

In this Issue

Chairman's Letter	2
In the Apiary	2
Tree Bumblebee	3
Spring Convention 2011	3
Woodpeckers & Bee Hives	4-5
It is All about Education	5
The Forager	6
The Essence of Beekeeping	6
Smelly Feet?	7
Pheromones - Part 3	8
Commercial Foundation	9
Taking the Plunge...	10
Healthy Progress	11
Taking the Medicine - Part 5	12
The Varroa Genome cont.	13
Notes from a Clifftop Apiary	14
Around the Shows	15
Honey Survey	16
Insect Pollination Initiative	17-18
Pros and Cons	18
Winter Losses	19
Mel Asks the Experts	19
Bee Book Collections	20-21
A Course with Many Names	22
A Lesson Learned	22
A Story of EFB	23
Business Corner	23/25
National Diploma in Beekeeping Education & Husbandry	
Technical & Environmental Products & Publications	
BDI & Insurance Premium Tax	
BBKA Enterprises	
From the Boardroom	
ADM 2011	
Your Letters	26-27
Robert Hammond Award	28
Diary of Events	28

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The Varroa Genome

An Exciting New Project to Decode the Entire Varroa Genome has recently been announced in the USA.

Some background

The 41st Annual Meeting of the Society for Invertebrate Pathology (which featured the Shakespearean quote from The Tempest, 'Poor worm, thou art infected! This visitation shows it', was held at the University of Warwick near Stoneleigh in August 2008. One of the more interesting sessions, at least to beekeepers, was one on bee viruses moderated by

Diana Cox-Foster, Professor of Entomology at Penn State University and well known as a member of the USA research community investigating Colony Collapse Disorder (CCD).

At that time the hot news was the relationship between Israeli Acute Paralysis Virus (IAPV) and CCD. Segments of the IAPV genome have been shown to incorporate into the bee genome, and bees carrying integrated IAPV sequences became resistant to IAPV [E. Maori et al., J. Gen. Virol. 88]. There had also been some

research which indicated that varroa can be infected with IAPV, and the viral sequences might be integrated into the varroa genome.

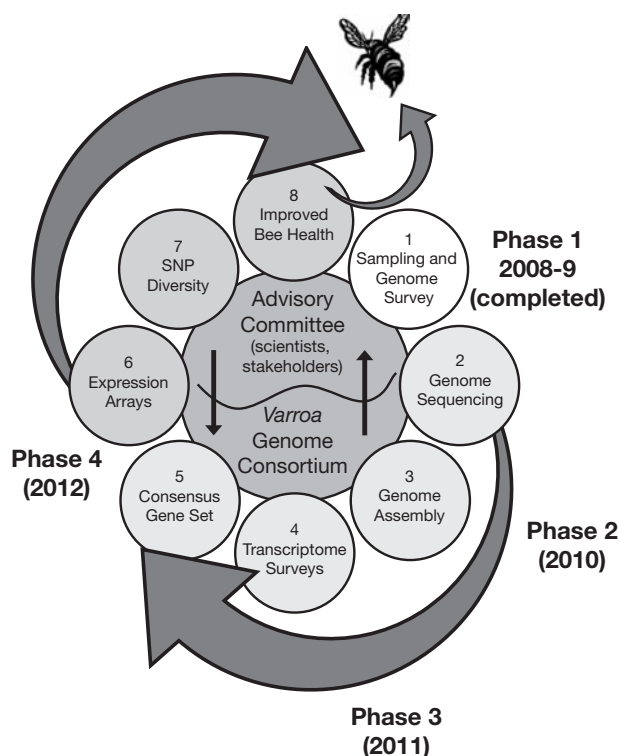
In 2006, USA government scientists had mapped genes in the cells of mitochondria of varroa mites. Mitochondria function as tiny power plants that fuel the cells' metabolic machinery. Compared to the mite's entire genome, mitochondrial DNA has fewer genes and can be coded easily. This work was primarily to look at variations in DNA gene coding in order to help taxonomic categorisation and identify geographic spread.

So why is decoding the varroa genome important?

As the result of sequencing the genome it is possible to search for sections of it that can be used as genetic markers. Markers are sequences of the nucleotide bases A, C, T, and G that are linked to traits of interest, such as virulence and pesticide resistance. They are thus important in indicating a genetic basis for these traits. Genomic information for varroa can be used to develop gene based control strategies, determine weak points for conventional controls, identify targets for biological control, and show

Continued on Page 13

Flow diagram of Varroa Genome Project



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Chairman's Letter

Well the summer season has come and gone and feeding and varroa treatment should ideally be completed, in Northumberland we had a much better year than in the previous two, and as a sign of activity there were more swarms about. However, one colony collected as a swarm then decided to swarm a further twice despite being on a double brood box; this colony becoming an ideal candidate for requeening.

Our beekeepers forum will have taken place before this issue of BBKA News is received and well after this column was written but I am looking forward to hearing the views of members from the associations who are already indicating they will attend. There will be a report of the forum in December BBKA News.

We all like to think we are indispensable but it is surprising, when circumstances force you to hand over responsibility to others, how they rise to the challenge and very quickly see no need even to consult. In my own local association time has prevented me from involving myself in many different aspects of association life and allowed me to see how things have continued, and I have to say extremely well.

True delegation can bring out the best in people, their knowledge improves as they are exposed to problems that they might otherwise not have been and as a result I believe my local association is much stronger, a lesson perhaps for others.

The BBKA web shop is now up and running and we are hoping that we see some income from sales that will help underpin the work we are doing on education and investment in research ideas.

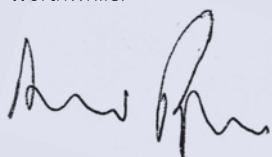
Overhearing a conversation at one of our local shows, it was good to hear ladies discussing buying Adopt a Bee Hive packs as Christmas presents which we hope as a result of further Saga help in their November magazine will see further good support from the general public.

The web site working party, following meetings with the three companies invited to tender, made their recommendations to the Trustees in September and I am pleased that their selection of a preferred bidder was supported and work has now commenced. I hope you like the improvements once the site goes live and I would like to express my appreciation to the team for their time and undoubted expertise made available to the BBKA.

The search for the ideal person to fill the post of Operations Director/General Secretary is well underway with some excellent candidates applying for the job. I only hope that the interview panels can arrive at a consensus on who best can fill the post which will underpin the development of the BBKA over the coming years.

The role of Chairman involves me in many different facets of running this charity, investigation and responses to letters of complaint (thankfully only three) it is also nice when you receive a response thanking for your answer, letters of thanks for donations one of £5,000 and one just as important from a member of the public on reaching 100 years of age. As the charity grows so does the work required, but I hope that the changes being made and others that will no doubt follow will be perceived as making a difference.

The winter season of lectures at associations is upon us and I would ask all associations to be aware that speakers give up their free time driving many miles sometimes in atrocious conditions to find the weather has kept the local audience away; if this might be a problem why not try and link with other local associations/branches to make the journey worthwhile.



Brian Ripley,
BBKA Chairman

In the Apiary



By now colonies should have been prepared for winter ensuring that they are healthy, adequately fed with good quality stores and headed by young fecund queens. This latter point ensuring a continuing brood nest and a more efficient replacement of winter bees whose life may have been shortened by virus infections triggered by varroa. If not hives must be prepared to overwinter as a matter of urgency. So what needs to be done in the apiary during October?

The apiary site

This is a good time to tidy up and cut hedges and grass. Hives that are in sunlight are less likely to suffer from isolation starvation caused when bees reach the top of their stores and are to cool to move around the frames to unused stores.

Monitor varroa

The majority of beekeepers wish to reduce their reliance on using chemical treatments for bees whilst still maintaining healthy stocks. As the current varroacides are not as efficacious as the pyrethroids were, beekeepers often have to apply additional controls during the winter. If we intend to reduce chemical reliance we must assess our stocks and only treat as required. Providing hives are equipped with open mesh floors it is simple to insert monitoring trays and count the daily mite fall during October and into November. Assessment is then straight forward so any full colony dropping more than an average of eight mites a day can be treated using oxalic acid, a single tray of Apiguard or other appropriate varroacide in December or January when little brood is present. Counting mites on a floor insert and then brushing clean each day or alternate days is easier and quicker than leaving it longer. Although a long assessment period gives a better mite fall average.

Protect colonies from damp

Damp rather than cold is a killer of bees so ensuring hives are well ventilated through the winter is important. Hives should be on stands that lift them off the ground thus reducing moisture being absorbed into wooden hives exacerbating damp conditions inside and encouraging timber to rot. Hives especially roofs need checking to ensure rain is shed away. If your apiary site is not vulnerable to windy conditions and you are using open mesh floors they can be left with the floor inserts out providing you are not monitoring varroa. If your hives are on solid floors or floor inserts are in place, then lift the crown board on two-millimetre lathes in late October when bees are settling down for the winter and will not propolis up the space. Used matchsticks are excellent for this and closing the feedhole with a piece of plywood or similar helps to reduce drafts through the brood nest. Entrance blocks are a debatable subject but entrances that are a single bee space in height and go from side to side reduce dampness around floors. Many beekeepers insulate their hives for the winter but trials carried out in the UK indicate that as a general rule it is better not to. However if you do use insulation make sure that it can 'breathe' and does not cause a condensation problem inside the hive.

Protect your hives from pests

Rodents can be a problem in winter finding unoccupied sections of a hive an ideal nest site. Fit mouse guards to prevent access by these animals. In some areas green woodpeckers can attack and damage hives by pecking through the walls to gain access to the ready feed of bees, larvae, etc. If this is a known problem in your apiary or nearby a simple cage of chicken wire placed around and over the hive being at least 300 millimeters from the hive walls will prevent damage whilst permitting bees to fly.

Richard Ball

Watch out for the Tree Bumblebee

In 2001, I caught a small and rather pretty bumblebee near Landford in the New Forest, Hampshire.

It struck me as odd because its colours were unlike any bumblebee species I had seen before – orange thorax, black abdomen, white tail. I looked it up in my old copy of *Chinery* and it seemed to be a tree bumblebee, *Bombus hypnorum*, a European species never recorded from the UK.



I sent it off to the Natural History Museum and they confirmed it. Presumably the bees had somehow hopped across the channel from France, although whether they flew or hitched a ride on a boat we will never know! Since then, the tree bumblebee has been spreading northwards, and it is now as far north as Northumbria – I hope to see some in Scotland any year soon! In the south of England it has become common in many suburban areas. Urban areas seem to have become refuges for bees in general these days, because they provide far more flowers and a better continuity of flowers than most farmland. Nonetheless the tree bumblebee seems to be particularly associated with suburbia, and the clue to the reason is in the name. Unlike any of our native bumblebees, the tree bumblebee nests almost exclusively up in the air, in holes in trees or similar cavities. Tit boxes are perfect for them, and suburban areas are full of tit boxes.

This can sometimes lead to problems. Some claim that the tree bumblebee is a bit more aggressive than our native species, and there have been a few cases of people being stung by them; something which is generally rare where bumblebees are concerned. It seems to be a particular problem if the nest box they are using is attached to a garden shed or outhouse which is frequently used by people; banging doors and vibrations from machinery make the bees nervous!

The tree bumblebee is also interesting in that it is common to see swarms of drones hanging around the entrance to the nest in midsummer. Some of our other bumblebee species do this too, but it is much more obvious when the nest in question is in a bird box in the garden. The drones are waiting for new queens to emerge, and will scramble to mate with them when they do.

Should we be worried about this French invader? My view is no. This species lives happily alongside other bumblebees and honey bees in Europe. So far as we know the invasion was natural, and it is very welcome to be able to report a bumblebee success story at a time when many bumblebee species are struggling. If you live in the north west of England or Scotland do keep an eye out for this distinctive bee; the Bumblebee Conservation Trust are trying to map its progress and would welcome a digital photo if you think you might have seen one!

Professor Dave Goulson,

*School of Biological & Environmental Sciences,
University of Stirling, Stirling FK9 4LA Tel: 01786 467759*



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Woodpeckers and Bee Hives

Woodpecker damage is mentioned in many beekeeping texts but unless a beekeeper has come across the damage it is difficult to imagine the damage that can occur.



The woodpeckers that cause the damage are Green Woodpeckers (*Picus viridis*), whose normal food is ants collected and eaten on the ground where the woodpecker will dig into the nest and eat the ants and their larvae and pupae. If an internet search is carried out it is evident that the species will eat other hymenoptera as many of the entries refer to damage to wooden buildings by green woodpeckers accessing carpenter bee nests in the buildings.

The green woodpecker is a dramatic bird that is more often heard than seen as it has a loud laughing call that led to one of its traditional names of 'Yaffle'. If seen on the ground the bird hops around digging in the soil for ants where it uses its bill and long tongue to collect ants to eat.

The bird is distributed all through England and Wales and most of Scotland and breeds across this range, it is a native bird and lives through the winter although very

severe winters can reduce the population significantly.

The woodpecker nests in trees and is more than capable of making the large holes that it uses as a nest and simply making a hole in the side of a hive is well within its capabilities especially if it detects food (bees, larvae and pupae) inside.

The damage can occur at any time of the year but is commonest during the winter when other food sources are more difficult to find and in the spring when the demands of raising nestlings increases the requirement for food. In cases where woodpecker damage occurs it is best to consider protection as an all the year round requirement.

The holes will often start at weak points such as the entrance or at the finger cutout on commercials and similar hives but in many cases the hole will simply be straight through the side of the hive. Normally it is easy to confirm that woodpeckers have been at work as the claw marks that they leave while holding on to the side of the hive are distinctive in that they are opposing pairs of claw marks. It may be worth noting that I have never heard or seen reference to WBC hives being damaged.

Once woodpeckers discover hives as a food source they may attack many hives in an apiary and cause much damage.

The damage may occur at several points and may not even be in the side of the hive as I have had one

roof with twelve woodpecker holes but it never got through to the bees or brood in this case.

The woodpecker has a long tongue and once its head is inside the hive it will sweep around with its tongue to collect bees etc., the damage can be to the frames as well.

It may be the case that the behaviour is learnt as at one apiary we knew that green woodpeckers were in large numbers but for many years had no problems and then over a couple of years major damage was incurred leading to the need for protection. On another site as mentioned above the woodpecker attacked the roof and on finding no success gave up and I have had no further attacks on that site despite no protection.

The only method of prevention is to prevent the birds getting access to the hives and this can be done in several ways.

In the case of attack to the roofs the answer is easy. I have changed to metal clad roofs and had no more problem; too tough for the birds.



Metal Clad Roof

For protection, the sides of the hives have to be made inaccessible to the woodpeckers.

This can be done by covering the hive with material that the woodpeckers cannot hold on to such as a polythene sheet. This can be a very cheap method but will only normally last for one season and does not allow the hive to breathe very well possibly leading to condensation problems inside the hive and continued damp woodwork possibly leading to rotting. If more than one box is on the hive manipulation will become difficult and this method does not protect the entrance.

A better method is to build a cage around the hive with some form of open mesh that allows the bees free access but prevents the woodpeckers reaching the hive. The commonest material for this is chicken wire which is relatively cheap but weak in construction and may need support or rapidly becomes distorted with lifting on and off the hive.



The most secure method that I have devised is to make the cage out of galvanised welded wire mesh which becomes self supporting and has stood the test of time without distorting or damage and in one recent case protected the hive from a falling branch.

Although the last option may seem very over the top and expensive it is worth considering the cost of any losses that may happen. If a brood box and all of

Damage caused by the Green Woodpecker



It is All about Education

The BBKA Executive made increasing the standard of beekeeping in the country through providing high quality teaching materials one of its strategic objectives, when considering its long term plans around eighteen months ago.

I am therefore very pleased to announce that we have been able to obtain funding to speed up the production of its Course in the Case (CiC) to enhance the training of beekeepers over the next few years. The Food and Environment Agency (Fera) which administers 'The Health Bee Plan' on behalf of Defra is funding up to 50% of the production of the successive stages of the CiC.

The CiC is designed to provide all

the information required to run a beekeeping course at different levels ranging from beginners through to more advanced levels. The initial CiC (coded white) has been distributed to branches during the summer in time for the winter introductory courses for new beekeepers. The next levels are due to be completed and released in the next nine months. The cases, that retail at £150 each, have been sold to local branches at a special offer price of £50 (This offer runs out on 30 October 2010 so hurry if you have not ordered one for your group). This funding will enable the heavily subsidised price of £50 to be maintained for other levels once they are released.

The BBKA, in conjunction with

the Welsh Beekeepers' Association (WBKA), the National Diploma in Beekeeping (NDB) has also secured additional funding to stage a series of training events aimed at teachers of beekeeping during the winter months. We all recognise that the huge number of people taking up beekeeping has put great strain on the teaching resources of most beekeeping groups and this initiative is to provide assistance and support to this hardworking group of individuals. Often the training is undertaken by two or three individuals, who need a way of involving others in this vital task.

Part of the funding will cover the cost of an Education Co-ordinator, for which interviews will take place shortly. This person will set and arrange the regional events over the winter. In order to kick start the process I decided that we should hold the first one of these in my local area, the North West

of England, on 23 October 2010 and am pleased to say we have obtained speakers and tutors to provide existing and prospective trainers and demonstrators with as much information and support as we can. Any trainer from outside the North West (who will therefore not have been automatically invited) is welcome to see if there are still places available.

Finally, I am particularly pleased that the BBKA has been able to work with other beekeeping groups such as the NDB, WBKA and the National Bee Unit (NBU) in a coordinated way to deliver high quality training for local associations. Equally I would welcome the opportunity of speaking to groups of beekeepers outside of the national beekeeping groups who might be interesting in participating in these training sessions.

Martin Smith, BBKA President

Woodpeckers and Bee Hives

the comb is damaged beyond repair and the bees killed, the value of this is considerable and far more than the cost of the cage. Even a super with its combs would probably be valued at more than the most sophisticated cage.



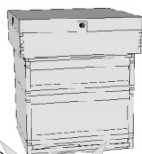
The approximate cost of the various options would be £1 or less for the polythene, £6 - £10 for the chicken wire and around £25 for the welded mesh. This cost is for materials only fabrication will take some additional time to construct.

*Julian Routh,
Master Beekeeper*

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The Forager

Double Trouble

As we go into the autumn and winter period, the shape of the apiary will often change – colonies are sometimes united and, suddenly, what looked in July like a crowded apiary can begin to look a little sparse. Uniting is one of those activities that can either go like clockwork or can present seemingly insurmountable difficulties. One of the major difficulties which it seems to present is that of getting the colony back to a single brood box and, for those beekeepers who habitually operate single brood box colonies, it is essential to return the colony to a single brood box before the winter sets in.

At this point I am in danger of upsetting those beekeepers who routinely operate on more than a single brood box because I honestly believe that, for the majority of beekeepers and colonies in the UK, a single brood box is all that is ever necessary. Certainly there are some commercial beekeepers who operate with very strong colonies and, I understand that the National Bee Unit also use double brood boxes but neither of these two categories are really representative of beekeepers or indeed beekeeping at large. For the vast majority of small scale beekeepers (and the average number of colonies operated by UK beekeepers is around four) a double brood box is an unnecessary inconvenience which will only serve to make your beekeeping more complicated than it need be. The same is also true of that curiously indecisive hive assembly known as brood and a half – surely the most inappropriate arrangement that mankind could ever conceive of.

So why do I feel that brood and a half or double brood is so unnecessary? Firstly, unless deliberately operated as a strong colony, it is rare that any colony has more than ten frames of brood even at the height of the season, so why give the colony 20, 22 or even 24 frames for the queen to roam through? Secondly, if you want to find the queen (and for many beekeepers, that is what their colony inspection comprises, whether they need to or not), it is much more difficult with double the number of frames. Thirdly, as one brood box has to be moved away to inspect the other, it places the queen at greater risk of being lost or damaged.

I personally do not feel that honey should ever be extracted from

combs which have had brood in as it will not be as 'clean' as that stored in super combs. So, fourthly, if you are motivated by honey crop, with a double brood box, you are severely limiting the honey which you can take from the colony.

Last winter, I came across a colony in an association apiary that had been united and overwintered on a double brood box. The queen was in the bottom of the two boxes and that is where she stayed for the winter. The top box was full of stores but neither the queen nor the accompanying bees were prepared to bridge the gap between the two boxes when it got really cold. The colony was regularly checked to see if there were sufficient stores and of course so it appeared from above because the top of the two boxes was untouched. But dead bees do not consume stores and, as they would not come up into the top box, the colony starved. The sad thing about this case was that it was only discovered during the first spring inspection. As far as the beekeeper had been concerned, all was well because there were still stores available!

Returning to the problem of uniting for the winter. There is a school of thought which says 'let's unite for the winter and sort the colonies out in the spring'. This was the policy practised by one beekeeper I came across a few years ago. After several years the result was four 'brood' boxes as the beekeeper was unable to find the queen and reduce the boxes to a single one! It took me and another beekeeper nearly an hour to sort that one out.

So, if there is a need to unite colonies, my advice is to unite early and, once the colony has settled down as a single unit, get it down to a single brood box by removing the worst of the brood combs. Unfortunately, these combs will need to be stored through the winter as the solar extractor will have stopped working by now, but as long as it is moth, wasp and bee proof they can be stored in the solar extractor until spring. One big advantage of this approach is that by maintaining a watchful eye and uniting early, you can largely avoid winter losses. All of the vulnerable colonies have been united already!

The Forager

The Essence of Beekeeping

As a part of the Healthy Bees Plan, Richard Ball and Ian Homer, Extension and Learning Officers at The National Bee Unit, are preparing a number of Good Practice Templates relating to various aspects of beekeeping.

These have arisen as there is a widespread feeling that, although there is little new to say about bee husbandry, the increasing number of new beekeepers encourages us to find new ways of communicating the basic beekeeping messages.

The templates are not intended to be the definitive way of doing things but will set out practices which are proven through many years use. Beekeepers are encouraged to set their own husbandry standards using the templates as a basis. It is hoped that they will also form the basis of discussion within beekeeping groups. Richard and Ian will add the templates to their current range of talks for associations and will happily lead discussions on the underlying principles of the templates and their use.

Over the coming months there will be around a dozen templates produced – these will appear on BeeBase (at <https://secure.fera.defra.gov.uk/beebase/index.cfm?sectionid=77>) and they will also be printed to be used as handouts at various events.

The first templates are:

- The Essence of Beekeeping
- Apiary and Hive Hygiene
- Handling and Examining a Colony
- Disease Recognition
- Bee Improvement

And these will be followed by others covering:

- Swarm Control
- Taking and Hiving a Swarm
- Making Increase (Artificial Swarming)
- Equipment
- Varroa Management
- Introducing Queens
- Starting Right with Bees
- Disinfection

Where possible, the templates will be limited to a single page covering the bare essentials of the relevant topic – beekeepers are encouraged to read further on each of the topics in order to extend their understanding of the subject.

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Smelly Feet?

This could be an article about a bee farmer's wellies but no it is a follow on from my article 'Do Bees Smell?' (BBKA News numbers 183 & 184, June - August 2010) and relates to the olfactory properties of a bee's foot.

Bees have six legs, each terminating in a complex structure, the foot. This is the fifth segment of the tarsus, see figure 1, and if you examine figure 2 you can see it has a pair of claws and an adhesive organ, the arolium or pad. The claws are hollow and bilobed with a curved point and are normally protruded to enable the bee to grip whichever surface it is traversing. However, as we know this has a drawback because the bee can be unable to disengage itself from hairy surfaces like a beard or good head of hair with a sting being the usual outcome! When we collect a swarm a non-hairy cloth is needed for this very reason.

When the bee finds itself on a smooth surface, like a window pane then claws are of little use so the median (centre) part of the foot is pushed onto the surface and the claws retracted. The arolium has lobes which flatten onto the surface to act as a sucker. The adhesion is further enhanced by a sticky liquid excluded from hairs on the planta between the claws. All of this is done by muscles and the Arnhart (tarsal) gland within the foot.

In figure 3, I have shown the difference in the claws of a worker, queen and drone. Why are there these differences? That is a good question and I have found a partial answer! What are the claws used for besides walking? Well according to Winston¹ they are involved in wax manipulation while comb is built and for workers to hang together when clustering to secrete wax and in a swarm. We have all separated frames of foundation and seen a 'string' of bees busy secreting wax. If these facts are true then the queen's smaller claws would fit but why are the lazy drones bigger? If you read the descriptions of the mating act then this becomes clearer as the drone approaches the queen from behind and above; his legs then grasp firmly before the act of consummation. So big claws would help get a better grip!

That is the mechanics of the foot but what about the smell? Well if a sticky adhesive liquid is secreted then as the bee moves forward a chemical trail will be left. Fellow hymenopterans, the ants leave a chemical trail which is illustrated by the fact that when one ant finds food spilt on the kitchen floor hundreds follow! Since most ants live on the ground, they use the soil surface to leave

pheromone trails that can be followed by other ants. In species that forage in groups, a forager that finds food marks a trail on the way back to the colony; this trail is followed by other ants, these ants then reinforce the trail when they head back with food to the colony. When the food source is exhausted, no new trails are marked by returning ants and the scent slowly dissipates. This behaviour helps ants deal with changes in their environment. For instance, when an established path to a food source is blocked by an obstacle, the foragers leave the path to explore new routes. If an ant is successful, it leaves a new trail marking the shortest route on its return. Successful trails are followed by more ants, reinforcing better routes and gradually finding the best path. Bees fly and so this method would not work so bees have evolved communication – the waggle dance (see The Dance of Bees in BBKA News 182 and 183, April and June 2010).

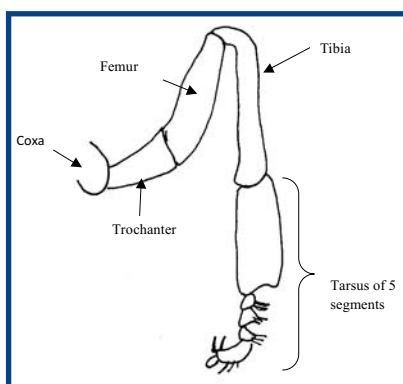


Figure 1: Sketch of a Worker's middle leg

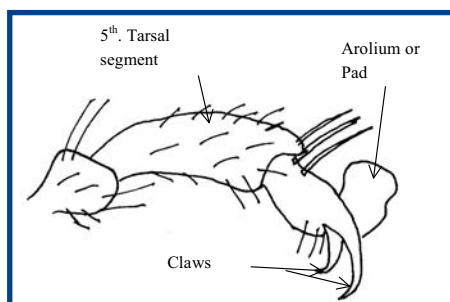


Figure 2: Sketch of a Worker's foot redrawn from Snodgrass

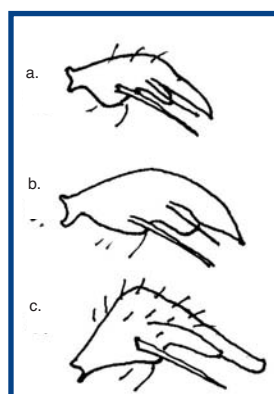


Figure 3: Claws of
a. Queen
b. Worker
c. Drone

So a bee does leave a chemical trail and as most chemicals smell, this is called the footprint odour or pheromone and is secreted by the tarsal (foot) glands. As you might expect there is a difference in the chemicals produced, and their function by the queen and worker.

In the worker this pheromone is left by bees when they walk and is useful in enhancing Nasonov pheromones in searching for nectar. According to Ribbands² this is useful in marking forage sources that do not have an innate odour such as water.

In the queen, it is an oily secretion of the queen's tarsal glands that is deposited on the comb as she walks across it. A young queen will deposit an oily trail on a glass surface at the rate of 0.8 mg per hour¹. This inhibits queen cell construction (thereby inhibiting swarming), and its production diminishes as the queen ages. However, like all the pheromones it works in concert with the queen's mandibular secretion and singularly it is less effective. All beekeepers were aware of this queen 'smell' because a matchbox used to house one, remains attractive to other bees long after the queen has been removed.

Bumblebees also leave chemical trails as Cederberg³ demonstrated in *Bombus terrestris*. He placed a sheet of plain paper between the nest and the nest entrance but restricted the passage across it to a narrow corridor. After a period of time he allowed the bees access to the whole paper but they nearly always kept to the established trail.

Do drones leave a chemical footprint? Well I see no reason why not but whether it is used to mark or guide fellow drone is another question. Drone congregation areas persist in the same location for many years but nobody has explained how a new cohort of drones, reared in the following spring, locate the area so perhaps it is the lingering 'locker room' odour – unlikely but who knows!

So to answer my question yes bees, and incidentally not only our bee, do have smelly feet but rather than it being a social problem it is a social asset!

**Bob Gilbert, Master Beekeeper,
Warwickshire BKA.**

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Pheromones – Part Three

This time I want to consider the way honey bees recognise their colony and how guard bees are able to determine if an arrival belongs to the colony.

We have all seen the guard bees at the entrance to the hive watching bees return from foraging trips and determining if the arrival really came from the colony or is an intruder. They use a lot of signals to decide their action.

- If a bee arriving looks unsure of its surroundings then this gives away the fact that the bee is intruding.
- If the arrival ranges back and forth trying to find a gap in the guard bees defences this is also a signal that the arrival is up to no good.
- If the returning bee seems light and its abdomen is not as high as other returning bees this also signals the need to investigate the new arrival.
- And if the bee does not 'smell' right they will be investigated.

This last signal is most interesting as we might think that all bees smell the same and all colonies have the same odour. In fact it has been shown that variations in the genetic makeup of the workers can produce small variations in the chemical constituents of various pheromones. In addition the general well being of the colony and the sources of pollen and nectar will alter the colony odour. These three elements are sufficient

to allow the guard bees to notice that an arrival did not come from the colony but maybe from an adjacent colony. Once inside the hive the intruder's chemical smell is compromised by the hive odour and it can now pretend to be part of the colony.

Robbing is a big nuisance at the end of the forage season and, if the robbers gain access to a hive, their own smell becomes masked by the strong odours in the hive and they then adopt the smell of the robbed hive. This will lead to 'silent' robbing and, if not checked will deprive the robbed colony of its stores. The guard bees have a very important job to do to prevent this happening.

There has been recent work on policing in the colony by the workers for worker-laid eggs. This policing has been studied extensively by Francis Ratnieks and his team as well as other researchers and is explained by the close relationships of super-sister groups in the colony who have the same father as well as the same mother. In fact the mating process of honey bees means that the genetic makeup inherited from their father is identical and thus they are more closely related to each other than normal sisters, hence the term super-sisters. These groups of super-sisters are able to differentiate themselves because the minor genetic variation between them results in very similar pheromone

constituents and thus very similar smells compared with their half sisters who have the same mother but a different father. These subtle smell differences are used to differentiate the classes of super-sister and, more importantly help in the recognition of eggs laid by a different sister class of worker. This in combination with the pheromones laid down by the queen when she lays an egg are sufficient to ensure the 'unwanted' egg is destroyed and not allowed to develop.

It is suggested that drones are repelled by virgin queens who are too closely related and this is one of the factors that limit the possibilities of inbreeding. Whilst nothing has been proven it is suggested that the small variations in the balances of pheromones produced by the queen (Queen Mandibular Pheromone and Queen Retinue Pheromone) and

particularly those from her tergite glands are sufficient for a drone chasing her in a drone collection area to recognise that it would not be beneficial for him to mate with her. One of the clear indicators of inbreeding is the appearance of patchy brood due to the queen laying diploid drones. That is fertilised eggs where the sex allele is identical from the sperm and the egg. These eggs are useless to the colony and are removed by the workers as soon as they are recognised and therefore create patchy brood. There are many more results from close inbreeding such as high deformities, reduced disease tolerance and other negative factors that are not immediately apparent so we should be thankful that drones can recognise their sisters and tend not to mate with them!

Ivor Davis, NDB

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Commercial Foundation? – There Are Alternatives

Much has been written recently in the BBKA News about the contamination of beeswax with chemical residues from varroa treatments.

Some authors believe that these residues are having an adverse effect on the fertility of our queens and drones. Several speakers whom we have heard lately only use their own cappings wax when making their starter queen cups.

In the mid to late 1990s when varroa was spreading across this country and the synthetic pyrethroids were first licensed for treatment we made a decision not to use them. As fully paid-up members of the Soil Association we saw these pesticides were very much a short-term fix. It was obvious that we could no longer use commercially made foundation. If we did not want the residue first-hand we certainly did not want the remains of the substances that other beekeepers were using at home and abroad. We decided to make our own foundation from our own wax.

The late Terry Herring of Basingstoke had demonstrated his method to our local association. He had made a board from smooth waterproof ply, a little larger than the required foundation. We use BS Deep foundation and our board is 14¼ x 9¼" with a batten raised about 1" on all sides. Part of this batten is cut away in the corner of one of the short sides.



The board is soaked in water for several hours. Heat a supply of your own beeswax to about 80°C.

Be very careful not to overheat the wax; 90°C is too hot. We use a Burco boiler half filled with water. The wax is melted in a wide-necked heavy container sitting on a grid in the water. The temperature is maintained with a simmerstat.

Drain the board, then hold it with the cut-away portion over the wax pot and quickly pour molten wax onto the board. The surplus drains back into the pot. Then put the board into a sink filled with tepid water and the sheet peels off. We then trim it to size using a template. If the wax sheet has lots of tiny holes, either the wax is too hot or the board is too dry. If the sheet cracks, the water in the sink is too cold. It is important to get the thickness of the sheet as even as possible. Aim for about 1mm. If the wax is a little too cool it gets thicker towards the draining point.

The next stage is to emboss these blank sheets. Terry Herring produced two nylon sheets that were embossed with hexagonal cell bases and lock together. The blank wax sheet is warmed in a water bath with a little washing-up liquid at about 50°C. The blank is then placed between the nylon sheets and compressed in an old-fashioned mangle.



The embossed sheet is then peeled off. We had a bit of trouble with this stage. We purchased BS deep sized embossing plates and when the wax was pressed between them the plates had a tendency to slip out of mesh a little. Needless to say, the bees did not like the foundation at all as the

reciprocal cells were misaligned. The answer was to use plates that were a size larger than the required foundation. These lock together much better.

The embossed sheets are again trimmed to size with the template, ensuring that the edge of the template is aligned with the lines of cells. If the blank sheet is too uneven in thickness it presses unevenly and some cells may distort. With a bit of practice you will quickly get proficient. We get about ten sheets to the pound and can make one hundred sheets over two evenings. It is a nice winter job.

We have now switched to wiring our brood frames horizontally and retensioning the wires when we refill them. If you prefer to wire the foundation diagonally, BeeCraft published an article when Arthur Dines was editor explaining how to make a wiring board. I assume it is still available. The beekeeping suppliers are now selling plates which look very similar to those made by Terry Herring. His originals may still be available second-hand; especially in the Basingstoke area.

The next problem is how to get hold of enough clean, uncontaminated beeswax. We were lucky because we started beekeeping before varroa arrived and then did not use the miticides or commercial foundation. Newer beekeepers can take a different route. Why do you use foundation in your supers? Brood frames need strength and the support given by wiring, but this is less important in supers. We sort our super frames in the spring and put the least desirable in the first super over the brood box. The pollen arc extends into this box, so we leave it in this position all summer. The second super is of drawn comb if we can

manage it, but for the third have a box of empty frames ready. You can use a bead of wax as a guide under the top bars if you wish, but this is not essential. When the second super is filling nicely, swap every other frame with one of these empty frames. The remaining frames are arranged in the same fashion in the third box. Over a good season the bees will fill the empty frames with beautiful clean combs. These can be extracted with care in a radial extractor. If you get the odd 'explosion' just trim the frame down and let the bees have it again. Do not be tempted to give them a whole box of empty frames in one go or they will fill it with wild comb that is difficult to remove. They cope well with every other frame. Mark your new frames and keep the wax separate. You will soon have enough wax to make your own foundation. There is a slight trade off in wax versa honey, but what you lose in honey you will save in time spent putting foundation in super frames.

One last tip was given to us by Malcolm Blake (the editor's husband). The best brood frames are drawn above the brood box where it is warmer when there is a good 'flow'. In July and early August after you have removed your supers, hive populations are large and the weather is warm. Leave the queen excluder in place then put on a brood box of foundation and feed gently. The bees will draw it out beautifully with few drone cells (as they are no longer needed) in about a week. Do not overdo the feeding or they will fill it with winter stores. Remove and store these new combs for next year's use.

*Paul and Paula Edwards,
Somerset BKA*

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Taking the Plunge ...

...from a Hobby Beekeeper to a Seasonal Bee Inspector

An advert for a Seasonal Bee Inspector early this year caught my eye and set the wheels in motion for a change of life for both myself and family. The honey bee and beekeeping became part of my life and rapidly took over so the chance to work in a 'bee environment' was too hard to resist.

The interview and apiary test were relaxed yet intensive but for me just a day at York and seeing FERA, the bee unit, and meeting Mike Brown felt unreal. The wait to know if I got the job was painful. I believed that I had failed as, once home, I realised that I had answered many questions not quite as fully as I should have liked. In truth I was in shock when I was offered the position of Seasonal Bee Inspector for the Eastern Region.

Next hurdle was the course at FERA in May. Leaving my children, aged 10 and 8 for the first time with dad in charge, was a daunting enough prospect let alone a week of Seasonal Bee Inspector training. I need not have worried as the other trainee Seasonal Bee Inspectors were great and soon a good rapport was apparent and missing home and loved ones affected us all.

I had no pre-conceived ideas about what to expect on the training course but it soon became apparent that it would be intense. For us trainees, two days in a classroom environment was suffocating when you are used to working outdoors, being self employed and not geared to a timetable. The 'classroom' work was a necessary part of employment today i.e. health and safety and housekeeping, but the core of the work involved was covered, also Legislation and Standard Operating Procedures for all the work we do.

At the end of the second day, Ian Molyneux, Regional Bee Inspector for the North of England, issued us with our equipment and started to train us all how to use it to a standard. What an eye opener that was, burning combs, scorching out hives, an area as a hobbyist beekeeper I did not know existed or perhaps did not want to know. It was upsetting to me to know that one day I would have to deal with such a situation. When I left home for the training course I had never envisaged half our garage being a storage place for the equipment needed and when I first arrived home my son saw the flame torch and his face lit up. 'Cor! Mum's got a flame thrower' so the plan of sneaking it all in so dad did not have a fit had gone out of the window.

Keith Morgan, Regional Bee Inspector for the Eastern England Region took us for the third day, an intense day of bee handling. All of us were excited at the prospect that we were actually going to handle bees. In some ways it was a 'kids in a candy shop' atmosphere that day and Keith had to control 'hyper' trainees inspecting the National Bee Unit bees!

Being instructed in the procedures for a 'random apiary survey' sample, shook swarms, and inspecting for European and American Foul Brood I felt was really beneficial in a classroom type environment. With an experienced trainer you could ask questions and discuss ideas which would be much more difficult in the field, where the important thing is attention to the beekeeper and the job in hand with their bees.

The two afternoons spent in the laboratory with Ben Jones examining diseased combs and seeing American Foul Brood spores under a microscope was brilliant, far

better than reading and studying it in a book.

Knowledge of the process from field to laboratory and putting names to faces made a complete picture. Ben was able to explain to us as future Seasonal Bee Inspectors what information he required to help make his and our jobs easier.

Ivor Flatman, Regional Bee Inspector for the North East of England, instructed us on the various treatment options for such diseases as European Foul Brood, nosema and also the varroa mite. Instructions regarding the danger of exotic pests, *Tropilaelaps* and Small Hive Beetle were frightening. The time spent seeing the larvae and adults of the Small Hive Beetle under strict controlled quarantine conditions was both frightening and illuminating and definitely beneficial in helping us detect them in the field, and understand their biology should they (heaven forbid) arrive here.

We were not issued with our laptop computers immediately, so for the first part reliance on good old fashioned pen and paper had to suffice. The staff at the National Bee Unit issued us all the stationery, mobile phones, EFB and AFB kits and have always been great when I later phoned with the smallest query.

At the end of the week we all left fully geared up with knowledge and enthusiasm for the next hurdle of ten days out on the road under the watchful (and patient) eye of other more experienced Bee Inspectors to be fully signed off the initial training programme, assuming it all went well.

Personally I no longer felt that I would look at my bees in the same way again, the 'romance' of beekeeping that I had had was now broken. Diseases and pests

do exist and need to be treated and contained in order for the honey bee to survive.

The first of my ten days out with an experienced Bee Inspector was worse than my first day at school, not only was I older but having been given the knowledge on the course I would have to know how to use it. What has occurred to me is that no amount of training can prepare you for the real thing; it just gives you the tools and how to use them. That first day my worst fear came true; burning dead diseased bees and scorching equipment. I knew that I would quickly learn to leave all emotions behind!

I started my ten days with the experienced Seasonal Bee Inspectors like a 'lost bridesmaid at a wedding' but with knowledge behind me and working alongside experienced inspectors; Peter Heath, Peter Folge and Sylvia Pettitt, confidence was quickly gained. For a large majority of the time I knew I would be working on my own but I was made to feel part of the Eastern team very quickly. Any questions even the smallest query I asked were always answered.

Paperwork and making appointments with beekeepers is a different aspect of the job which I did not fully appreciate or come together until I got the laptop. Also I had not realised the amount of miles I would travel to do inspections.

Finally..... as with all things in life nothing is perfect and the same is what I have found on inspections of hives, it turns out that bees do not read text books or go on courses. However, meeting such wonderful people fully compensates!

Sandra Gray
*Seasonal Bee Inspector
Eastern England Region*

Ben Jones from the National Bee Unit Laboratory shows new Seasonal Bee Inspectors how to remove and examine suspect larvae from the comb, using diseased combs under safe conditions.



Regional Bee Inspector Keith Morgan instructs the new Seasonal Bee Inspectors in the techniques of colony examination, here showing a strong double brood 'Smith' colony.

Healthy Progress

News from the Healthy Bees Plan

The contribution being made by the BBKA to the Healthy Bees Plan (HBP) project since its return to the Project Board in May this year has been substantial. This is not just in terms of advice and comment but also in more tangible terms through the output of our own Education Project under the direction of Chris Deaves manifested in the Course in a Case series.

All Area Associations have received their free copy and many branches and divisions are taking advantage of the discounted offer to acquire their own examples. The Novice and Improvers CiCs follow the Beginners shortly, which will really help associations get the flocks of new beekeepers off on the right track and also help those who wish to learn more and improve their husbandry technique thus helping to achieve the object of healthier bees, one hopes. The CiC complements the other activities being promoted by the HBP, the random apiary survey and augmented inspection team should also in time improve matters.

Having previously considered the motivations and communications preferences of beekeepers, following the survey carried out earlier this year, the Communications Working Group of the HPB at its most recent

meeting, spent a great deal of time looking at BeeBase. Its strengths and weaknesses were examined. On page 26 you can read more about BeeBase from Helen Crews of FERA. There is huge hidden strength in terms of the data-base which lies secure behind the public and registered areas. There is a mass of data on apiary inspections and their outcomes going back more than ten years. This data serves first and foremost the NBU but can also be made available, in an anonymous form to academic institutions for legitimate epidemiological work. Data access is strictly controlled – not even the Minister can see it without giving the Data Controller good reason. On the weakness side, it has to be said that as a website there is room for improvement. The excellent NBU publications/leaflets are there but there is a need for more advice and help in its key role of aiding disease identification, prevention and management. One aspect of this is the current inability to send e-mail alerts to all registered beekeepers to warn of disease in a given area because e-mail addresses are held for only half of them. An effort to obtain and supply these seems to make sense and would indeed be real progress, enabling BeeBase to interact with registrants.

Tim Lovett



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BEEKEEPERS PROTECTIVE CLOTHING

Taking the Medicine – Part Five



The Prescribing Cascade and Importation of Veterinary Medicines into the UK

We have discussed in previous articles why veterinary medicines, including those authorised for use in bees, need to be regulated and how they are regulated. We have seen that the regulatory system in the EU and in the UK exists to ensure the safety, quality and efficacy of authorised veterinary medicinal products and that legislation on veterinary medicinal products requires veterinary medicines to be authorised in a Member State before they can be placed on the market in that Member State. The authorisation procedure consists of the scientific assessment of data on the quality, safety and efficacy of the product in relation to a given species. For medicines which are to be used in food-producing animals, including bees, additional information has to be provided to ensure that produce obtained from the animals, such as honey, is safe for consumers.

However, the European Commission has acknowledged that insufficient authorised veterinary medicinal products are available for the treatment of every clinical case. This is particularly true for the treatment of minor species, such as bees, horses and goats, for example, and rare conditions in major species, such as the treatment of epilepsy in cats. Therefore, the EU legislation allows, under certain circumstances, veterinary surgeons to prescribe products that are not authorised for the relevant clinical case or for the relevant species – this provision is known as the Prescribing Cascade. In the UK the VMD has implemented the Cascade in national legislation, the Veterinary Medicines Regulations. It is worth noting that both the national and European legislation require that a veterinary surgeon prescribing a medicine to a food producing animal under the Cascade specifies an appropriate withdrawal period for the animal's produce, to ensure that there will be no risks to consumers' health.

The principle of the Cascade is that, if there is no veterinary medicine authorised in the UK for a condition, the veterinary surgeon responsible for the animal may, in particular to avoid causing unacceptable suffering, treat the animal in accordance with the following sequence, in descending order of priority:

- a veterinary medicine authorised in the UK for use in another animal species (eg, a veterinary surgeon may treat a ferret with an anti-inflammatory medicine authorised for use in dogs) or for a different condition in the same species. If there is no such product, the next option is either -
- a medicine authorised in the UK for human use (eg, use of certain anticancer human medicines in dogs), or
- a veterinary medicinal product not authorised in the UK but authorised in another Member State for use in any animal species (in the case of a food-producing animal the medicine must be authorised in a food producing species) in accordance with an import certificate issued by the VMD. If there is no such product, the last option is
- a medicine prescribed by the veterinary surgeon responsible for treating the animal and prepared extemporaneously (eg, a solution of boric acid) by a veterinary surgeon, a pharmacist or a person holding an appropriate manufacturer's authorisation.

There is a large degree of misunderstanding amongst the general public and even to some extent within the veterinary profession regarding the use of the Cascade. It must be emphasised that the objective of the Cascade is to improve the availability of medicines used for treatment of animal conditions in the interest of animal welfare. It is clear that the use of an unauthorised medicine (that is, a medicine that has not been assessed for quality, safety and efficacy in that animal species) represents an undefined risk to the animal or the human consumer and unquantified benefits for the animal and therefore the decision to use such medicine must not be taken lightly.

The VMD is aware of the plight of beekeepers regarding availability of medicines for treatment of conditions such as varroosis and noseosis.

Our ambition is to fully authorise medicines for bees in the UK and, therefore, decrease the need for beekeepers to use unauthorised medicines. In the meantime, we have created, in cooperation with BBKA, BFA, NBU and other organisations, an action plan to try to ameliorate the situation for beekeepers within the legal constraints of

the Cascade. Details of this action plan can be found within the VMD's website <http://www.vmd.gov.uk/VetSQP/Bee/actionplan.pdf>

One of the measures to help beekeepers is to allow the importation of medicines authorised in other member states for use in the UK, as described above. Unfortunately, the use of the Cascade for bees is limited because the EU legislation clearly indicates that only a veterinary surgeon can prescribe a medicine for use under the Cascade - but only a few veterinary surgeons are involved in beekeeping. The VMD recognises that there are occasions in which other specialists could be allowed to prescribe medicines under the Cascade and have proposed to the European Commission that the principles of the Cascade should be amended to allow specialists in apiculture, who are not veterinary surgeons, to prescribe medicines for bees. This is a medium to long term objective and, as an interim measure we have created a directory of veterinary surgeons who have an interest in apiculture and are willing to help beekeepers to import bee medicines authorised in other member States. The VMD, the BBKA, BVA, BFA and NBU hold this directory.

It is worth mentioning that the importation of veterinary medicines authorised in other member states is only legal if carried out under an import certificate obtained from the VMD. Any veterinary surgeon may apply for an import certificate. In most cases applications can be made on line but for certain products postal applications are required. Information on the VMD's import scheme may be found here: <http://www.vmd.gov.uk/VetSQP/Bee/bee.htm>

The next article will discuss the distribution of veterinary medicines in the UK and how the VMD deals with reports of suspected adverse reactions (side-effects) in animals, humans and the environment, including suspected lack of efficacy.

Martha Spagnuolo-Weaver, VMD and Tim Lovett, BBKA



Key Criteria for Veterinary Medicines Efficacy – Safety - Quality

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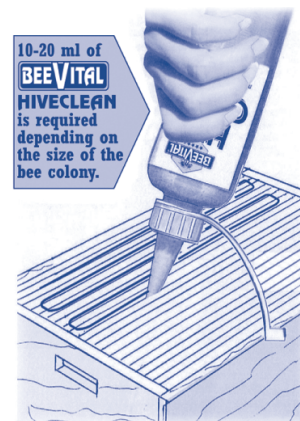


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The Varroa Genome

...cont

how mites find honey bee hosts and reproduce in resistant and susceptible bee lineages.

The new project

This year a project to decode the entire varroa genome has started. The project is being run by the USA Department of Agriculture Research Services at its Bee Research Laboratories, Beltsville, Maryland (south of New York on the East Coast). The team leader is Jay Evans who has been heavily involved in honey bee research in the USA for over ten years. Jay has created a consortium of some forty researchers from thirty different research establishments including some in Europe, including supplying European stock and also neurobiological input, to be led by Yves Le Conte of INRA, France. Although it is a four year project, the initial sequencing will be completed in the first year of the project and released publicly into genomic databases, thus allowing other projects to make use of the work as early as possible.

Possible benefits

As with the human genome, the benefits are unlikely to be as first predicted and may manifest themselves in unexpected ways. Top of the wish list would be the development of a 'suicide gene' to insert in the varroa genome, followed by the development of mechanisms to make varroa non-pathogen bearing. Far more likely is that other research programmes, for example those involved with breeding 'hygienic' bees, those investigating interaction between varroa mites and honey bees and those looking for more effective treatments will be able to reach fruition faster and with greater likelihood of success by virtue of access to a comprehensive set of genetic markers.

For more information, just Google 'varroa genome project' or http://www.ars.usda.gov/SP2UserFiles/Place/12750500/VarroaGenomeSketch_Jan072010.pdf

David Bancalari, Norfolk Beekeepers' Association and member of BBKA Technical Committee

Notes from a Clifftop Apiary

Actually, the cliff edge is several metres away. But still, colleague-beekeepers hearing of a sea-edge location for the hives tend to be sceptical: "So, your bees have only got 180 degrees, half the compass to forage in, the rest is open sea. Bit of a handicap, that." As far as I can see, and on a good day that's as far as Portland, it makes no difference. The honey crop is as heavy as this beekeeper's management skills can make it, and that applies wherever hives are sited: be it forest or farm or travelling fairground. My bees aren't deprived, they fly inland to the hedgerows and rich pickings of village gardens, and they fly sideways along the cliff edge where the hawthorn and the blackthorn and the bramble tangle with each other.

The hives are sited on the seaward side of the allotment under a blackthorn hedge for protection from prevailing westerlies. This means that anything I try to do by way of vegetable growing puts me in the flight-line of foragers. Digging or weeding, I'm an irritant, I'm in the way of flying bees. After five minutes I start getting head-butted. If that doesn't clear me off, then it's harrying, before finally a sting. Result: bees 1 : vegetables 0. I wonder if other allotment-beekeepers manage bees and vegetables together?

It's a sunny morning in mid-July and I am standing on a wobbly chair trying to lift off the forth honey super, but it's heavy and the chair is tilting. This is not a good arrangement; the hive stand is too high. At moments like this I have to admit that my wife's insistence that I put the mobile phone in my pocket is a good idea. I see myself lying winded in the grass with a brood box and maybe a super or two on top of me and just possibly a cracked rib; the mobile would come in handy then. The forth

honey super is in fact a brood body; it's all that was available back in the end of May when this particular colony were roaring away, sliding nectar into the supers like a rising tide. Now I have a leaning tower and I have to risk my life to lift off the top and see if all that honey is capped and ready for extraction.

Cracking the seal under the top box and testing the weight, and keeping my balance, I sense I am being watched. Turning to look over my shoulder I see my wife standing silently by the scrub and bramble. The scrub and bramble is not the name of a pub. It is the state of my allotment. It is not usual for my wife to be here. The allotment-apiary is a good ten minute walk from home. Why is she here? Why is she standing silently among the long grasses like a ghost. "Hello," I call. "What's up? Everything alright?"

"Man phoned," she calls, keeping her distance. "He's got a swarm in his compost bin. Do you want it?"

"Did you take his number? I'll phone him back."

She is gone. And not a word about me teetering on a wobbly chair grappling with a heavy box full of honey. How is it that women never get the moment for concern and sympathy right? When you need it you don't get it; when it's the last thing you want, there's lashings of it.

In the evening I go to visit the man with the swarm in his compost bin. The bees are so docile I can scoop them out with my hands and fill the bin lid, then tip them onto the sheet where they can walk into my waxy cardboard box¹. Later this is inserted into an empty brood box and a second brood body filled with frames is put on top. It's an alternative way of introducing bees to a hive; rather than knocking and shaking the bees down onto the top bars, the bees naturally move up and occupy the

frames above them. I am indebted to Wally Shaw, who writes in *Bee Craft*, for this excellent practical way of introducing a swarm into a hive. Next day the cardboard box (which has been liberally painted with liquid wax) is removed and the colony fed syrup. Job done.

On one side of my plot is a cottage garden. The owner comes down from London at weekends. He tells me there is a bee hive installed on the roof of his office in Cavendish Square. I shall be interested to find out if he has a honey crop this summer. On the other side is Frank. Frank is my caustic vegetable growing neighbour. I ask him if he too is bothered by being in the way of flying bees. "Nope. They's too high. They's over my head." He nods over at one of the hives. "You got bit of newspaper stuck in there, you know that?" I tell him I'm in the process of combining two colonies. "They're eating their way through the paper and making friends that way instead of fighting."

"So, what you give 'em then? The Telegraph?"

I shake my head. "I think bees are more likely Guardian readers, wouldn't you say?"

On the hive stand beside the Guardian-reading hives is a nuc, which I made up around a capped queen cell earlier in the summer. This caused me some puzzlement when, days later, I found a stunted little queen skittering over the cells. She was barely identifiable as a queen; it took me some moments of hard looking to decide that that was what she was. She clearly had the spider-like legs, but she barely had the abdomen. I marked her with a blue spot and continued to feed the colony. Later in the summer I cornered an expert, Dr Mick Street, in the Bee Tent at the Agricultural Show and asked him about runty-looking little queens and received the answer that what I was looking at was a newly

emerged virgin queen, whose abdomen was not yet fully extended. Once she had been mated and her ovaries had developed, then she would start to look like a proper queen and the lateral membrane and the plate casings which make up the segments of her abdomen would extend and form the recognisable rear end. True enough. On looking in the nuc some weeks later I found her looking distinctly queen-like, gently bumping her finely-shaped rear end along over the cells. What could be more pleasing to the eye: a fine looking woman with a beautiful bottom.

There is another successfully expanding nuc in the apiary. This one was built up initially around a frame of eggs which had been lifted out of the parent colony and left for two hours in a brood box sitting on top of the hive. Time enough for the frame to become covered in nurse bees. This was then lifted out and put into the nuc box, with brood, food, emerging and shaken-in bees. They raised a queen from the frame of eggs.

Having hives overlooking the sea adds another dimension to bee keeping. Since much of one's time is spent peering into the minutia of the insect world, or else rearranging internal hive furniture, it's a relief to look up and out across the bay, to streaks of glittering light on the sea, and the travelling ridges of waves coming in out of the Atlantic, angled to the shore. And why shouldn't bees too share this pull of distance, even if they must stop short of the open gulf and harvest the very last and the very first of the flowers growing on the edge of this land.

Rowland Molony
East Devon BKA

1. A full explanation of Wally's waxed wine box method of capturing and housing a swarm is given in his article in the June 2010 issue of *Bee Craft*.



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Around the Shows

2010 has proven to be a busy year for the BBKA and its members at shows around the country. Together with our partners, New Holland and Saga a real impact has been made meeting and greeting the general public, beekeepers, farmers and land-owners. The

message has not been simply to consider taking up beekeeping, more to consider what can be done to improve bee habitat and general awareness of the contribution of bees to the wild and managed environment. Our presence at Gardener's World Live was rewarded by a Best in Show award. Well done and many thanks to all who have helped spread the word.

Royal Visit to BBKA at Hampton Court Flower Show



Photos: Tim Lovett

British Beekeepers Association



and the 'Course in a Case' project. She has recently installed hives at her Wiltshire house and is very keen that they are managed properly. She

was given a gift of honey, candles and a copy of the BBKA booklet, 'Advice for Beekeepers'. Beekeepers Sandra Rickwood, Debbie Vivers, Serena Fraser and Alasdair Maclean were presented to HRH.



Gardeners' World Live



The BBKA stand at Gardeners' World Live was awarded two 'Highly Commended' certificates.

The team did a super job with the exhibits and after many meetings and lots of hard work by the show team in the run up to opening day the cream on the cake was Clive Joyce accepting the 'Best in Show Feature' - a beautiful Dartington glass flower vase. Not a bad achievement for a bunch of enthusiastic 'amateurs'.

Photos: Gary Francis



The Royal Bath and West Show



New Holland at the Bath & West Show



A bee on the bonnet



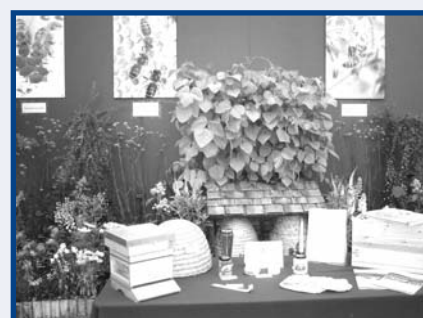
Chris Rawlings receiving the overall show winning shield.



RHS Show Tatton Park



The classic skeps on the BBKA stand at RHS Tatton Flower Show in July, including one with a 'super', aroused a lot of interest from the public. The judges obviously liked them too, awarding a Silver Gilt to Cheshire Beekeepers' display with a theme of 'Beekeeping Past & Present'. The BBKA's 'Adopt a Bee Hive' scheme was also promoted, and judging by the leaflets disappearing off the stand, it will not be long before there are a lot more 'adoptees' than the 4,000 already signed up.



The BBKA's Honey Survey

Please tell us how you got on this year

The BBKA was asked this summer whether beekeepers would be getting a better honey crop this year. Rather than guess or base our response on our own individual experiences, we would like to hear the views of as many BBKA members as possible.

Please spare a few minutes to tell us about your honey crop this year and where your bees went to forage. The information will be used to help us build a picture of this season's honey crop, region by region.

You could win one of two B&Q gift cards worth £50 each

We are hoping at least 1,000 of you will take part, and as encouragement, B&Q who are corporate members of the BBKA, have kindly donated two £50 gift cards to go into a prize draw for two completed questionnaires drawn from a hat.

The easiest way to take part is by going to the BBKA web site <http://www.britishbee.org.uk/> where you will find the survey online. It should not take more than five minutes to complete. It is quick and easy to take part on line although you can complete the questionnaire below in ball point pen and post it back to us if you prefer.

Which ever way you choose, thank you for taking part, please reply by **Friday 15 October 2010** at the latest.

You will be able to read the survey results in the next issue of BBKA News. I look forward to hearing from you.

Brian Ripley, BBKA Chairman

HONEY QUESTIONNAIRE

1. For how many years have you kept bees?

Please write in how many years to the nearest half a year, including this year as half a year if you started beekeeping any time in 2010.

..... years

2. How many hives do you have?

Please write in how many hives you either own or were wholly responsible for on 30 September 2010, even if you have had more or fewer hives at different times of the year.

..... hives

If you keep your hives at more than one site, please could you tell us how many different sites or apiaries you had on 30 September 2010.

..... apiaries

3. How many lbs of honey did you get this year?

Please write in how much honey you had taken from your hives by 30 September 2010 to the nearest 1lb, including an estimate of how many lbs this will mean if some of your honey is still on frames, but out the hive, waiting to be extracted.

If you are a new beekeeper this year and therefore do not have any honey yet, please just tick the 'new' box for new beekeeper and skip to question 6.

.....lbs new

4. About how much more or less honey was this than last year?

Please write in how much more or less this is compared to the same time last year to the nearest 1lb in either the 'more' or the 'less' box. If this is roughly the same as last year please put a tick against 'same'.

.....lbs morelbs lesssame

5. In your opinion what do you think this difference is due to?

Please write your views in your own words

6. How much of the following sources of food (nectar and pollen) have been available for your bees in the past year?

Please tick one box for each column, as relevant for your bees.

	Exceptionally large amount	Average amount	Exceptionally lacking amount	Not applicable or relevant in my area
Garden flowers and shrubs				
Garden vegetables				
Fruit trees in gardens or orchards				
Other types of trees				
Hedgerows				
Heather moor or heath land				
Farmers or market gardeners crops				
Please name the main above crops for your bees this year				
Something else, please write in				

7. How would you describe the type of area you keep your hives in?

Please tick all which apply to you ☐ urban ☐ rural

☐ have apiaries in both rural and urban area ☐ move hives to seasonal crops

8. Could you tell us the first section of your postcode? (This information is to help us look at possible geographical patterns of honey quantities.)

First 4 digits of postcode

Would you like to be entered into the prize draw to win one of two £50 B&Q gift cards?

Please tick one box ☐ Yes please ☐ No thanks

If you have ticked the yes box for the prize draw, please give the telephone number or email address we can use to contact you if you have won the prize draw.....
We will use this information for the prize draw and for no other purpose.

THANK YOU FOR TAKING PART

PAPER & POST: Cut out this page, complete it with a ball point pen and post it in an envelope back to the following address:

The BBKA Honey Survey
BCDP
Unit 18, Rockware Business Centre
5 Rockware Avenue
Middlesex, UB6 OAA

ONLINE: Go to the BBKA's web site <http://www.britishbee.org.uk/> where you will find this survey and can complete it online in about five minutes.

All entries must be received by Friday 15 October 2010 at the latest, thank you

Insect Pollination Initiative

Modelling systems for managing bee disease: the epidemiology of European Foulbrood.

Introduction

Occasionally in science you are confronted by something which appears so blindingly obvious that you ask yourself 'surely someone must have tried this before?' Actually, 99% of the time you find they have, and you feel pretty daft for not already knowing all the facts. This project concept represents one of those moments when this question was answered with 'so no one else has thought of this!'

The National Bee Unit (NBU) has been around in one form or another since the 1940s when it was formed to control brood disease and also regulate the provision of sugar to beekeepers under wartime rationing. The ability to maintain consistency in activity across years is important, because longevity of activity leads to the generation of sound science and long term datasets. Whilst times have changed, some of the old enemies still persist. The following quote from Della Rocha describes a foulbrood epidemic:

'The remains of the hives that were lost were taken to the streets of the town to expose them to the sun in order to extract all the wax, and the bees from the neighbourhood sucked up the honey, caught the disease, and communicated it to the other hives, and all without exception perished in a short time.'

This historic reference resounds today as much as it did when it was written over three hundred years ago! The recent large outbreaks of foulbrood in Jersey and Scotland are fresh reminders of the persistent threat posed by these endemic brood diseases. Other threats come in the form of emerging diseases, spread by the global industry in honey bees and their hive products. Who could have imagined what varroa would have done to our bees yet alone what *Tropilaelaps* mites may do? More recent reminders come in the shape of massive losses in Spain and Portugal attributed to *Nosema ceranae*, an Asian variant of an endemic fungus. New

invasive pests and pathogens do not just threaten the health of our honey bees, but some can also infect other important pollinators such as wasps and bumblebees. So what can we do to protect our pollinator populations from such treats? Many other areas of science have utilised mathematical models to provide insight into how diseases move and therefore how best to control them e.g. foot and mouth in cattle; mycobacterial infections in children. My team and I believe we can minimise the impact of disease on pollinator health using such methods; a seemingly obvious marriage of modellers, long-term datasets and experts in insect disease management.

Modelling approaches

We will use a combined modelling and molecular approach to investigate the dynamics of honey bee diseases, starting with European Foul Brood (EFB) as an example of endemic brood disease, which we will use to hone our mathematical tools. We will combine a program of statistical, analytical and spatially explicit modelling to understand how disease begins within a hive and follow its dispersal across the UK landscape. We will identify factors involved in the epidemiology of disease, including land use, weather and management practices; and understand the role of transmission processes in determining the epidemiology of disease. The project will also investigate the efficacy of different practical control measures with a view to providing advice on improving current best practice for disease control.

Host and pathogen diversity

Our project will better understand how the genetics of host and pathogen contribute to disease development. Our team has established methods to 'fingerprint' honey bee colonies using microsatellite markers. These methods will be used to describe the genetic makeup of our honey bee population and to identify genotypes which differ in susceptibility to disease. Our team has, in collaboration with the Sanger centre and Ed Haynes (BDI/BBSRC CASE funded PhD

student), already generated a draft genome sequence for *Melissococcus plutonius*, the causal agent of EFB. We will use these data to identify suitable markers to effectively characterise the UK *M. plutonius* population. These data will allow us to distinguish between failed treatments and reinfection, and will also shed light on the genes responsible for virulence and how pathogenesis proceeds in the bee host. Data on host and pathogen genetic diversity will be used as additional factors in the models exploring the epidemiology of EFB in relation to host resistance.

Extending models to other diseases

Whilst EFB will be used as an example disease, the tools developed in this project will be applicable for other pollinator diseases. For example, developed models will be used to investigate the epidemiology of fourteen honey bee diseases collected across 4,600 apiaries as part of the ongoing Defra funded apiary survey. In addition to bacterial disease, these will include damaging viruses such as deformed wing and chronic bee paralysis viruses and fungi like *N. ceranae* and *N. apis*.

Meet the team

Food and Environment Research Agency (Fera)

Mike Brown is the head of the NBU; created the now award winning database (BeeBase); and is one of only five EU bee experts who advise the commission on honey bee health issues. Graham Smith and David Wilkinson are biological modellers with interests in modelling the dynamics of populations and disease and have worked on multi-species models of rabies, bovine tuberculosis and also varroa. Theo Allnutt (population geneticist) and Hez Hird (molecular biologist) have together investigated the genetics of UK foxes and bats as disease vectors. Richard Thwaites is a molecular microbiologist with experience of next generation sequencing and culturing *M. plutonius*.

University of Bath

Ed Feil has experience in the generation and interpretation of

population-level nucleotide sequence datasets for many bacterial species and has recently completed a study examining the global geographic structure and microevolution of a widely disseminated methicillin resistant clone (MRSA). Nick Britton is a mathematician with expertise in modelling ecological, epidemiological, and evolutionary systems and has experience of modelling behaviour and ecology in social insects. Nick Priest is an expert on the evolutionary and ecological consequences of recombination in insects.

University of Newcastle

Steve Rushton, Aileen Mills and Mark Shirley are biological modellers with extensive experience in modelling diseases with complex transmission and aetiologies including squirrel pox virus (SPV), bovine TB in badgers and human disease such as paediatric atypical mycobacterial infections and pneumococcal disease.

University of Warwick

Matt Keeling is a mathematical modeller with expertise in a range of human and livestock infections, and has considerable experience in dealing with the spatial spread of infection and the optimization of practical control measures e.g foot and mouth disease and the ongoing H1N1 outbreak. Jim Bull is an expert in using simple mechanistic models to understand the role of spatial heterogeneity in host-parasite dynamics and has developed statistical approaches to underpin population level responses to disease in honey bees and drosophila with high throughput transcription data.

Our project also includes partners who have agreed to provide advice and project steer including the University of Versailles, the Bee Research Centre in Switzerland, and The Bee Farmers' Association and we are looking for another industry partner.

Practical outputs and dissemination

We will produce practical guidelines for disease management targeting three groups:

Continued on Page 18

Pros and Cons

Continuing the series of articles looking at the differences that affect an aspect of your beekeeping, giving an opportunity to consider the good and bad points and make your own decision on what suits you best.

Clipping Queens (using sharp scissors to remove part of the queen's wing to help delay swarming)

Pros of Clipping Queens

- Clipping queens delays the issue of a swarm, allowing for less frequent apiary visits. It prevents the loss of bees if the colony decides to swarm as the queen falls to the grass when attempting to fly and either returns to the hive, dies in the grass or settles with some of the bees on the underside of the mesh floor. The worker bees that were attempting to swarm then return to the hive and the beekeeper has a little extra time to deal with the problem before the first virgin queen emerges. This is especially helpful if you are trying to reduce losses when you go on holiday or if your work pattern does not allow weekly (or eight day) visits.
- Clipping can be an adjunct to marking: to identify queens by (for example) clipping the right wing in odd years and the left wing in even years.
- Plus an advantage to honey bee geneticists: may be used to obtain genetic material for analysis from the queen or other bees without killing them.

Cons of Clipping Queens

- Clipping queens requires a degree of manual dexterity and visual acuity that not all beekeepers are blessed with. I have heard one tale where an old beekeeper was asked to clip the queen and promptly cut off the queen's abdomen! It can be all too easy to accidentally remove part of the queen's leg as well, causing the bees to supersede her. There is a risk that handling the queen will damage her, stress her or leave a scent from the beekeeper's hands that makes her more likely to be superseded. Clipping queens requires a degree of confidence and practice.
- You need to wear gloves to keep your hands clean and you need to remove those gloves when handling (and therefore clipping) the queen.
- A clipped queen is less easy to handle as you cannot easily pick her up by the wing that you clipped. Hence you should mark her first and hope you do not need to re-mark her.
- Clipping queens may give a false sense of security: I have seen swarms that have issued with a clipped queen heading them (although it might be argued that not enough of the wing was removed).
- Some people object on the basis that it 'damages' the queen (even though it is safe to the queen if in good hands).
- Plus one beekeeper I know objects to clipping queens on the basis that he enjoys beekeeping so much that he likes seeing his bees every eight days, which is of course unnecessary with a clipped queen.

Richard Bache, Somerset BKA

Insect Pollination Initiative ...cont

- Biosecurity advice for beekeepers to minimise contact with and the establishment of disease.
- Advice on control and improved targeted inspections for the NBU.
- Guidelines to policy makers to ensure the framework exists to support any recommendations for improved disease control.

We have been candid about how our project results will be passed on to end-users by including an entire objective concentrating on dissemination and extension. The first step for dissemination of project results will be to produce a list of key end-users who are interested in being involved or who are interested in receiving our six-monthly project newsletter (you can register by emailing ipi@fera.gsi.gov.uk and stating your interest); a website will follow once the project begins. We will also be running two 'stakeholder' workshops, one at the beginning of the project to co-vert your opinions on what our project should cover and your disease management concerns (Nov/Dec 2010) and one at the end of the project to inform you

about project outputs (Sept/Oct 2012). Our team have all agreed to write publications in industry press, like BBKA News, Beecraft, Bee Farmers' Bulletin, Beekeepers Quarterly and The Welsh Beekeeper and also to present results at Apimondia in 2012.

How can I be involved?

You can be involved in workshops and receive newsletters by contacting the e-mail address above. You can also become an entry in the long term data set by registering on BeeBase and having an inspection by a local friendly bee inspector. The first simulations are already running on a computer in Newcastle, so expect to see the first publications from this project early next year.

I hope this article helps to share the exciting prospect that this project holds for the future of disease control in pollinating insects and the clear focus on honey bees. After all, honey bees are the most economically important pollinating insect in the world!

*Principle investigator:
Dr. Giles Budge, Research
Coordinator, National Bee
Unit, Fera, York*

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Winter Losses

In the August issue of BBKA News I promised to provide some more information on the results of the analysis of the data we abstracted from the 2009/2010 winter loss survey forms.

The following table contains the overall percentage loss of colonies for each county. Clearly some members responded with county names which were not easy to assign and these can be seen in the table.

County	Overall % loss for the County	County	Overall % loss for the County
Avon	17.2	Lincolnshire	12.5
Bedfordshire	31.7	London	33.3
Berkshire	6.9	Middlesex	26.2
Buckinghamshire	36.0	Monmouthshire	11.1
Cambridgeshire	24.0	Northamptonshire	23.0
Cheshire	22.3	Norfolk	11.2
Cleveland	19.0	Nottinghamshire	16.9
Cornwall	14.6	Northumberland	21.9
Cumbria	37.0	North Yorkshire	22.4
Derbyshire	20.2	Oxfordshire	35.1
Devon	12.4	Shropshire	27.6
Dorset	14.5	Somerset	11.9
Durham	5.0	Staffordshire	15.7
Essex	19.1	Suffolk	11.3
East Sussex	12.7	Surrey	22.5
East Yorkshire	12.1	South Yorkshire	14.3
Gloucestershire	22.4	Tyne and Wear	18.2
Hampshire	21.6	Warwickshire	9.4
Herefordshire	12.2	Wiltshire	19.4
Hertfordshire	18.9	West Midlands	13.6
Isle of Man	6.3	Worcestershire	10.5
Isle of Wight	36.7	West Sussex	8.2
Kent	13.5	West Yorkshire	19.2
Lancashire	27.3	Yorkshire	16.0
Leicestershire*	40.0		

**small sample number*

Clearly there were differences between the counties and probably with no one causal factor contributing to the losses.

To date we have talked about winter losses but it may be more appropriate to talk about winter survival and seeing if there have been any national or county or district initiatives which may affect the survival figures. These figures will also be used by the BBKA to look at the impact of the BBKA's training and education programme in conjunction with the input from the National Bee Unit and inspectors on the increasing survival of colonies due to improved bee husbandry and colony health awareness.

It will be interesting to see if there are any changes when we conduct the next survey covering the period October to March 2010/2011.

We also analysed the data for the number of colonies being kept by BBKA Members and these results can be seen in the following table.

Number of Colonies kept by the beekeeper at the end of March 2010	Percentage of beekeepers responding in the survey keeping this number of colonies
1	26.0
2	24.4
3	12.9
4	10.1
5	6.5
6	5.1
7	2.6
8	2.3
9	1.6
10	1.6
11-15	3.5
16-20	1.3
21-30	1.2
31-50	0.5
51-100	0.3
101-128	0.3

Note figures do not add up to 100% because of rounding to one decimal place.

These figures are self-explanatory and show that over 50% of the BBKA members who responded to the survey kept less than three colonies.

We will be conducting the survey again in March 2011 so please keep a note of the number of colonies you had on the 1 October 2010 and the number on 31 March 2011 in case you are invited to complete a survey report form.

Please remember this time of year is critical for getting your bees ready for the winter.

THINK:

VARROA – do you know the varroa status of your colonies?

NOSEMA – consider treating with Fumidil in the sugar syrup

FOOD STORES – make sure there are plentiful stores

WEATHER AND VERMIN PROOF HIVES – make sure there are no gaps etc

APIARY HYGIENE – Remove all old/unused boxes, combs and frames from the apiary.

Dr David Aston,

Chairman of Technical and Environmental Committee

Mel Asks the Experts

This month the question posed is not about bees or beekeeping but about honey. We posed the following question to Simon Flanagan, an expert on allergies.

'Is a nut allergy relevant if bees have foraged on 'nut' trees?'

An unusual request for which unfortunately there is not a truly definitive answer. As regards the characterised allergenic tree-nut proteins, these tend to be associated with either storage and defence functions within the nut kernel. As far as I am aware there are no reported reactions to proteins associated with the flowering bodies of the plants, i.e. that affect the pollen collected, however this assertion is probably due to the lack of clinical data rather than data to suggest otherwise.

The other interesting thing to consider here is the issue of cross-sensitisation, whereby an individual will become sensitized through a non-oral route of exposure and then go on to develop a food allergy. Probably one of the best studied of these mechanisms of reaction is via pollen. Essentially a significant portion of allergy to hazelnut in parts of Northern Europe is believed to be due to birch pollen cross-sensitisation. Other pollens such as mugwort have also been linked to these type of reactions.

Simon Flanagan, BSc. FIFST. Head of Speciality Analysis & Allergen Services RSSL, Reading Science Centre

Mel

Bee Book Collections

'But are there not more than enough bee books?'- Karl von Frisch and my wife

I have been asked to comment on some of the more notable collections of bee books over the years.

As an avid collector of books about beekeeping I leapt at the opportunity to own a bee book business when Tony Davies offered me 'Honeyfield Books' some twenty- five years ago. This was later sold to Karl Showler, who renamed it, B & K Books, and latterly sold to C Arden Books in Hay-on Wye.

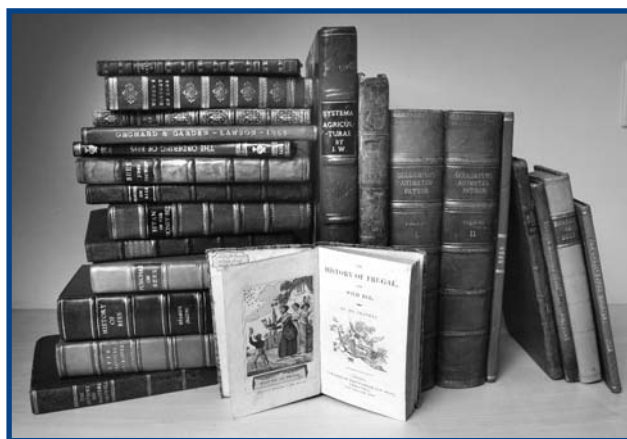
Most great bee book collections were started by one man and then bought or inherited by another bibliophile and here lies some of the more interesting histories of provenance of great collections.

The Charles C Miller Memorial Library (over 5,000 titles) at the University of Wisconsin has one of the more interesting backgrounds involving Tegetmeier, Neighbour and Lt.-Col.Walker. William Bernhardt Tegetmeier (1816-1912) was educated at University College and became a founder member of the Royal Entomological Society. He was a pigeon fancier, who introduced long distance pigeon racing into Britain, as well as writing an established standard book on Poultry and Pheasants. He wrote in 'The Field' until he was over ninety and was their Natural History Editor for over fifty years. He became interested in bees in the 1850s and corresponded with Charles Darwin. Darwin mentions Tegetmeier's studies on the formation of cells in the comb in his books on 'Origin of Species' and on poultry in 'Animals and Plants under Domestication'. Tegetmeier wrote only one book 'Bees, Hives and Honey' but contributed to entries in 'Encyclopaedia Britannica' and references to his work appear in Thomas Cowan's 'The Honey Bee'. Tegetmeier's bee book collection was purchased by Alfred

Neighbour (1825-1890), son of George Neighbour, who was a great 19th century bee appliance manufacturer. The firm were fortunate to be agents for Thomas Nutt and Alfred, often accompanying Nutt on visits to the firm's customers. The Neighbours managed a public apiary at the Zoological Gardens in Regents Park, which is illustrated, both interior and exterior, at the back of his book 'The Apiary'. Their stand

by Lt.-Col. Walker' was published in 1929 and was purchased by the Miller Memorial Library.

Harrison Ashforth says that the reason the Walker collection was not purchased by the BBKA was that they had just completed their purchase of the 1800 volume collection of their late President and founder member, Thomas William Cowan (1840-1926). Cowan was the first chairman of the BBKA, an office he held



at the International Exhibition of 1862 is also shown in 'The Apiary' where Neighbour's Unicomb Observatory hive was stocked with Ligurian (Italian) bees first introduced to Britain by T.W.Woodbury in 1859. When Neighbour died in 1890 a large proportion of his collection went to form the nucleus of Lt.-Col. Walker's bee book collection. Lt.-Col. Herbert John Oucherlony Walker (1843-1934) first became interested in beekeeping through reading a copy of Cheshire's book, 'Bees and Beekeeping' in 1886. Lt-Col. Walker is gratefully acknowledged to have spent two weeks at the offices of the British Bee Journal in the Strand re-cataloguing the 1882 catalogue and making a Card Index of the library of the British Beekeeping Association (BBKA) in 1912. The 'Catalogue of Bee Books collected and offered

continually for 48 years, in addition to being proprietor and editor of BBJ from 1885. Cowan is certainly counted as one of the greats in British Beekeeping. His book 'British Beekeeping Guide Book' first published in 1881, ran until its twenty-fourth edition in 1924 with over 100,000 copies. Cowan's death was attributed to falling off some steps whilst reaching for a book from his collection. Cowan's collection was purchased by the Ministry of Agriculture, Fisheries and Food for £260 and housed at Whitehall, but is now at Sand Hutton, York.

One of the world's greatest collections of apicultural literature is housed at the Albert. R. Mann Library at Cornell University in Ithaca, New York, USA. This was started by Prof. Everett Franklin Phillips in 1925, who persuaded 223 people from twenty-nine states and twenty-six foreign

countries to donate thousands of books and pamphlets. He also initiated an endowment by persuading hundreds of New York beekeepers to set aside one of their hives for the Library. When the hive had produced \$50 from honey sales the beekeepers obligation was honoured with the money being donated to the library. Reverend Lorenzo Lorraine Langstroth (1810-1895), the Father of American Beekeeping, owned a notable collection of bee books, some of which are thought to have ended up in the Cornell Library. Florence Naile (Langstroth's biographer) refers to American Bee Journal Nov 28 1895 vol xxxv, page 765 for the list. Langstroth's daughter, Mrs.H.C.Cowan, inquired for a college to buy the collection as a lot of about 100 books but they were sold to a dealer and dispersed, though some fifty volumes found their way to Cornell. Some rare beekeeping works are now on-line including the first twenty years of the 'American Bee Journal' 1861-1884.

Scotland's greatest collection is the result of another avid bibliophile, John William Moir (1851-1940). Moir started beekeeping during his thirteen years in Africa because he required better pollination of his crops but on returning to Scotland in 1890 continued beekeeping as a hobby. In 1912 he became one of the original founders of the Scottish Beekeeping Association (SBA) and started seriously to collect bee books. By 1916 he owned 167 volumes and decided to bequeath the books to the Scottish Beekeepers' Association and act as Honorary Librarian and continue to house the collection in his house. In 1933 a catalogue was issued showing 1270 items but with failing health the library was transferred to the Edinburgh

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Bee Book Collections

Public Library in 1939 with some 1799 books and pamphlets. Since 2002 the rare books are now kept at the National Library of Scotland and the balance is held at the Fountainbridge Library, Edinburgh.

William Charles Cotton (1813-1879), a student of Christ Church, Oxford lists about 125 valuable books in his work 'My Bee Book'. His own collection ran to over 200 rare works and he acknowledges titles from collections of a Mr. Dawson of Botesdale in Suffolk, Mr J H Payne, author of 'The Apiarian's Guide' and John Milton who wrote 'The Practical Beekeeper' 1843. In this latter book notes left by Cotton were put to unauthorised use, and a row ensued when Cotton returned from New Zealand. His collection was bequeathed to his parish of Frodsham, Cheshire, which retains ownership but was deposited in the library of the Ministry of Agriculture, Fisheries and Food in 1932 and transferred to the University of Reading in 1987. The University also holds some thirty pre 1851 works owned by H. Malcolm Fraser as well as his own collection of papers.

The largest collection of apicultural literature in Britain started relatively recently in 1949 with the formation of the Bee Research Association (BRA), which came about as a result of the actions of the scientists on the Research Committee of the British Beekeepers' Association. BRA started in March 1949 and by December had over 1,000 publications. The largest initial part came from the Apis Club but in 1964, the Morland Bequest greatly enriched the collection. By 1973 following the W. Essinger Bequest of the previous year there were nearly 29,000 publications. Many famous names helped in creating the collection including J Pryce Jones, Brother Adam, Miss A D Betts, Miss M D Bindley, E G and M G Burt, Eva Crane, H A Dade, A G Eames, Dr H M Fraser, Miss Dorothy Hodges, Miss Dorothy Galton, C C Tonsley and Mrs W Wedmore (E.B. Wedmore's widow). Graham Burt came across a copy of Langstroth's book 'The Hive and the Honeybee' that Langstroth presented to T W Woodbury of Exeter, the bee master who

introduced the movable frame hive into Britain. Burt gave this book to BRA. In 1976 the Bee Research Association changed its name to the International Bee Research Association (IBRA). The pre-1900 books still remain with IBRA at Cardiff (some 600 volumes) but the bulk of the collection of post-1900 books and pamphlets representing fifteen tons of material went as the Eva Crane Memorial Library to the National Library of Wales, Aberystwyth. An illustration of the professional care of national libraries is that on receipt of this consignment, it was all quarantined, and then every book was placed in a partial vacuum sink whilst each page was cleaned of any spores.

A L Gregg in 'The Philosophy and Practice of Beekeeping' urges associations to keep lending libraries of bee books and many county and branch associations maintain good depositories available to their members. A county Association Library, which I know of due to my serving as Honorary County Secretary, is that of Hampshire. It is the oldest with a sad history, and had its first catalogue printed in the Hants and Isle of Wight Beekeepers' Association annual report of 1884, listing some forty-one treasured works, which by 1907 had risen to eighty one. In 1930 the council bought a copy of all of Mace's

books and distributed 100 copies of his 'Beekeepers Manual' to every member. H.P. Young allowed his books to be added to the library in 1939 which continued until after his death in 1961 after his giving forty years service to HBA. The library was renamed the H.P. Young Memorial Library and then contained 270 different titles, when in 1966 disaster struck. The Bee Department at the college of Agriculture, Sparsholt was destroyed by fire and many of the priceless books lost. Fortunately a number were out on loan. After an appeal for more books by Captain Tredwell, the library was up to 166 titles by 1968. 'Hogs at the Honey Pot' by Frank Vernon lists over 600 separate titles and 'British Bee Books' bibliography lists only Hampshire as a county association with an important collection of bee books. I do know that as a result of a bequest in 2005 by Sid Pullinger the library benefited from even more titles. At national level the British Beekeepers' Association has recently had two generous bequests. Marjorie Knights left George Knights' contemporary collection of some three hundred titles to the BBKA, as well as a large financial sum and the granddaughter of Herbert Mace left a comprehensive collection of all his books and pamphlets including his 1929 criticism of the BBKA.

British Bee Book Bibliography lists eleven major British library collections and three in the USA together with ten other important collections worldwide and Johansson lists another three in North America in his book 'Apicultural literature published in Canada and the United States.'

Lastly there are the individuals, bee book dealers and publishers. Jeremy Burbidge of Northern Bee Books was lucky enough to obtain the Gregg collection as well as a vast quantity of books from David Bone. Karl Showler has amassed a sizeable number from trading as B&K Books and for myself I was most fortunate to be offered the book collection of my mentor, Frank Vernon, by Mary his widow, as well as many from Tom Shutte and Harrison Ashforth. Geoff Lawes lists a number of titles from the Sussex author Rev. Tickner Edwards collection as well as a number owned by A.M. Sturges. I know of a number of other large private collections in the UK but without their permission to publish feel reluctant to quote their names. I wish you all happy and successful collecting.

Martin Tovey,

Ex. General Secretary BBKA

Reprinted from a 'Catalogue of Bee Books collected and offered for sale' by Geoffrey Lawes published by Northern Bee Books October 2009 (ISBN 978-1-904846-43-7)

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A Course with Many Names

A Personal View of C & G 7303

Last December an invitation went out to all the BBKA Area Associations from the FERA Project Management Board. It had been decided that it was a key priority to raise husbandry standards through education and training of beekeepers.

The City and Guilds 7303 award had been identified as an appropriate course and FERA would pay the course fees up to a limit of £300. Training places were allocated according to the association membership eg Devon with over 800 members had five places.

Searching through websites for courses was complicated as it soon became obvious that different names were used by different organisations – 'City & Guilds 7303 Level 3', 'Train the Trainers', 'Preparing to Teach in the Life Long Learning Sector' and even 'PTLLS'!

A local course was found that needed a thirty minute interview to establish my 'suitability'. Then some 'pre-course activities' - a functional maths paper that

included calculations of simple averages, areas, volumes etc. - summarising an article in 'The Guardian' from 400 to 100 words - a 500 word essay on the role of the teacher reflecting my experiences as a teacher and learner.

The course consisted of three hours on a Friday morning for ten weeks. The first day I discovered that I was one of sixteen students. I am in my early 70s and nearly all the students were about half my age. Was I going to be able to keep up?

The timetable revealed the submission of seven essays ranging from 250 to 500 words and seven practical assignments. It looked very confusing at first but all eventually became clear. What irritated me as a senior citizen was the use of all the politically correct phrases. IT (Information Technology) was now reborn as ICT (Information Communication Technology). The principle of ECM (Every Child Matters) is commonsense. I have been teaching beekeeping for several years from Basic Certificate level

up to Module Eight. My teaching methods were now identified with formal phrases. 'How are you getting on?' is now replaced by various initial and continuous formal and informal assessment methods (more jargon).

The essays ranged from describing roles, responsibilities and boundaries of teaching, identifying relevant legislation, establishing the ground rules of the class, and promoting inclusion, equality and diversity of the learners. Then on to record keeping, embedding functional skills and the use of different assessment methods. These essays were not as difficult as they sound as we were well prepared by a good teacher who provided plenty of handouts and took draft essays to be corrected before formal submission. On average I had to work for about four hours, reading and writing after each class.

Then there were the practical assessments. These included the preparation of a learning programme or scheme of work

(that I used to call 'a course'), consisting of six lesson plans. Then other minor tasks - keeping a learning journal following each session, an end of course summative profile, an action plan, self evaluation and giving and receiving feedback to your peers and tutor.

The course comes to a final daunting experience of giving a thirty minute lesson before the class using many of the teaching techniques that had been taught. I was able to convert a forty slide (too many) talk on 'The Importance of the Honey Bee' into a twelve slide lesson. This impressed on me that, in simple terms, when, in the past, I thought I was teaching - I was really giving a talk!

My overall impression was that the course was very worthwhile and, although only an entry level teaching qualification, it provided me with many new teaching skills that I am already using to advantage.

Chris Utting, Devon BKA

A Lesson Learned

This is a cautionary tale of Bill Bell's life with bees, which he has titled 'A Lesson Learned'. It is a situation that many male members of our association can see themselves in!

As a fifteen year old lad with seven years beekeeping experience, I was a typical teenager, in that I thought I knew all about everything. However, I was soon to learn otherwise.

I was well known in our village as a beekeeper and was often contacted to remove swarms or remove some of the wild bees when trees were felled or blown down. On coming home one summer evening, I received a message from Mrs Hayton, a local farmer's wife, asking if I would remove a large swarm of bees from near her washing line in the orchard.

Now here was an opportunity to show off my skills. The bees were not the main attraction this time.

Mrs Hayton had two very good looking daughters about my age. Dressed only in corduroy trousers and open necked shirt, I quickly collected my swarm box and goose wing and set off across the fields. While apparently looking for the swarm, I had my eye open to check if the girls were watching my act of selfless heroism. Sure enough, they were peering through the kitchen window. Soon I wished they were not.

I spotted the swarm on the side of a large oak tree covering an area of about eighteen inches across and boldly walked up to it, placed my box underneath and attempted to sweep the bees off with my goose wing. Horror of horrors, immediately on touching the bees the whole lot appeared to take off and attack. I was stung on almost all exposed areas and a few not exposed, all over my face and neck, from my finger tips to

my arm pits. You can imagine the pain. I do not think I could stand that sort of assault today. I turned tail and ran home as fast as I could, where my mother removed the stings, scraping them off with a kitchen knife. I do not think I have ever been so viciously attacked since.

Two days later I plucked up the courage to face the bees (and the sisters) again. This time I was suitably armoured against the bees but just had to brave face it with the girls. Mrs Hayton admitted that she and the girls had had a good laugh on seeing me skidaddle, but were sorry to hear it was so painful. She said the swarm had been there for about eight days. Consequently when I had gone over to them, they had been starving, hence the bad temper. I decided to have another go and, although they were not happy to see me, they were calm enough after a dose of carbolic and smoke

for me to retrieve them with only a handful of stings this time. On the tree bole, there were three small pieces of comb, indicating that the bees had nowhere to go and so were unusually defensive of what appeared to be a temporary resting place, but was in fact the nearest thing they had to a new home. Back at the apiary and after a good feed of syrup, they turned out to be a strong, hard working colony, if a little ill mannered.

The lesson learned and never to be forgotten, is always try to determine where the bees came from and how long ago. If you cannot find out, one way of checking a swarm's mood is to pass something, eg your hand, quickly over the surface of the cluster. If they rear their tails, then beware and either leave them until they are quieter or ensure your kit and your pride is bee proof. I never did see the girls much after that.

Bill Bell, Yorkshire BKA

The National Diploma in Beekeeping

Assessments for the National Diploma in Beekeeping (NDB) will be held in 2011. These will be the first to use the new revised syllabus.

The assessment will consist of a three hour written paper, to be held on Saturday 19 March 2011, the same date as the BBKA examinations, to be taken at a convenient location to be arranged. The practical assessments, consisting of practical bee handling, disease recognition, biology and viva voce, will be held in July. In addition, candidates will be asked to supply a portfolio of beekeeping experience, and carry out an individual assignment, involving a written submission and short lecture.

Past written papers are available from the NDB website:-
<http://www.national-diploma-bees.org.uk/>

The 2011 Advanced Beekeeping Course will be held at Fera, York in July, and prospective candidates are strongly recommended to attend. Details will be available shortly from Ken Basterfield, Course Tutor: ken@basterfield.com

For further details and informal enquiries about the NDB, please contact the Board Secretary: Norman Carreck, New Hall, Small Dole, Henfield, West Sussex. BN5 9YJ Email: norman.carreck@btinternet.com

The closing date for applications will be 1 February 2011.

TECHNICAL & ENVIRONMENTAL

General: The Committee has handled a number of enquiries ranging from the provision of information and contact names to pesticides in sugar and Himalayan balsam.

Nosema: Defra has released a report on the state of knowledge on nosema, prepared under contract by Francis Ratnieks, and we are looking to see if we need to change any of our recommendations on best practice for managing nosema. The report is available on the Defra science pages.

GM Crops: The proposal to enable individual Member States to decide on whether to permit the planting of crops with GM approved at the EU level is worthy of BBKA support.

BBKA Spray Liaison Scheme: We have started to determine whether the current scheme is fit for purpose. It is intended to represent the scheme early in the New Year ready for the 2011 beekeeping season.

Healthy Bee Plan (Science and Evidence Advisory Group (SEAG)): The BBKA is represented on this group and recently there has been a teleconference of a bio security sub group of the main SEAG, (Belinda Phillipson, Mike Brown, Stephen Martin, Norman Carreck and David Aston). Topics discussed included:

- Definition of Bio security
- Identification of gaps in bee related bio security
- Sales and imports of queens and bees into the UK
- Import of Small Hive Beetle risk material
- Sales and movement of bees in the UK

The results of these discussions will be discussed within the main SEAG group at its meeting on the 13 September 2010.

David Aston,

Chairman of Technical and Environmental Committee

The Story of EFB

As some of you may be aware, European Foul Brood (EFB) was found in a hive at the BBKA apiary at Stoneleigh during an Advanced Husbandry Examination session. Subsequent examination of colonies in the apiary found three more affected hives.

All have been treated using the 'shook swarm' option offered by the National Bee Unit (NBU) and an interim inspection has not found any recurrence, so we are keeping our fingers crossed.

What can we learn from this event?

- Firstly, even the best beekeepers and apiaries are always at risk; there is never any reason for complacency or considering that any lapse in hygiene standards is acceptable. The local area

around Warwick has a high density of beekeepers; the Seasonal Bee Inspector for the area tells me that he now has well over one hundred colonies to examine as part of the surveillance process.

- Secondly, it is important to accept that this has happened and to contact any beekeepers who may be affected by this. In the case the of BBKA apiary, this is especially important as activity from various parts of the UK is involved – the Spring Convention events, practical examinations and assessor training plus, this year, some filming as part of education work. It is surprising how many people do visit the apiary in a season. Do you know who has

visited your apiary in the last six months? Do you know about every piece of potentially infected material that has entered or left your apiary in the last six months?

- Thirdly, it is important that new beekeepers are aware that partial or complete destruction of theirs and others' colonies may follow as a consequence of EFB being found in an apiary. Poor hygiene management and 'unwise' movement of bees can be the cause so EFB can happen to the best of beekeepers. The view that it 'cannot happen to you' is fine until it does! Not finding EFB before it kills a colony is the real failure. Destruction of colonies is often likened to loosing a close

member of the family, but a more positive way to look at it is that it is removing a threat to other beekeepers.

Finally, the opportunity was taken, with FERA's permission, to film the diagnostic and treatment process. This will form part of the educational material being prepared by the BBKA.

But that was not the end of the story. Two new colonies were confirmed with EFB during the final inspection after the previous outbreak. These colonies and their equipment were destroyed. The previous four affected colonies were treated by shook swarm and remain clear.

*Chris Deaves, Chairman
Education and Husbandry*

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PRODUCTS AND PUBLICATIONS



The summer has seen me attending some of the National Shows where we have been highly successful and won much praise and few trophies.

The overall interest in bees – not always honey bees I might add – has been tremendous and all of us working at these shows have been impressed by the huge numbers of interested and interesting visitors. The popular 'Trees' and 'Shrubs' leaflets have recently been reviewed, updated and are about to be printed in our new house style. A new series to carry on the theme – 'Herbs' and 'Flowers' are winter activities for writing, revision and production. 'Ten Ways to Help Honey Bees' has been a very popular leaflet and has already been reprinted such has been the overwhelming interest in *Apis mellifera* and its wellbeing. A new leaflet – 'How do I start beekeeping' – based heavily on the BBKA Press Officer, Christine Gray's popular handout is presently in production.

If you have read my Enterprises report first you will know that the second of the new posters in the planned series is 'From Hive to Honey'. Further images are still required (I will have them by the time you read this!) and it is hoped to have these very shortly. Production is scheduled for launch at the National Honey Show, which I shall be attending on behalf of BBKA Enterprises.

The beginners 'Course in a Case' (CiC) education project is proving very successful and all associations have now responded to our delivery requests and we have arranged either collection or couriers for the initial free cases to them. A further number of cases have been sent out to branches and we are now receiving requests for copies daily. Remember, the special offer to purchase additional copies at a substantial discount runs out at the end of October. This discount has been made possible by subsidy from sponsorship income.

Meanwhile work continues on delivery of the second CiC – the Yellow label 'Novice Course' a sample of which will be available for inspection at the BBKA Forum.

*Roger Cullum-Kenyon,
Chairman, Products and Publications Committee*

EDUCATION & HUSBANDRY



By the time you read this we hope to have appointed a Regional Tutor trainer/Education Coordinator.

Thanks you to all those who applied, we had over forty expressions of interest and 23 formal applications. To those of you, who decided not to apply or were not appointed, please consider helping in this activity in your region – I know a number of you have already expressed this wish.

We are continuing to see if the catalogues for the Cowan and Cotton collections can be made available via the BBKA. Both collections of old beekeeping books are accessible on a reference basis at their respective locations.

We have started work on a 'guidance and risk assessment' document for beekeeping on commercial premises and in public spaces. This will complement the existing leaflet for allotment beekeeping. If you have material that you think might be helpful, please forward this to Chris Deaves.

Work continues on the 'Course in a Case' project. The next one in the series is the Novice Course, aimed at teaching candidates at the BBKA 'Basic' level, will be shown in prototype at the National Honey Show.

Chris Deaves, Chairman of Education and Husbandry

BDI and Insurance Premium Tax

As a result of changes made by our Government in the last Budget, Insurance Premium Tax (IPT) is to rise from 5% to 6% on 4th January 2011. Bee Diseases Insurance Ltd., (BDI) has to pay this tax on the subscriptions and extra premiums paid by beekeepers, usually as part of their BBKA and WBKA membership. For the coming year BDI are absorbing this extra cost so premiums for 2011 will remain as previously announced.

When BDI assesses premiums for the 2012 season they will consider the implications of the extra cost involved with the increase of IPT, along with other influencing factors. Associations will be notified of the rates for 2012 when they have been set.

Richard Ball, President BDI

BBKA Enterprises Ltd

Sales of gifts, clothing and educational materials particularly DVDs have been ticking over very well during the summer holiday period.

New products including a range of native wildflower seeds and gift/note cards for example will be available from the Christmas catalogue enclosed with this issue of BBKA News.

The 2011 BBKA Calendar will be available by the time you read this report. We have chosen to theme the images on a photographic interpretation of the 'Old Masters' paintings so loved of our forebears to illustrate the vital importance of honey bees in good crop pollination. I do hope you will all buy a copy for they will make excellent and useful presents.

The Healthy Hive Guides continue to sell well and we will shortly be requiring a reprint of this popular educational guide. Our Virtual Hives are still popular and now finding homes in RHS properties, Universities and City Councils. We will shortly be introducing a nucleus of disease and other useful images on frames – look out for details on the BBKA website.

Two new educational posters are being added to the existing group of five on offer to associations and branches. The first of these was produced just in time for the Hampton Court Flower Show – entitled 'The Life Cycle of the Honey Bee'. The next one will be themed - 'From Hive to Honey Pot'. As mentioned in my last report a diary with a 'beekeeping notes' section will be offered for sale shortly and I hope in good time for the National Honey Show.

We continue to look for high quality educational, travel, clothing and gifts that are sometimes unique but always provide real value for money and you will be pleased to learn that all our profits are gifted back to the BBKA charity for education or research projects.

Roger Cullum-Kenyon, Chairman, BBKA Enterprises

Varroa still a problem in the 21st century?

29th January 2011 University of Worcester, UK



Varroa

IBRA is organising a
major one day
conference focusing on
the continuing problem
of Varroa.



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Business Corner

From the Boardroom

Our Chairman, Brian Ripley, was unable to Chair the September Executive meeting for the very good reason of his daughter's wedding and so I was asked to deputise and also write a short piece on the meeting.

One of the consequences of the increasing profile of beekeeping and the higher profile of the BBKA to the public, the media including the BBC, the National Trust and so on is the fact that the agenda for the Executive meeting becomes longer. This in turn means the Executive has to work under a lot of time pressure being brought up to date with all the developments which have taken place from one meeting to the next and the very important task of discussion and planning for the future. Such planning takes time and a careful evaluation of the benefits and potentially unacceptable consequences. The draft agenda for the BBKA forum was discussed and agreed. Likewise the deadlines and arrangements for the documentation and the procedure for finalising the propositions and the sending out the documentation to member associations for the 2011 ADM were agreed.

A key function of the Trustees is to ensure the financial viability of the BBKA and make sure the plans and aspirations of the BBKA in response to the demands of its members can be sustained. Consequently a significant proportion of the meeting was concerned with financial matters, especially the budgeting process.

A number of the agenda items are still 'work in progress'. Over the course of the coming months the Executive will be bringing forward a number of initiatives which will improve the quality of and access to information for members and also the public, for example the BBKA website.

The importance of the education and training project which the BBKA has developed as part of the Healthy Bee Plan and the work being done by BBKA members in the work streams supporting the implementation of the Plan; and the assistance being given to FERA in the development of their business case for bee health related activities were discussed. Such issues are of vital importance and the case has to be made strongly for continuing public funded support to secure the future of honey bees and indeed other pollinating insects.

Adopt a Bee Hive has been a great success and we need to continue to innovate and engage with the public through our arrangements with SAGA to continue to attract money which will be spent on the training and education programme and also the research fund.

The Executive agreed, subject to an agreement being signed, to support the work of Ron Hoskins on his work to find hygienic bees, not only because of the interesting results he has achieved so far and his wish to scale up the work, but also his intention for the next phase of the work to increase the number of participating beekeepers.

The range of activities of the BBKA continues to increase and the Executive are very grateful to all those BBKA members and their families who contribute in one form or another for their help and support and last but not least to thank our staff at the National Beekeeping Centre.

David Aston, Vice Chairman

ADM 2011

The closing date for propositions and nominations for the 2011 Annual Delegates' Meeting to be received at the National Beekeeping Centre is 23 October 2010.

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Is Morphometric Analysis Really Useful? - One View

You recently gave space in June BBKA News to an article by Brian Dennis encouraging beekeepers to undertake morphometric assessment of wing vein patterns in their colonies.

His argument is that 'it will enable you to decide whether the qualities you want in your bees will be reproduced with a degree of consistency'. Dr Chris Coulson has followed this up with an account (August) of his recent experience. He 'found the technique fascinating if not a little addictive'. I feel strongly that the many thousands of new beekeepers who now receive your excellent newsletter should read another point of view before some of them become addicted.

I write from only some seven years of keeping a small number of colonies for a hobby, but I have been professionally involved for over fifty years in the genetic improvement of most species of farm livestock. Of course I appreciate that there are important differences in the biology of bees compared with domesticated birds and mammals. There is also the fact that few of us are able to keep our colonies out of range of other bees, so we have a responsibility towards our fellow beekeepers. But several of the basic assumptions underlying BIBBA's advice seem strange to anyone who has successfully improved other livestock.

The principles that a 'pure race' should outperform even the best 'racial hybrid', and that it is a waste of time breeding from racial hybrids, are completely at variance with the fact that almost all today's commercial livestock are deliberate breed or strain crosses. The exceptions are where the female's lifetime reproductive rate is too low e.g. dairy cattle and hill sheep.

Morphometry is a taxonomic procedure. In our context it can be used to determine whether a sample of honey bees conforms to the mellifera subspecies rather than one originating further south or east. This 'race' evolved over millennia as a wild species in our islands, and over a shorter time in our ancestors' hives. But why should it be the ideal and exclusive starting material for today's hobbyists or bee farmers?

Yes, it emerged in our climate. But is this now changing? Professor Dave Goulson's (August) article on the observed northern movement of

our native bumblebee species should make us think. And the requirements from our stocks in modern beekeeping are vastly different from those of the wild bee, even when it was partly tamed by keeping in skeps. Our forage, both wild and farmed, has changed in both species and season. White clover and many wild flowers have gone; oil seed rape is now a major source. The disease challenge, the type of hive, the management system, the relative price of honey and feed sugar, all are different today.

It seems to me that any sensible bee improvement programme should start with a mixed population and thus utilise all available genes which may prove valuable for our current and future needs. It should certainly not use initial morphometric assessment to cull them out just because they were not present in the mellifera subspecies (the native black bee). It is such a pity that our one bee improvement and bee breeders' association should have adopted this restrictive principle as its core belief. The early German academics evolved some excellent organizational structures and practices to tackle the real problems of post WWII bee improvement, but insistence on initial racial purity was not one of them. They may ascribe their success to it. I suspect the well known national traits of discipline and organizational ability were more important.

One final point. Brian Dennis says 'Remember, if you buy a hybrid queen you will always need to buy replacements from the supplier'. I suggest we should not dismiss such a system without more thought. Skilled specialist breeders can produce large numbers of mated queens quite cheaply. If they can create hybrids which satisfy the hobby or professional beekeeper's current needs, then a system relying on regular repurchase could easily carry the additional cost compared with using free but inferior queens from one's own hives. My bought in queens currently cost eight jars of honey. If a large enough market developed, the breeders' income could support quite sophisticated improvement programmes.

Ask any progressive pig producer whether he tries to make his own genetic improvement, or relies on a specialist science-based breeder!

Dr Maurice Bichard, Vale and Downland BKA

Beekeepers on the National Unit's BeeBase

As many of you know, we strongly encourage registration of beekeepers on BeeBase.

We are aware that many local beekeeping associations have in place procedures whereby they have each of their members' permission to pass on his/her contact details to the National Bee Unit for registration on BeeBase. However, not all associations have such procedures in place. The importance of being registered is highlighted by the recent announcement that Small Hive Beetle had been found in Hawaii.

We watch the continuing spread of Small Hive Beetle overseas with great concern, as I am sure you do too. The occurrence in Hawaii set in motion checks by our Bee Inspectorate of all apiaries known to have imported queens from Hawaii. At present, if beetles were found here, we would not be able to guarantee that we could identify all the beekeepers within the 16km radius around the first affected apiary that would become the first check zone (and all subsequent findings would initiate similar check zones). Each zone is an area of around 804 square kilometres, in which there may be some 300 - 400 apiaries that our Bee Inspectors would have to check as the first step in attempting to contain and eradicate this serious pest.

Successful control of statutory diseases such as foulbrood and the eradication of exotic pests like Small Hive Beetle are totally dependent upon our Bee Inspectors and associations being able to identify all the apiaries in any particular area, so that full inspection can be carried out. This would obviously be much easier if all beekeepers registered on BeeBase.

We recognise that some beekeepers are concerned that any information given by them directly or through their associations might be

used for purposes other than for which it was intended. I would like to reassure you that beekeepers' personal details are only used for planning and conducting statutory apiary inspections for the control of pests and diseases and for no other purpose. As such, use of personal details on BeeBase is restricted to National Bee Unit staff. No personal details are passed onto any third parties, including other Government Departments.

BeeBase is in place to allow us to be able to take action to prevent serious bee health issues and to be able to inform you of these when they might impact on your own bees. We have recently upgraded parts of BeeBase in response to feedback received and would invite you to take a look at the changes. The 'Beekeeping Essentials' leaflet received with this copy of BBKA news includes some further information on BeeBase.

We greatly value your contribution to beekeeping and hope that you will register on BeeBase, if you have not already done so, to help further promote the improvement of bee health in this country.

*Dr Helen Crews, Head of Inspectorates
The Food and Environment Research Agency*

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Is Morphometric Analysis Really Useful? - An Alternative View

Dr Maurice Bichard refers to Brian Dennis' article on wing morphometry and poses several questions relating to the idea that if British beekeepers seek to improve their bees by selective breeding, they should begin by using wing morphometry to identify the Northern Dark Bee, *Apis mellifera mellifera*, and to breed only from this.

His concept is that BIBBA advocates morphometry as a primary filter, but this is not true. Rather, BIBBA advises selection among local bees, what Beowulf Cooper termed 'village bees' and, as Brian Dennis stresses, on a broad front, for performance and both behavioural and physical characters. 'Local bees across most of Britain are however mostly near-native hybrids and experiment shows that morphometry distinguishes *mellifera* with around 95% accuracy among British bees.

Dr Bichard draws attention to the outstanding beneficial outcomes of scientific animal breeding, but let us think again. Most agricultural livestock requires containment, special feeding, expensive housing, repeated veterinary supervision, elimination or neutralization of the vast majority of males and artificial insemination. This is very labour intensive, intrusive, costly and in some cases ethically unacceptable. British beekeepers already consider autumn feeding, all-enveloping protective clothing and repeated dosing with toxic chemicals the norm. Is this really the direction we want British beekeeping to go?

When I first became a beekeeper I planned to assemble together the best attributes of many stocks and so create a 'super bee'. I found however that 'the best attributes' were not those I had initially identified. They were instead such issues as the ability to forage and mate in cool, wet summers, to hibernate safely in the coldest winters, to shrug off disease, to use stores frugally, to swarm rarely and to be a joy to work with.

My eyes were really opened when oilseed rape arrived. I placed two hives beside a rape field, one of local, dark near-natives, the other orange-banded bees. The latter produced honey that tasted like turnips, the local bees' delicious honey with a range of subtle flavours. The banded colony had pollen stores dazzling in their even yellowness, while those of the local bees showed a range of hues, revealing our local bees' superiority at gleaning a varied and to humans more exciting diet. Moreover the dark bees filled their super a week before the banded ones. At this point I abandoned my breeding plan, re-queened the banded bees and set about line breeding local dark bees. To ensure survival of only the best adapted I withdrew all supplementary feeding.

Line breeding is the strategy invented by the Neolithic farmers with staggering success. Being semi-conservative it retains all that is good while leaving the door open for improvement. With honey bees you can re-queen your poorest colonies with daughters of the current best and propagate drones from those colonies that performed best under queens of the previous generation.

Within ten years my average brood nest at the first spring inspection had enlarged from four to eight frames. Honey yields in the most productive colonies increased from 40 to 100 lbs (150lbs one year), swarming was minimal and the bees became so gentle I could work without gloves or smoke. When in doubt I based my selections on morphometry and was greatly encouraged when the characteristic pollen distribution of native bees (i.e. pollen stores below the brood) appeared without my selecting for it. When mitochondrial DNA analysis showed they were of an authentic native queen line I was over the moon. Later I obtained several other native stocks which acquired or already displayed similar properties as well as evidence of additional queen lines. Varroa arrived in AD2000, but they just shrugged it off. I last treated for varroa in 2002 and if it were not for what I repeatedly read I would consider the problems generally associated with the mite to be merely a myth. Line breeding of near-native bees is therefore very effective, but it only works properly when your neighbours for many miles around are maintaining genetically similar bees. That they do not is

currently my major obstacle. Conversely, my immediate neighbour is overjoyed his bees are now so gentle.

Theoretically line breeding will eventually approach the genetic limits for that population and this is where cross-breeding comes in. This involves mating between different line-bred stocks to create F1 hybrids. These sometimes show impressive qualities of hybrid vigour, although the outcomes of breeding from them are quite unpredictable. Whereas line-breeding works *with* nature, cross-breeding aims to 'pull a fast one' on naturally evolved systems. BIBBA only advocates cross-breeding between stocks of the same race and preferably only if from neighbouring or geographically similar regions. Cross-breeding and varied interbreeding are I believe what Dr Bichard is advocating, but between stocks, neither of which is necessarily of the same subspecies, nor necessarily from similar or neighbouring regions.

Most non-*mellifera* bees in Britain originated around the Mediterranean, where summer temperatures are much higher than ours. These may perform spectacularly for short periods in excellent British summers, but most lack the essential bad weather adaptations of British bees that have survived here come hell, high water and Isle of Wight disease, since the end of the Ice Age. Mediterranean strains cannot reproduce in cool summers, nor hibernate in a cluster, making them more susceptible to winter weather and prone to persistent brood diseases. Cross-breeding among such bees is therefore unlikely to assemble a package of genes anything like as good as that we already have in the native British bee. By contrast, crossing *A. m. mellifera* with any other subspecies typically promotes overtly aggressive behaviour and when the drones of effete foreigners escape they also undermine the inherent rugged excellence of our own breeding stock.

Nevertheless, I see two areas where BIBBA might see eye to eye with the commercial players. These are in the establishment of native honey bee reserves and the creation of male-sterile hybrids. Commercial beekeepers demand annual honey yields in excess of 200lbs and because of their low prolificacy this is unlikely with natives. Conceivably, carefully bred F1 hybrids with a major native component might enjoy both high survival rates and high yields, although production of those crosses would require a reliable source of native bees. To meet such requirements we *must* preserve the good native stocks still surviving and this ideally requires several secure native honey bee reserves. Commercial and government support for national native honey bee reserves could yield unimagined benefits for us all in the long term, as well as beneficially raising the profile of British beekeeping.

If viable artificial strains could be constructed which when crossed produce F1 hybrids that yield no fertile drones, this would represent a giant step in the acceptability of artificial strains. Independently self-sustaining partner strains could be created by genetic modification such that cross-mating between them yields F1 hybrid queens that produce drones that are all sterile. Or alternatively, the F1 hybrid queens might lay eggs capable of development only when fertilised, rendering drone production impossible. Such hybrid queens should create no unintended genetic impact on other stocks.

Currently however, our bees fly free and mate with whom they will, while instrumental insemination is too difficult for widespread use. We therefore need to think communally: if we all keep the welfare of our beekeeping neighbours in mind, by not importing maladapted aliens, or fostering weaklings, in the end we all should win. If on the other hand we manage our bees solely for our own benefit, in the end nobody wins - an outcome currently looming in much of the world. True, our climate and agricultural environment are changing, but British dark bees have a great capacity to adapt. After all, they have been doing it for a very long time, and very successfully.

Dorian Pritchard, PhD

Conservation Officer of BIBBA, President of SICAMM

Awards

The Robert Hammond Award for the highest marks awarded for the Intermediate Theory Certificate goes to:

Paul Hurley, Bourne End, Buckinghamshire

Wing Morphometry Course

BIBBA (Bee Improvement and Bee Breeders Association) are organising a wing morphometry weekend at Stoneleigh on 20/21 November 2010.

Morphometry is a useful tool for helping to identify the various sub-species of *Apis mellifera* and is particularly valuable in a breeding programme where it can indicate the racial purity of a sample of bees. This course will enable attendees to be able to make two simple measurements of wing veins using a computer programme and then plot the results on a graph.

BIBBA (www.bibba.com) aims to help those who are interested in our native and near native bees. This course is particularly suitable for those who wish to improve their bees along those lines. Attendees will need to bring their own computers (which must have Microsoft Excel); detailed instructions will be given before the event.

Cost: Free to BIBBA members, £30 to non-members.

Booking is essential as spaces are limited.

Book with Dinah Sweet dinah@dinahsweet.com

Course enquiries Roger Patterson roger-patterson@btconnect.com

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Diary of Events

2010

28 - 30 October - National Honey Show

6 November - Sussex BKA Annual Conference - Rural Business Centre, Plumpton. See www.sussexbee.org.uk or telephone Harold Cloutt 01424 838302

2011

19 February - Somerset BKA Lecture Day - Jurgen Tautz, Adam Hart, Michael Keith-Lucas, Robert Carpenter-Turner and Adam Vevers. Details from Caroline Butter, e-mail:

educationofficer@somersetbeekeepers.org.uk or 01934 742075

13 April - Somerset BKA, Special Lecture, Keith Delaplane, at Hazlegrove School, Sparkford on the A303.

15-17 April - BBKA Spring Convention, Stoneleigh, page 3

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