serves 8–10.

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Gormanston 2012

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At the Franciscan College, Gormanston, Co Meath

Sunday 22 July to Friday 27 July 2012

Guest Speaker: Jennifer Berry
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Full Cost: En-suite rooms €405, Single rooms €335, Rooms with 3 cubicles €320, Dormitory €305
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Full details from: Gerry and Mary Ryan, Deerpark, Dundrum, Co Tipperary. Tel 00353 (0) 62 71274 or 00 353 (0) 87 1300751 or 00 353 (0) 87 9745115
Email ryansfancy@gmail.com

Business Corner

Update From the Operations Director

The forthcoming ADM presents an opportunity to present the new initiatives that we hope will support all associations with tools that will enable them to make their tasks easier. At the ADM, delegates will be able to see for themselves the revised literature that trustees and volunteers have worked hard to bring up to date. We endeavour to have samples of new fund-raising tools on display, to be ordered in time for the event season.

You may be aware the Mini Hive collection box, with the *Pocket Guide to the Honey Bee* has already been trialled at several events. Not all collection returns are in, but to date the scheme has covered its costs and has yielded over £500 for the Research Fund — not a bad effort for just three events; Tatton Park being the most successful, having reached a total of £530! Congratulations and thanks to everyone who has embraced the scheme. Be sure that your delegate orders at the ADM for each of your branches.

The ADM is taking place at the Chesford Grange Hotel this year as our delegate numbers in 2011 pushed the NBC to its Health and Safety limits. Chesford Grange is part of the QHotels group and is hosting the 2011 ADM as part of their corporate membership of the BBKA.

Jane Moseley, Operations Director and General Secretary

BBKA Year Book — Directory of Lecturers

Every beekeeping association organises meetings throughout the year and needs speakers to educate and inform its members and provide an interesting social event where members can come together to exchange ideas. The task of arranging meetings and speakers is not always easy because the meeting organiser is dependant upon who they know or who they are told about, which can be very limiting.

Within our beekeeping fraternity, we have many excellent, very able and knowledgeable beekeepers that are willing to impart their knowledge and experience to others, but the trick is to find them. Over the years, the BBKA has published information about speakers in all areas of the country who are willing to talk at association meetings either locally or at a distance, but that information now needs to be updated.

You may think that all speakers need to be qualified experts in all aspects of beekeeping, but that is far from the truth; because to make meetings interesting and informative a speaker needs to be able to address the needs of the membership at all levels of knowledge and experience i.e. from the beginner to the more experienced. If you are willing and able to be included in the *BBKA Year Book* directory and included in the members' area of the BBKA website, please contact the *Year Book* Editor at sharon.blake@bbka.org.uk. Your active involvement will help to maintain interesting association meetings and enable you to pass your knowledge to others — and what is more, it is good fun and benefits all beekeepers!

BBKA Correspondence Courses

These take you through the BBKA Examination Board syllabuses for the Basic Assessment, the seven modules and the Microscopy Certificate (theory) modules. You are guided by friendly and helpful tutors who have nearly all qualified as Master Beekeepers. You work at your own pace and can expect to take several months to properly prepare yourself.

The module courses each consist of five papers supported by a full book reading list enabling you to prepare a study plan to target the examination day in March or November each year. All the theory for the Senior Certificate in Apiculture is covered. The Basic Assessment is for complete beginners and the twelve papers prepare you in the theory for the practical assessment in the summer.

You will be attached to a tutor who will comment on your work and provide help and encouragement where necessary. Tutors receive no fee and are happy to put back into the craft the help they received from their own tutors when they were studying. All tutors are active beekeepers and they obviously prefer to help their students during the winter months.

The courses are extremely good value at £45 per course and are an alternative for those who have no suitable classes or study groups available. Some people combine the correspondence course with a local discussion group which is an excellent way to learn. Many will take two courses.

For an application form see the BBKA website or phone Chris Utting on 01234 474 500.

New AFB Research

Bee Diseases Insurance Ltd in accordance with their objectives of funding research is pleased to announce that they have entered into a second research programme.

We are pleased to confirm that Barbara Morrissey has been successful at obtaining a departmental BBSRC CASE Studentship with the University of York. The studentship will focus on understanding the diversity of the causative agent of American foul brood, *Paenibacillus larvae*. Once Barbara discovers more about the diversity of the organism, she will be able link outbreaks and understand more about the origin of this damaging bacterium. The industrial partner for this studentship is Bee Diseases Insurance, who is providing the required matched funding. Barbara has recently completed a Master of Research (MRes) where her project involved developing methods to characterise the diversity of AFB on the Island of Jersey, and so she has a good grounding in the methods she will need for the new PhD. After receiving a distinction for her thesis, she applied for the studentship in a competitive process at the University of York. Barbara will be supervised by Dr. Thorunn Helgason, a microbiologist from the University of York; Dr. Giles Budge, the Research coordinator for the National Bee Unit; and Bernard Diaper, a supervisor from the industrial partner, Bee Diseases Insurance.

Bernard Diaper, BDI

Business Corner

BBKA Education Strategy

Educational activities within the BBKA have moved on a great deal since the Forum meeting in October 2009 when the first education 'workshops' were held. We have created a new relationship with Fera, produced the Healthy Bee Plan, delivered four Course-in-a-Case (CiC) products, run two winter and one summer programmes of training events, explored some of the possibilities of on-line learning and started to engage with the formal Further Education sector regarding beekeeping training. In addition, the numbers of BBKA examination and assessment passes continue to rise at all levels. This is all good news. We are now moving to a new phase of this work for a number of reasons:

- We need to give the CiC material time to 'bed-down' so that we can make considered improvements to it,
- We need to increase and promote the use of CiC at all levels,
- We need to address the needs of the 'tutor' community to make it larger and more effective,
- There is a need to reduce the 'churn

rate' of new beekeepers and encourage the new beekeepers to progress to a more advanced level of understanding.

These issues have been concerning the BBKA Trustees for most of 2011 and we have done considerable work to develop a medium-term education strategy and related material, which we hope will guide the work of the BBKA for the next few years. The core elements of the medium-term strategy are:

- Rebalancing the competence of the membership by emphasising training of the second and third year beekeeper and reducing, but emphatically not removing, the emphasis on new beekeeper recruitment activity,
- Encouraging a regional approach to training delivery for the 'mid-level' beekeeper, creating a model of progression for beekeepers and emphasising the role and status of the tutor community,
- Working with all industry groups to deliver beekeeping education; not just

to BBKA members,

- Aiding and guiding local associations to deliver this training model in a sustainable way in the longer term, using local resources where possible,
- An increased consideration of the use of appropriate third parties to deliver education, while safeguarding the BBKA's Intellectual Property.

A key part of this strategy delivery is the planned appointment of one or more 'Training Co-ordinators' to help in carrying out this work. These roles will operate in a job-share fashion, so that there is a scalable approach to resourcing, which can be varied as demands and funding permit. These co-ordinators will work with Member Associations to encourage and develop a locally-based approach to training, building on best practice and fostering and expanding the tutor community. An advertisement for the first of these co-ordinators is below.

Chris Deaves, Chairman of Education and Husbandry

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Vacancy

Regional Education Co-ordinator £40k FTE



As part of the BBKA's work to encourage the development of training activities at every level of beekeeping skills the BBKA wishes to recruit a regional training co-ordinator. This post will be for 50% full time equivalent (FTE). The ideal candidate for the role will:

- have previous successful experience of delivering education or training;
- have previous experience of organising and marketing events/courses;
- have good inter-personal skills and proven ability to motivate and persuade people;
- have considerable experience of, and qualifications in, beekeeping (at least to the BBKA General Husbandry plus some Modules level);
- be enthusiastic about improving beekeeping skills and knowledge;
- be able to work at times appropriate to the role, especially at weekends and evenings;
- be able to travel easily within the UK;
- be computer-literate and have an awareness of 'electronic' training methods.

It is hoped that, as funding permits, the BBKA would be in a position to fund a number of these part-time positions, each one being regionally based. It is also hoped the first appointee would be able to start in during March 2012.

Applications should be e-mailed to Denise.Lewis@bbka.org.uk, from whom a more detailed job specification can be obtained. Interested applicants can also telephone Martin Smith 07831 695732 for an informal discussion about the role.



The Beekeepers Quarterly

see a sample copy at
<http://beekeepers.peacockmagazines.com>

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 Cost of course: £40

Beginners Course — 8 week course
 Jan, Feb, March start date tbc
 Cost of course: £50pp
 Contact details: tbc

Bucks County Beekeepers' Association
16th Annual Seminar — Not just beekeeping
 Saturday 3 March 2012 — 10am to 4pm
 Wendover memorial Hall, Wharf Road, Wendover HP22 6HF

Speakers: Prof. Mike Hulme — How will climate change affect our honey bees?
 Christine Stevens — Successful marketing adds value.
 Dr. David Aston — Proteins and honey bees.
Plus: Related stalls (Inc: NBU and BBCT) and exhibits

Cost for the day to include refreshments and lunch, £12
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Diary of Events 2012

Starting late January. Kingston BKA Surrey.
 Module 2 Honey Bee Products & Forage — 8 week evening course
Starting Tuesday 17 January (Cost £40)
 Beginners Course — 8 week evening course
Starting Monday 16 January (Cost £50)
 Contact: lillyhive@email.com

Starting late January. Beekeepers and microscopes: preparing for the BBKA Microscopy Exam. Three half-day, weekend training sessions at University of Bath. E-mail for details stevemynard@sky.com Tel: 01373 300 748

18 February. Somerset BKA Lecture Day at Kings of Wessex Academy, Cheddar. Dr Jim Tew, Graham Royle, NDB, Dr Gay Marris, Nic Charlton B.Sc. Details form Caroline Butter 01934 742075 E-mail: okapi.bhive@uwclub.net

25 February. Holsworthy Branch of Devon BKA — Spring Convention. Speakers include Adam Ververs, Dr Michael Keith-Lucas, Dr Juliet Osborne, Bill Summers (Zest hive). Website www.holsworthybeepers.org.uk or 01409 250230.

March 3. Bucks County Beekeepers 16th annual seminar. Not just beekeeping. See advertisement above for full details.

Saturday 31 March. LBKA, Lincoln District. Sale of Bees and Equipment. From 11am, County Showground, Scampton, Lincoln. Details from: Alan Campion 01522 522679; Bill & Jenny Williams 01522 730365 or Jonathan Korejko 01526 378222.

20–22 April. BBKA Spring Convention 2012 at Harper Adams University College Campus, Newport, Shropshire.

Reflections of the Retiring President of the BBKA

I come to the end of my two-year term as President of the BBKA at the January 2012 ADM having previously spent five years as a member of the BBKA Executive, and I thought it might be of value to write what might be described as an 'end of term report'.

Membership and service

I ought not to ascribe more than co-incidence to the fact that I joined the Executive when membership was at all-time low and it has since more than doubled, but I am proud to have been part of the team that brought about this change. Perhaps more importantly I have worked hard to ensure, from the BBKA's point of view, that it has been able to improve the service to its membership at the same time. Now and again the cracks have shown but overall the response that the BBKA has been able to give the public, individual members and associations has now improved out of all recognition. The BBKA is now also able to provide an immediate response to enquiries as befits a charity with such a high profile.

Organisation

During the last few years the organisation has gone from working as an extension of local beekeeping associations to being a professionally run charity. The charity has sought to raise funds from external sources and to use these funds to pay for improvements in services to members; also to fund other activities, such as research and education.

The BBKA constitution means that at trustee level there is a reasonably rapid turnover of people; this keeps the ideas fresh and stops the same people from dominating the charity. The opposite side to this, however, is the officers might be expected to stay a bit longer and this is something we need to work on. We have in the recent past put unrealistic demands on some of our officers and this has reflected in quite a high turnover of staff. As the charity is now able to offer commercial rates of pay and conditions I would hope this can improve.

Working with others

I am by nature a consensus-seeking person and have worked hard to make the BBKA a more inclusive body. I think we now are better at consulting and working with other national BKAs within the British Isles.

The BBKA has engaged at a variety of levels with Government. I am particularly pleased with our work on the Course in the Case (CiC) project that Fera co-funded with the BBKA and would thank those civil servants who have strived to work with us on the project. Both sides had their share of doubters but I believe we have funded a world class series of teaching aids that will be of value for many years to come.

Research funding

When I first joined the BBKA trustees, we never discussed funding research; in fact for the first couple of years our research fund was practically idle. True we were lobbying hard for others to produce money for others to spend on research. One dramatic change has been the concept of the BBKA actually soliciting funds for its own

research activities and then spending it ourselves. Once again this has brought new challenges: how do we invite proposals for research projects, how do we evaluate proposals, award the funds and then monitor the progress of the projects? This was a whole new skill set that the BBKA suddenly needed to acquire.

Education

Anyone who has read any of my articles will realise that education is important to me. When I look back on the early years, the BBKA did almost nothing to assist local associations improve beekeeper education. In fact by continuing with its successful public awareness campaigns that brought in yet more new members, we probably affected the education of those who had joined the previous year by depriving them of the attentions of the scarce band of beekeeping tutors.

We have now realised how we can assist local associations by the provision of good quality materials, such as CiC, and by raising awareness of the benefits of studying for (and even taking) beekeeping assessment and examinations; whether theoretical modules or practical basic and husbandry assessments. One tutor, given adequate resources and backup, can then pass this knowledge onto many aspiring beekeepers, helping to improve the standards of the craft.

Events

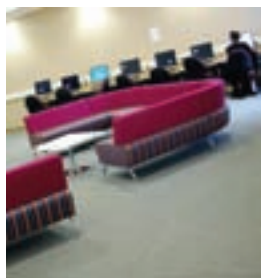
Events have buffeted the BBKA during my time; endorsement of pesticides springs to mind. It was a policy that had run its course and it was important to move on; our membership profile had changed and our policies needed to reflect this. I believe the policy we now have of engagement and lobbying to put our point of view without endorsing any products is the right one for the times we live in.

The first national meeting I attended was called to discuss our attitude to genetically modified organisms (GMO). I was struck at the time by people who had taken up beekeeping simply because they saw us as a useful group to help them lever against the introduction of GMO. The debate has left the front pages in the intervening years, but as reported elsewhere in BBKA News it has been back in the news recently. My personal view is that the beekeeping community must be alert to this. If you have strong views for or against GMO then argue them in the relevant forum; do not presume to speak for beekeepers. Equally as beekeepers we need to keep our distance from both sides of the debate; we are working for bees and I urge my successors to keep this in mind in all their dealings on this matter.

A stronger body

Overall the BBKA is now a stronger, more resilient body than it was when I became a trustee. It has repaired its finances and has depth in its personnel, both voluntary and paid. It is more outward looking and confident in its abilities. I am also sure that as we hand over to a new group of trustees they will continue to lead this charity for the benefit of bees and beekeepers for many years to come.

Martin Smith, BBKA President



Spring 2012 Convention



Friday 20, Saturday 21, Sunday 22 April

The New Venue

Harper Adams University College, Newport, Shropshire TF10 8NB

LECTURE PROGRAMME

27 stimulating lectures spread over Friday and Saturday, for all levels of experience including: Yves Le Conte – *Social organisation of the hive*; Robert Pickard – *Big Bang*; Debbie Delaney – *The importance of genetics*; Jochen Pflugfelder – *The biology of mating*; Tom Salter – *Swarm Control*; Alan Bowman – *Gene knockdown*; Celia Davis – *Practical Beekeeping*; Adrian Davis – *Honey bee Nutrition*; Stuart Roberts – *Solitary Bees*; Juliet Osborne – *Pollination* and many more – see programme and web-site for further details.

COURSES AND WORKSHOPS

From practical to the theoretical covering a wide-range of beekeeping aspects including: *Build Your Hive, Microscopy, Anatomy & Dissection Microscopy, Botany for Beekeepers; Bumble Bee Conservation and Identification; Making Beekeeping Easier; Changing Combs; Bee Space; Photomicrography; Honey Appreciation; General Husbandry; Advanced Husbandry; How to Pass the Basic; Disease Recognition Soap Making; Queen Rearing* and more, all lead by experts in their field. See the programme or web-site.

Please note: Booking is required for most courses.

New for 2012 – One day Food Hygiene Certificate course; Honey Beer Brewing

FOR NON-BEEKEEPERS

Patchwork & Quilting Workshop; Cupcake Workshop; Creative Poetry; Tours of the Harper Adams set-up; A visit to Shropshire Lavender.

Trade Show & Exhibition – 2500m² – All major traders present – Saturday only

On-site Accommodation, Camping and Catering

Contact June Hughes – june.hughesbees@hotmail.co.uk or 01256 464280

Tickets on sale 9 January: £14 members in advance, £16 after 31 March;
£20 non-members in advance, £22 after 31 March.

Non-members admitted only on Saturday 21 April. Buy through the web-site or by post, sending your cheque and a self addressed C5 envelope for return to:
Christine Hayward, 19 Kings Road, LEISTON, IP16 4DA - 01728 832487

General enquiries to Tim Lovett – tjl@dermapharm.co.uk





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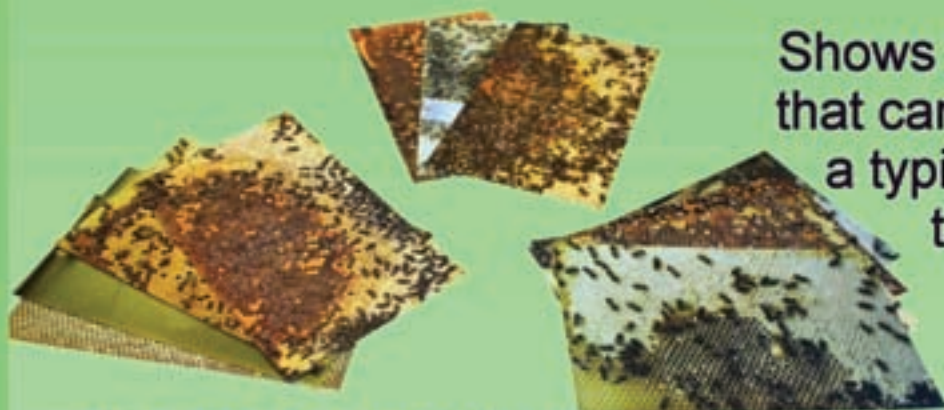
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Virtual Hive

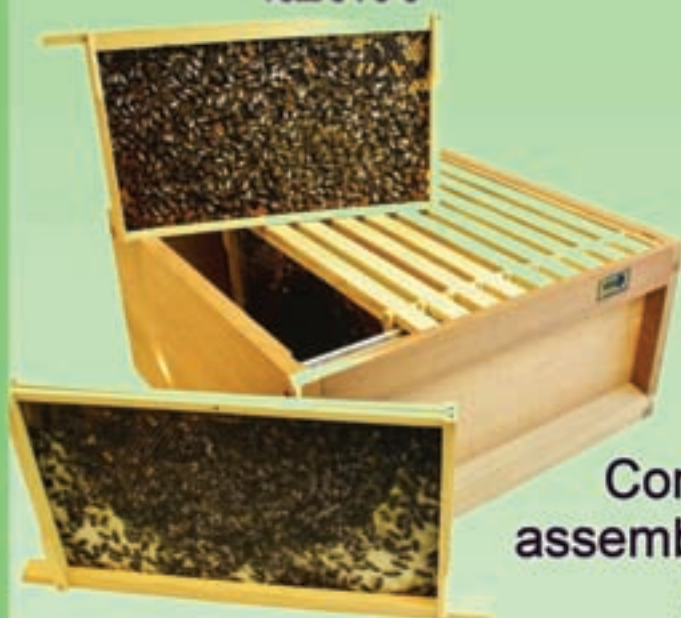
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