

BBKA News

BBKA - Supporting Bees and Beekeepers

FREE TO MEMBERS OF THE BRITISH BEEKEEPERS' ASSOCIATION

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Self-destructing Varroa mites?

Recent media coverage of the latest scientific breakthrough in the battle to defeat *Varroa* might have left you feeling that the end is nigh for this little crab-like blood-sucker. But is it harmful to bees?

Dr Giles Budge from National Bee Unit, part of the Food and Environment Research Agency (Fera), said: "This cutting edge treatment is environmentally-friendly and poses no threat to the bees. With appropriate support from industry and a rigorous approval process, chemical-free medicines could be available in five to ten years."

Varroa has become the bane of many a beekeeper's life, leading to infection of our precious bees with a range of pathogens and viruses, particularly if there has been poor summer forage and harsh winter conditions. This has led to much activity both within the research community and within the beekeeper community (see the article by Ron Hoskins, p17) to control the *Varroa* population. Now, researchers from the National Bee Unit and Aberdeen University have reported that they have worked out how to 'silence' natural functions in *Varroa* mites' genes, which they say could make them self-destruct. Essentially, the treatment works by "introducing harmless genetic material" into the mites, which encourages the mites'

own immune response to prevent their genes from expressing their natural functions." And, "this could make them self-destruct" according to Dr. Alan Bowman from the University of Aberdeen. He also noted that: "The beauty of this approach is that it is really specific and targets the mites without harming the bees or, indeed, any other animal." So how does this treatment work?

Manipulating Varroa genetics

The process uses the Nobel Prize-winning molecular biology technique of 'RNA interference', in which specifically designed stretches of double-stranded RNA molecules are synthesised and administered by microinjection into the haemocoel of *Varroa* mites. As you may imagine, the technique of injecting into the mites' tiny body cavity, which contains haemolymph (mites' blood) is in itself technically challenging and the researchers are working on less 'invasive' administration methods. However, once inside the haemolymph the double-stranded RNA molecules can gain access to *Varroa* mites' organs where they are able to generate small 'interfering' RNA molecules. It is these molecules that target and destroy specific mRNA molecules that would normally generate specific proteins, such as enzymes. In these early experiments, scientists targeted the mRNA that

is responsible for producing an enzyme involved in detoxifying compounds such as pesticides, known as glutathione S-transferase – the variant mu1 found in ticks and mites. They then monitored the glutathione S-transferase mu1 mRNA and protein levels of found that these were suppressed within 48 hours of the injection.

More challenges ahead

Clearly, much more work needs to be done to refine the methodology, but these early attempts to 'silence' specifically targeted mRNA have been encouraging. Further work is now ongoing to find a gene that can be targeted within the *Varroa* mites, which will affect them so profoundly that they will self-destruct, but there will be no effect upon other insects. If such a molecule could be found it might be possible to add it to bee feed placed in hives, from where it could be taken to feed larvae. It would then be a matter of time before the *Varroa* mites feeding off the larvae ingested the molecule and self-destructed.

The next question is, however, when this treatment becomes available... will we open our hives to see hundreds of exploding *Varroa* mites – like popping popcorn? We may need to modify our face-guards!

Christine Knott,
Deputy Editor

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Chairman's Letter

January is always a busy time to be a BBKA Trustee – we have two trips to Stoneleigh to look forward to. The first, the ADM, addresses issues of concern from the membership through their association delegates and allows questions to be asked of the Trustees. Seven days later we hold the first Executive meeting of the year, which allows the committee structure to be reconsidered and progress on outstanding initiatives to be considered.

The Adopt a Bee Hive sponsorship agreement with Saga ends in March 2011 and we have completed a new agreement with Burts Bees for three years, which will see some changes to the way in which the scheme is organised. For those not familiar with Burts Bees, it is a company that offers earth-friendly natural skin care, natural beauty and natural personal care products using both bees wax and honey. This agreement will see the BBKA involved in a number of bee-related promotions this year, including on-line auctions and exposure via the Burts Bees Facebook page. All monies received will make a difference to BBKA's ability to support associations, members and research.

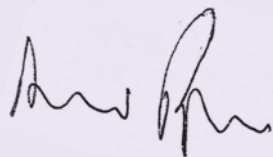
The new web-site, under the watchful eye of David Teasdale and his working group, will deliver a test site early in 2011, with further work on the BBKA web-shop to follow.

Jane Moseley has taken up her duties as Operations Director/General Secretary and has set about the task of keeping this Chairman extremely busy in considering and discussing ideas for the future.

In my August report I commented upon the need to keep local councils informed of beekeepers who are prepared to collect swarms, so as to help reduce workload on BBKA headquarters staff. I recently received a call from a member who said that his council's policy was to give the BBKA telephone number to members of the public with bee-related problems – including swarms. From BBKA's viewpoint this is hardly helpful. I contacted the council, pointing out that this policy is unlikely to be useful to their local constituents who call Stoneleigh to receive a local beekeeper's contact details as our head office will have no idea of the relative location of the problem and by the time the parties get together any swarm could have taken up permanent lodging in an inappropriate place. After some discussion the official agreed to a change the policy, and was sent details of local beekeepers who are willing to collect swarms. Please make sure your council is not following a similar system of passing this responsibility to BBKA.

The weather from mid November until the end of 2010 in Northumberland has been awful, with my village making the national news for the amount of snowfall. Thankfully, the fields are clearing and a check on hives has shown that all have survived so far, but a small number have had to be fed with fondant having already nearly cleared the supply given. In view of the conditions that we have had – snow driven in from the North East, and temperatures down to -20°C – I am pleased we prepared well for this winter. And with more snow forecast, pleased to have been able to get round them and support sinking hive stands!

Following the Trustees decision to produce *BBKA News* monthly we have formed an editorial team to help share the workload and decision-making. I am pleased to advise the team comprises Sharon Blake (as Editor), Dr Christine Knott (as Deputy Editor), Tim Lovett, Jane Moseley, Roger Cullum-Kenyon and myself. I can also report that Adela Booth who has looked after advertising over the past 12 months has tendered her resignation and I would like to take this opportunity to thank her for her efforts. Her replacement, Lyn Pearce, an experienced advertising consultant, will step into the role and help take *BBKA News* forward.



Brian Ripley,
BBKA Chairman

In the Apiary



At this time of the year many beekeepers think there is little to do, but it is not good practice just to put bees to 'bed' in the autumn and do nothing until April. To do so is to dramatically increase the risk of colony losses. Previously in 'In the Apiary' winter *Varroa* treatments and hefting hives were discussed, but what else should beekeepers be busy doing in the apiary now?

February is a good month to assess *Varroa* populations. Leaving this until March means that the results are less accurate because the ratio of bees and brood varies so much between colonies. In my home apiary I count mites falling through an open mesh floor onto a tray each morning and then brush it clean. I record the daily figure and calculate the average daily mite drop figures over fortnightly periods. This is much quicker and more accurate as it is easy to see the mites in the small amount of hive debris present. Colonies dropping more than six mites per day can be treated before the need to super them. Similarly, if the drop is between two and six mites per day then management, also known as 'bio-technic' control methods, can be planned for April and May.

Also make regular checks that hives haven't been knocked over by stray animals or vandals. Are the roofs secure? Shallow ones tend to blow off in windy conditions. Is rain being shed away? At the same time heft the hives as previously discussed to check store levels – this means lifting the back of the hive to check the weight of remaining stores. All beekeepers should develop this skill, but it only works effectively if equipment is standardized and there isn't a mish-mash of different hives and materials. An alternative to hefting on frosty days when there is a firm cluster of bees – or on warm days when bees are flying – is to remove the crown board, look down the side of the frames and assess the store levels. This is particularly easy if you have raised the crown boards on matchsticks to ensure adequate winter ventilation.

If bees are starving and on the edge of collapse spray a weak sugar solution onto them and fill an empty comb with sugar syrup placing it adjacent to the bees. It is a wonder cure! If bees are short of stores they can be fed fondant over the crown board. If, like me, you over-winter five frame nuclei this is a 'risk' time because of a lack of stores so extra vigilance is needed.

At this time of year bees in a full size hive should be covering between five and 10 frames, if it less then it indicates that the bees are dwindling. This could be caused by *Acarine*, *Nosema* or poor *Varroa* control. February is a common month for bee colonies to collapse because of varroosis caused by late or poor control methods used by the beekeeper. The adult bee disease of *Nosema* shortens the life span of adult bees so the over-wintering bees start dying before the new generations can replace them causing a dwindling effect. This can be checked by simple microscopy examination. Often colonies recover during the summer; treatment is available but new brood comb is the key to long-term success.

Check the entrance to the hive where you will probably see dead bees on the ground – if it is more than about 100 then the colony could be in trouble. If it is a warm day and the bees are flying then look to see if returning workers are carrying pollen, which indicates that all is well.

On warm days at the end of March it is possible to carry out full spring inspections – but more about that next time.

Pinguis Imperium

Tempted to Take The Microscopy Exam?

Ever wondered what's involved in taking the BBKA Microscopy Examination?

With all exams it helps to talk to people who have been there before you. Unfortunately, few people take this excellent exam and I found it difficult to get first-hand advice, so I thought I would share my experiences with you in the hope that, armed with a little more information, you will be inspired to have a go yourself.

Pre-exam practicalities

Let's start with the exam itself. It could be held anywhere that is convenient to the examiner and the candidate(s) and is normally held at the end of the beekeeping season. I took mine in October at the BBKA Headquarters at Stoneleigh along with three other candidates. Because I live some distance from Stoneleigh I stayed overnight at Stoneleigh Park Lodge (walking distance from the BBKA Headquarters) so I was able to arrive early and relaxed – well, relatively relaxed – in good time to set up my gear.

Exam format

We were each given a large table, well spaced from each other. (It's worth taking an extension lead with you in case you are not close to an electrical socket.) The exam took about 2½ hours and I have to say, as exams go, I found it enjoyable. We were very lucky to have had two excellent examiners. They divided the syllabus between them and moved from candidate to candidate, so you could say it was like a series of short sessions rather than one gruelling slog! They put us at our ease – even made us coffee – and I learned a lot from both of them.

The nitty-gritty: what you will need to know

The syllabus is available on the BBKA website. Briefly, you need to understand the construction and principles of dissecting and compound microscopes; how to set up microscopes for identifying pollen and bee diseases and how to diagnose diseases, and infestation. You will also need to identify pollen, perform acarine and abdominal dissections, make a noseema slide and produce your own pollen and anatomy slides.

This is all very well, but you are probably interested in understanding just how much you need to know. The clue is in the aims of the examination, which is 'to provide a qualification and measure of achievement for those beekeepers interested in pollen, anatomy and disease relevant to the honey bee'. Having taken the module exams I was able to fall back on my anatomy and bee disease notes. My impression is that the examiners are not looking for the detail expected in the modules – but a sound knowledge is essential so anyone with the disease and anatomy modules under their belts will be at a distinct advantage. For pollen, Rex Sawyer's *'Pollen Identification for Beekeepers'* is essential reading.

Show you can use your kit

You must demonstrate to the examiner that you understand the theory of how microscopes work in simple layman's terms. You do not need to be a physicist! Get a copy of *'Microscopy for Beekeepers'* (Beekeeping in a Nutshell number 69 – Northern Bee Books). You will need a low magnification dissecting microscope and a high power compound microscope. They don't have to be new or expensive – you just need to show that you understand how to get the best from what you have. When you are dissecting, good light is essential. I found the in-built light on my microscope was inadequate. If your lottery ticket comes up, fibre optic lighting is a joy to use. If it's just a £25 premium bond then an angle-poise lamp is a big help.

Plan ahead for your set tasks

The fun starts with the requirement to provide six pollen slides and three anatomy slides made by you in the last 12 months. The pollen slides must be from a set list with flowering times throughout the season. The first is hazel so you need to be organised and collect some catkins in January or early February. You can get a huge amount of hazel pollen very easily so if you are new to making pollen slides I suggest you keep plenty for practice. Keep it in something that breathes – an envelope for example. Pollen goes

off in plastic containers. I found it educational to go beyond the syllabus list and make reference slides of as many pollen types as I could. There are instructions for making pollen slides in 'Sawyer'. John White's *'Pollen, its collection & preparation for the microscope'* is also helpful. Brunel Microscopes will sell you a pollen starter kit including simple instructions. You also need a warming plate. This can be improvised with a light bulb and a large tin. The temperature shouldn't go much over 60°C so I clamped the probe thermometer I use for melting wax to the tin and used a dimmer for temperature control. *'Microscopy on a Shoestring'* has just been re-released by Northern Bee Books and is full of good tips including how to make a warming plate.

Unless you are lucky enough to have a local expert it is very hard to find someone to teach you to make anatomy slides. It takes days to make a good one so demonstrating is difficult. My advice is to start practising as soon as you can. A good 'teach yourself' option is to get a kit called 'Making Mounts of Insect and Spider Parts' (again from Brunel). It contains the materials you will need and a simple instruction leaflet. If you can find a copy, *'Practical Microscopy'* by J. Eric Marson will give you lots of valuable information.

Tips for the successful surgeon

Dissection needs plenty of practise. You must use fresh bees. Bees can survive for several days in a ventilated jar with a sugar lump. Kill them at the last minute with ethyl acetate. You have to remove legs, wings and antennae; then embed the head, thorax and abdomen to about half their depth in wax. I use the round tins sold for polish and fill them with clean wax to about a ¼ inch from the top. The embedded bee is covered with dissecting fluid – a weak alcohol – the fluid supports the viscera as you work. Efficient embedding is the key to success. Melt a bee-sized puddle of wax in the middle of the tin (don't work at the edges as it's difficult to manipulate the tools). The trick is to place the tip of the abdomen for a second or two, allowing the wax to grip it;



then pull gently to stretch out the abdomen in the rest of the wax. Give the wax time to set before you start work. It's so frustrating when the bee disengages from the wax as you cut. In the exam, embed more than one – just in case! The bible for this is H.A. Dade's *Anatomy and Dissection of the Honeybee*. Chapter 10 describes the process needed for the exam (actually more than I was asked to do in my exam) and there are fantastic diagrams at the back of the book. Dade also suggests tools for the job. Currently I use a scalpel (new blade every time – it must be very sharp) and fine spring scissors. For probes I find hypodermic syringes excellent as they have finer points than sewing needles and can be used for certain types of cutting. Your local chemist will sell you a bag of them quite cheaply – although other customers may look sideways at your 'excuse' for buying them! For really gentle manipulation of the alimentary canal I find an acupuncture needle is effective. You will also need some good quality forceps. Take a critical look at the tips before you buy. You can improve them by honing on a fine grindstone.

So there you have it. I enjoyed the process of preparing for the exam although I had to be disciplined about making time for it among the many demands of the active beekeeping season. So go on – have a go this year! You have until 28 February to get your application in. And yes – all four of us passed!

Bob Maurer
Chairman of Surrey
Beekeepers Association,
Reigate BKA

Notes from a Clifftop Apiary

There's cold air and a grey sky up on the cliff top. Out at sea, a wintry sun finds holes in the cloud-ceiling, and shafts of sunlight slant down like theatre spotlights tracking over the choppy waters. Winter days on the cliff! Does an allotment 10 minutes walk from home count as an out-apiary? It's a safe site. There's no livestock to knock the hives about, and this isn't woodpecker country so the hives don't get disturbed. (Just how alarming would that be, I wonder, having a woodpecker hammering at the box just inches from your ear?)

There are creatures here: rabbits, mice, gulls, pigeons, pheasants, a family of foxes, a rat or two and they compete with all the gardeners on their plots for food. It's fair enough – after all, everyone is aiming to get through the cold months intact. For the bees winter is a reasonably easy time in the mild, temperate air of the south Devon coast. This is the margin of England where palm trees shake out their fronds in sub-tropical gardens. To the west of us a section of coast is called 'The English Riviera'. Winters are rarely severe for us and being up on the cliff means we get no frost pockets. And a fringe of trees shields the hives from the westerly winds so all they need is sufficient stores to see them through the cold weeks.

The greater part of those stores will be sugar syrup fed in September after the Apiguard treatment; but some of it will also be late honey from ivy nectar and pollen gathered in October and November. Ivy is a mixed blessing. It's the final source of winter food.

But a potentially lethal one for if it's a cold wet spring with limited flying weather then a colony, which is solely dependent on granulated ivy might starve. You could heft a hive in the Spring and find it satisfyingly heavy, but that's not a guarantee that all is well; the weight could be crystalline and difficult for the bees to dissolve and absorb.

If the presence of ivy stores is a perennial problem for you, then piling in the syrup in autumn to limit the space left for ivy honey is one possible counter-measure. There were many bright sunny days last October, and throughout the month I found noisy and excited bees crowding the landing board, jostling and swaggering up to the entrance with their baggy orange legs. This went on intermittently until late the following month. One note in my diary records: '24th Nov: yellow ivy pollen still being carried into hives.' Perhaps it's the peculiar quality of ivy honey plus the fanning of bees on warm and windless autumn days that fills the air around the hives with the scent of honey. But how our weather veers! Within a week of that diary note, the whole of Britain went under frozen snow, bitter easterly winds and sub-zero temperatures.

But let's not breathe a word of criticism about late-season ivy pollen. Pollen is tough stuff. It's been around for over a hundred million years. The two thousand year old body of Lindow man recovered from a peat bog in Cheshire in 1984 still had mistletoe pollen in his stomach. That must have been quite a party. He'd not only drunk all the punch, he'd eaten the mistletoe too. And

Christmas hadn't even been invented yet.

So here we are now on the edge of Spring. Yellow crocus and grey pendulous willow pollen will be appearing on the alighting board. The queen is shifting her laying rate up a gear. And over in the Branch Apiary The Beginners' Course is moving out of the cricket pavilion, where all the theory and the slides have been keeping them amused during the winter meetings, and the students are now gathering outdoors on Saturdays at a new farm site. These have been learning experiences for everyone. Even for experienced beekeepers, meetings always contain hints, tips and suggestions for different ways of doing things. The prize for the most entertaining beginner's question goes to the lady who at the Q & A session asked: "Tell me, when bees go out foraging, do they always come back home in the evening, or do they ever stop off overnight at a B & B?"

•

Not so long ago the BBKA announced that from now on beekeepers could shop at Booker the wholesalers. This has been a very helpful move. At Booker a 25 Kg bag of white granulated sugar costs £13.49. The same quantity of sugar at the Co-Op can cost you £24.75. A potential saving on the late summer feeding of your bees of £11.26.

Most shopping trips contain an element of voyeurism, ogling things you don't need and can't afford. A visit to the Booker warehouse is the reverse: you do need and can afford the big bag of sugar, but all the other stuff you trundle past with your reinforced heavy-duty catering for-the-five-thousand trolley is of no use to you. Cooking oils in tonnages; teabags by the five-thousand-in-a-box; rice by the impossible-to-lift sack. You can't buy a mars bar in Booker. You have to buy a box of five hundred. And you don't want five hundred mars bars, do you? No, steady on now. No, you don't.

So I'm lugging the sugar sack into the kitchen, when Wife appears. "That new bee keeper down the road rang while you were out," she says. "Why are you bringing all that sugar into the kitchen, it'll only bring ants. Anyway, he wanted to know what hives and frames you use. I told him you had Longstrong hives and Hoffley frames." I ease my aching back. "I see. You didn't consult the catalogue, then?" "Don't need to, do I? I know about bee keeping." "They're called Langstroth hives and Hoffman frames." "Near enough." She eyes the sack. "I hope you'll not be dripping sticky syrup all over my kitchen floor. I don't know why you don't use baker's Fondump."

Rowland Molony
East Devon BKA

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Making The Best of Queen Cells

With the start of the beekeeping scene imminent, now is the time to make plans to replace winter losses or make increases.

Last year I showed how a seemingly awkward situation (the issue of a swarm) could be reshuffled. In this case, honey gathering being left to the swarm and increases being made from the swarm cells. At the end of that article I added that the making of nuclei, was in itself, a challenge that could stimulate a beekeeper into the realms of selectively rearing queens, not from colonies that swarm but from selected stock.

Making increase from swarm cells is the lazy beekeepers way of making increase, and it has a number of deficiencies. I would like to introduce some organization into the process so that queens can be raised from selected colonies and the first rung of the breeding ladder can be ascended.

There are a multitude of breeding schemes and it is difficult to know what is best for the amateur with around, say, 10 stocks. It depends on how much time is available, how much pleasure you take in manipulating bees, and if the bees and the weather cooperate. Much of the following information has been borrowed from others in the field and I cannot claim that there is anything ground-breaking in what follows. I used these techniques when I had a full-time job as a works metallurgist in Sheffield more than 30 years ago. In five years I built up my stocks from 10 colonies to over 100, obtained good honey crops (pre oil seed rape) and lost no swarms.

Queens were marked and their wings clipped*. This, of course, did not stop swarming but I found it did allow me to keep the colony

** At the first opportunity after mid-April you should ensure you clip the queens' wings. From then until the end of July the nine-day inspection routine should be carried out, with artificial swarming to fall back on if all else fails.*

together provided I inspected the brood nest every 10 days. My bees then were mainly dark. I do not claim that they were *Apis mellifera mellifera* but I was a member of the Village Bee Breeders Association (now BIBBA) and found that the local 'northern' bees were satisfied with 11 British Standard (BS) frames in a single National brood box. The fact that I now manage Italianate bees in Langstroth hives in no way invalidates what I am going to put forward.

When and how to divide colonies

A crucial point in dividing colonies with minimum stress is timing. The procedure should only be attempted on strong colonies in suitable weather when the bees are exploiting the available forage. Weather is by far the biggest problem in the UK.

Fresh pollen in spring triggers the colony to reproduce. As the colony grows more room is required to accommodate its expansion. The more sealed brood the more heat generated, and this releases adult

bees from clustering duties. Longer days offer more foraging opportunities and more food means more brood. Colonies thus grow exponentially until they are ready to swarm.

Provided that all the hive occupants have satisfying work to do most beekeepers should be able to keep their colonies together until May. Swarming is not likely to occur if the queen has empty cells to lay in and if there is ample room for storage and bees. Steady feeding in cases of nectar shortage will help to keep the bees occupied. If you really want early swarms, you should force them, from one or two selected stocks, and not leave all stocks short of space 'on the off-chance' (Box 1).

Splits

There are many variations on this theme. American literature abounds with making divides/splits/divisions. Here the beekeeper breaks up colonies letting the queenless part raise a new queen, often making ineffectual weak units in my view. The simplest approach is a direct separation of a double brood unit allowing the box without the queen to make queen cells.

- There will be no eggs laid in the queenless half until the new queen is mated and laying. The first adult bees can only emerge 21 days after the egg was laid.
- A queen can be produced from eggs and larvae but in their queenless panic bees often raise queens from old larvae, which will not receive the quantity and quality of the queen's special diet.

This results in a long broodless period (mating may take some time) poor quality queens and the chance of swarms as the virgins emerge. To counteract some of these shortcomings the queen cells can be reduced in number and sealed brood can be added to compensate for broodlessness. However, this is not a way of raising queens that I favour.

The method

Let us assume there are:

- 10 colonies at our disposal.
- A chosen breeder queen in hive A
- Cell raising will be carried out in hive B

Box 1. 'Forced' swarms in May

Beekeepers can try to 'force' colonies to swarm early. If a stock has the desired characteristics it is possible to make increase from it using the swarming impulse. However, it is not a technique I use any more because so much can go wrong.

As conditions vary throughout the British Isles the timing given is for Sheffield where I first practised this system. The selected stocks were chosen the previous year (from my record cards). They were fed well in autumn and went into winter on two National brood chambers with plenty of young bees. Such colonies must be built up in early spring so that there is a considerable brood area by mid April. This meant I had to start feeding sugar syrup in late February. I also fed pollen supplement in those years when there was little opportunity for bees to collect it.

The chosen stocks were given every opportunity to expand. Some manipulation would be needed every now and then to prevent the colony swarming before the first apple blossom. I remember having to sometimes replace frames of stores with empty combs in the brood nest and occasionally give supers.

When there was plenty of brood in both brood boxes (more than 16 BS combs) the unit soon become crowded. Incoming nectar would help to congest the hive and the bees would usually build queen cells. When the queen cells were still uncapped the colony could be divided into nucs (each with a queen cell). See my article last year for further details.

A better method for more experienced beekeepers is to find the queen and set her up in a nuc just before the queen cells are capped. The colony can then be left to carry on looking after the queen cells for a few more days before division. This entails carefully examining the colony to ascertain the number and age of all the queen cells. Under no circumstances should a virgin queen be allowed to emerge. This will swarm and the entire manoeuvre will fail.

Snags

This technique is suited to a National double brood box nest. Other frame sizes need a slightly modified approach. On no account should a swarm be 'forced' out of a single National brood box. This will only result in weak units. The weather and the local forage play a big part in the timing of the operation.

Just because you want the colony to swarm do not assume that it will oblige. However, obstinate units that refuse to swarm no matter how you restrict them, could, in fact, be just the colony you should be looking to make increases from (see main article).

I eventually abandoned the practice because I could easily make increase by other means that were more under my control.

BDI Sponsorship

Epidemiology of European Foulbrood of honey bees



As BDI's support for research into the Epidemiology of European Foulbrood enters its second year, Ed Hayes, the researcher, reports on his work to date.

I have just completed the first of four years of a PhD, based at both the University of York and the Food and Environment Research Agency (Fera) and in partnership with Bee Diseases Insurance (BDI), studying the epidemiology of European Foulbrood of honey bees (EFB). EFB is the most important larval disease of honey bees in Great Britain, with 337 separate apiary infections being reported in 2009, and is caused by the bacterium *Melissococcus plutonius*. During the course of my doctorate I hope to increase our knowledge of how *M. plutonius* is able to spread between apiaries and cause disease, and I hope to make suggestions which help reduce the impact of EFB. What follows is a presentation of my studies so far.

Distinguishing between bacterial isolates

The first stage in understanding disease spread was to develop a typing scheme to allow different isolates to be distinguished from one another, and their degree of relatedness calculated. This allows infection routes to be tracked and predominant strains of the pathogen to be identified. I have developed an appropriate technique, and the next step is to roll this scheme out to the collection of around 40 *M. plutonius* samples that I've been isolating over the summer.

Constructing a map of the *M. plutonius* genome

I was extremely lucky to start my PhD with access to a well annotated genome of my study pathogen. This contains the sequence of all the genes in the organism, potentially giving clues about how the bacterium causes disease. However, there were some ambiguous sections of the genome, so in an attempt to resolve these issues a new batch of sequencing was performed on Fera's 454 pyrosequencer. This is a recent acquisition by the agency, which allows the sequencing of vast amounts of DNA very quickly.

Having been incorporated into the old genome, all that remains is for the newly found genes to be characterised.

The *M. plutonius* genome can be used to study bacterial metabolism. By comparing the metabolic pathways of *M. plutonius* with another, closely related bacterium I can provide insights that might, for example, allow me to grow *M. plutonius* more easily than I do now.

Hunting for EFB with an inspector

As well as the time spent in the lab and behind the computer, I have also had the opportunity to get outside and encounter some bees 'face-to-face'. As BDI has input on my project, it was agreed that I would spend some time this summer accompanying Seasonal Bee Inspectors on their apiary visits. I accompanied inspections across a broad range of disease states, saw infection with numerous other pathogens, and witnessed the response of apiaries to treatment by colony destruction and shook swarm. It was a very worthwhile experience, and one I look forward to repeating in the future.

Summary

The outlook for my project appears very positive. Immediate plans include completion of the improvements to our sequence of the *M. plutonius* genome, rolling out the typing scheme to the stored isolates, and setting up experiments to test modified media for improved *M. plutonius* growth. In the longer term, exciting avenues of research include further use of Fera's pyrosequencer and incorporating my molecular data into computer models that explain and predict EFB prevalence at a landscape level, in collaboration with the Insect Pollinators' Initiative led by Dr Giles Budge (NBU).

Ed Hayes

This project is funded by the BBSRC and BDI.

Supervisors: Dr. Thorunn Helgason, University of York; Prof. J. Peter W. Young, University of York; Dr. Richard Thwaites, Food and Environment Research Agency (Fera); Dr. Giles Budge, National Bee Unit, Fera; Industrial supervisor: Bernard Diaper, Bee Diseases Insurance (BDI).

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The Asian Hornet – A Threat to UK Beekeeping

This article has been written by Gay Marris to appraise readers of the National Bee Unit's response to the potential threat posed by the Asian hornet. This bee predator is now present in France and Spain and could soon arrive in the UK; possible routes of entry into the UK have been identified by the NBU. The NBU urges vigilance and awareness-raising to help keep this invader at bay.

Introduction

The Asian hornet, *Vespa velutina*, is an aggressive predator of honey bees and other beneficial insect species. It has recently extended its native geographical range from Asia to mainland Europe, following accidental introduction to France, and is now also present in Spain. Adult hornets are highly mobile; their speed of spread across the French départements being equivalent to ~100km/year. David Bancalari's piece in the December 2010 issue of *BBKA News* provided useful background information about *V. velutina* and its history in France. The current article outlines the National Bee Unit's (NBU's) response to the threat that this invasive species may pose to British beekeepers' colonies.

Non-native risk assessment

The Non-native Species Secretariat (NNSS) has responsibility for helping to coordinate the approach to invasive non-native species in Great Britain (GB). The NNSS is responsible to a Programme Board representing the relevant governments and agencies of England, Scotland and Wales. At the request of the NNSS, the NBU has undertaken a Non-native Organism Risk Assessment for *V. velutina* with respect to beekeeping in GB (read more about the activities of the NNSS at <https://secure.fera.defra.gov.uk/>

[nonnativespecies/home/index.cfm](https://secure.fera.defra.gov.uk/nonnativespecies/home/index.cfm)) The draft assessment was completed in September 2010. In as much detail as possible, it considers, based on available literature, scientific evidence and personal accounts, all feasible pathways of entry into GB – how these are regulated and potential volume of movement along each one (i.e. relative risk posed). It discusses likely impacts on honey bees and other insect prey sources (which may for example be important pollinators), possible methods of control, and implications to human health and amenities, should the Asian hornet be found over here. It also lists some actions that would be useful now to help keep the hornet out. This lengthy document is in the process of review by peer(s) in the field and by the Non-Native Species Risk Analysis Panel (NNRAP). It is anticipated that the finalised risk assessment will be made public in spring 2011.

Potential entry pathways to Great Britain

The life-stage of the Asian hornet that poses the greatest risk of entry is a newly-mated queen, because just one such inseminated female can found an entire colony comprised of several thousand offspring. There are multiple pathways by which Asian hornet queens could, at least in theory, enter GB. Firstly, hornets present in northern coastal regions of France could possibly fly across the Channel 'under their own steam', with certain weather conditions assisting this natural spread. There are no confirmed records of other social Hymenoptera crossing from the Continent to GB via this route, but the invasive Median wasp, which entered GB from Europe in 1988, was first found just outside Brighton in East Sussex, and there are numerous records of other insects (butterflies, ladybirds)

crossing the Channel each year. Secondly, in the autumn, mated queen hornets seek out refuges in which to hibernate, and small clusters have been found under tree bark or, occasionally in soil. This means that imports of untreated wood, large specimen trees, or soil associated with plants could harbour over-wintering hornets. Thirdly, hibernating queens will also hide away inside manmade objects, as long as these provide suitable cracks and crevices in which to conceal themselves. It is believed that hibernating *V. velutina* was first introduced into France from Yunnan (China) in ceramic bonsai pots. These, and other imported goods sold *al fresco* at, for example, British garden centres, represent a route of entry. Fourthly, adult *V. velutina* use various flowers and ripe fruits as sources of sugar, so there is the potential for hornets to enter GB with such produce imported from its known geographical range. There aren't any reports of *V. velutina* being transported in this way, but there are Plant Health Interception Records for other hornet species arriving in GB on imported fruit and plant produce. In these cases the hornets were found at importers' offices and open air market stalls.

Raising awareness

The NBU posts information about the Asian hornet on its BeeBase website (www.nationalbeeunit.com). Our contact details are also included in an information leaflet about *V. velutina*, produced and distributed by BWARS and Hymettus Ltd (BWARS is the national society dedicated to studying and

recording bees, wasps and ants in Britain and Ireland (www.bwars.com); Hymettus Ltd is a useful source of advice on the conservation of bees, wasps and ants within GB and Ireland (www.hymettus.org.uk)). However, other media and avenues of dissemination are also being explored; e.g. besides articles in popular beekeeping literature, similar publications used by Garden Centre suppliers, fruit and flower importers etc. must also be targeted. The NBU is liaising with the NNSS to discuss what can be done now to further raise awareness of the potential threat posed by Asian hornets and the priority with which likelihood of entry should be addressed. A 'Species Alert' for *V. velutina* has been posted on the front page of the NNSS website (see <https://secure.fera.defra.gov.uk/nonnativespecies/home/index.cfm>). We have worked together to produce an identification sheet for *V. velutina*, which is available through BeeBase and the NNSS website.

Monitoring for arrival – early interception

Strategies for keeping *V. velutina* out of the UK, and for containing it in the event of an incursion are being addressed as a matter of priority. At present, the NBU undertakes apiary surveillance for other exotic threats (in particular the Small Hive Beetle, *Aethina tumida*), targeting apiaries close to ports, freight depots, ports of entry for fruit and other foodstuffs, and those belonging to bee importers. The NBU also monitors for exotic threats using sentinel apiaries – these have been set up in each of the eight English

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The Asian Hornet – A Threat to UK Beekeeping ...cont

and Welsh beekeeping regions (120 apiaries in total), and are regularly examined by trained Inspectors for pest incursions. It is recognised, however, that selection and inspection of these 'at risk apiaries' is based on current understanding of the most likely routes of entry for beetles, and needs to be adapted to reflect what we know about pathways of entry for the Asian hornet. We have advised colleagues in the UK's Plant Health Seed Inspectorate (PHSI) (~100 personnel responsible for inspection of controlled imports of fruits and

flowers), about the biology and appearance of *V. velutina*, and alerted them to its possible arrival on Asian, French or Spanish produce. Regarding public response to the Asian hornet threat, at this stage we are simply aiming to achieve earliest possible detection. The NBU is therefore currently requesting that members of the public who suspect they have found an Asian hornet should notify us, providing as much information as possible. If possible, they should also send us a sample for examination to confirm identity. The NBU and

NNSS will publicise practical response plans for dealing with the arrival of *V. velutina*, including who will have responsibility for implementing them, as soon as these are finalised.

Gay Marris, National Bee Unit

Further Information

BeeBase (www.nationalbeeunit.com) is regularly updated with the latest news and information. Address enquiries about honey bees to nbu@fera.gsi.gov.uk. For enquiries regarding Bee Health Policy and Regulatory issues, contact beehealthinfo@fera.gsi.gov.uk.

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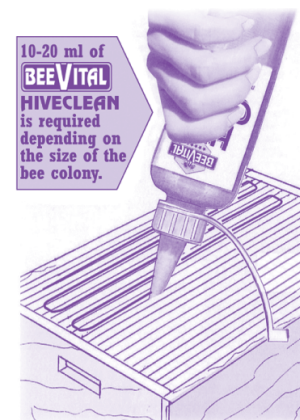


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BBKA PhD Studentship Progress

Gianluigi Bigio is the recipient of a BBKA PhD studentship at the University of Sussex. He is a beekeeper with research interests and experience in genetics. These are being brought together in his PhD project, which he describes for us below.

Now that winter is here it is a good time to look back over the past season and to summarize what we have achieved, as well as making detailed plans for next year. After training as a molecular biologist in Italy, obtaining a bachelor's and later a master's degree in agricultural biotechnology at the University of Turin, I spent some years doing applied research on plant genetics in Ireland. I decided to change subject and looked for a PhD position studying honey bees. Coming from a small town in the rural area of north-western Italy and being raised from a family with a farming background, I was exposed to beekeeping from a young age, first helping my grandfather and later my aunt in their apiaries. I eventually managed to establish my own apiary 10 years ago with up to a dozen colonies. In Autumn 2009 I looked for a project that would focus on applied genetic research, in order to combine both areas that fascinate me, and I contacted Prof. Francis Ratnieks who after interviewing me, found funding for a PhD. In April 2010 I started the project and I am really looking forward to producing some concrete results.

Aims of my project

I work with Norman Carreck and Dr Karin Alton on the project entitled 'Breeding disease-resistant hygienic honey bees', which forms part of the 'Sussex Plan for honey bee health and wellbeing' (Carreck 2009a,b) and which is partly funded by Rowse Honey Ltd and Michael Chownen.

I started my PhD project, which is also partly funded by the British Beekeepers Association, in April 2010. A number of honey bee colonies already existed at the Laboratory of Apiculture and Social Insects that had been shown the previous year to be hygienic when tested using the 'freeze-killed brood assay'. This is a simple yet efficient screening procedure, which involves pouring liquid nitrogen into a cylinder placed on a section of sealed brood to freeze it, then replacing the frame into the hive and monitoring the percentage of dead brood that has been removed by workers after 48 hours. A colony can be considered to be hygienic when it removes about 90% of the frozen brood.

Because honey bee queens will mate with up to 20 drones the resulting offspring will consist of a number of subfamilies or 'patriline' corresponding to individual drone fathers. Even in a colony that has been identified as hygienic, this hygienic behaviour may only be expressed by a small number perhaps just one of these patriline as shown by previous work carried

out in the laboratory (Pérez-Sato *et al.* 2009). The first task, therefore, was to try and get a clearer picture about the impact of these multiple patriline on the expression of hygienic behaviour in a colony. We marked individual bees collected from three hygienic colonies, and introduced them into an observation hive with a frame containing a patch of freeze-killed brood. By setting up a high definition video camera and watching the recordings afterwards, we were able to observe the different behaviours of the worker bees, and note down the identity of individual hygienic bees. At the end of the experiment, tissue samples from these bees were collected and sent to Dr Annette Jensen at the University of Copenhagen, Denmark where genetic analysis was performed. With this information we are able to correlate the genotype with the hygienic tasks performed, and subsequently to use these data to perform selective crosses

Gianluigi Bigio rearing queens



Queen rearing nucs



Photos: Dr Karin Alton

between queens and drones reared from hygienic colonies.

Re-queening for hygienic bees

Much of the work carried out last summer focused on developing the necessary skills to rear queens from our breeder colonies, and having them successfully mated and then introduced into hives. The goal we set ourselves at the start of the season was to keep the same number of total bee colonies, but to have as many as possible re-queened with queens reared from the hygienic colonies. Controlled mating between selective colonies allows us to speed up the breeding and avoid contamination by other strains of bee. Next year we will establish our own facilities for instrumental insemination of queens. This year we focused on trying to optimize the method as well as learning the techniques of insemination from Michael Collier of Cornbrook Bee Farm, Shropshire. One of the major difficulties with instrumental insemination is obtaining virgin queens of suitable age, which together with using the correct technique will lead to good results. Most of our efforts were therefore concentrated on the comparison of different options and conditions for maintaining virgin queens in the laboratory in order to cause them the least stress.

Experimental designs

We designed an experiment that could compare the effect of three different stress factors. These can be broadly defined as 'the cage model', the presence/absence of attendant workers, and feeding. Additionally, we tested the interaction of these factors on the survival of queens over a period of one week. We used this one week period because this will provide us with more flexibility during the breeding process in case of adverse weather, and it also corresponds to the appropriate age for queen mating.

Our aim is to breed a line of hygienic Dark European honey bees, *Apis mellifera mellifera*, the sub species native to the British Isles and north western Europe. Our plan therefore was to also increase our genetic resources in order to have more colonies from which to rear queens and collect drones. We have obtained *A. m. mellifera* queens from Scottish and Irish beekeepers and re-queened some of our hives, and more queens will be obtained next season thanks to useful contact with Danish bee scientists made during the EurBee conference in Ankara, Turkey in September. Hopefully, some of these colonies will show a high degree of hygiene and can be incorporated into our breeding program.

Getting ready for 2011

At the time writing this article, we have treated all of our colonies against *Varroa* using fumigation with a mixture of thymol, menthol and eucalyptol; we have fed them with syrup or candy and equalized them to put them in the best conditions for overwintering and to be able to perform the freeze-killed brood assay early next spring. The University of Sussex is situated in the South Downs and last winter during the heavy snow, some hives were seriously damaged by attack of green woodpeckers, so we have also placed protective cages made out of chicken wire over the hives to act as a deterrent.

I am pleased with the progress that I have made this year, and look forward to recommencing my practical work next spring when we will be establishing the number of hygienic colonies that are present in our apiary. Once our instrumental insemination laboratory is constructed we will start queen rearing and continue the breeding process. For more information and regular news updates see our website: www.sussex.ac.uk/lasi

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The London Bee Summit

Such is the growing interest in beekeeping that more than 150 people were tempted to brave the elements and travel to the Festival Hall on London's South Bank to what was styled the London Bee Summit.

The event was organised by Capital Bee under the umbrella of Capital Growth, a partnership initiative between London Food Link and the Mayor of London, Boris Johnson. Capital Growth has at its heart the 'greening' of London and is campaigning for 2,012 new food growing spaces in London by 2012.

Capital Bee aims to promote community-run beekeeping in London and campaigns for a bee-friendly city. The Bee Summit was the launch-pad for the initiative and the start of a process whereby community groups wishing to take up beekeeping can bid or compete for the 50 start-up kits that are being financed by the Mayor. Details of the scheme can be found on the website: www.capitalgrowth.org/bees

The enthusiastic audience was made up by an eclectic mix of beginners, experienced beekeepers, eco-warriors and campaigners, which heard presentations from a wide range of speakers. Under the chairmanship of Myles Bremmer (CEO Garden Organic), Lord Henley (Environment Minister) opened the meeting. He hit some choppy water from the anti-pesticide campaigners present, but made encouraging remarks that indicate he is in no doubt about the importance of honey bees. Prof Opi Outhwaite (Greenwich University) made a contribution about regulation of beekeeping; nothing new here, but she seemed to accept that compulsory registration was a non-starter. Mike Brown (NBU) reviewed his team's activities and responsibilities with particular emphasis on the research programme and BeeBase, of course. Nick Mole (PAN) talked of the problems of pesticides and their effect on bees. His conclusion, that we could not legislate against Varroa and viruses but we could against pesticides, was popular with supporters in the audience. Theory turned toward practice with Nick Fraser (National Trust) talking about organic, chemical-free management of parkland, based on the real-life experience at Nunnington Hall in North Yorkshire.

The summit then moved onto beekeeping when BBKA's Director of Public Affairs, Tim Lovett, talked of the need to temper raw enthusiasm with proper training and support from experienced beekeepers. The Course in a

Case package drew much interest and may well be offered as part of the start-up kit. The importance of affiliating to a BBKA Association was also strongly underlined, which Karin Courtman (London BKA) strongly endorsed, highlighting the wide choice of Associations in and around the capital and the importance of working together considerably to manage our bees and the diseases that can afflict them, together with steps that non-beekeepers could take to encourage forage availability.

The tea break gave a chance for delegates to visit the various stands exhibiting, including the BBKA stand, and for a honey-tasting competition, which was the source of much amusement.

Back in the conference room Elinor McDowall spoke of the Bungay Community Bees project, where a start-up group got together for low input cooperative management with the help of Waveney BKA. Tim Baker (Charlton Manor Primary School) then gave a fascinating talk on the positive community and educational outcomes from the bees that swarmed on the school premises (see below). Steve Benbow (London Honey Company) gave an animated and entertaining talk about his beekeeping epiphany and his development into an urban bee farmer, although he has many hives outside London. Some helpful comments on choice of hive sites and moving bees about in the urban environment were made. Heidi Hermann (Natural Beekeeping Trust) reminded everyone that it's not just about honey, proposing less 'take' and more 'give' to our bees and the need to examine the way we live, concluding that 'agriculture is sick', which resonated with some delegates. Sue Walton (Bug Life) gave a spirited and relevant talk reminding us that the honey bee isn't the only pollinator out there, flagging-up the difficulties that other species face and their key importance in both the wild and agriculture, noting the huge loss of flower-rich grassland from 3M hectares down to 100K hectares today.

Rosie Boycott gave a brief closing address announcing officially, the 50 hive kit giveaway and echoed many of the themes that had emerged during the afternoon. So here is a bold project backed by the Mayor; it is now the task for Associations to engage with and support these groups as they start their beekeeping journey to ensure that they achieve good competence to the benefit of the whole community.

Charlton Manor School project

Tim Baker, Headmaster at this south east London primary school, took the opportunity to turn a derelict part of his school grounds into a garden. Excellent! But he didn't exhibit the usual 'Health & Safety reflex' when a swarm of bees arrived one day. This brave Head saw that the kids were not scared but really interested and so with the help of the Ruxley Beekeepers, a group within Sidcup BKA, he got beekeeping underway at the school. A club was formed involving pupils and parents and all the tasks from frame-building, inspections, harvesting and marketing of the honey were undertaken by the children, with appropriate 'buddying' and training, of course. Their pride and joy is their bee shelter, which allows them to manipulate the bees on one side and observe in safety and comfort from the other, by installing glass panels in the brood boxes. The school has enjoyed excellent parental support and local politicians have not been slow to recognise the good work being done. Mr Baker summed-up the benefits to the school in his London Bee Summit Presentation as providing a real world learning opportunity, supporting the school curriculum, improving behaviour of challenging pupils, promoting environmental understanding, and giving a sense of pride across the school.

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The Forager

Thoughts of Spring

Traditionally, beekeepers have considered autumn to be the start of the beekeeping year but I thought I would make some allowance for the fact that beekeepers are, in some ways, no different to most other people – they generally leave things until the last minute. I am no different in this respect and all of the good intentions that I had in September somehow got deferred so that now, I have to get all of the equipment prepared and ready in case we experience an early season – and time is getting short. There is, after all, an old Chinese proverb (isn't there always?) which tells us that 'Spring is sooner recognized by plants than by men'.

So, where do we start? Well I always feel that the most important thing to do is to decide what your priorities for the year are to be – what you want to do and what you need to do. Strangely, the 'want' category is much harder to deal with than the 'need' category as it requires some thought as to what sort of beekeeper you are. Are you someone who plans your beekeeping, knowing what you want to do and when, are you a 'reactive beekeeper' who waits to find out what state your colonies are in when you inspect them or are you a member of that hardy band of stalwarts known as the 'let-alone beekeepers'?

If you are a planner then you may well have already decided what your main priorities are for the year. You may have decided that you will work to keep *Varroa* levels low throughout the season in order to avoid the need for treatment in the autumn. You may have decided that this is the year when you will rear enough queens to re-queen all of your colonies or you may have decided that you will aim for complete comb changes throughout your stock. Whatever your plan is then stick to it and make sure that you keep sufficient records of what you have done so that you can really learn the maximum from your season's efforts. Be sure not to make too many changes to your usual practice because, if you do, you may find it difficult to identify which were the most beneficial actions.

If you are a 'reactive beekeeper', I would just ask you to consider

whether you might not get more enjoyment out of your beekeeping by being able to take some of the credit for what your bees achieve this year. It can be very rewarding going to examine a colony and knowing that it will have survived rather than having the apprehension of not knowing. There is probably little point me even commenting on the 'let-alone beekeepers' other than to ask why they have bees if they don't even bother take the simple pleasure that is to be had from handling a colony. Many who fall into this category have told me in the past that they are let-alone beekeepers because their bees are too wild or vicious or generally scary for them to examine. I fear that for many, this is just an excuse for the beekeeper's inadequacy, having never learned to handle a colony properly. But if the colony really is too lively, then it sounds to me like a wonderful opportunity to re-queen with stock more suited to being handled.

Turning now to the things you need to do with your colonies – it is not a long list, but whatever kind of beekeeper you are, you do need to do these things. You need to ensure that your colonies are given the maximum opportunity to prosper.

To do this you should be certain that they are free from disease and that they remain that way. Carry out diagnostic checks for *Nosema*; carry out careful inspections of the brood and be sure to identify the cause of any brood abnormalities that you identify; carry out routine checks on the *Varroa* mite population and constantly work to reduce it (leaving *Varroa* control until the autumn merely leaves more mites in the colony to breed more mites). Keep records so that you know what has happened in each colony and what you will need to do at the next inspection. Make sure that your hive and apiary hygiene are the best you can achieve. Finally, think about your beekeeping – rationalise your actions and those of the bees and understand why the things that are happening in your colonies are happening that way. Most colonies of bees are very capable of managing without the intervention of a beekeeper so please make sure that your interventions are beneficial ones.

The Forager

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Bees and Darwin

This was the winning entry in the 2010 National Honey Show essay class, which is sponsored by BBKA. For 2012, the title for the essay is 'Disastrous Beekeeping Purchases'. The essay needs to be not more than 2,000 words, excluding references. Now might be a good time to start writing!

If Charles Robert Darwin had not failed in his studies at Edinburgh University he would have followed his father into the medical profession. Instead he concentrated more on his friendship with local fishermen learning so much from their catches that he was able to read a paper on zoological observations to the university's natural history group, the Plinian Society, in 1826 when he was only 17 years old.¹

If, at Cambridge, he had not been distracted from the classics and Paley's *Natural Theology* he would have entered the church. Instead he joined the hunting and shooting set and collected butterflies.¹ Most importantly he befriended Professor Henslow the botanist.

It was this friendship which ultimately led to him being invited to join HMS Beagle as a naturalist on its five year voyage from 1831 to 1836.

For the length of the voyage Darwin does not seem to have done any work on bees, or at least none is recorded in *The Voyage of the Beagle*. Once settled in Down House, Kent, in 1842 he engaged in the common Victorian hobby of beekeeping and began to study them.

His main interest was in the complex construction of the cells. This was a matter which, although bees had been observed for centuries, was not fully understood. At one point he followed the idea put forward by his old associate George Waterhouse² that the bees formed a cylindrical cell from which hexagons were formed by the external pressure of surrounding cells. He knew this to be the case with the Mexican stingless bee *Melipona Domestica*. Darwin hoped to be able to show evolutionary steps from the simple spherical cells of the humble-bee (bumblebee) through *M. Domestica* to the complex cell of the honey bee. He spent so many years studying this problem

that one commentator was led to suggest that Darwin had delayed his publication of *The Origin of the Species* until 1859 to give himself more time to prove his point.³

Darwin's work on honey bees spanned the period during which Langstroth realised the importance of the 'bee space', which led to the introduction of the movable frame hive and the creation in 1857 of pre-formed foundation. TW Woodbury who introduced moveable frames into Britain in 1862 sent Darwin a sample of this foundation. In a letter to thank Woodbury Darwin wrote that it '*interested me much*'.⁴

In studying cell building he introduced pieces of wax including some dyed with vermilion and gave lengthy and detailed descriptions of his experiments and observations in the *Origin of the Species*.⁵

He was considerably helped in 1858 by the installation of an observation hive with the assistance of the Rev John Innes who stocked it for him. Surely a true example of Christian Charity since, on the face of it, Darwin's work was aimed at proving the theory of Evolutionism against the theologian theory of Creationism and, *en-route*, largely doing away with God.

The observation hive enabled the scientist to study comb building at close quarters allowing him to complete his great work, '*On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*', published in 1859.

In the end he was unable to find the evolutionary steps he sought and in his *Origin of the Species* he wrote, 'The subject of instinct might have been worked into the previous chapters; but I have thought that it would be more convenient to treat the subject separately, especially as so wonderful an instinct as that of the hive-bee making its cells will probably have occurred to many readers, as a difficulty sufficient to overthrow my whole theory. I must

premise, that I have nothing to do with the origin of the primary mental powers, any more than I have with that of life itself. We are concerned only with the diversities of instinct and of the other mental qualities of animals within the same class'⁶.

On this matter I fancy he came as close as possible to describing it as an instance of one use of the word teleology 'the doctrine that there is evidence of purpose or design in the universe, and especially that this provides proof of the existence of a Designer'.

Darwin studied humble-bees as they were known at the time by observing them at great length in and around the garden at Down House and walking the local hedgerows. He was well aware of the importance of both honey bees and humble-bees in the cross pollination of plants and wrote extensively on the subject.⁷

With the help of his children he particularly studied the movement of male humble-bees around his garden. He found that they tended to follow set paths, which he recorded in his field notes.⁸ He also found that they had chosen places along their route at which they paused and 'buzzed' before moving on. On 17 September 1857 he wrote: 'Saw several on the same thorn...I saw what I fancied was a female come and find with difficulty the tree and it rested on twigs and seemed to sting them'. At this point he made a marginal note 'Do not females find males by their buzzing places?' Was he describing what in the honey bee world is known as a drone assembly area?⁹

In the matter of pollination one of his most important observations was bringing attention to the fact that only bumblebees could pollinate red clover which had not previously been known. He wrote 'The tubes of the corollas of the common red and incarnate clovers (*Trifolium pratense* and *incarnatum*) do not on a hasty glance appear to differ in length; yet the hive-bee can easily suck

the nectar out of the incarnate clover, but not out of the common red clover, which is visited by humble-bees alone; so that whole fields of the red clover offer in vain an abundant supply of precious nectar to the hive-bee'.¹⁰ This observation led directly to humble-bees being taken to New Zealand to pollinate red clover when it was found that there was no indigenous insect with a tongue long enough to reach into the flower. The first attempt was made in 1875 but it was ten years later before a successful transfer was made.¹¹

Darwin was also aware that the population of humble-bees in an area was largely reliant on its nest not being eaten by mice. On this he wrote 'I have, also, reason to believe that humble-bees are indispensable to the fertilisation of the heartsease (*Viola tricolor*), for other bees do not visit this flower. From experiments which I have tried, I have found that the visits of bees, if not indispensable, are at least highly beneficial to the fertilisation of our clovers; but humble-bees alone visit the common red clover (*Trifolium pratense*), as other bees cannot reach the nectar. Hence I have very little doubt that if the whole genus of humble-bees became very rare, or extinct or very rare in England, the heartsease and red clover would wholly disappear. The number of humble-bees in any district depends in a great degree on the number of field-mice, which destroy their combs and nests; and Mr H. Newman, who has long attended to the habits of humble-bees, believes that 'more than two thirds of them are thus destroyed all over England'. Now the number of mice is largely dependent, as every one knows, on the number of cats; and Mr. Newman says, 'Near villages and small towns I have found the nests of humble-bees more numerous than elsewhere, which I attribute to the number of cats that destroy the mice'. Hence it is quite credible that the presence of a feline

Continued on Page 14

Bees and Darwin

animal in large numbers in a district might determine, through the intervention first of mice and then of bees, the frequency of certain flowers in that district!'¹²

There is one story which is inseparable from any commentary about Darwin and humble-bees. The local farmers noticed a steady decrease in their crops so decided to take their problem to the great Darwin now settled in at least semi-retirement. Darwin agreed to look at the situation. Together with a group of farmers he walked some of the hedgerows before declaring 'Get more cats' then turning to walk away. The farmers did not understand the instruction and called after him to explain. 'Your crops are fertilized by humble-bees. Their nests are being eaten out by mice. Get more cats which will eat the mice and allow a larger population of bees' and continued on his way.

On a lighter side Thomas Henry Huxley another eminent English biologist and others went on to

expand this idea, pointing out that the success of the British Empire really depended on 'Old Maids'. Why? ... because soldiers eat roast beef, the beef cattle eat red clover, red clover is pollinated by bumble bees which, in a round about way are protected by cats. The cats eat the mice that prey on the honey and Old Maids keep cats, therefore the continuation of the British Empire was really dependant on cat loving elderly ladies.

It's a nice thought and nice enough for A D Hope to write a poem about it. In 'Clover Honey' from 'A Late Picking: Poems 1965-1975', he includes the following verse:

So when we find - what does the Bible say?

A land flowing with milk and honey, we do

Not doubt, we naturalists, that there we may

Expect to find old maids a-plenty too.

Darwin's study of bees may not be the first thing about his work that springs into the mind of the public or for that matter the minds of beekeepers. His knowledge and studies of matters concerning natural history have without question made him a world renowned figure. One has to wonder however if, had he entered medicine or the church, his eminence in either field would have been such that he might enter anyone's mind at all.

Ian Copinger, Durham BKA.

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Spring 2011 Convention

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Spring Convention News

Colloquium - Research Creating A Buzz

The Insect Pollinators Initiative put £10M into important research projects, now getting underway. All nine projects will be the subject of brief presentations designed to inform and gain feed-back from beekeepers. The colloquium will run on Saturday afternoon and will be of interest to all those who campaigned for increased research funding.

Lectures

Keith Delaplane, Ingemar Fries, Mario Pahl and Francis Ratnieks are amongst the head-line lecturers this year. Other speakers including Ian Craig, Dan Basterfield, Ron Hoskins, Pam Gregory, Giles Budge, Andy Wattam and Margaret Thomas who bring the total number of lectures on offer during the convention to more than 30!

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New General Secretary

Jane Moseley

Jane has lived for the past 10 years in rural Hertfordshire and brings to the BBKA a diverse range of both business skills and personal interests.

Her working career has encompassed a range of employed roles, from early roots in local newspaper advertising through to big-budget global corporate sponsorship and exhibition sales. More recently she created a series of entrepreneurial business ventures in off- and online retail aiming in particular to support the growth of young British designers of sustainable products for the home, including furniture, lighting and such like.

In addition to bees (five hives barring a bad winter!) her garden is home to chickens and ducks, and as a result is also a popular feeding station for a range of uninvited, but welcome, guests from deer to birdlife. Other, less welcome guests are attracted to an amateurish but productive vegetable patch. When not tending the garden Jane enjoys travelling to unusual, natural locations beyond the usual tourist routes. Among other hobbies she loves sewing, reading, getting together with friends and has a bit of a passion for live music of all styles.

Be it in or out of work, Jane is characterised by her positive views of life in general and of what can be achieved on any particular project or goal. She embraces new ideas, much prefers working with people than PCs and perseveres despite inevitable setbacks along the way. She is delighted to be working with the BBKA and determined to apply both her personal and professional skills in ways that will bring real benefits to a community for which she has a passionate enthusiasm and belief.



Pheromones – Part Five

This time we are going to discuss the pheromones released by the Nasonov gland.

This pheromone is often the one we first learn about because the gland is very visible and, whenever the colony is disturbed, workers deploy this gland to attract their 'sisters' to return to the hive. This sight is very familiar to beekeepers as many workers can be seen gripping onto the surface with their abdomens pointing upwards and fanning the scent away with their wings. The gland looks like a grey band that is exposed between the tergites 6 and 7 and is exposed by the worker bending the last stage of the abdomen down.

The pheromone is a releaser type; it is volatile and is transmitted through the air. It contains a number of chemicals but the most prominent are Geraniol (oil of geranium), Nerolic acid, Geranic acid, Citral, Farnesol and Nerol. As can be seen from the names, these chemicals are closely related. The pheromone can be sensed by some beekeepers and has a lemony geranium smell. However, the relative concentrations of the chemicals can vary, which makes this cocktail rather complex.

The obvious effect is to attract other workers to the same spot, but we need to understand why there are so many different chemicals involved. Firstly, we can surmise that the need to identify a specific colony will mean that small differences in the concentration of the components could help workers recognise their own colony. This is true for other pheromones so it is

probably true for the Nasonov pheromone.

Secondly, the pheromone is used by workers in a number of different situations and this may have some bearing. When a swarm flies off to its initial resting place the scout bees will expose their Nasonov gland to attract the other workers to the site. Similarly, the scouts will fly through the swarm with their Nasonov gland exposed to leave a scent trail for the other workers to follow to the new nest site. Recently, Jürgen Tautz has postulated that when a forager finds a source of food and returns to the hive to dance to recruit more foragers, after the dance the group will leave the hive and the initial forager will fly through the group leaving a 'Nasonov trail' to help the others find their way. In all these activities it is important that the followers can sense the direction in which the pheromone is most concentrated. Having two antennae with highly sensitive receptors gives bees the ability to direction find and follow a trail.

The Nasonov pheromone is also used to help mark sources of water and sugar solutions that have no odour. Here, the pheromone is used in conjunction with 'footprint' pheromones to act as a guide to the source. One can assume that the Nasonov pheromone (as a releaser pheromone) produces a vapour trail that other workers can follow and that the 'footprint' pheromone then marks the spot where the water or sugar source can be found.

Ivor Davis, NDB



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Gita Weller has always had an avid interest in bees and, with her partner, Oliver van Bilsen, became one of our wonderful beehive adopters.

Gita and Oliver are soon to be married and when they were asked what wedding gifts they would like, their thoughts turned again towards helping honey bees. Gita said: 'We both wanted to ensure that the generosity of guests that often comes with weddings went to a good cause and as we've been together for over 8 years it seemed terribly selfish to ask for more 'stuff' when we were already struggling for space in our house'. 'We really hope that not only will our wedding guests make a contribution, but also by giving them information on the BBKA we will help to increase visibility to the importance of the work it is doing.' Gita and Oliver have created a 'JustGiving' account for the donations, and we send them very best wishes for their special day.

The 'Swindon' Honey Bee

My introduction to bees occurred 67 years ago as a 12-year-old evacuee during WW2. I learnt beekeeping as well as any young student could; I thought I knew a lot about bees but soon realised it was only the start. I have remained a student ever since. Whenever I open a hive I wonder if there is something new to see, understand and perhaps improve upon – and if so whether I can share it with others.

Varroa arrived

In the late 80's I became a self-taught 'Queen Insemination Practitioner' concentrating my efforts on selectively breeding *Apis mellifera mellifera* (A.m.m). In 1992 when *Varroa* was discovered in England I think we all panicked a bit and worried how it would affect us. Here I was, getting along nicely with a new strain of gentle A.m.m bees in my 80 colonies and now I was fearful of losing them.

Bombard them with 'baccy' or use costly chemicals?

I attended one of the early MAFF workshops in Devon to be shown how to divide an ounce of Golden Virginia Tobacco into eight portions; place one portion into the smoker; reduce the hive entrance with newspaper and puff the tobacco smoke into the hive, having put a sheet of sticky Fablon on the floor to catch falling mites. My mind boggled.

At the same meeting the *Varroa* mite was described as being like a crab with a carapace and eight truncated legs on the forward side of its body. I imagined it was therefore likely to be hard and bony 'like a crab'. I was wrong - *Varroa* are exceedingly soft and very easily damaged, as I was to find out.

Bayvarol came next but placed a

similar burden on the pocket as did tobacco. After a couple of seasons I seriously considered reducing my colonies, but that idea was put on the back burner when I was faced with a serious setback. The queens I had inseminated were being quickly superseded for no obvious reason. Some colonies inspected had capped supercedure cells, but were not about to swarm. My young inseminated queens were removed and dissected. All had full spermatheca. The cause for rejection was not established. My methods had not changed. The new queens were always accepted previously.

I felt my insemination technique must be at fault, so I took an excellent course at Ohio University with Susan Cobey. I learned how to do things more skilfully, but discovered that I had been doing nothing very wrong in the first place.

Solving the supercedure mystery

The problem still had no answer until I met Dr. Jeff Pettis, an entomologist and chief researcher at the USDA's premier bee lab in Beltsville, Maryland, US. He had found that the chemicals used to control *Varroa* were having an adverse effect on the viability of drone semen. This had to be the answer. The drones used in insemination came from our well-treated hives and some of the drones were seemingly 'firing blanks'. The workers, realising their new queen was placing unfertilised eggs in worker cells were soon replacing her.

I stopped using chemicals immediately. That decision was to become a major turning point. Before *Varroa* I had been used to

having very strong colonies, but after *Varroa* they seemed to become much weaker and were much slower to build-up. Twelve months after stopping using chemicals I found that several colonies had grown stronger. *Varroa* was present, but not in great numbers. I had lost several colonies along the way but these stronger ones intrigued me and warranted further examination.

Under the lens

I carefully collected *Varroa* mites from a couple of *Varroa* floors and examined them under the microscope that I used for insemination. I found some with a damaged carapace and some with legs missing. This suggested to me that some colonies appeared to be taking action against the mite and so I stepped up my collections and examinations.

Researching in earnest

My apiary was not the easiest to work in, so in 2004 I approached my local council with a Honeybee Conservation Proposal, which they agreed to support and allowed me to take over a secluded site within a local park. From here I could collect mites daily for examination. I now collect mites with the finest artist paint brush so as not to damage them, and then gently ease them onto a slide under the lens. I have now examined more than 50,000 mites in two years.

I soon realised that some colonies were doing a better job than others; the range of damage in different colonies that I recorded was as wide as 60% and 4%. What did this mean? Could this be explained by genetic or learned mechanisms? When I swapped two queens with different mite damage percentages (60% and 4%) over and waited a few weeks

I found the 60% damage dropped to 4% and the 4% went up to 60%. It had a genetic basis. Had it been a learned achievement the percentages would have remained much the same because the older resident workers would have continued their teaching despite the fresh queen mother.

Selective breeding for hygienic bees

Always selecting from the best, queen rearing and re-queening progressed until many hives became 'groomers'. We now have about 50 that are hygienic, and have given our queens to many beekeepers, who, we hope, have been able to dispense with using chemicals.

A second breakthrough

Each spring our hive floors are cleaned as soon as we have a nice day when the cluster breaks and the bees fly. In 2007, however, one of our hives – hive 8 – had a very low spring mite drop, but by May, during a routine brood inspection, we found they were present and we suspected that hive 8 had missed its spring clean. A fresh floor was prepared and swapped for the dirty one.

On top of the debris on the dirty hive floor were lots of whitish pieces of bee larvae, at first thought to be the result of larval moults. With the help of a specialist lens, however, I saw translucent, watery, white larval antennae – like those newly formed on capped pupal larvae. Closer study showed miniature baby *Varroa* mites were also present. This was to be the second major breakthrough in hygienic behaviour: bees in this hive had detected *Varroa* activity behind the capped cell. The bees had

Continued on Page 18

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BUCKS COUNTY BEEKEEPERS' ASSOCIATION

15th Annual Seminar - Not just beekeeping

Saturday 5th March 2011 - 10:00am to 4:00pm
Wendover Memorial Hall, Wharf Road, Wendover HP22 6HF

Speakers:

- Dr. Nigel Raine - Learning to forage in the floral supermarket
- Dominic Dyer - Can pesticides and bees co-exist?
- Stuart Roberts - The decline of our insect pollinators

Plus: Related stalls (Inc: NBU and BBCT) and exhibits

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uncapped the cells and tried dragging the larvae out by grabbing their antennae, which broke off and dropped onto the floor. In dragging the larvae out baby *Varroa* mites were dislodged and they also fell onto the floor. Daily inspections of the floor showed this to be consistent behaviour in this hive. I do not know if, like the grooming of adult bees, this behaviour is genetic or learned, but I consider myself lucky to have realised that this hive was uncapping cells and removing larvae and *Varroa* mites. By selective breeding, some insemination and re-queening we now have many hygienic colonies.

Seeking funding with unexpected results

I applied for a BBKA Research Grant at the Spring Convention in April 2010, nearly three years after finding the uncapping colony. Though it was in their pipeline I had heard nothing positive by the back end of August so I made an appeal through my local paper for sponsorship. This has unimagined consequences – article appeared in all channels of the media: radio interviews with media in Spain, Ireland, Canada, Germany, N.Z. and so on, but it was all very hyped up. My 'Swindon Wonder Bee' was about to save the world. Rubbish! What I have come up with is little more than many a beekeeper could have done with patient observations. I found that if you stop using chemicals the bees will find their own answer – and I helped develop this a bit faster. I am now ready and hoping to involve others. Our plans are to encourage many beekeepers to

have a small colony of bees in their garden and for them to assess the hygienic qualities with equipment loaned for the duration of the assessment. We were overjoyed when in October; BBKA gave us a £6000 grant from their research fund. This, plus several small public donations, has enabled us to purchase 20 sets of equipment that will be 'loaned' initially to local beekeepers, located as close together as can be arranged so as to create a compact drone coverage area. Later, after re-stocking we intend to extend the program to beekeepers in a wider geographical area.

Hygienic behavior testing kit

Each participating beekeeper will receive a 5-frame nuke with *Varroa* floor, a hygienic queen and about 2000 bees. One frame will be drone comb, the aim being to encourage drone breeding in the area to spread their genes. To deter the workers ejecting drones in inclement weather the kit will also include a contact feeder and syrup. By agreement the assessors will not be allowed to use chemicals or to cull drones as a method of *Varroa* control. Should the colony collapse, so be it. It was obviously not sufficiently hygienic to survive. When the nuke reaches 'boiling point' they will be permitted to transfer the bees, on their frames, to a hive they own on the understanding they will continue to treat the colony as

hygienic and to encourage and aid drone production. The participating beekeepers will be loaned a dissecting microscope, a powerful lens (similar to the one I use), an artist brush, some 1oz mite collecting pots and record cards. Training will be given in daily collection of dropped mites, inspection and record keeping. Grafts may be taken by me from the most hygienic.

At their request participants' hives will be re-queened with one of our young queens on condition that chemicals and drone culling practice are never used. A large number of available hygienic drones in an ever increasing area is the main objective of our program.

By involving other beekeepers we hope that at least some will come to understand that chemical control of *Varroa* can be a thing of the past. We have not used

chemicals on our bees for around 10 years. We also hope that some will invest in similar equipment and continue the studies, breeding new queens only from their best hygienic colony.

Get involved

Our objective is to involve many more beekeepers in this program, but to do that we need much more funding. Each full kit costs £350 and we have a 'Sponsor a Hive' scheme running with the aim of buying more kits to distribute. So, if you wish to help by donating to this scheme please make your cheque payable to Swindon Honeybee Conservation Group and send it to Ron Hoskins, 10 Larksfield, Swindon, Wiltshire, SN3 5AD. Further details can be obtained by emailing Ron Hoskins at: ron@honeybee1.org.uk

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MBE for Surrey Beekeeper

Our warmest congratulations go to Anne Buckingham, aged 72 years, of Farnham, Surrey who has been awarded an MBE for her contribution to beekeeping.

She is recognised, in particular, for the expertise she uses when on round-the-clock call to collect difficult and awkward swarms.

Well done to Anne!!

Education



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The Novice Course - the second of our training products, aimed at BKAs to help tutors impart skills and competences to fellow beekeepers managing bees at the BBKA Basic level.

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For further information on how to order your BBKA 'Course in a Case' - email support@britishbeekeepers.com or call the National Beekeeping Centre on **02476 696679**

ADM Report January 2011

It is with great pleasure that I report on one of the key events in the BBKA calendar.

The Annual Delegates Meeting (ADM) is where Area Associations and the BBKA action the propositions (motions to be taken forward or immediately applied), approve nominations for new Area Associations, elect Trustees and recognise services to beekeeping. It also serves as a review of Trustees' management of the BBKA and its resources. Each Area Association sends one delegate – who votes and debates items on the agenda – and they may bring one observer.

Margaret Anderson, Office Manager, and her support team prepared the offices for the arrival of 66 Association Delegates, Ex-Presidents, Honorary Members, Executives and guests. Packs prepared and tea-urns at the ready, an empty room soon filled with conversation as old acquaintances were revisited and new ones were made. Finally all 120 seats were filled and the meeting was promptly opened by Chairman, Martin Smith, BBKA President.

Electronic voting: For the first time electronic voting was used. This proved

a resounding success and enabled the meeting, with good chairing of course, to run to time. Thanks to Chris Deaves and Margaret for their rigorous testing and set-up of the system, there were no technical hitches and it will be used again.

Committee reports: All of last year's minutes and Committee reports were approved without question until we came to the Education & Husbandry Committee, where questions arose about the proposed interactive DVD, which had stalled due to ill health of Trustee, David Bancalari, who heads the project. Much interest was shown about the forthcoming Red, Green & Black Course in the Case's, available this year completing the series.

Website: David Teasdale brought delegates up to speed on the website progress and presented a visual graphic of the site. The content and functionality are well underway and delegates' questions about security were answered. Delegates felt that the website is a key interface for BBKA membership & public alike, so has to be easy to use. We should all be exploring the new site by April!

Adopt-a-Beehive: BBKA Chairman, Brian Ripley confirmed that Adopt-a-

Beehive will be sponsored by Burts Bees for the next 3 years. Various fundraising initiatives are underway to coincide with their take-over from the current sponsor SAGA. Clarification was requested on whether or not this was a self-funding project and it was supplied, along with a breakdown of costs. The campaign yielded £32K profit in 2010, which was applied to our research and educational funds.

Accounts: Our key income streams outside of membership are: Spring Convention, Adopt-a-Beehive and BBKA Enterprises. All-in-all, though in a good state, fundraising to achieve our research and education objectives is of primary importance. It was also agreed that the Capitation fee, the money that members pay to the BBKA, will rise from £14 to £15 from 1st October 2011. This is the first increase since 2008/9.

Education: As our membership grows, the thirst for knowledge increases, and the need for Basic Assessors is one of the many challenges that meet the Exam Board head on. The Bee Basic attracted 644 candidates this year, an increase of over 400 on 2009!

Pesticides, Propositions And Queens

In case you didn't know, the BBKA does not endorse pesticides. However, before the ADM, a letter distorting this truth was published by an external group and BBKA staff experienced some abhorrent emails and abusive phone calls, much to the horror of delegates and recipients alike.

And so the Pesticide debate opened the afternoon session. Opinions were expressed and an amended proposition produced as follows: 'That the BBKA cease any commercial relationships with agrochemical or associated companies relating to the use of the BBKA logo, for the endorsement of pesticides (for money or any other form of remuneration) as soon as possible.' This was passed almost unanimously with 16,777 membership votes for, 1949 against and 352 abstentions.

Subsequent, similarly constructive, discussions followed on constitutional changes and the proposal of Junior Membership. The focus of concern with Junior Membership was insurance; specifically, who would be responsible in cases of claims arising from junior hive management. Although the proposition was passed, it was agreed that the BBKA would supply Area Associations with guidance notes on concerns raised.

At a time of expansion and the demand for good quality bees on the increase Cumbria proposed that the BBKA consider a committee to promote queens bred in the UK. This wasn't with a view to bee standardisation, but to limiting disease from imported bees. The Technical committee was tasked to investigate its viability, based on previous studies and their own findings, and report to the next ADM.

Associations: Cleveland, which has been going for 60 years, was approved as an Area Association, following its agreeable breakaway from Durham. It was noted that fragmentation of the areas is not to be encouraged because it's not always to the area's advantage, but it will be considered and voted on by the membership where warranted.

Specialist Members:

The Instrumented Hive Project - Devon based charity that study honeybees and social insects using modern technology and educate the public.

See www.instrumented-hive.co.uk

Examinations Board for the National Diploma in Beekeeping - set up in 1954 as an independent board, the NDB is the highest beekeeping qualification recognised in the UK.

On a personal note I found the ADM constructive, informative, interesting, welcoming and enjoyable. I thank all attendees for their warmth and good wishes and look forward to meeting more members soon. It was a thoroughly positive day – and we finished on time!

Jane Moseley,
General Secretary

Congratulations!

Trustee Elections

David Aston, Roger Patterson and Michael Sheasby were reelected for a further 4 years. Doug Brown of Cambridgeshire was elected as a new Trustee for a 4-year term and, despite his absence, Michael Young MBE of Northern Ireland secured 1-year tenure. Tom Canning, Pam Hunter and Peter Sutcliffe were elected to the Examinations Board for 3-year terms.

Examination Awards

The Surrey Shield, which reflects examination success, was won by Surrey. George Knight Memorial Award of £100 was won by Buckinghamshire.

Honorary Membership

Tim Lovett in recognition of his work and commitment of the BBKA.

Service Award

Norman Carreck for his commitment and achievements in Bee Research.

50 Years of Beekeeping

Certificates to be presented at local level to many committed Beekeepers, all of whom were mentioned.



Norman Carreck and Martin Smith



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Your Letters

Keep thinking about your beekeeping

I usually avoid discussions regarding hive types and sizes as they are very much a personal choice influenced, maybe, by location and individual preferences. However, I feel the Forager's comments (BBKA News No. 185) merit a response.

Many years ago at Rothamsted Dr. James Simpson estimated that a single BS brood box was adequate for the average queen. But this was a mathematical exercise and did not take into account that the brood is usually ringed by pollen and then honey, or the fact that incoming bees during a heavy honey flow deposit honey in the brood nest further reducing comb area available for egg laying. It is also significant that many queens are above average in their brood production.

In the 1950s I worked on a commercial honey farm in Cornwall. We used the owners' own design of hive; they were long hives holding 21 deep Dadant frames. These hives were intended to be used with vertical queen excluders, but these inhibited colony growth and were rejected giving the queens free reign. Colonies in these hives produced up to 14 combs of brood – that is equal to 22 BS combs!

During my time working as an apiarist at Rothamsted, colonies were run on deep BS boxes without queen excluders. It was not unusual to have colonies on four boxes, and occasionally five, with brood spread through three of these.

I have found that colonies that are congested with stores going into winter are invariably restricted in their growth the following spring. This situation can arise when over-wintering on a single BS box.

There is another issue here; overcrowding within a hive is a contributory factor in the spread of disease. This is particularly relevant in the early spring when the proportion of older, diseased bees greatly outnumbers the young healthy ones and it becomes more of an issue when moving colonies to pollination.

For many years now, after working with most known types of hive, I have been running my bees on the 'most inappropriate arrangement' of a brood and a half, but with a difference. I place the shallow super UNDER the brood chamber. This has many advantages, too many to go into here, but I will mention two or three. It is not necessary to go through both boxes at every inspection, in fact I only go down into the super maybe two or three times a year – all that one needs to know can be ascertained in the brood chamber. The super raises the brood chamber to a more convenient working height. Combs are often chewed down by the bees at the entrance and it is more convenient to remove these from the shallow than from the brood chamber.

Try it and discover the other advantages for yourself.

Peter Tomkins, Bedfordshire Beekeepers Association

In response

I am pleased that Peter Tomkins, and Ian Mclean (in December 2010 BBKA News) have responded to my article, which touched on the thorny question of single or double brood boxes. They have both, quite evidently, given the matter a good deal of thought and promoting thought about what beekeepers do, and why, is after all the prime purpose of my articles. The eagle-eyed reader will have noticed that, at no time in my article did I mention which hive type I prefer only that I feel that the brood is best contained in a single box. I do agree partially with Peter Tomkins that, for all sorts of reasons, a super under the brood box is an excellent arrangement for overwintering and it is one which I have used myself for around 20 years now.

We will never resolve this issue as most beekeepers are firmly wedded to the hive type they started out with – rarely do beekeepers try different hive types or different management methods. However, we can all learn from Peter's letter where he encourages us to experiment with hive types and arrangements and from Ian's letter in which he recommends that we select (develop) a strain of bee that suits our own area and management style. Thank you both for helping to demonstrate that thinking about your beekeeping can make it a more rewarding activity.

The Forager

Varroa Resistance

I was very interested by Dr Richard's article and Dorian Pritchard's response in the October 2010 BBKA News. Not being a scientist and having only a limited knowledge of genetics I will not comment on the line breeding and production of hybrids. However, in the UK we have a number of dedicated people trying to come up with solutions for our bees to live with the Varroa mite. In addition to Dorian, there is John Dews in North Yorkshire, and Ron Hoskins in Swindon who have dedicated innumerable hours and other expenditure to working successfully on their solutions. FERA and many other organisations are putting a considerable amount of cash into resolving the Varroa problem, much of this being spent on non-chemical solutions, such as Professor Ratnieks research at Sussex University on hygienic bees.

It seems to me that no matter what success these people have with their projects, the results are going to be continually compromised by the buying in of queens and bees. The drones from the imports will mate with the local queens and dilute the Varroa resistance and any other desirable properties that have been developed in the local bees. I have a few suggestions of what can be done to remedy this as follows:-

- One way to considerably improve the situation and reduce the necessity to buy in queens is to encourage our beekeepers to produce their own queens from a selected source. We have many new beekeepers that are very interested in improving their knowledge and experience and surely there is no better way of doing this than by rearing their own queens. It is much more interesting to propagate your own queens than to send off a cheque.
- Each BBKA area should aim to supply the annual intake of new members with bees to get them started. This would then make it unnecessary to rush out and buy 'imports'.
- The BIBBA queen rearing groups could use Varroa resistance as one of their breeding criteria and use material from nearby Varroa-tolerant colonies in their breeding programmes.
- Have queen suppliers breed queens from bees which have been shown to have Varroa resistance in the UK. Due to our short season and unpredictable climate I realise that it is much easier and cheaper to breed queens in warmer countries, and the commercial suppliers need to make a living. But of course Varroa-resistant queens could be sold at a premium. Initially a breeder could possibly be subsidised to offset any initial set up costs. It is very easy to buy in cheap imported queens, but perhaps the buyers should have a little consideration for their neighbours, and the effect their actions are having on them, and particularly those who are dedicating so much effort to help us all in living with Varroa.

And finally, other countries can ban our cattle because of foot and mouth disease or blue tongue, so why can't FERA ban the import of all honeybees to the UK?

Ray Dowson, Master Beekeeper, Ormskirk, Lancashire

Want to take your beekeeping to a higher level?



The National Diploma in Beekeeping (NDB) board is delighted to announce that an Advanced NDB Course will be held on 18-22 July 2011 at the National Bee Unit (NBU) in York.

Each year, the course covers elements of disease recognition, colony handling skills and practice in teaching beekeeping to others. This year there will also be a focus on adult bee disease diagnosis, including honey bee dissection and microscopy.

All meals and en-suite accommodation in student rooms of the University of York are included, so the course fee of £455 represents really excellent value.

A full week immersed in advanced beekeeping techniques and in the company of some excellent beekeepers is certain to invigorate your beekeeping and enhance your skills.

For further information or to book a place, please contact Ken Basterfield: ken@basterfield.com or tel. 01404 815 885

(Priority is given to those wishing to undertake the NDB examination but anyone who is likely to benefit from training at the highest level may be accepted on to the course.)

Your Letters

The secrecy of EFB

I was interested to read the article 'The Story of EFB' in October *BBKA News* as I too experienced EFB in a hive this summer.

Unfortunately, the shook swarm procedure failed to remedy the problem and the seasonal bee inspector had to use the OTC antibiotic as a follow-up remedy. My purpose in writing to you is to express my concern about the veil of secrecy that surrounds EFB and to question what, if anything, this achieves. In the interest of openness, I believe that the interests of beekeeping would be better served if the confidentiality that currently surrounds EFB were to be lifted and beekeepers were advised where such outbreaks have occurred with more precision that squares on Ordnance Survey maps, and then advised to be vigilant. Surely, there is not the same confidentiality surrounding diseases of farm animals such as foot and mouth - and why should beekeeping be treated differently and what does this achieve? It is not a matter of apportioning blame for the outbreak of EFB but ensuring that any EFB outbreak is contained as efficiently and quickly as possible.

Graham Farren, SW&MBKS

In response

Mike Brown from the NBU referred us to the Fera NBU Fact Sheet on confidentiality, an extract of which is below

What if a notifiable disease or pest is found during my inspection?

It is still considered a matter of privacy and the right of the individual that disclosures of exact locations are a matter for the owner or person in charge alone. Beekeepers are encouraged by Fera National Bee Unit Bee Inspectors to warn neighbouring beekeepers if disease is confirmed. The NBU disclose the presence of notifiable bee diseases, pests, and where applicable details of other bee disease, by using Ordnance Survey 10 x 10 kilometre squares.

Why don't you advise other beekeepers of my disease problem?

There is a legitimate interest of other beekeepers to know of the presence of disease in an area but that interest has to be reconciled with the rights to privacy of the individual. The location of disease outbreaks in the Fera National Bee Unit records uses the Ordnance Survey (OS) six figure map reference. The Data Protection Act restricts disclosure of such information. The NBU uses the 10 km square for disclosure of the area of disease. The 10 km square is based on the OS grid and can be easily identified from OS maps and OS and AA road map books. Maps are also available within the public pages of BeeBase showing the area affected. Disease notification alerts are also sent to all beekeepers in BeeBase notifying them of disease found within 5km of their apiaries. Occasionally, upon request, details of parishes infected with foul brood are released but only where this information does not identify a beekeeper.



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Gormanston 2011

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Guest Speaker: Professor Robert Pickard
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This annual beekeeping course is internationally renowned attracting beekeepers from all parts of the world. The range of lectures and workshops has universal appeal both for the beginner and the advanced enthusiast covering a wide programme in the practical and scientific areas.

Full Cost: En-suite rooms €405, Single rooms €335,
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BBKA Practical Assessment Results

Successful Candidates for the Show Judge Certificate

John Hope Goodwin, Congleton, Cheshire

Successful Candidates for the Microscopy Certificate

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Maurice Ballard, Halesowen, W. Midlands

Anne Binns, Milton Damerel, Holsworthy

Alan Brown, Pontefract, Yorkshire

Peter Callan, Newton Hall, Durham

Andrew Cooper, Gateforth, N. Yorks.

Nigel Davies, Claxton, York, N. Yorks.

Adrian Davis, Deal, Kent

Jeffrey Gamberton, Hampsthwaite, N. Yorks.

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Linda Mills, Otley, West Yorkshire

Malcolm Padfield, Scout Hill, Dewsbury

Jim Pearson, Dewsbury, Yorkshire

Jeremy Quinlan, Woodbridge, Suffolk

Jane Sargeant, Gateforth, North Yorkshire

Andrew Sluggett, Bradworthy, Holsworthy,

Stewart Spinks, Norwich, Norfolk

Jill Tinsey, Dereham, Norfolk

Congratulations to these successful beekeepers.

Val Francis, Examination Board Secretary

Bees for Development

Bees for Development (BfD) works to provide reliable information and support to beekeepers in developing countries. We are aiming for a world in which apiculture is recognised for its important contribution to sustainable livelihoods, food security and biodiversity, and where policy and practice are designed to include and support beekeepers. We function at the heart of an international network of beekeepers, organisations and institutions involved with apiculture in the developing world.

BfD is now well-known to beekeepers in developing countries worldwide, and many people contribute to this successful work. At our offices in Monmouth in South Wales, we have a small team of experienced professionals implementing BfD's main work, which is providing information, and running our research and development projects. These core staff are supported by many volunteers who enable our work by running our website store, maintaining our data bases and website, representing us at UK and international events, running Bees for Development Trust, our supporting UK registered charity, and crucially, raising funds for our continued work.

BfD was founded in 1993, based on the belief that beekeeping is an excellent way for poor, rural people to create viable incomes, without need for expensive hives or equipment. Beekeeping can be undertaken almost anywhere, and some of the world's poorest, and most marginalised rural people are beekeepers. Yet very poor nations do not have beekeeping institutions or extension services, and beekeepers find it difficult to locate the information they need. BfD has done much to raise awareness of local beekeeping skills. We promote sustainable beekeeping based on the use of local bees and building on available skills and resources.

We believe that information and knowledge are key to worthwhile development of the apiculture sector. Over the years we have built an exceptional resource of information, knowledge and experience, making BfD an international centre of excellence in sustainable apiculture. We have published a range of books, training modules, posters, booklets and other resources that we distribute free of charge to people and organisations in developing countries.

Some people know us only from *Bees for Development Journal*. This is a quarterly magazine containing articles on sustainable beekeeping, mainly contributed by members of BfD's network. The *Journal* provides an avenue into the network, which in turn enables information exchange. We send the *Journal*, free of charge, to individual beekeepers, groups and organisations in over 130 developing countries. This is made possible by people sponsoring subscriptions and by donations to Bees for Development Trust. For example, when groups in developing countries are organising workshops and training events, we send them, free of charge, resource boxes of information to support the training.

In addition to compiling and distributing technical information, we undertake our own research and development projects. Current examples include a long term honey trade project in Uganda funded by Comic Relief; a project in Cameroon concerned with the export of organic honey and beeswax to the EU, funded by the Welsh Assembly Wales for Africa Fund; and a project to build the capacity of organisations supporting the apiculture sectors in Ethiopia, Kenya, Tanzania and Uganda. While these current larger projects happen to be in Africa we work in developing countries worldwide and support

numerous small-scale initiatives in many countries: too many to mention here.

We also advocate for policy change, enable people to make contacts through our web-based network centre, inform beekeepers about training opportunities, maintain the largest online resource for beekeepers in the developing world, and we offer consultancy services to donors and development projects.

We are dependent on charitable donations to maintain our information provision service. You can help by giving a donation, becoming a member of BfDT, by sponsoring a recipient to receive *Bees for Development Journal*, or by giving your time and assistance. For further details about BfDT and how you can help, contact www.beesfordevelopment.org or 01600 713648.

Nicola Bradbear



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Business Corner

FINANCE



The last quarter of 2010 was extremely busy with the 2009/10 financial year closing, preparation of accounts and their audit.

Due to the substantial growth in income of the BBKA, the Trustees appointed new auditors, Murphy Salisbury, Chartered Accountants and Registered Auditors of Stratford upon Avon, and the preparations for their audit were quite time-consuming. The audit went very well and everything was completed satisfactorily and on time. The resultant Trustees' Report & Audited Financial Statements (a substantial document) were distributed to associations in advance of the ADM. Budgets and financial projections for the next three years were prepared and approved by the Executive for submission to the ADM.

During that quarter, new insurance brokers, Towergate Risk Solutions, were appointed following their conduct of a detailed survey of the BBKA's insurable risks and cover requirements. Cover in respect of all officers of all member associations and their divisions etc and of registered members was strengthened, and details of the entire insurance programme as it affects members is being published in the BBKA Year Book.

The Committee also took steps to formalise and assure the death-in-service benefits for all BBKA employees and to provide for an employees' voluntary pension scheme to which employees (not the BBKA) will be able to contribute if they so wish.

Michael Sheasby, Treasurer and Chairman, Finance Committee

GOVERNANCE

The Committee reviewed all nominations and propositions submitted by Associations and the Executive to ensure that they complied with Standing Orders and the Constitution and should therefore go forward for consideration by the ADM. Where there were issues the Committee worked with the relevant Associations to resolve them to the satisfaction of the Associations concerned. In all, there were nine nomination and 10 propositions to consider. Work was also undertaken on designing an induction programme for new Trustees.

Michael Sheasby, Chairman, Governance Committee

TECHNICAL & ENVIRONMENTAL

A number of BBKA members have contacted the office regarding the use of Cuprinol wood preservative products on beehives.

Cuprinol's website now states that it cannot recommend the use of any of its wood preservers on beehives. This statement in fact is not very helpful in terms of the legal status of their products under the non-agricultural pesticide legislation. We are in contact with the company and will report further on this subject. We will amend the advice given in the leaflet on preserving beehives.

Kris Wisniewski has started his research work at the University of Keele on the presence of pesticides in honeybee colonies. This is a CASE AWARD studentship, supported by the BBKA Research Fund.

An update of the BBKA advisory leaflet on honeybees and pesticides is being prepared.

Our winter loss survey will be carried out again this year and so please could all members make a note of the number of colonies they had on the 1st October 2010 and the number they have on the 31st March 2011. There will be more information on how the data will be collected in the next issue of BBKA News.

*David Aston,
Chairman of Technical and Environmental Committee*

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Bee Craft - After Dinner Talks

**After Dinner Talk, by
The Rt Hon The Lord Hattersley PC
A Life in Politics and Journalism
30 March 2011**

Something new, something special!

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*All surplus proceeds will be donated to various worthwhile causes, such as Smile Train, Bees Abroad and others.
Lord Hattersley has kindly donated his fee to the Salvation Army Social Fund.*

For more information contact
Erica Osborn
Telephone 07833 158 565
Email erica.osborn@talktalk.net



Bayer Acquires Exosect Varroa Mite Control Product

The market launch of this new bee health product based on the innovative Entostat™ technology combined with the miticidal active ingredient thymol is planned for the United States in 2011. First registrations in major European countries are expected from 2012 onwards.

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20,000th BBKA Member

Little did she know that in joining the Sidcup branch of the Kent Beekeepers Association Mrs Tara Ford would become the 20,000th member of BBKA.



Tara, a florist, became interested in bees in 2009 and took a recognised BBKA Introductory Course, organised by Sidcup Beekeepers. She said: "I'd always been fascinated by honey bees, but concerned about their decline, so having got an allotment and some chickens; it just seemed natural to go on and learn about beekeeping." She was well supported by her local association, who helped her to learn how to handle bees responsibly in her association apiary before she got her own bees. However, she said: "By July I felt confident enough to have a hive on my allotment. It's so satisfying to watch the bees flying around the allotment, collecting nectar and pollinating the crops - every site should have some." Tara is obviously enjoying her bees and they will surely reward her by pollinating her crops - a good reciprocal arrangement!

BBNO



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Welsh Beekeepers' Association Convention

Saturday 26 March 2011 - 9.00am

Tea & Coffee available from 8.30 am

Royal Welsh Agricultural Showground

Llanelwedd, Builth Wells, Powys, LD2 3SY

Admission - £7, Juniors (under 17) - free. Advance Payment £5

Guest Speakers: Norman Carreck, Pamela Hunter, Andy Willis

Again in 2011 "Beekeepers Question Time"

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Barbara Chick, 11 Porthcawl Road, Caerua, Ely, Cardiff CF5 5HU

Diary of Events

5 March - Bucks County BKA, 15th Annual Seminar. Contact John Catton, 01494 726616, email richard.catton1@ntlworld.com - see page 17 for further details.

12 March - Cambridgeshire BKA, 'Better bees and better beekeepers', covering Varroa, Bee improvement, Management, Queen rearing. David Aston, Norman Carreck, Roger Patterson, Andy Wattam. Contact David J. Abson, 6 Ascham Lane, Whittlesford, Cambridgeshire, CB22 4NT (SAE appreciated). 01223 834620

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

15-17 April - BBKA Spring Convention, Stoneleigh, see page 15 for further details.

9-11 June - Royal Cornwall Show. Schedules from Sheila Sleeman, 01872 863842

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