

BBKA News

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



No: 199 – March 2012



Is this the BBKA News' youngest reader? Photo by Brian P Dennis

BBKA ADM 2012

The 52nd Annual Delegates' Meeting (ADM) opened on a beautiful, white, frosty winter's morning at the Chesford Grange Hotel, near Stoneleigh. The facilities were given free of charge courtesy of Q Hotels. Both this generosity and the venue itself met with whole-hearted approval of the assembled delegates and guests resulting in a day of business conducted in a comfortable and relaxed atmosphere.

The meeting opened with some very light-hearted testing of the electronic voting system before getting down to business at a fast pace set by outgoing President, Martin Smith. Several matters arose from the committee reports including a renewed request for a DVD resource to aid disease recognition and an explanation of a strategic objective to obtain additional sources of sustainable income. The new look to *BBKA News* was described as impressive, but some felt that it was more a journal than a newsletter which posed unfair competition to other publications. This was refuted and the case put that it was BBKA's responsibility, as an educational

charity, to keep its 23,000 members informed in a timely manner. Costs have risen as a result of its monthly publication, but these equate to a modest £4 per member per year.

Val Francis, Secretary to the Examinations Board, explained BBKA was planning for a large increase in the number of Basic Exam candidates. Modules 1 and 2 show a drop off in passes, but this is due to new members underestimating the jump between the basic and modular levels. A cheer was given to Jo Schup who was awarded the Wax Chandler Award; while the Surrey Shield, for outstanding results in the Basic, was awarded to Margaret Murdin on behalf of Lancashire and North West BKA; and the George Knight's Memorial Award, for excellent results at all other exam levels and worth £200 toward education, was awarded to Colin Sherwood for Devon BKA.

This report is continued on page 24

Dawn Girling, Trustee



Bees in Trees in the USA

US research reveals feral bees' ancestry and suggests possible varroa tolerance. Read more on page 9.



A 'Des Res' for Bees

Have you ever considered keeping bees on an allotment in a deluxe 'bee house'? Find out about bee houses on page 13.



Varroa: NBU Guideline

For essential information about varroa and best practice methods to help you keep their levels low turn to page 17.





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Chairman's Letter

For me, one of the fascinations of beekeeping is the many different areas of interest it opens up: honey bee biology, flowers, insects, honey bee products, social and economic history, and today's continuing importance of the honey bee to the health of humans. Add to this a craft which does not recognise social boundaries or class and we can understand why we continue to see growing interest in beekeeping.

In recent years the news has been full of the problems of honey bees and other insect pollinators and there is still much to be done to improve conditions for our bees. We now live in a world of almost instant communication and accessibility to information, and while there are undoubted benefits from this there are also pitfalls — do not accept all you read at face value; question it.

However long beekeepers have practiced this age-old craft we should all aim to improve our skills and competencies, passing them on to help and mentor new beekeepers and encouraging them to develop a lifelong interest in bees and enjoy their relationship with them. Not everyone wants to be a beekeeper, yet many are passionately interested in helping bees and improving aspects of our environment, and while we have started to engage with public interest and begun the process of improving public understanding there is still much to be done. 'What can I do to help bees?' is a question often asked when people know I am a beekeeper. And here is another fascination of our craft; as well as the cut and thrust of the business of the ADM it always reminds me that the diversity of accents of our members reflects the continuing variety of location, tradition, and history that makes beekeeping vary throughout the UK.

I am very optimistic about the future of our bees especially with more beekeepers willing to increase their skills and competence to help them. It is also good news that the British public are increasingly expressing the wish to be involved. Also our government has recognised the threats that face bees in the UK and this is why there are likely to be changes to EU agricultural practices resulting in a shift from production subsidies to payments for improved environmental management and habitat creation, which hopefully will have a significant impact. As beekeepers we can help by giving ideas to neighbours, friends and local land owners on practices which will help our bees.

Your association is here to serve your needs and represent the interests of the honey bee. Our membership has grown significantly and so your Executive has to continually review its operations to meet members' expectations. This is an ongoing task for the Executive and BBKA staff. They cannot do it in isolation so please communicate with your local link Executive member, or write to or email our Operations Director/ General Secretary, Jane Moseley, at the National Beekeeping Centre at Stoneleigh. We want to hear your views.

I wish you all a successful and enjoyable beekeeping season; please keep reading *BBKA News* for all the latest information, including details of courses, meetings and our Spring Convention, which this year will be held at the new location of Harper Adams University College in Shropshire.



Dr David Aston, BBKA Chairman

Cover photos: Youngest *BBKA News* reader by Brian P Dennis; right-hand panel: top, Deborah Delaney; middle, Julia Wallis; bottom, courtesy of Fera.

Contents

Regulars

Chairman's Letter	3
In the Apiary	4
Beekeeping Notes for Beginners	6
Going Wild: From Old Lawns to Wildflowers	12
Varroa: Best Practice Guideline from the NBU	17
Learning from Others: Queen Rearing Part 2	19
Notes from a Clifftop Apiary	21
On the Bookshelf: A Practical Manual of Beekeeping	23
Diary of Events	26
Business Corner	27
BBKA Assessments	27
Classified Directory	29
Your Letters	30

Features and Practical Advice

HMF: What is it and Why is it Important for Bees?	8
Bees in Trees: Unmanaged Honey Bees in the US	9
A 'Des Res' for Bees	13
Artificial Swarming using the Pagden Method	15
Bee Circulation and Temperature Control	22
BBKA ADM 2012 Report Continued	24
Fumidil B — Bad News for Bees	24
New Executive Members	25
New Initiatives	28
BBKA 2011–2012 Winter Survival Survey	29
Prize Winners Announced	29

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In the Apiary

March is always an exciting time in the garden and the apiary. Overnight it seems, plants grow and flowers appear from nowhere. The bees have anticipated this time of renewal and encouraged the queen to increase her laying rate so that the colony can build and take advantage of the new forage. We saw last month that the colony is developing from the remnants of the old winter bees to the bees reared this year. It is a testing time for the colony and should the weather prove inclement the bees will need help to survive. If you are in an area where early pollen is not available it may be necessary to feed patties of pollen supplement or substitute. While these are never ideal they may allow the colony to continue developing until natural pollen sources are in abundance. Beware the sudden cold snap; winter is not yet over and it is still possible to have an extended period of sub-zero weather. This will make maintenance of the brood temperature (34–35°C) very difficult for the workers and they might need some help by being fed candy on top of the brood chamber.

If there is a fine sunny day when the temperature exceeds 12°C during March you should take the opportunity to check all is well inside the colony. Be swift and only concentrate on confirming all is well. This inspection should take no more than about five minutes and you should be aware that the colony is getting cold which will, in turn, upset the bees. The objective of the inspection is to ensure that the queen is present and laying well, has room to continue laying and there are sufficient stores for the rest of the month. Even if you have very gentle bees it is better to dress properly and have a smoker to hand. These bees have not been disturbed for some months and may take exception to the roof being removed from the hive.

Once you have access to the brood chamber, remove a frame or two from the outer edge to give working space. Then

identify where there are adult bees on the frame and, using your hive tool, move the frames to open the gap there. Remove the frame with the bees on it and have a quick look on the faces of the frames to identify if any larvae are present. Check the brood pattern and then replace the frame. Remove the next frame with bees on and continue the process until there is no sign of brood on the frames. Do not look for the queen, this can be a waste of time and as long as you can see larvae you know there was a queen there in the last week or so. There is no reason to suspect the queen is not there if you can see larvae. Register how many sides of frames had brood and how many sides had more than a handful of bees. You should also register whether there were any stores on these frames. Having done the inspection and reassembled the hive you should note down and interpret your findings.

- No larvae probably means that there is not a queen in the brood chamber (she might be dead or she could be laying eggs in your supers!)
- You will probably have the same number of sides of larvae as sides covered with bees. More bees is good.
- You should have about six or more sides with brood on. Fewer may mean that this colony is not building well.
- There should be at least 5kg of honey stores. Less will mean the colony needs to be fed (however, some beekeepers will place a bag of candy on the crown board as insurance against the bees running out of stores).

Having finished and decided on the state of the colony just tidy up and leave alone for a few more weeks. You should also make sure that you have sufficient clean equipment ready for the forthcoming season. Check the state of spare brood boxes and supers. Prepare some frames with foundation both for the brood chamber and for supers, and finally plan for the season ahead.

Now is the time to consider if you want to increase the number of colonies you have and if you will be re-queening any colonies this year. Deciding on your objectives for the season at this stage will give you time to prepare and ensure you have enough equipment for future needs. Plans always need to be flexible as we have little control over the weather and must be ready to delay or advance our plans according to the state of the bees.



Early brood pattern. Photo by Dr Bee.

Although obvious, it is worth stating that during spring when colonies are rapidly building you have many opportunities to solve problems with your colonies because they have time to recover once the problem has been resolved, albeit disease, lack of stores, poor queen etc. In late summer colonies will not have time to recover from any setback before winter arrives. So, now is the time to plan and prepare because in April you will be assessing the health of the colony and making sure it is in top condition to flourish in the summer.

A final word of advice: Try to visit as many beekeeping talks and demonstrations as you can. Watching others and hearing their approaches to beekeeping will help you to learn the good and the bad ways to keep bees!

Dr Bee

WANTED

Stewards for BBKA Spring Convention
Harper-Adams University College
Newport, Shropshire
Saturday 21 April 2012

To ensure the continued success of our Spring Convention, a number of additional stewards are required to compliment our winning team.

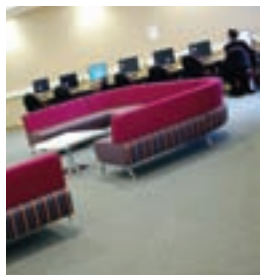
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So, why not join us by contacting
Chief Steward
Norman Hughes
103 Coniston Road
Basingstoke
Hampshire, RG22 5HU

Tel: 01256 464280 or Email:
norman.hughesbees@btinternet.com



Young queen in March. Photo by Dr Bee.



Friday 20, Saturday 21, Sunday 22 April

The New Venue

Harper Adams University College, Newport, Shropshire TF10 8NB

LECTURE PROGRAMME

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

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How to Pass the Basic; Disease Recognition Soap Making; Queen Rearing and more,
all lead by experts in their field. See the programme or web-site.

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

COURSE BOOKINGS

Please note: Booking is required for most courses.

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All other courses: Workshop Convenor, Ruth Homer, 5 Malvers Cottages, Litton Cheney, Dorchester,
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FOR NON-BEEKEEPERS

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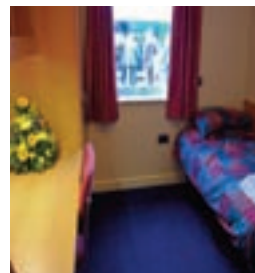
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General enquiries to Tim Lovett – tj1@dermapharm.co.uk



Beekeeping Notes for Beginners



The message of the month is: keep monitoring your colony's health, food stores and varroa levels; watch out for signs of nosema and wax moth infestation, and prepare for the active beekeeping season. Then you will not go far wrong!

In most parts of the country the daffodils are out and spring is well advanced. In others, flowering nature is still struggling to get going. However, in the bee colony things are well advanced. The queen has been laying since mid-January; the first new bees of the year are now appearing at the entrance of their home and are learning their basic orientation. How do you spot these? On a bright warm afternoon look around the hive entrance. If you watch you will see some bees 'hovering' a short distance from the hive, say about 9" to 12" (20–30cm) and facing the hive entrance as they fly. These bees are fixing the pattern of the entrance, including its height from the ground, before they venture further afield.

So the bees are, as they have done for tens of millions of years, preparing themselves for the next major cycle of their life. This brings us to you, the new beekeeper, preparing for the second year of your beekeeping life. This time last year, you probably had just received or were expecting your bees. This year, the excitement is different, not new bees but seeing your present bees again. It is always remarkable when the hive, which has seemed to be inert for so many months, does after all contain a thriving colony.

Firstly, a word of caution. Do not be too keen to dismantle the hive for a good look. On a warm day (8–10°C) you can satisfy your curiosity by lifting the roof and looking under the crown board (wear a veil) but do not go any further. Looking in brood needs a warmer day — shirtsleeve weather. If you can see new bees and you can see pollen being taken into the hive on warm days, then all is as well as it can be for now and you should relax.

What should you do next?

Last year, you were unaware of the many perils and vexations of beekeeping; now you have a little more experience. You know that the 'health and wealth' of the colony are of prime importance. Soon it will be time to start giving the colony a good spring clean (we did this in April last year) but there are some things you can do in preparation.

Does the colony have food?

February and March are critical times; if you have 'bees in the crown hole' then some feeding of candy is required. Do not feed syrup at this time of year; the colony is too cool to properly process it. Remember, winter is not the threat, but long wet springs are.

Check for varroa drop

There is little that you can do immediately if the drop levels are high, but now is the time to re-establish your weekly monitoring process. It is too late for oxalic acid treatment (this will seriously damage eggs and larvae) and too early for any frame-based methods as it is too cold to open the brood frames, but you can start to see if you have a problem in any particular colony. Remember, as the level of brood-rearing rises, so will the varroa count. You may be misled for a while into thinking that the levels are lower than they really are. This is because most of the adult mites that made it into the winter will have had no cells to

reproduce in and will have died over the winter period. All the remaining adult mites will now find new brood cells to live and reproduce in. As new mites are produced they will find new brood cells in the growing colony. The effect is like a sponge; the new brood 'soaks up' mites as fast as they appear. It is only when an equilibrium is established and mites have to live outside brood cells for several weeks that they will die and appear on the floor of the hive. Beware of false optimism at this time of year.

Do you have problems with nosema disease?

Nosema builds up in colonies over winter. It is recycled from bee to bee by excretion and cell cleaning; damp winters are ideal for this. You can get an early indication of problems in two ways:

- Walk round the apiary and the garden looking on flat surfaces such as hive roofs. If you see lots of little yellow and brown splodges, about 5mm across, then a colony nearby probably has a bad nosema problem.
- Looking at each hive entrance will confirm which are badly affected. Make a note of these. Your local association will probably run a spring clinic to look for this disease in adult bees. If not, why not suggest it? The effective treatment for nosema in the spring is very good house cleaning so start getting your hive clean and equipment ready.

Wax moth

If you followed advice before Christmas you will have stored all your wax and supers to prevent infestation by this pest. Now is a good time to check that all is well and to re-treat with Certan if required. Once wax moth gets a hold in your bee shed it will inevitably find its way into the hives, where it is almost impossible to deal with. A thorough shed inspection and clean is a good idea, in particular, check materials that contain lots of little tubes; rolls of corrugated cardboard are a common nesting place.

What will I do this year?

Let us now think about the forthcoming year. You are now beginning to see that beekeeping is more than just keeping bees. There are lots of approaches to the manipulations required and lots of different outcomes. The simple question to ask yourself is 'What do I want to accomplish this year and what condition do I want the apiary to be in, in October?'

More colonies?

You may just want to increase the number of colonies you manage, either for pollination or for honey. In either case, ask yourself:

- How much time do I have to manage these and carry out swarm control/ disease checks and process the honey to a condition fit for sale?
- Do I have the space?
- Can I afford the equipment needed?
- Do I have an outlet for the honey or is it just going to sit in the shed or under the stairs for months?

Nuclei

If you have come through the winter with just one colony, then you may like to contemplate Wedmore's Law: 'There are very few problems in the apiary that cannot be solved by having a spare nucleus available'.

There is a lot of truth in this. You will now realise that many problems you may face through the year are due to the lack of a queen or having a queen of the wrong age or in the wrong state. A nucleus provides a vital 'insurance' resource to help remedy such problems. So, perhaps your plan for this year should include making and maintaining a couple of nuclei. If you follow this logic a little further, you may think to yourself: 'I could make several nuclei and sell them to other beekeepers later in the year'. There is no harm in this enterprising thought, but do it responsibly. If this is your intention you will need to think about:

- ❑ What advice and support did I need when I got my first nucleus? Am I sure that I can provide this to another new beekeeper?
- ❑ Is the queen in the nucleus of a good temperament suitable for a beginner? Do not use this route as a means of profiting from (and promulgating) bad queens.
- ❑ Is the nucleus fit for sale? The BBKA publishes guidance on what a nucleus should look like. Read and digest — your customers will.
- ❑ Is the nucleus disease free? This is the major point. Have your nucleus inspected by your NBU Bee Inspector or an experienced beekeeper before release.

An out-apiary?

You may find yourself with an offer of the use of another location as an out-apiary. Out-apiaries mean 'organisation'. Ask yourself:

- ❑ Have I enough equipment? What you need is never in the right place as the bees can 'sense' what you forget when you came to the apiary.
- ❑ Are my hygiene arrangements adequate? Moving equipment around could spread disease e.g. you may not be aware that EFB is present in a colony when you move it.

My skills

You do not become an expert beekeeper in one year, although a significant fraction of learning is done in the first year. Now is the time to think carefully about which beekeeping skills you really want to develop. Swarm management is of primary importance. Last year you may have succeeded in this, but this year you need to make progress. There are several aspects to develop:

- ❑ Understanding the biology of swarming. What does the colony do and what state does it need to be in?
- ❑ Develop one or two methods of swarm control so that you can be sure (or at least 95% sure) they will work for you. Do not confuse swarm control with swarm prevention.
- ❑ Understand the equipment and time implications of the methods you choose to develop.

More honey!

You may want to increase your honey production or to extend this into areas like cut comb and sections. There are many, many books on this aspect of beekeeping, but all are based on the premise that you have strong and healthy colonies at exactly the right time of year to coincide with nectar flows. Until you have mastered the

'strong and healthy' part, try not to become over ambitious or you will be left with lots of half filled supers later in the year.

Queen rearing?

Every beekeeper wants to do this. However, the word 'rearing' hides a multitude of sins. If you want to breed good queens, then you have to recognise that this is not the same as just producing swarm queens. Breeding implies selection over time and this, in turn, implies record keeping of the queens, colonies, production etc. Think about the breeding of pedigree dogs or horses. This is a complex and very carefully planned process; simply producing lots of puppies or foals and just selecting the best is not how it is done. Colonies produce queens under two different impulses. The first is the swarming impulse; this will produce some queens and will tend to select for swarming behaviour. Colonies also produce new queens when they are queenless. This is the requeening impulse and it is the one that the real queen breeder can use. Again, there are as many books on this as beekeepers. For the beginner, I would simply say:

- ❑ Real queen selection and breeding is complex and requires a lot of practice to get good yields.
- ❑ Queen breeding requires lots of bees at different stages; you cannot operate the same colonies for honey production and for breeding queens.
- ❑ So please try and start in a small way and get a feel for the complexity and timing. Try the 'Miller' method as a simple starting point.

Chris Deaves

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Hydroxymethylfurfural:

What is it and Why is it Important for Bees?

We all know we should be aware of HMF in honey, but do you know what HMF is? Dr Julian Cooper from British Sugar plc, explains.

Hydroxymethylfurfural (HMF) is an organic molecule that is produced from the breakdown of sugars. HMF is of concern to beekeepers because it has been reported to produce gut ulceration and dysentery-like symptoms in bees (Bailey 1966).¹

What is in nectar and honey?

Nectar contains a mixture of sugars principally sucrose, glucose and fructose. The levels depend on the species of flower and the different levels are responsible for some of the characteristic flavour associated with honey. When a bee collects nectar it digests the sugars in its honey stomach and the two main reactions are the conversion of sucrose to equal amounts of glucose and fructose and the conversion of glucose to gluconic acid and hydrogen peroxide. Thus honey typically has a mixture of the two sugars, glucose and fructose with trace amounts of the other sugars e.g. sucrose, trehalose, maltose etc. plus trace amounts of gluconic acid and hydrogen peroxide.

How is HMF formed?

HMF can be formed by the action of heat and acid on sugars. If you heat honey, levels of HMF will increase and high HMF levels can indicate that honey has been adulterated. If sugars are heated in the presence of acids (sulphuric, nitric, cream of tartar) they will break down along defined pathways. If sucrose is heated with acids the first thing that happens is inversion; it breaks down to a mixture of glucose and fructose, the invert sugars. If the heating is continued fructose is broken down preferentially to give HMF. The HMF then reacts to give the characteristic colours and flavours you get in golden syrup and brown sugars. Thus these products will contain appreciable levels of HMF and should not be used for over-wintering feed for bees.

If candy is made using cream of tartar measurable levels of invert may also be produced. The formation of HMF will be slow at low temperatures but if candy is reheated it can produce increasing levels of HMF. If any sugar-based product looks yellow it is likely that HMF has already formed. The problems of using candy produced in this manner were highlighted by Bailey in 1966.¹

Sucrose is very stable at normal pHs, if you add acid it will form glucose and fructose; this process is called inversion. Fructose is more reactive than glucose, which is more reactive than sucrose in terms of producing HMF. As a 'rule of thumb' if you increase the temperature of a reaction by 10°C you will double the reaction rate. For example if you increase the temperature of a solution containing fructose from 20°C to 100°C the rate of formation of HMF will increase by 256 times.

What levels of HMF are acceptable in honey?

Work carried out by Jachimowicz and colleagues² suggested that solutions containing up to 30 parts per million (ppm; mg/kg) HMF were harmless to bees. In the *Honey Regulations for England* (SI 2003 No 2243)³ the levels of HMF are specified to be not more than 40 ppm (except Bakers Honey) and for honey from regions with a tropical climate the limit is not more than 80ppm.

What temperature is 'safe' to heat honey or sugar solutions?

Put simply if you heat sugar solutions at high temperatures (above 49°C) for long periods you will produce increasing levels of HMF. The hotter and longer you heat sugar solutions the more HMF will be formed. If acid is present it will accelerate the production of HMF from fructose. If the solution starts to go yellow you will have HMF present.

Dr Julian M Cooper,
Head of Food Science, British Sugar plc

References

1. Bailey L. The effect of acid-hydrolysed sucrose on honeybees. *J Apic Res* 1966; 5: 127–36.
2. Jachimowicz T, El Sherbiny, G. Problems of invert sugar as food for honey bees (in German). *Apidologie* 1975; 6: 121–43.
3. Statutory Instrument 2003 No 2243; Food, England; *The Honey (England) Regulations 2003* available at: <http://www.legislation.gov.uk/uksi/2003/2243/contents/made>.

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Bees in Trees: Unmanaged Honey Bees in the US

The 'western' honey bee *Apis mellifera* L. has a curiously large native range that covers Europe, Africa and parts of central and western Asia. It is in this range that over two dozen subspecies or 'geographic races' have been identified by morphometric and DNA analyses. The subspecies classification refers to differences not only in morphology but also in behaviour representing regional and in some instances local (ecotypes) adaptations to unique climates and ecologies. Local adaptations have been reported readily in Europe where honey bee biologists have described and are concerned with the preservation of these different ecotypes.

Apis mellifera is a cavity nester and therefore its typical nest site is a cavity in a tree or on a rock ledge. The natural nest location is dependent on the amount of available cavities and is largely determined by climatic variables which affect the nest occupant's ability to thermo-regulate the cavity. Since ~15,000 BC early cave paintings have depicted bees in their natural nests and the human interactions with these nests. The early relationship between humans and honey bees was much like the relationship between humans and other wildlife; honey bee nests were hunted and then harvested. The honey bees were wild and did not depend on management by humans to persist in nature.

Honey hunters became beekeepers

The occupation of 'beekeeping' evolved and emerged from 'honey hunting'. The main differences between these are that early beekeepers tended and somewhat controlled the destiny of a bee colony by providing an adequate nesting cavity. They also manipulated the colony to increase honey production which often meant prohibiting swarming behaviour. The gathering of swarms into man-made hives or 'beekeeping' gave humans the ability to expand the honey bee's natural range, introduce them into the 'New World' during European settlement and start selecting for favourable traits.

Honey bee imports: managed and feral bees

First documentation of honey bee importation into North America is from the early 17th century. Ships carried European settlers to North America along with familiar plant and animal varieties to ease their transition to a new life in a foreign land. Along with peacocks, rabbits and apple trees came honey bee colonies; the precursors of today's unmanaged honey bee population and eventual managed or commercial bees. Early honey bee imports to North America consisted of only a partial sampling of the original diversity contained within the species *Apis mellifera* (only 9 out of 26 subspecies were brought to the US). Not only was this a small sampling of the species-wide diversity, but within most sampled subspecies only a few queens of each subspecies were initially imported to the New World. From these early importation events two honey bee populations developed; managed and unmanaged or feral honey bees.

Managed honey bees are those that are maintained and kept by beekeepers, and research supports the suggestion that the

genetic lines are mostly controlled by honey bee breeding practices. Of the nine that were imported only three subspecies found favour with the beekeeping community and have been



A selection of photos of feral bee nests supplied by Deborah Delaney.



maintained as selected strains available to beekeepers today: *Apis mellifera* ligustica (Italian honey bees), *A. m. carnica* (Carniolan honey bees) and *A. m. caucasica* (Caucasian honey bees). The results from mitochondrial DNA (mtDNA) analyses help to explain the effect that humans have had on US honey bee populations. Over four centuries of selecting for traits/phenotypes associated with Italian and Carniolan strains has caused the mitochondrial diversity of commercial populations to narrow significantly. The US managed honey bee population sampled in 2004–2005 had mtDNA characteristics of the subspecies *A. m. ligustica* and *A. m. carnica*.

While the composition of US managed honey bee populations are limited to these three selected strains, the feral populations are not. It is during the early settlement of North America that a feral population became established and flourished well into the late 1990's.

Excerpts from settler journal entries tell of the proliferation of feral honey bees into the forests of eastern North America. The forests contained numerous cavities suitable for honey bee living which helped perpetuate their spread. Studies have shown that the genetic composition of previously collected feral honey bee populations in North America were different and more diverse than managed honey bee populations, containing genetic remnants from subspecies imported during the early colonisation. Individuals in feral populations, before the arrival of *Varroa destructor*, represented a separate 'gene pool', or diverse genetic reservoir. Not only did this population contribute genetic variation to the managed populations, but it also provided essential pollination and mating ecosystem services.

Present day honey bee populations

Currently, managed populations of honey bees in the US are in decline due to various pests and pathogens; reductions in this population were estimated at close to 35% for the winters of 2007–2008 with a 29% reduction in 2009. Research has focused

on identifying the possible causes of colony death by screening for parasites, fungi, bacteria, viruses and toxic levels of miticides and pesticides. Research has also focused on colony and queen health, trying to determine if adequate genetic diversity is present in the managed honey bee lines.

With the arrival and establishment of *Varroa destructor*, feral honey bee populations were thought to be largely decimated. Work done shortly after the mite became established estimated that the lifespan of untreated honey bee colonies was between one and four years. However, the increasing presence of feral honey bee nests on the East Coast into the mid-west and the persistence of a feral population of honey bees in the Arnot forest since early 1970's imply that unmanaged honey bee populations have not only survived but may be rebounding in the US.

Distinct feral populations

Previous studies of bees sampled from 692 feral nests in eleven states during 1982 to the early 1990's found that this composite population was genetically distinct from managed honey bee populations sampled during the same time. These differences suggest that there were some barriers to gene flow between the feral and managed populations, possibly attributable to adaptations to the local environment and geography. The existence of geographic variation in feral honey bee populations was reported in 1991 in California, suggesting the presence of different ecotypes adapted to variable climatic conditions. Findings from this research was the impetus behind re-sampling feral nest sites throughout the southern and mid-western US to uncover whether these nests were truly feral and representative of the historic feral population or whether they were escaped swarms from managed bee colonies.

The feral bee project

The Feral Bee Project was started in 2009. This project is a dual effort between researchers and citizen scientists aimed at locating and sampling unmanaged honey bee nests. Samples of bees collected from unmanaged bee nests are continually being processed and analysed using both mitochondrial and nuclear DNA markers to assess ancestry and genetic differentiation. Collection sites include old buildings (bees really seem to like churches and old construction equipment) and trees. To date over five hundred nests have been sampled along the east coast of the US and analyses show that these bees are genetically distinct from the managed honey bees. However, the full story will not be told until all of the samples have been analysed and run through population structure software. Another study conducted in the US produced mitochondrial sequence analyses of over five hundred feral nests from the central and south central US. It revealed mitotypes characteristic of subspecies that were imported over two hundred years ago also supporting the claim that feral honey bees are persisting in spite of the varroa mite and recent unexplained die-offs in managed honey bee populations.

In further support of existing feral honey bee populations ongoing studies have tracked a feral population of colonies in the Arnot Forest, a 1651-ha research preserve of Cornell University since 1978. Indeed, the first census of feral colonies in this forest

was conducted in 1978. In 2002 another census of feral colonies in this forest found the same number of colonies in only two thirds of the western portion of the forest despite the introduction and establishment of *Varroa destructor*. The feral colonies in this forest were infested with varroa mites, but further analyses revealed that the varroa mites in this forest have developed a stable coexistence with them.

Similar findings came out of research conducted in France in 2007. This study found that local, untreated honey bee colonies in France was surviving even in the presence of the varroa mite. These untreated colonies comprised varroa surviving bee stock that was selected from unmanaged local populations. These locally adapted, unmanaged colonies were able to survive for up to eleven years without any human manipulation.

Hopefully, the Feral Bee Project and off-shoot research will lead to the identification of true 'survivor stock' here in the US that could be used to develop sustainable breeding programmes. A goal of this research is to identify mechanisms and traits that enable feral colonies to coexist with various pests and pathogens. Another goal is to examine whether local adaptation is occurring. We aim to discover whether feral bees better adapted to their own physiographic region than bees from other areas in the state and other managed commercial stocks.

Most beekeepers cannot afford to simply 'let nature take its course' and weed out the less-fit colonies. However, it is documented that selection has acted on populations of feral colonies to produce colonies that can survive without human assistance. Determining the mechanisms by which feral colonies survive will help us improve the health of honey bees and their service as pollinators.

Future research targets

To date most of the studies that are examining feral honey bee populations have focused on locating and mapping feral nests. Unfortunately, a large void exists in our knowledge of the behaviour, ecology and population genetics of feral honey bees. There are no studies that integrate feral honey bee colony density with the importance of honey bees in pollination of agricultural crops and their sustainability in light of introduced pathogens and pests.

The next step in the Feral Bee Project is to integrate colony health measures with survivability and to understand the mechanisms that are allowing these unmanaged honey bee colonies to flourish in spite of large scale declines in managed honey bee colonies.

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Going Wild: From Old Lawns to Wildflowers

Most, virtually all, gardens are gripped by a strange affliction: an area that produces no flowers, fruit or other edibles. It has to be immaculate (or neighbours will comment). Bent double we are driven to fork dandelions out of it, rake moss out, bang holes in and brush sand into these holes. And roll it. Almost weekly it demands cutting with a petrol-guzzling engine. And, as if that is not enough, we are led to believe we should kill anything which may lurk beneath it, munching roots or moving soil, and there is an array of noxious substances to help us do this... It is a lawn.

I came to the conclusion that this is quite a lot of work for little end-gain. Have you ever wondered why we British are so partial to so much lawn? The advantages of having longer grass with wildflowers in the grass are ten-fold those of lawn. Wildflower meadows provide nectar and pollen for all bees, moths and butterflies, and a habitat for a whole host of beneficial insects which will noticeably keep a check on pests in our gardens. Also, it is a constant treat to watch different wildflowers blooming through the seasons. Now here is some good news. We can break this addiction to lawn



Photo: Christine Knott.

painlessly in five easy steps. And when we have created this masterpiece, we can mow a path into it, place our favourite garden bench in its midst, and enjoy some well-deserved 'me-time'.

Creating your mini wildflower meadow

This is best done in early spring or autumn, though it can be done in summer if attention is paid to watering during dry spells.

- Assuming we are starting with a piece of lawn, the first thing we need to do is turf-out old turf (modern hybrid grass is bred to be lawn and not much more). The best way to do this is to cut the turf short, then cover with sheets of black plastic mulch (or old carpet) which will kill the grass in a month or so. Alternatively, a rotavator could be used; it will allow you to incorporate turf in larger areas.
- The soil will need to be de-compacted by loosening the top few inches with a fork, then treading in to break up clods and raking with further treading to create a level and firm seedbed. (A rotavator would have done this in step one.) No need to fertilise as most wild flowers love poor soil. If your soil is very acid or alkaline it is best to talk to a seed merchant who could create an appropriate mix for you.
- A good wildflower mix should consist of around 80% non-aggressive wild grasses and 20% wildflowers as these have evolved to grow together and will form good permanent swards. These are available from many places now, though one taylor-made for honey bees and bumblebees is available from www.beehappyplants.co.uk. Spread seeds evenly. This is best done by using visual markers, such as stones placed strategically,

to divide the plot into smaller areas. Weigh and divide the seed by the number of areas and place in separate bags, so that as you pass from one patch to another you can sow each area with a measured amount. If a wind picks up you just have to hold your hand low to scatter.

- You are now meant to roll the seed in to form good seed-soil contact, but as most of us do not possess rollers, the same can be achieved with a family of welli-booted feet, by shuffling along like penguins, back and forth until all looks firm. It is hard not to giggle at the sight of others doing this and younger members may even end up rolling around on the ground in stitches. But hey, job done!
- You can now walk away and wait for rain. But if you have a hose that reaches then why not water it in for a flying start. It is important, however, that over the next few months while the new plants establish, you do not organise a car-boot sale or suchlike on your emerging meadow.

Maintenance of your wildflower meadow

In the first year of establishment, annual weeds will need to be cut fairly regularly. This can be done using a mower on a high cut not lower than 7.5cm (3in) or a strimmer. In second and subsequent years, treat as an established wildflower meadow:

- Do not cut or mow at all throughout spring or summer, but wait for most flowers to finish flowering, which is around August to October. The sward will be quite tall now, so you could either use a strimmer, again cutting no lower than 7.5cm (3in) or for a truly green and groovy idea why not purchase a scythe, which is the most rewarding and tranquil way of all to cut grass.
- Leave the cuttings to dry for up to seven days to allow the seed to be shed, then gently rake off the hay (and put on your compost heap or feed to animals) allowing unhampered growth of your wildflower meadow.

Jobs to do in March

- Sow broad beans in pots or trays under cover and plant out next month in double rows 20cm (8in) apart. Eventually the plants will need support, so install posts at each row end with two tiers of string placed to hold up those plants that reach 90cm (3ft).
- Sow *Viola tricolor*, *Calendula* and other hardy annuals direct.

Top: Broad beans in their pod;
Right: *Calendula*; Left: *Viola tricolor*.
Photos from Wikimedia Commons.



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A 'Des Res' for Bees

My first bee house season

Stretching the kinks out of my back after putting on the last feed of the year, I breathe in the evocative scents of beeswax, propolis, and just a little rosemary wood smoke from the smoker. I can see out over the hives across plots where fellow allotmenters are harvesting and muckspreading, and it is hard to remember now when this was just the scrappy end of my patch and not the cosy dry home of a couple of colonies of bees.

I have been keeping bees for about four years now, but this is the first full season on the allotment and for the bee house. The allotment association and I have both come a long way in that time and I would recommend both allotment beekeeping and bee houses now. There is a mixed and growing community at allotments who regularly ask after 'their' bees, offer advice, sympathy, seedlings — and sprouts.

Allotment beekeeping

Allotment beekeeping is increasing nationally; our branch in Nuneaton gets regular enquiries from sympathetic allotmenters, but it has not always been that easy and a softly-softly approach worked for me. Four years ago, when it was first suggested, plotholders saw bees as dirty pests, just waiting to make a nuisance of themselves, much as they still see wasps.



A commercially available bee house from Taylors Garden Products, Northamptonshire.

It was not always going to be a bee house

The original plan was for an enclosure, secure enough to prevent both vandalism and accidental meetings with bees, and I was originally offered a derelict shed which I had thought could lose its leaky roof and become two sides of the enclosure. This is where being a member of a beekeeping association, which I would recommend to all beekeepers, was useful. Brian, my 'bee buddy' has been around for a while and he put me on to the bee houses used in Europe.

Winters on the European continent are generally colder than they are here, going below the -20°C we occasionally experience but do not expect, so the bees and their beekeepers benefit from bee houses. European bee houses tend to be colourful too, with landing boards painted in different colours to prompt bees back to the right hive and minimise drift. In Slovenia, in particular, this has extended to a tradition of painting scenes, people, and even religious themes on the front of the houses. British beekeepers seem to be a resourceful community, reusing everything from pigeon lofts to chicken houses.

The garden shed bee house

My bee house has more in common with UK bee houses than the decorative European ones — so far. It is a more conventional garden shed, about four feet by six feet (photo opposite), now painted a discrete forest green with a couple of letterbox openings (photo right) below the window, giving the bees direct access to each hive. The horizontal slat design of the shed panels made it easy to cut out slots in a letterbox-style between the upright slats to coincide with the entrance height of the hives inside.



Letterbox opening.

To date the only other modifications are a solar light fitting and an opening at the top of the fixed Perspex window, so that bees inside the shed can bump their way up the glass to freedom. That also gives year round ventilation. I try to allow enough time to work quietly and calmly, so that I can keep smoke to a minimum with all my bees. That has paid off and I do not find I am choking in the confined space. So far, the 'girls' and I have been through just one full season here. The temperature has not been too excessive in the summer and it certainly seemed more comfortable inside during the winter. Because of the orientation of the plot the hive entrances face east, rather than the preferred south-east for the rising sun, but it does not seem to stop the 'girls' getting up in the mornings. The shed is all wood with the odd knothole and warped corner, which means that condensation did not seem to be a real problem either, but I will be watching out for rodents.

Other styles of bee house

Purpose-built bee houses can be much bigger, to accommodate a larger number of hives. Some are even 'double-deckers', with the boxes built into the bee house. They can also be designed to enable easy removal of hives or supers, by including a ramp.

Keeping bees and allotmenters apart

For safety, the bees fly in and out above head height. This keeps bees and allotmenters apart. I achieved this by running fixed 'curtains' of horticultural netting between the bee house and my tool shed about three yards away, so bees fly in above the tool shed, and only drop down to landing height between the curtains. I have covered the



The bee house (above left) and tool shed (right) linked with netting. Photos by Julia Wallis.

ground between the two sheds with thick black polythene, to keep maintenance down and I have been given wood chippings to improve the appearance in the future. The curtain sides are fixed to battens which bolt to the shed sides, so I can get in to tidy and in late summer, to place a wasp trap. It is said that there can be one thousand wasp nests in a square mile!

Another potential 'flashpoint' for bees and allotmenters might have been competing for water, but more by accident than design, that has not been a problem. Parts of the allotments are so boggy that vehicle use is limited; springs occasionally appear and disappear and my plot has several resident frogs while other allotmenters have wildlife ponds. Most of us also keep water-butts topped up from standpipes too. The options available seem to suit the girls — I have not had reports of them queue-jumping at the standpipes.

Did vandals meet their match?

The biggest potential hazard to plotholders, beekeepers and bees alike is vandalism. Last autumn, almost every shed on the allotment was broken into causing much

damage, although not a great deal was taken. Despite warning signs, the bee house was included in the break-ins. We are still undecided on whether it was down to bravado or stupidity, but I do not store much spare equipment in there now. Also the allotment hut (our HQ) has my details and those of a couple of handy beekeepers, in case of the unexpected. Common practice now is to leave our sheds unlocked, as the damage caused breaking in took a bit of putting right. I am following that practice with the bee house at present and nearly a year later, there has been no further damage.

Getting agreement for allotment beekeeping

You do need to check the ground rules for your allotment site as some do not allow the keeping of livestock, but once past that hurdle recent publicity on the plight of honey bees has converted many, so you may well find you are pushing at an open door. There is also more recognition of the vital role that bees play in pollination these days.

Hanging around the allotment 'HQ' getting to know the 'movers and shakers' and getting good growing tips is time well spent. If there is not a very formal structure there is usually someone who collects the subs and collates seed orders that you can talk to. Then there is the 'old boys'; they may not have big plots anymore but they usually sit in the sun on a Sunday lunchtime, reminiscing before their pre-lunch pint. They are likely to have good memories of beekeeping from the last war when it was encouraged because of sugar shortages. You can also visit the BBKA website



Splitting the first colony: hive and nuc.

and print off the leaflet on allotment beekeeping to hand around.

Hints for aspiring beekeepers

Most readers will already be BBKA members, but for those who are not, there are two good first steps. First, join a local group that is affiliated to the BBKA and attend regular meetings. This gives you a chance to get used to handling bees at the branch apiary and to get to know beekeepers, most of whom are only too eager to share their skills and knowledge with you. Then, sign up for a beekeeping course and back up the practical skills with some know-how. After several weeks, around May or June, you may be ready to get your first bees.

Setting up my bee house: advice and pitfalls

In hindsight, I would have put the bee house further away from the tool shed and even had a bigger bee house; there have been occasions when I wanted to practice swarm prevention or split a colony and a little more separation would have been useful.

If you are having a purpose-built bee house, or even designing one yourself, you do need to think of all the possibilities in the beekeeping year, no matter how remote their chance of occurring. For instance, when the oilseed rape was in full flow I had four supers on one hive and the ceiling was looking fairly close. With built in hives, you need to carefully think through how you are going to feed and treat bees, bring in and remove supers, clean off wild comb and propolis or cope with notifiable disease.

A dustpan and brush is a must

One thing I did not find out until the bee house was up and running was that I would need to take on some of the girls' housekeeping duties. With bees only living for around six weeks in summer there are always bees dying. Usually the house bees take care of this, removing them from the hive and nature does the rest. However, in the bee house, the husks of departed bees are discarded on the floor and blown around inside. So my job each visit, includes sweeping up. Nevertheless, on balance I would recommend both allotment beekeeping and bee houses. I enjoy visiting all my bees, but at the allotment, I am not the only one who finds that sitting watching, quietly and comfortably, getting to know their ways is fascinating and relaxing; something I will never tire of.



To find out more

1. Bates DF. *An Introduction to Bee Houses*. Bee Books New & Old; 2nd edition, 31 Dec 1997, ISBN-10: 0905652452.
2. http://www.taylorsgardenbuildings.co.uk/bee_house_beehives.html
3. <http://www.honeyshop.co.uk/Bee.html>

Julia Wallis,
Warwickshire BKA

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Artificial Swarming using the Pagden Method

For many beekeepers (except perhaps, for commercial beekeepers), the most effective and simplest form of swarm control is to carry out an artificial swarm. Carried out properly it is nearly always effective at stopping swarming, allows the beekeeper to raise a new queen and, as a bonus, offers a highly effective way of carrying out varroa control. All artificial swarm techniques rely on separating the queen and some of the flying bees from the brood with the objective of making the bees believe that they have swarmed, but without the loss of bees which would have occurred if a real swarm had happened. One of the simplest methods of artificial swarming is the Pagden method.

What is the Pagden method?

The basic idea is to put the queen into a new brood box on the original site; the original hive is moved to a new site and any flying bees will return to the old site and join the queen thus forming a 'swarm'. A new queen is then raised by the non-flying brood on the new site. One word of warning though, it requires duplicate equipment and sufficient space in the apiary to move brood boxes around. The right time to start these manipulations is once there is evidence of swarming preparations (the presence of swarm cells which are charged rather than just queen cups). Starting the procedure too early can result in emergency queen cells being raised and these will often result in poor quality queens who may fail to mate or may mate inadequately. Starting the procedure too late will almost certainly result in a swarm emerging.

How do I use the Pagden method?

Figure 1 shows the situation at the start of the procedure. The colony has a single brood chamber, marked A, and two supers, and is at location 1. On a good flying day, the supers are removed and

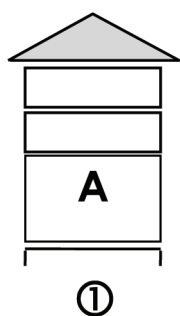


Figure 1. Original colony in brood chamber A at location 1. All diagrams are drawn by Ian Homer.

the colony is moved one or two metres to one side (and, ideally turned through 90°) to location 2. A new floor and brood box (containing a full set of undrawn frames) are placed at location 1 where the brood box was originally (Figure 2); all of the flying bees will return to this original site. The original brood box A is inspected to find the queen and she is then moved to the new brood box at location 1. Traditionally, the queen has been moved over on a frame of brood but, for hygiene reasons, we prefer not to move any frames over. If you choose to move the queen over on a frame, it is imperative that the frame contains no queen cells whatsoever. We have found it useful to place a queen excluder under the brood box until sufficient new comb is drawn for the queen to start laying (usually around three days) as this can

discourage any tendency for the colony to abscond. Any supers which were on the original site may be left with the original brood box or can be returned to the original site (this is the usual method), in either case, above a queen excluder. Whichever hive is not given the supers may need feeding; one school of thought says this should be the new brood box (on the original site) as the feed will help the colony draw the new comb while other opinion

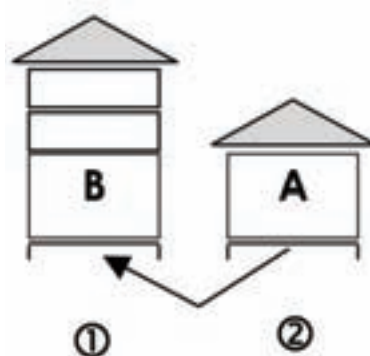


Figure 2 — day 1. Old brood chamber A at new location 2 containing only unsealed queen cells, brood and non-flying bees.

New brood chamber B at old location 1 containing queen, one or two frames of brood, empty combs, supers and flying bees.

Any flying bees in A will go to the position of the old home (arrow) i.e. location 1.

suggests that the supers should be on the new brood box as this is where the foraging bees are.

Brood chamber A (at location 2) will have sufficient nurse bees to feed and nurture the frames of brood and will also contain a number of queen cells. All sealed queen cells should be removed (leaving only unsealed queen cells which can be reduced to two or three); this ensures that a new queen will not emerge for at least eight days. If you choose to transfer the queen on a frame, an additional frame, either drawn or with new foundation, should be added to brood chamber A at the edge of the brood nest to replace the one that was transferred. Make sure that both hives are fully reassembled and leave them for a full week before taking any further action. Any bees which become foragers after these manipulations will naturally return to brood chamber A since they will never have flown from the original location.

Is there anything else to do?

After seven days it is usual to move the original brood box A from location 2 to a new position one or two metres the other side of the new brood box, location 3 as shown in figure 3, and placed at 180° to its position when it was at location 2. There is some doubt as to whether this is part of the original Pagden method or an

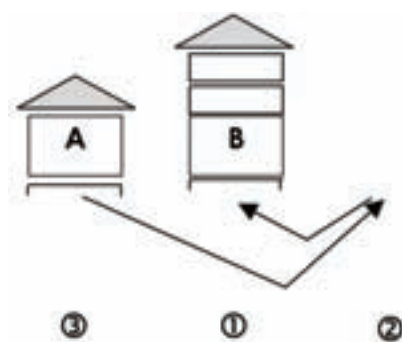


Figure 3 — day 8. Old brood chamber A now moved to location 3. Bees which have become foragers in the last seven days will return to their old 'home' at location 2, then enter brood chamber B since it is nearest to their home location.

adaptation to it known as the Heddon method. This has the effect of 'bleeding off' further bees from returning to the original brood box A and boosts the artificial swarm. It also reduces the risk of a cast emerging from the original brood nest as further bees emerge. After this manipulation, foragers from A, on returning to location 2 and not finding their hive, will go to the nearest one — brood chamber B at location 1. As a result of this second manipulation, brood chamber A will contain only young bees, brood and maturing queen cells and will not produce a cast because of the absence of flying bees. This absence of flying bees may make it necessary to feed this colony. Queens will start to emerge within a day or so and on the emergence of the first, the remaining queen cells will generally be torn down. If several queens emerge within a short space of time, natural selection will ensure that the fittest survives.

And then what?

After a further period of eighteen to thirty days, the new queen in brood chamber A should have mated and be laying eggs. The beekeeper now has to choose whether the artificial swarm was intended to increase his colonies or to raise a new, young queen. If it was the latter then it will be necessary to locate the old queen in brood chamber B, remove her and then unite the two colonies.

Using Pagden for varroa control

Varroa control should not always mean using chemicals; creating artificial swarms provides an ideal opportunity to substantially reduce the varroa population in a colony without their use. The creation of a broodless colony (brood box B at location 1 on day one) creates a situation where the varroa mites have nowhere to go to feed or breed as they do both inside brood cells. We know that the use of undrawn foundation will mean that several days will elapse before the queen is able to lay any eggs, and probably at least ten days before there will be any brood ready to be sealed. All of the varroa mites will therefore be on adult bees and will be becoming desperate to feed (and breed). The introduction of a frame of brood which is on the point of sealing will be a great attraction to these mites and most will quickly migrate into the introduced brood. After several days, once all of the brood is sealed, the frame can be removed and destroyed, thus destroying a very high percentage of the mites present in brood box B.

The second stage is to cleanse brood box A of varroa and this can only be done once all of the brood in that colony has emerged (say 24 days after the initial manipulation). At this stage we will again have a colony which is broodless and containing varroa mites having nowhere to feed or breed. A new queen will have emerged in this brood box but, even if she has mated she will not yet be laying so the introduction of a couple of frames of brood on the point of being sealed from brood box B will prove effective at cleansing the colony. Again, it is important that these frames are removed and destroyed as soon as they are sealed or you will end up breeding mites rather than destroying them.

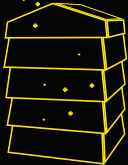
One step at a time

This procedure may sound more complicated than it really is; it is well within the capability of a competent beginner. The important thing to remember is to do one step at a time and stick rigidly to the timings. As a result of making an artificial swarm you end up with two operating hives instead of one. If you want more bees, all well and good. If you do not, then once the new queen is laying you can remove the old queen and unite the two colonies using the newspaper method. And the really great thing is that your new young queen will be very much less likely to swarm next year.

Ian R Homer, Devon BKA

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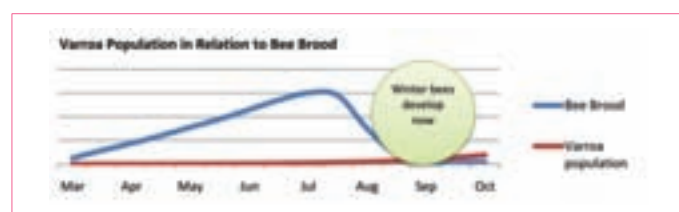
Varroa

All beekeepers must manage varroa in their stocks. If they fail to do this then colonies will collapse and die. Primary details of biology and control methods can be found in the Fera/NBU booklet *Managing Varroa*, which is available on-line at www.nationalbeeunit.com. This sheet highlights best practice and some important considerations in developing a management programme.

Know your enemy

Study and understand varroa. The basics are précised as follows:

- ❑ Varroa feeds on haemolymph by piercing the cuticle of honey bees and grubs with their mouth parts. This feeding activates and spreads various bee viruses and other disease problems.
- ❑ It is generally considered that varroa as a sole bee pest will probably not kill the colony for a number of years, though it does impact on honey bee social cohesion, their ability to function and it can debilitate bees by depriving them of nutrition. However, when varroa is acting in concert with viruses and other bee disease it becomes fatal quite rapidly. One colony can therefore live happily with thousands of mites while another will collapse with only a thousand.
- ❑ As a honey bee colony collapses the remaining bees that can fly, numbering many thousand, leave with phoretic varroa mites (i.e. those which are carried on adult bees) and enter nearby colonies. This creates large surges in mite populations in neighbouring colonies and is often referred to as re-infestation.
- ❑ Varroa mites can reproduce in either the worker or drone brood of the western honey bee *Apis mellifera*, but has a preference to enter drone brood in which, due to the longer development period, more varroa progeny emerge. In worker brood, on average, 1.3 of the progeny will mature to reproduce while in drone brood this becomes 2.6. Each mature mite is capable of up to three reproduction cycles. While significant brood is present mite populations will double every three to four weeks so this exponential growth means that honey bee colonies can collapse very rapidly if mite numbers are allowed to exceed the treatment threshold. Learn the early signs of colony damage as these can be used to trigger an unscheduled or emergency control.
- ❑ During spring and early summer mite and bee brood populations increase but bee brood peaks in July while mite populations will continue to double. After this peak more varroa mites are entering a reducing number of bee brood cells causing an increase in multiple mite entries and in viral and other bee disease levels. If this situation continues into September and October then the lifespan of individual overwintering honey bees will be significantly shortened. This will cause dwindling and possible collapse of the colony in late autumn or winter, even though varroa was controlled in late summer. The following graph illustrates these populations.



Use integrated pest management (IPM)

- ❑ IPM involves using different control methods at different times of the year to maintain varroa levels below the treatment

threshold. With proper planning and monitoring, bio-technical or management methods will be the first controls used and chemical treatments will become the last resort.

- ❑ The use of these different methods enables more effective control. It also reduces chemical use and resultant residues in hives and bees.

Thresholds

- ❑ It is not possible to eradicate varroa and they will always be in honey bee colonies. Try to maintain varroa populations at below 1,000 mites, which is the UK recommendation to keep all colonies safe.
- ❑ Do not allow mite levels to exceed 2,500 as this will put a colony at significant risk of collapse, especially if viruses are also present.



Monitor varroa infestation levels

- ❑ Learn to monitor infestation levels. As a minimum use open mesh floors and drone brood uncapping. These are described in the *Managing Varroa* booklet.
- ❑ There is no need to monitor all the time but rather at key points during the year.

In February or March assess the mite population going into the spring. This enables informed decisions about the need to control varroa.

- Very low infestations will require no action.
- Light infestations can be controlled by using open mesh floors and drone brood removal to slow the mite population growth.
- Heavier infestations can be controlled by using Queen Trapping, Artificial Swarm methods, Shook Swarm, or in extreme cases varroa medicines.

In late spring and summer infestation levels of drone brood can be checked to monitor progress or detect mite invasion.

In July decide if an autumn treatment is required. This treatment should be carried out in early August after removal of the honey crop.

In October assess the effectiveness of the autumn treatment and to decide if a winter treatment is required.

- While examining colonies during the season look for early signs of brood damage, known as Bee Parasitic Mite Syndrome, and check adult bees for signs of Deformed Wing Virus. This can help to detect when an unscheduled or emergency control may be needed.

Use approved varroacides

- APISTAN®, BAYVAROL®, APIGUARD®, API LIFE VAR® and THYMOVAR® are all approved for use in the UK. An up-to-date list can be found on the VMD website <http://www.vmd.defra.gov.uk/public/bee.aspx>.
- APISTAN® and BAYVAROL® are pyrethroid-based and where mites are not resistant they are 99% effective, so one treatment per year may be sufficient. However, in many parts of the UK mites are resistant so if you wish to use them check that the mites are susceptible. A simple resistance test is described in *Managing Varroa*.
- Other modern varroacides are not as effective so do not assume that one treatment per year will be sufficient. Where possible use different varroacides in successive years. Ringing the changes by using varroacides containing different active ingredients helps to reduce resistance selection. Never use the same varroicide year after year.
- Always follow the label instructions.
- Current UK-approved varroacides only affect phoretic mites (those which are carried on adult bees) so mites that are in brood cells during their reproductive phase are unaffected. Some products require two applications to ensure that all mites in the colony are exposed to it. To ensure this follow the recommended time periods.
- Varroacides should not be used:
 - With supers or section crates on the hive. (In an emergency there are exceptions so check the label instructions).
 - When there is a nectar flow.
 - Some should not be used when feeding. (Check the varroicide label instructions).

Consider a withdrawal period between the cessation of treatments and putting supers or section crates on the hive. Some varroacides set a time period so check label instructions.

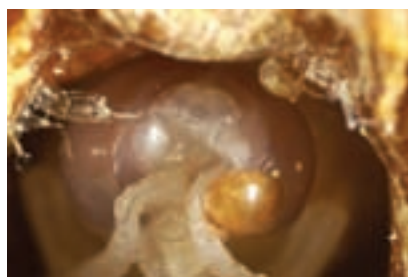
- You must maintain a record of varroicide holdings and use, including where you purchased it, the type, batch number, expiry, your specific use and its disposal.

Resistance

- Varroa mites can rapidly develop resistance to treatments especially with repeated use. Mites that are resistant to APISTAN® and BAYVAROL® are present in many parts of the UK. At the time of writing, resistance to other treatments has not been confirmed in the UK.
- After treatments have been completed it is wise to monitor mite drop to check effectiveness. If you suspect that mites are resistant to a treatment other than APISTAN® and BAYVAROL® please inform your local National Bee Unit Bee Inspector or the National Bee Unit laboratory.

Be flexible

- Methods that work well in some circumstances may not work well in others so be prepared to adapt.



Immature mites on a pupa. Photo courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; images supplied by the National Bee Unit at Fera.

Talk to neighbouring beekeepers

- Varroa is a communal problem so talk to your neighbours and co-ordinate treatments.
- Mites from collapsing colonies will re-infest controlled colonies nearby.

Select tolerant bees

- Some bee colonies appear to show a tolerance to varroa. Retain these colonies and incorporate them into queen-rearing programmes.

Keep up-to-date

- Knowledge of varroa is increasing all the time and together with new controls becoming available it is essential to keep up-to-date by reading the bee press, using the internet, attending relevant lectures and discussing varroa with colleagues.

The very least approach

Unless beekeepers are monitoring and controlling varroa by best practice the very least that successful beekeepers now do to control varroa is:

- In early August treat bees by using an approved varroa treatment such as APIGUARD®, APILIFEVAR® or THYMOVAR® immediately after honey crop removal.
- Between late November and January when there is little or no bee brood apply oxalic acid by the 'trickling' method.

Oxalic acid

At time of writing there is not a commercially prepared treatment containing oxalic acid approved for use in the UK. Oxalic acid is an 'Annex II' substance which can be prescribed when approved products are not effective or suitable, and is applied by trickling, spraying or sublimation. It removes phoretic mites for up to about 48 hours, which means that it is very effective if no or little brood is present but ineffective in the presence of significant quantities of brood.

It is safest and most practical to obtain a proprietary, pre-mixed and ready-to-use solution of oxalic acid from a bee supply company. 'OXUVAR®' is available, which is approved for use in at least one EU Country. (Consult the VMD website to check its current status in the UK <http://www.vmd.defra.gov.uk/public/bee.aspx>). It is used in late November, December or January when there is little or no brood. The crown board is removed and five millilitres of the solution is dribbled onto each seam of bees in the cluster using a calibrated syringe or drench gun. It is only used once in the winter and is best carried out with the outside temperature greater than 3°C. This treatment cleanses the colony of the majority of the remaining varroa mites so that it will probably require no further controls until the following August.

Is there an alternative to using oxalic acid?

Some beekeepers are using a single tray of APIGUARD® in winter or early spring before supers are placed on the colony. They report satisfactory results.

Mention of a treatment should not be taken as an endorsement of efficacy, safety or a recommendation to treat. It is referred to because it is commonly available and used by many beekeepers.

National Bee Unit, Best Practice Guideline

Queen Rearing for Beginners: Part 2

Last month's article hopefully awakened your interest in rearing your own queens, either on your own or, better still, as part of your local association's 2012 plans. Despite the warmer than usual weather early in the year there is still plenty of time to get organised to have a go this year, but as ever with bees you need to work with your local weather conditions rather than 'seasonal norms'. What I and Sedbergh and District BKA have learnt from our attempts at queen rearing over the last two years are as follows:

Communication

You will have at your disposal a huge amount of goodwill, but you need to tap into it. You will not be able to do this unless people know what you are trying to do. There is no point having a few thoughts about having a go without letting your association know what you want. Other local associations, your local Bee Inspector and your association members will have a lot of very valuable knowledge. For example, we had two evening lectures from our local Bee Inspector who was very supportive with his time, hints and suggestions. Our experience is that the generosity of those people with experience is there for you to release — but communicate and set out what you want to do.

Preparation

As with all beekeeping you need to be ready for the active season well in advance, otherwise playing 'catch-up' is a recipe for swarms/starvation etc! Get your Jenter kit now, identify your queen rearing team now, buy your Apideas and assemble them now, get your fondant now, get your queen handling equipment now. The best piece of equipment I have is Thorne's 'queen catcher tube', absolutely invaluable for confidently and harmlessly putting the queen into the Jenter frame or removing an old queen from a colony into a nuc. The lack of fuss when handling the queen really does build confidence — it certainly did for me and the team of helpers who were relative novices at the start of our queen rearing. Tom Robinson's spreadsheet, available from BIBBA's website <http://www.bibba.com/downloads.php>, sets out exactly what needs to be done and when; follow its dates and you are half way to success.

Practice

There is no point in setting up a queen rearing plan and not being confident with

how all the bits of kit work. Get your queen catcher tube and use it to ... catch the queen, so that when you come to do it for real neither you nor your team are nervous. How will the frame containing your Jenter cage fit into your brood box? Will you need to take out an extra frame to allow it to slide in easily? Can you work the parts of the Apidea, either with the feeder being at the back, or better still with the 'super' feeder, which gives a slightly larger brood area? Can you shake bees off some frames into a bowl or bucket to then be able to stock up the Apidea?

Breeder queen selection

Which queen are you going to use to breed your better local stock from? Well it depends what you want. How do you know what you want? Have that discussion/debate first and try to get some objectivity into the discussions. Brother Adam approached the selection process from the primary aim of production; he wanted productive bees. Is that what you want, or are other qualities more important for you? I am sure that most, if not all of



The queen-rearing kit: back row, Jenter kit; middle row, Apidea; front row, Thorne queen catcher. All photos by Andrew Royce.

us, enjoy handling bees that are calm and would forgo a few extra jars of honey for bees that you, and your children, can handle with minimal smoke and maximum enjoyment. Who in your club has got calm bees and why are they calm? Are those bees productive and is that because they are good bees, or in a good area, or are good robbers? Having records is useful, but initially we selected one of my colonies as, by common consensus, they were very calm, and were not bad at honey production.

Obviously the queen side is only part

of the genetic equation for the new colonies headed by those new queens and getting them to mate with suitable drones is something that has to be borne in mind. We have not yet found this to be a problem, but no doubt as our 2011 queens start leading their colonies we will see if we need more care with this aspect.

Queen clipping

Marking and clipping your queen is likely to be part of the annual cycle of hive husbandry and it becomes more important if you are handling the queens as part of queen rearing. Marking is easy using a press in cage and paint, clipping is much more nerve racking. But, back to my favourite piece of equipment, using the queen tube it is much easier to capture the queen in the tube. You need to read the excellent article by Michael MacGiollaCoda at www.bibba.com/queenfinding.php but do get some distance between you and the hive and take off your gloves.

Why bother to do this? Because, as one of our members found out an unclipped queen will fly off if so inclined, this simple precaution would have allowed him to retrieve her. More importantly with the cell building colony, if the queen is unclipped she may well swarm if you put a dozen or so queen cells in a brood box above her, as I found out to my cost !!

Jenter use

The Jenter kit (back row, left, in the photo opposite) is really simple to use and having never tried grafting I really do not think it can be easier or better than the Jenter system. However, the plastic cartridge needs to be in a brood frame and screwed into the top bar. You therefore need a drawn frame and then cut out the appropriate sized hole in the middle of the frame to get the cartridge in. Then get the whole thing, with all the little plugs out, back into the brood box for a while to get the bees to repair the damage you have done to their precious frame, some sugar syrup sprayed on the whole frame will speed up the process.

The plastic cups are a little fiddly but if you can put all the pieces into a Miller feeder in the top of the hive with a bit of syrup on them before you want to use them the bees will take to them more easily. Dipping the 'business' end of the cup, into which the queen will hopefully lay her

eggs, into some wax will also help.

Put the frame in the centre of the brood box where there is plenty of existing brood and make sure you leave enough space around the Jenter cartridge for the worker bees to get in and out. For the timing of your actions follow Tom's spreadsheet and you will be fine.

When you come to install Her Majesty in the cartridge, yes you guessed it, use the queen catcher; it really does keep the whole colony happy and then the next evening release the queen by just taking off the circular escape hatch but be careful not to lose it.

Cell drawing

Following the spreadsheet timing on the third day you will need to distribute the plugs from the breeder to the cell raiser and get that colony to draw them out. This is where we had our main problem — getting the cells drawn out but I think that we now have a working system.

You need a brood frame with the metal strips fitted into them to take the made up Jenter plugs. You also need a strong colony with a lot of brood and a good nectar flow. You need to take the Jenter frame out of the colony and very carefully (without gloves) ease out the little plugs and check there is the 'c' shaped larvae in there. A warm evening with a lot of light makes this much easier. I did mine sitting on a stool in the apiary at a little distance from the hive and without smoke — no stings!!



Apidea, opened up to show the components.

There are a number of different systems you can use, but having the cell building colony queen-right seems to me to work best, at least on the scale of our queen rearing. You need a colony with two brood boxes and put the cell building frame in the top box with a queen excluder between the top and bottom boxes with the queen in the bottom box. Put a couple of frames of eggs and grubs, if you can, in the top box with a frame or two of pollen

and stores this gets the key nurse bees into the top box.

If you put twenty plugs in the top box do not be disheartened if you only get five drawn out the first time, those bees and you will do better



the second time around. But a clipped queen in the bottom brood box is key, otherwise a swarm ensues. It may well be that the frames of brood you put in the top brood box have a queen cell or two drawn out from them. These can be used, as I did last year successfully to make up some nucs that I have overwintered as a double nuc box ready to plug any gaps this spring.

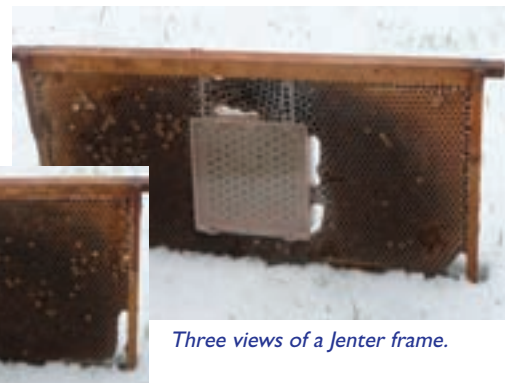
Mini-nucs

Ron Brown's book *Honeymoon Flats for Honey Bee Queens* is a 'must read'; a small book packed with useful practical guidance. I agree using fondant is much better than syrup but you do need to keep an eye on the food levels all the time.

Stocking five out of our six mini-nucs was done one horrible wet cold afternoon but it was successful. The bees were shaken into a washing up bowl from a super of a very well behaved hive (no need to worry about a queen here). The ease in which a large plastic cup of bees could be scooped in was really quite something for the onlookers. Our one failure with a mini-nuc came when it was stocked from bees in the same apiary and fed with syrup. This only resulted in robbing and complete mayhem. Therefore stock from calm bees and move the nuc away at least the usual three miles and use fondant not syrup.

The timing for all of this is in the spreadsheet, and it works. However, do not forget to line up the little frames in Apidea so that you can slot in from above the ripe queen cell using the purpose built flap in the plastic roof.

What we did find, consistently, was that it took longer for the queens to get mated and laying than was anticipated, and this was



Three views of a Jenter frame.

in good queen flying weather. I think this year we will not leave such matters to chance and will feed the Apideas once the cells are in and keep feeding until the queen is really laying. Looking from the outside is all you need to do: pollen going in = laying queen.

Handling Skills

Our entire queen rearing team who handled the bees became more confident. Their delight at reporting back that their Apidea was bringing in pollen was matched by their advances in bee handling from using the Apideas and the good natured little colonies they contained.



Queen catcher and queen cell components.

Conclusions

The practical guidance out there is really good; use the spreadsheet and Ron Brown's book as your starters and do tap into the expertise of others who have done this before. We are not experts but we all feel that we have learnt a lot, are more confident with our bee handling skills and are looking forward to what 2012 brings. How will our 2011 queens perform this year? Hopefully calmer and more productive than last year. How will we get on with queen rearing in 2012? Hopefully no swarms, more cell drawing, quicker mating and an easier day of stocking the Apideas rather than a wet miserable Sunday in May!! Good luck and have fun!!

Andrew Royce,
Sedbergh and District BKA

Notes from a Clifftop Apiary

The Irish writer Flann O'Brien once made a vital observation. 'People,' he wrote, 'who spend most of their natural lives riding iron bicycles over the rocky roadsteads of this parish get their personalities mixed up with the personalities of their bicycle as a result of the interchanging of the atoms of each of them and you would be surprised at the number of people in these parts who are nearly half people and half bicycle ...' I've had these words in mind lately after reading that the styrene molecule is now present in human fat. How did it get there? Quite possibly from styrofoam cups that keep your drink hot or cold, and from the plastic fluff-chips that protect your computer during shipping. So by extension, what about polystyrene? What are the implications of this for the beekeeper who has opted for polystyrene hives? They're very popular in Finland, apparently. One can only wonder if after a lifetime involved with Nordic bees your Finnish beekeeper finishes up half-man half- hive?



March. The month of preparations. We can do regular inspections now to check for adequate food stores, to see if we have a queen laying normally, and to make sure there's enough comb space. Do we have the swarm-collecting gear ready? (Swarms can appear very early in the year down here in the balmy coastal margins of Devon.) Do we have enough supers for this year's incredible bumper harvest of honey to come? Are the queen excluders sterilised and ready? Do we have spare boxes to house an artificial swarm? Do we have nuc boxes and frames ready for increase of colonies? Is this the year I replace the old bee suit? No. Not yet, I'm fond of the old propolis-stained, smoke-smelling, waxy jacket. I've had a few memorable experiences in that jacket.

My vegetable growing neighbour, Frank, is spreading seaweed on his allotment. Rather late, but better than not at all. His efforts look neat and professional: an even carpet of black ribbons strewn artfully all over his beds. This doesn't seem to work for me. Whenever I try it, bringing up a couple of sacks of stormwashed seaweed off the beach, I find I've got crab claws, scallop shells and fish heads in among the tangles. Clearly, I'm not sorting the stuff out properly. Mind elsewhere. It's yet one more reminder that for me bee keeping and veg-growing don't work together. Not on the same plot. Obviously others in the country manage it, since there was an extensive survey of hives on allotments recently. Anyhow, for me I must focus on one thing. Or rather, several thousand things. Bees.

I'm looking at the hives that stand in direct sunlight and those in more-or-less permanent shade from hazel and blackthorn. The hives that catch the sun tend to do well. Is this because the bees are tempted out whenever sunshine hits the landing board? One might suppose that they have a better chance of remaining healthy because they can take cleansing flights more readily than their shaded neighbours. Plus there is less chance of fungus or mould. Photographs of Brother Adam's hives on Dartmoor show no trees

or shade, only the boxes dotted about the open hillside, out in full sunshine. On the allotment, the sun swings around the sea's horizon and there is often a brilliant quality of water-reflected light. This is a motivation to cut back sections of the protecting blackthorn hedge and let some bright light onto each of the landing boards.



I had a near-death experience on the allotment not so long ago. My heavy stainless steel smoker toppled off the top shelf in the shed and hit me on the head. I was in there stacking supers prior to lighting sulphur strips to kill off wax moth. I suppose all the heavy moving must have tipped it over. Bang. An explosion of stars. The floor swung sideways and came up to lie against my face. The stars resolved themselves into a catherine wheel, and then into a tunnel. There was a light at the end of the tunnel and it was filled with hazy beings all clothed in white, and they were looking at me and beckoning. 'Come,' they said. 'Come.'

'No,' I said. 'I can't come. Not yet. My work here isn't done.' I was beginning to find the white suits and the gauze in front of their faces rather familiar. 'Who are you, anyway?'

'We are the Southern Chapter of the East Grinstead Bee Keepers Association.'

'Good God,' I said, 'how come you're all here together, and why have you still got your beekeepers' suits on?'

'Ah,' they said, 'we were always a tight-knit group, and we find the bee suits very comfortable, they sort of fit in here.'

'Okay,' I said, 'but I can't join you. I'm in the East Devon Branch, and I don't see any of them here.'

'Oh,' they sighed, 'the East Devons, they go on and on and on. They think they're in Heaven already ...'.

'Anyway,' I continued, 'My work here is not finished. I think I need to spread some seaweed on my allotment. And besides, my wife wouldn't be very happy. I haven't shown her how to do an oil change on the car yet.'

They looked at me thoughtfully. 'We think you may be mistaken there, but we'll let it go. The choice is yours.'

They faded away and were replaced by a single figure standing in the shed doorway with its arms folded. 'What are you doing down there?' it said. 'Having a sleep? Listen, let's get this oil change done, I've got shopping to do.'

Rowland Molony
East Devon BKA

Bee Circulation and Temperature Control

Having a keen interest in anatomy I have been following Graham Royle's articles on honey bee anatomy. He is to be congratulated for the clarity and excellent photographic illustrations. All beekeepers need a modicum of anatomical knowledge of the honey bee to help understand many of their activities.

Heat exchange in bees' aortic folds

In Graham's article on the circulatory system there are two areas that I would like to expand on. Graham describes how, when passing through the narrow petiole, the aorta is folded into several loops — nine in total, which as he says act as a heat exchange. It is true that 'in this way heat loss in the abdomen is minimised' but that is only part of the adaptive significance of this anatomical feature. A bee, like all insects is ectothermic or cold blooded (poikilothermic) and depends on its environment, in part, to maintain the temperature of its body, unlike mammals, which are endotherms (homoeothermic or warm blooded) and maintain a constant core temperature. Our body temperature is 37°C being maintained by internal 'central heating' independently of the outside world. During winter the cluster within the hive generates heat by individual bees uncoupling and vibrating their wing muscles, so that wing muscle vibration rather than motion generates heat. Flight is a very active metabolic process so a bee's body will warm up as it flies.

To explain my next point let us consider a car on an icy morning; full choke and no racing starts until the engine is fully warm. Why? Because a cold engine is not efficient. Muscles are the same. This is why athletes warm up. Mammals are warm blooded because the increase in efficiency means they can colonise cold climates and become nocturnal. A lizard needs the sun to warm up before becoming active. Incidentally, the evolution of warm bloodedness is one of the ten great inventions of evolution and is all about stamina.¹

Back to bees — Winston states 'a worker's wings beat in flight at a rate of over two hundred cycles per second, which according to anatomical and aerodynamic analysis of flight is not possible'.² I will not try to explain how they fly except to say that effective and efficient warm muscles are essential. In fact bees maintain a thoracic flight temperature at an extraordinary 46°C. This ensures the indirect flight muscles operate at peak efficiency. The aortic folds, which function as a counter current system, together with the insulating abdominal air sacs ensure that no heat leaks from the thorax backwards to the abdomen, so maintaining the high thoracic temperature. This is the real adaptive use of the aortic folds, because on a cool day heat loss would mean cool flight muscles and less efficient or no flight. To illustrate this consider the bees enticed out by the bright reflected light on a snowy day; they get chilled, cannot take off and so die.

As Graham explains, 'Any excess heat generated during flight is carried by the haemolymph flowing along the aorta into the head where it is dissipated by evaporative cooling'. To expand on this; insects have waterproof cuticles (exoskeleton) and they do not sweat. So heat loss cannot be by simple evaporation. A temperature of 46°C is needed for active muscles, but if it gets too high, heat stress and death would follow. My research has found

that for bees the lethal external temperature range is 50–51°C and the internal temperature range is 46–48°C. According to Winston and Goodman³ excess heat is passed to the head by conduction and accelerated blood flow, and 'gobbetting' is used to dissipate the excess heat. Gobbetting is a process where the bee regurgitates a drop of liquid, which is then either held between the thorax and abdomen or spread over the ventral (lower) surfaces of the legs. Normally during flight the air passing over the head would take away excess heat, but gobbetting has been shown to lower temperature by 3°C or 4°C when at rest. So a flying bee could expose damp mouthparts to cool while flying on a hot day. By retaining and concentrating heat in the thorax using these adaptations honey bees are able to forage at times of the day and year when the temperatures are too low for other insects to be very active.

For the curious

Snodgrass⁴ and Goodman are recommended further reading, but you may notice that Snodgrass states there are four pairs of ostia. If you consult Dade⁵ or dissect a bee you will find there are five pairs. figure 1 shows the lids of a bee's abdomen inverted to show the membranous heart running down the centre. The transparent dorsal diaphragm cannot be seen easily but the fibre running through it can together with their attachment to the muscles that bring about its pulsation. Some of the ostia can be seen and figure 2 shows an enlargement of one, the most posterior one. It is difficult to get a better photograph of this structure as it has to be in water for support and the water reflects the light source or flash. I would like to develop a way of injecting a dye into the aorta and so see the ostia more clearly — one day maybe!

Bob Gilbert, BSc. Master Beekeeper, Warwickshire BKA.



Figure 1. Bee abdomen inverted to show the membranous heart running down the centre. Photographs by Bob Gilbert.

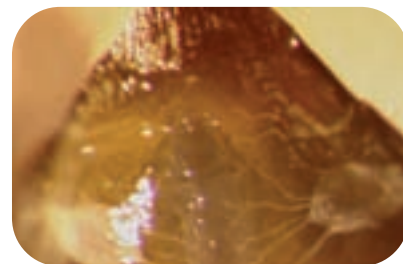


Figure 2. Enlarged image of the posterior ostium.

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1. Lane N. *Life ascending: The ten great inventions of evolution*. 2009.
2. Winston M. *The biology of the honey bee*. 1987.
3. Goodman L. *Form and function in the honey bee*. 2003.
4. Snodgrass RE. *Anatomy and physiology of the honeybee*. 1925.
5. Dade HA. *Anatomy and dissection of the honeybee*. 1962.

On the Bookshelf:

A Practical Manual of Beekeeping

The author writes in his introduction: 'Many readers will ask themselves whether another book on beekeeping can really add anything new to the beekeeping scene.' He then answers his own question: 'Yes' and I agree! This is one of my favourite practical beekeeping books and I find, even though I have now clocked up over twenty years beekeeping, a lot of value in this book.

David Cramp has a wide range of expertise to offer the reader, ranging from a hobby beekeeper in the UK to a professional large-scale beekeeper in New Zealand, via Cardiff University. Good points of this book include an excellent, detailed, list of contents of each of the chapters and a comprehensive index, making it easy to track down information. The first few chapters cover ground that is often present in other books, but the information is presented in a very clear and readable format, with good chapter summaries. All the usual topics are covered well, such as the background of the honey bee colony, products of the hive, obtaining equipment,

spring and summer season and overwintering bees. Some chapters deal with aspects often not included in other books. A feature I particularly like is the chapter 'Dealing with problems.' This includes, laying workers, coping with aggressive colonies, dealing with queen problems and introducing a new queen; all problems that the new beekeeper may encounter in the first few years of beekeeping. The author's approach is very thorough; he describes first what may give rise to a problem and then what may be regarded as the commonest way of dealing with the problem. He also includes various techniques, sometimes suggested in other books, with comments as to why he considers them perhaps not so good.

There is a good chapter on pests and diseases, which includes *Tropilaelaps*, small hive beetle and CCD. The pictures are clear and good and the summary is excellent. For me, the real asset of this book is the extensive chapter on 'Rearing queens and breeding bees'; a subject missing in many

books. The author discusses why the beekeeper should consider queen rearing and describes several techniques in a very clear and understandable way presenting their advantages and disadvantages. He describes methods that involve grafting and those that do not (including the Miller method). There is a trouble-shooting section and one on bee genetics, essential for anyone wanting to do any serious queen raising.

The final chapter, 'Exploring products and career possibilities', explores how to make money out of beekeeping. Providing a pollination service for farmers and growers is covered, with details on the number of hives needed per hectare for various crops. Hive products, other than honey, include royal jelly, beeswax, propolis, venom and pollen. This book is a very worthwhile purchase and contains much food for thought.

Pam Hunter, C.Biol. FSoB. FLS,
Master Beekeeper



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BBKA ADM 2012

Continued from front cover

Michael Sheasby, Chairman of the Finance Committee, gave a comprehensive review of the financial reports including the budget. He indicated that the balance of the research funds is expected to be committed in full during 2012. He also explained that, on a 'managing risk' basis, BBKA has enough liquid assets to initially weather a storm (such as a sudden loss of membership) during which time it would be able to adjust its spending base. At present, modest increases in membership are budgeted for the next three years.

It was confirmed that the move of the Spring Convention was due to outgrowing the present premises with no viable alternative on the current Stoneleigh site. Brian Ripley explained the rationale around the production of mini-hive collecting boxes at a prison. Martin Smith explained the recent advertisement for a Regional Training Co-ordinator had resulted from the changing needs of the education system at local level in response to increased membership, and that there will be a continuing review of such need by the new Executive Committee (EC).

Questions arose over insurance cover, particularly for equipment owned by associations, which is being facilitated through BBKA's brokers, Towergate, as an optional extra insurance. Through due diligence, Towergate has identified various anomalies and it has become apparent that there must be serious doubt whether, under previous policies, members were in fact covered for some aspects of risk. Jane Moseley, BBKA's Operations Director/ General Secretary, will continue to work closely with Towergate to achieve clarity and promises a statement in BBKA News and on the website, but it was emphasised that it was unlikely that a statement covering every conceivable eventuality would be possible.

Michael Sheasby ended his presentation by stating that BBKA is now a substantial enterprise and can no longer rely simply on volunteers. Both the accounts and budget were approved by delegates. Elections for EC and Examinations Board followed. Martin Tovey was elected President. A three-stage voting system for new trustees was introduced by Martin Smith, which resulted in Ian Homer, Tim Lovett, Margaret Murdin and David Teasdale being elected for three year terms; Ken Basterfield for a two year term; and Peter Sutcliffe for a one year term. Thanks go to the three unsuccessful candidates.

Mike Somers advised that Governance Committee had an issue with the election system used but your author pointed out that the outcome would have been the same if the suggested alternative had been used. The issue will be cleared up by Governance Committee to avoid any confusion and consternation in future. For the Examinations Board there were four candidates for four vacancies for three years. Gerry Collins, Ivor Davis, Ken Edwards and Jo Schup were duly elected.

Following lunch and a walk in the crisp winter sunshine, many '50 years a beekeeper' awards were announced but only John Hendrie was available to receive his in person. A Service Award certificate and flowers were presented to Christine Gray, who has been responsible for creating an impressive Press Officer role for the BBKA. She thanked her partner, Robin Dartington, for his support. Steve Turner was not present to receive his Service Award certificate for his excellent work as Web Manager. Martin Smith publically thanked his wife Gilly for her support during his time with BBKA.

It was then time for the Propositions to be considered. Julian Routh, for EC, addressed the need to recognise good husbandry in all methods of beekeeping in response to Middlesex BKA's call for a policy to address the shortfalls of 'natural beekeeping' methods. The vote went against the proposition. Middlesex's second proposition, for better and more resources to support associations in their training activities, was supported by Martin Smith on behalf of EC. He explained BBKA's drive to support education structures at local level where it is bottom-heavy with beginners, and intermediate level training is much more difficult to achieve. The vote supported the proposition.

The EC proposition led by David Aston firstly requested a voluntary donation toward research funds, and then suggested a method for its collection. The proposition was simplified to invite members to make an annual voluntary donation of £5 collected by Area Associations. Delegate and Membership votes were exercised, resulting in majority votes in favour.

The final five propositions all involved improvements to the Constitution and were addressed by your author as Secretary of the Governance Committee. Four received solid votes in favour, one of which was the creation of a Junior category of membership. Many concerns were expressed by delegates about the ramifications of engaging juniors at local level and it was made clear that it was for each association to decide whether or not it wished to create a local Junior membership category. Reassurance was given that carefully thought out and inclusive guidelines would be made available as soon as possible. Another proposition worthy of mention is that the power to lapse the membership of an association for late or no payment of capitation has been removed in favour of suspension. One proposition was withdrawn and referred back to EC for further consideration.

The chains of Presidential Office exchanged hands and the meeting closed. Thanks go to the retiring trustees who have worked tirelessly on behalf of BBKA and beekeepers.

Dawn Girling, Trustee

Fumidil B — Bad News for Bees

Our headline on the cover of the February issue of BBKA News asked 'Are we to lose Fumidil B?' We now have an answer from Jim Plaice, the Minister responsible for animal health. In reply to our eleventh hour appeal to stay his hand while an economically viable solution to generating the data needed to tick all the regulatory boxes was found he has cited EU regulations as the reason compelling the

withdrawal of the licence for Fumidil B. The Minister points out that Fumidil B was removed from the market in a number of EU countries some years ago. This is true, but when that happened there was not the present and growing concern over the incidence and virulence of *Nosema* spp. infections. The BBKA finds this latest development runs strongly counter to the objectives stated by Defra in their strategy

to improve bee health. To remove what has in recent years become a key strategic medicine can only have negative implications. Fumidil B remains on sale until existing stocks run-out in this country and stocks may be used by beekeepers until the expiry date of the product ... and then what? In the meantime, we intend to continue to press the Minister over this issue.

Tim Lovett

New Executive Members

Ken Basterfield

My background is as a graduate scientist and engineer, adept with good hand and machine skills and a very practical bent, working in private industry and more recently in further education. I believe very firmly in empowering beekeepers with the sound knowledge and husbandry skills required, particularly in these trying times for bee health, to make their hobby or business successful. I have been the NDB Courses Director since 1999 organising and running the one week residential NDB Advanced Beekeeping Courses at the NBU each summer. More recently I have established the NDB Short Course study programme.



I am a member of the BBKA Exam Board and have initiated module study groups and husbandry assessment preparation programmes and I am now active on the BBKA Education and Husbandry committee. I was introduced to beekeeping at the age of six and about forty years ago I started a semi-commercial beekeeping outfit running on average about 150 colonies. I am retired now, with my son Daniel running the honey farm whilst I keep about ten colonies for my own pleasure.

Tim Lovett

I took-up beekeeping in the early 1990s, joining Kingston BKA, becoming association Chairman and later Surrey's delegate to the BBKA ADM. I was elected to the BBKA Executive in 2001 and became Chairman in 2006. I initiated the establishment of the Members' Register and the direct mailing of BBKA News. With others, I ran the successful campaign to get Defra to stay its hand over proposed cuts to the NBU Inspectorate. In January 2008 I was elected BBKA President. During this tenure I orchestrated the successful BBKA campaign to raise public and political awareness of the plight of the honey bee resulting in the establishment of the £10 million Insect Pollinators Initiative and substantially increased funding for the National Bee Unit, with the collateral effect of a surge in membership of the association. I am BBKA Director of Public Affairs. I also provide the secretariat for the All Party Parliamentary Group on honey bees, I am a member of the Healthy Bees Plan Project Board, set-up by the UK Government to help confront challenges faced by honey bees and I have a special interest in the provision of medicines to treat honey bee diseases.



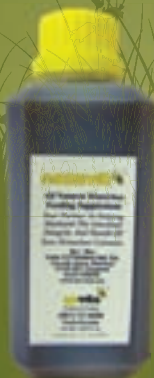
A graduate biologist and Honorary Fellow of the University of East Anglia, my career in the pharmaceutical industry involved start-ups, gaining wide international experience in marketing, business development, technical-scientific and management.

Are your bees healthy?

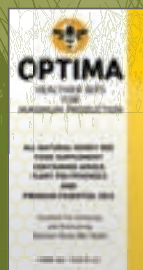
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New Executive Members

In addition to these new faces in the BBKA Executive we have Margaret Murdin and David Teasdale and they will be introduced to you in April BBKA News.

Ian Homer

My major interests are encouraging beekeepers to practice good bee husbandry and attempting to present beekeeping issues in a practical and straightforward way. I feel strongly that if beekeepers can develop a greater understanding of their bees, they will derive more pleasure from keeping them.



By profession, I am an electrical engineer but joined the National Bee Unit in 1999 as a Bee Inspector, initially working seasonally in Northumberland, Tyne and Wear and Co. Durham, then in Devon and, from 2003 until June 2009, as the Regional Bee Inspector for Southern England. From then, until retirement

from the NBU in August 2011, I shared a new role as Extension and Learning Officer with former National Bee Inspector, Richard Ball. Over the last twelve years I have provided around 300 talks, demonstrations and apiary meetings for local associations, spoken at numerous conventions around the country and was the speaker on the Scottish Autumn Lecture Tour in 2011.

My wife Ruth (who first kept bees at age nine) taught me my beekeeping and, together, we have kept an average of twelve colonies over the last 32 years, in both Dorset and in Northumberland. Having achieved the Basic Certificate in 1996 I embarked on the theory modules which, for a variety of family reasons, took twelve years to complete. I successfully took the General Husbandry Assessment last year and this year I intend to take the Advanced Husbandry Assessment. I am also aiming to take the National Diploma in Beekeeping (NDB), but only when I am ready!

Peter Sutcliffe

I started beekeeping in Suffolk in the eighties, and then moved with the bees to Cheshire in 1991. Although I have always tried to be a competent and informed beekeeper, the hobby took second place to my job as Deputy Head of a large comprehensive school, and I look back on the first twenty years of my beekeeping as constituting about five years of real experience!



In recent years we have expanded to twenty hives in four different apiaries. Similarly, I have tried to expand my theoretical and practical knowledge, progressing through the BBKA Modules and, last year, the General Husbandry Assessment. I now work as a tutor for the BBKA Correspondence Course, trying to repay the help that I received.

I am active in the Cheshire BKA as magazine editor, librarian and archivist, and chairman of my branch.

My background in teaching and examining, together with my experiences going through the BBKA Modules, led me to join the BBKA Examinations Board. I am very conscious that we have a very developed examination system with an under-developed system of training towards those exams, which is now stretched to breaking point by the number of new members. I have therefore become involved in an initiative to improve and coordinate the provision of 'in service' support for beekeepers.

Diary of Events 2012

3 March. Bucks County Beekeepers 16th annual seminar. Not just beekeeping. Further information: 01494 726616; Email: richard.catton1@ntlworld.com.

10 March. Cambridgeshire Seminar. Norman Carreck, Professor Andrew Bourke, Catherine Thompson. Tickets £19.50, (includes lunch and refreshments). Info: David J Abson, 6 Ascham Lane, Whittlesford, CB22 4NT (01223-834-620), SAE appreciated.

17 March. A training event for association committee members, York College, York. Free event. Information from Bill Cadmore, bill.cadmore@ntlworld.com or tel: 0113 216 0482..

24 March. Eastbourne BKA, Beginning Beekeeping Day a one-day introduction to beekeeping. Details and booking contact: jonathan@iwoodplace.wanadoo.co.uk or 01435 830124

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

31 March. North East Beekeeping Convention. Great North (Hancock) Museum, Newcastle 9am–5.30pm. Speakers: Professor Francis Ratnieks, Tony Jefferson and Dr. Jeri Wright. Information and application forms from www.nebees.org.

31 March. Kingston BKA. Start of a six-week Beginners Practical Beekeeping course on Saturdays, 2–4pm at Hampton Court Apiary. Course cost £50. Contact Membership Secretary for more details at <http://kingstonbeekeepers.org.uk/contact.us>.

14 April. West Sussex BKA Annual Bee Market & Auction, Brinsbury Campus, Pulborough. Info: Graham Elliott 01403 752 493, grahammt@tiscali.co.uk or www.bbka.org.uk/local/westsussex

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

28–29 April. Southport & Formby Beekeepers. Two-day introduction to beekeeping course, £100. Merchant Taylors' Boys' School, Crosby, Liverpool L23 0QP. Details: julie285@gmail.com.

5 May. Meon Valley BKA. Bees and beekeeping equipment auction at The Greatham Village Hall, Liss, Hampshire. Entries to be received by 19 April. Details: Bruce Taylor 01489 895428 or Bruce.Taylor@tiscali.co.uk.

13 May. Yalding and District BKA – Honey Bee Fayre and Auction. Fayre opens 10am to 4:30pm, auction starts at 2:30pm. Free entry. More information: www.beefayre.yaldingbeekeepers.co.uk

7–9 June. Royal Cornwall Show, Wadebridge. Schedules available from Sheila Sleeman, 01872 863842.

Business Corner

From The Boardroom

As is the usual custom the new Executive got down to business and held their first Executive meeting one week after the Annual Delegates' Meeting. This year almost half the Executive consists of newly elected trustees and so there was much to be done to ensure no break in the BBKA's operation. To facilitate this, for the first time, all trustees attended an induction session to brief themselves about the obligations and responsibilities of a BBKA trustee. The session was a great success.

The BBKA is a significant organisation in terms of the funds it handles and the scope of its activities. This has required the association to adapt and change over the years and the new Executive was asked to consider how to manage the changes necessary for the BBKA to deal successfully with the business and improve its services to members. As usual members will be kept informed of progress in the coming months.

Members will be aware of the increase in BBKA activities involving education and training, and activities associated with these areas account for a significant part of BBKA resources at the present time. The effective management of these resources is vital and the second major topic discussed by the Executive was the evolution of its strategy on education and training. This is a big topic and the Executive are keen to consult with the membership to hear of members' requirements and aspirations for their charity and how we can deliver them. We acknowledge and appreciate all the achievements of the previous Executive and wish to record our thanks to the outgoing President, Chair and trustees.

Dr David Aston, BBKA Chairman



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BBKA Assessments

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Alan Brown, Pontefract, South Yorkshire

Successful Candidates for the Microscopy Certificate

Janet Bates, Ravenshead, Nottinghamshire
Margaret Embleton, Malvern, Worcestershire
Jonathan Friend, Axbridge, Somerset
Reginald Godwin, Holsworthy, Devon
Philip Green, Earls Croome, Worcestershire
Keren Green, Earls Croome, Worcestershire
Gareth Morgan, Wandsworth Common, London
Martin Porter, Suckley, Worcestershire
Michael Sealey, Bridgwater, Somerset
Mary Walter, Leominster, Herefordshire
Alan Woolhead, Wychbold, Worcestershire

Master Beekeepers qualifying in 2011

Daniel Basterfield, Colyton, Devon
Paul Curtis, Wrexham, Clwyd
Kenneth Edwards, Spaxton, Somerset
Gail Johnson, Dulverton, Somerset
Adam Leitch, Reigate, Surrey
Robert Maurer, Redhill, Surrey
Joanna Schup, Dobsons Bridge, Shropshire

Congratulations to these successful beekeepers!

Val Francis, BBKA Exam Board Secretary



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New Initiatives

As we enter the beekeeping season, I am pleased to announce that we are launching new fundraising initiatives to enable us to generate funds, which will primarily go toward the research into honey bee health.

WBC Collection Boxes. We have ordered one for every branch of the BBKA, and it is a fantastic kit, which comes you to with everything you need to get started. WBC hive, security seals, graphics, *Pocket Guide to the Honey Bee*, literature dispenser and instructions. The Pocket Guide provides information on the world of the honey bee and for just £1 donation represents good value for money. Order yours today from Letitia at admin@britishbeekeepers.com and collect it at the BBKA Spring Convention.



Pollination Dating. This scheme links land owners with suitable sites with BBKA members looking for pollination sites on which to keep hives. Free to members and just £5 for landowners. The scheme will launch mid March.



New Corporate Supporter Initiatives. We are introducing various levels for corporates that wish to support and aid us in our activities. If you know of a company wishing to get involved please ask them to contact Jane.Moseley@bbka.org.uk.



Friends of the Honey Bee is a new fundraising scheme which engages with the general public. Benefits include a welcome pack of goods and a newsletter. The scheme launches this spring, more about this in April BBKA News.

And finally, **SwarmWatch** will launch this season raising public awareness of the importance of swarms and describing how to identify them. This campaign will support our Swarm Collectors featured on www.BBKA.org.uk, and with your support, it will help us to gain a clear idea of how many swarms we collect throughout the season.

Jane Moseley, BBKA Operations Director and General Secretary



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Prize Winners Announced

The lucky winner of the Membership Survey Prize draw was Mike Dorricott from Farnham in Surrey who receives £250 of B & Q vouchers.

And the winner of £100 of Thornes vouchers in the the Arnia draw was Ed Newman.

Your Letters



Daffodils

Last year Adrian Davis commented that honey bees will only work daffodils if there is a dearth of forage.

These photos, taken in the garden in Dorset on 12 February 2011 within a twelve minute period show that



this is not the case. The honey bee gathering pollen is clear to see. It does raise questions over

the hypothesis that lycorine is a deterrent to honey bees. Of course it could be that this particular bee was away from the class the day they did that particular part of the syllabus and so did not know about lycorine!

Ian Homer, Dorset

Solar Wax Extractor

I thoroughly enjoyed the article by Dr Chris Coulson about constructing a solar wax extractor, which will be an invaluable source of reference during the building of my own piece of kit over the next few weeks. There is one word of caution which I think you might wish to consider. The use of a supermarket trolley, even 'an old' one is probably theft in as much that old supermarket trolleys are recycled via commercial arrangements by their owners and are not sold to beekeepers or others. Even if it is a 'rescued' trolley from, say, a canal, local community tip, or just 'lost', the ownership remains with the supermarket. As these trolleys cost over £100 when new they represent a considerable investment by retailers and thus 'shrinkage' of their stock is viewed extremely seriously. I would therefore suggest a simple solution; use a pair of swivelling castors; Axminster Tool Centre has 50mm ones for £5.30/pair and construct a removal prop to hold the extractor in position. A handle can be fixed to the other end and used to move the extractor around. A white disabled bathroom rail would be ideal and can be purchased on eBay for less than £5.00.

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Allan Clark, Romsey BKA



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