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## So what's Plan Bee?

They are nature's most productive workers, the farmer's friend and the essence of wholesome country life. But within a decade Britain's honeybee could be extinct. Simon Garfield meets the keepers battling a killer disease that's already wiped out a third of America's colonies – and now threatens our own

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**Simon Garfield**

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Bee Keeper Brian Durk with his Assistant. Photograph: Andy Hall

Beekeeping, once the lazy hobby of men and women in summer hats, has become the preserve of entomologists, epidemiologists, propagandists and technical specialists. It has also become an occupation for the not badly off, particularly if one is in the market for the WBC Starter Kit. The WBC - a traditional, double-walled hive with a sloping roof, which makes it safe from bad weather and woodpeckers - has been hard to beat for more than a century, each one coming as it does in cedar, with one lift that has a porch, two lifts with a roof, a brood chamber with 10 frames, a steel queen excluder, a 'super' with 10 frames and a crown board. The £500 kit also includes a bee suit, gloves, a stainless-steel smoker, smoker string, a stainless steel hive tool, four pints of rapid feeder and the Guide to Bees and Honey by Ted Hooper.

But the starter kit does not include bees, and for those one has to travel to such events as the Gloucestershire Beekeepers Association's annual open day and auction, held earlier this month at Hartpury College, an old agricultural school. In a field at the back, well away from the crowds and bacon bap van, are 15 sets of 'nucs', or nucleus starter sets of bees. These are small boxes crammed with up to 10,000 industrious insects and a queen, and will provide a good basis for a beginner. Manage this lot well, keep them free from disease, and you can have a hobby that will provide the time-tested antidote to stress and modern life. That at least is the idyll, and not just for rural folk. Many townspeople now also keep bees on allotments and terraces. For if we can avoid their sting, and they are not aggressive unless provoked, we have always welcomed bees and what they do.

They are the subject of nostalgia, the essence of a sweet summer. They are tirelessly productive, and as such are one of the few insects we trust enough to put into advertising campaigns. They have provided us with a useful terminology: we are busy as a bee, the place is abuzz, Angelina Jolie has been stung lips, the first word announcing we're home is 'honey'. Their closest competitors are singularly unpleasant: waspish.

Elsewhere at this open day there is a stall run by Maisemore Apiaries, who will not only sell you the starter kit but also the chemical treatments to ensure it

'Some of it is rubbish,' the manager of the auction, Jeff Bee, tells me, 'and some of it is extremely useful.' As one walks among the rows of 550 lots displayed in a courtyard, it is not immediately apparent which is which, such is the array of old gas canisters, battered hives, bee veils with holes in them and slabs of wickless wax. The most appealing thing to browsers who are just starting out - and there are quite a few of these, including several young couples looking for a joint hobby now that their gallivanting days are over - are the boxes of thick-drenched honeycomb that lie sweating in plastic containers. This is the end-product; people who admire it, or at least those with experience, speak of how difficult it is to make a lot of honey these days, such is the daily battle they face against blood-sucking varroa mites and viruses, and something they refer to with horror as CCD. This is not part of the usual carefree repertoire of the beekeeper's life. Clearly there is something wrong in bee world.

A short walk from the auction, a highly regarded beekeeper called Clive de Bruyn (pronounced "Brain") was giving an engaging talk about the traumas of bee husbandry in 2008. De Bruyn has been keeping bees for 25 years in 11 different counties, and he tried to put a positive spin on things. 'I think I was asked to talk about varroa disease,' he began. 'But I said no. And then I was asked to talk about other disease and I said no.' He said he was going to talk about maintaining bees in spite of varroa, because it was important not to stress the negative side of beekeeping. But in the 45-minute talk that followed, disease was everywhere.

'I've had varroa in my hives since 1992,' de Bruyn said, 'and I've never knowingly lost a colony because of it.' He said that out of his 200 colonies last year he lost only 16, which was regarded as a good tally, certainly compared to the devastation many apiarists suffered in the United States.

Varroa is not new, but it is prevalent and worrying. When de Bruyn contributed to the New Varroa Handbook in 1993, most British beekeepers saw it as a distant threat from abroad. But bees have wings and are imported, and varroa travels on other insects as well, and it would be uncommon for a large hive not to be infected. The mite, which is a leeching parasite that hooks on to the bee's body, is now so prevalent that it has become resistant to the most common form of chemical treatment.

De Bruyn commented on feeding bees pollen supplements to boost honey production, and on how we exploit bees to our own ends by keeping them in stressful conditions. 'Learn what's normal,' he implored. 'Eggs in the right place, the expanding nest, healthy sealed cells, larvae looking juicy and pearly white... if you don't know what's normal, how will you know when things are wrong?'

When he sensed that his audience might be losing concentration in the mid-morning heat he asked them to name other adult bee diseases. The response was sluggish, but then the names emerged: nosema, bee paralysis, sacbrood virus, brood diseases caused by bacteria such as European foul brood and American foul brood. Then there was the potential catastrophe of the acronym CCD, the cause or symptoms of which no one claimed to fully understand, but whose name suggested a sort of bee Armageddon: Colony Collapse Disorder. But the problem with bees should not just be of concern to those gathered in a small English lecture hall, but a matter for us all. The question of dwindling honey supplies is one thing, but the greater threat is to apples, pears, raspberries, cherries, strawberries, blackcurrants, broad and runner beans and oilseed rape, and about 20 other crops dependent on insects for pollination. For bees are not just part of the foodchain; they are its clasp.

In the last few months, the British Beekeepers' Association (BBKA), which claims almost 12,000 members, has begun speaking words of doom. 'Nation's honeybees could be wiped out in 10 years' the organisation claimed in December. 'The British Beekeepers' Association has alerted the government and we want action. BBKA will launch a campaign to make sure this action happens.' To date, the campaign has raised public awareness but has achieved no increase in government funding. 'Defra [the Department for Environment,

One of his problems is that his members are seen as eccentrics engaged in a haphazard activity. Some are. But there are about 240,000 colonies of bees in the UK, managed by 44,000 keepers, a ratio that suggests the amateur plays almost as significant a role in honey production and pollination as the professional. In 2001, it was estimated that the value of bees to pollination in England - the boost in crop production - was £120m, a figure that the BBKA has now revised to £165m in the UK. (The plight of the bumblebee should also be recognised: Britain's changing landscape, not least our love of silage and decking, has led to the extinction of three of 25 species and a threat to seven others; orchard pollination will have suffered as a result.)

The BBKA lives a multi-tasking life. It is a repository of fun facts (on average, a hive produces 55lb of honey per year, making a total of 6,000 tonnes in the UK annually - about 20 per cent of the honey we consume; to collect a pound of honey, a bee can fly a distance equivalent to flying twice around the world, visiting flowers more than 10,000 times - for more facts, see box below.) It acts as cheerleader for the novice (what to do when bees escape the hive and swarm around your garden) and hosts a blog for the worried ('Despite me having put up an extra fence and having the bees at the end of the garden on the far side from her, the mad neighbour came round with an inflamed eye tonight'). The BBKA also offers disease insurance and other services, and it campaigns for more research into those things that threaten its existence. Membership has increased by almost 4,000 over the past seven years, boosted by younger enthusiasts in cities. 'The real problem is, you can no longer be an amateur in the old casual sense,' Lovett says. 'If you are, you lose your bees.'

Lovett is disappointed that several acidic treatments which were effective against disease in the Nineties have now been banned by EU directives. He is worried that the funding allocated for bee research by the government - £200,000 - has remained the same over the past five years. In total, the government spends £1.2m on bee health each year, the vast majority of this on bee inspectors. 'You could argue that the inspectors will be finding things we might have prevented,' Lovett says.

A few days after I met Lovett, a parliamentary select committee gathered to discuss Defra's priorities, and heard oral evidence from Helen Ghosh, the department's permanent secretary and its most senior civil servant. The minutes from the meeting confirmed many beekeeper's worst fears.

Ms Ghosh: 'I am sorry, I am not a technician on this. I do not think that particular disease is rampant.'

Mr James Gray, MP for North Wiltshire: 'You cannot be serious. We have had debates on this in the House of Commons. Varroa bacilli is by far the biggest threat facing the bee population in the world. It is a massive problem here in England and you are telling me that your bee lot are not focusing on varroa. I find that absolutely astonishing.'

A Defra minister subsequently appeared on Radio 4's Farming Today suggesting that Ghosh may have been under-briefed, but that funding was entirely adequate for the current conditions. By contrast, the BBKA is asking for £8m to be spent on bee research in the next five years, reasoning that this is a small sum compared to the estimated £800m that bees will contribute to the economy over the same period. Lovett met with Lord Rooker, the Minister for Sustainable Food and Farming and Animal Health, but he was disappointed. 'He could have wrapped the wool around us and said, "We'll see," but he turned us down flat, and that's when we said, "Right - a campaign."'

In the past few weeks, Lovett's criticisms of the government have gelled into the alarmist prospect of bees disappearing within a decade, a claim that has been voiced in parliament. 'We've received so much support,' Lovett says. 'It's not about planting pine trees in Panama - it's about doing something important here and now. But it is clear that the government is being extremely complacent.'

Lovett's organisation is not without its own critics. Graham White, a beekeeper and environmental writer living in Scotland, believes the BBKA itself has done much to damage beekeeping in this country by its endorsement of pesticides and sponsorship links with Bayer CropScience and Syngenta, and other

'It's an absolute bee emergency,' Manfred Hederer, president of the German Professional Beekeepers' Association, told Spiegel Online earlier this month. 'Fifty to 60 per cent of the bees have died, and some beekeepers have lost all their hives.'

White lost half of his hives to disease over the winter, and he is concerned that his hobby now demands a strong understanding of drugs and chemistry. 'Our brand as beekeepers used to represent wholesomeness and sweetness, and everything that's good about Britain,' he says, 'but that's almost gone now. Bees are like the canary in the coalmine - indicative that something is seriously wrong on a large scale.'

White suggests we are suffering from a 'globalisation of parasites,' and he observes that mites and diseases that once took centuries to cross continents are now appearing after only a few years. It is not just bees that are suffering, but all winged insects. 'We had about 12 years to prevent varroa before it came here from Germany, but we did nothing to stop bee imports. The BBKA didn't campaign to the government over that. Had it been foot and mouth we would have closed our borders immediately.' He says the situation is getting worse. He is finding it impossible to buy a British queen bee, but can easily obtain one from Turkey or Greece for £20, each with the potential of a native disease. He says he has heard that a new strain of the nosema fungus was recently discovered in Spanish hives landing at a British port. 'If that takes hold, we're finished.'

Already, the potential losses to British crop yields have a dangerous precedent. In the US, where almost a third of the bee population vanished last year due to CCD, disease and pesticides, the Californian almond crop, which produces half the world's supply, is under serious threat. Growers of Maine blueberries, Cape Cod cranberries and Florida melons, all of which are reliant on the importation of commercial honeybee colonies to boost pollination, have also been damaged. Farmers lost about 750,000 hives, and last year millions of bees were flown in from Australia to boost the crop yield, which still suffered an estimated drop in profits of \$2.5bn. Colony Collapse Disorder was diagnosed in 27 states, and of the many possible causes, varroa was considered the least likely. Instead, they suspect modern problems of our own making: pesticides, GM crops, the stress to bees of overwork and excessive transportation. There is no indication that the American yield will improve this year.

In Britain, we may also be losing a part of our island history. The honeybee, *Apis mellifera*, has been here for about 30m years. The author of *The Hive*, who is almost inevitably called Bee Wilson, has traced a bee-line from Mesolithic rocks, through Pliny, to Victorian factory models, to Honey Nut Loops, and suggests that our world would have survived without bees and honey - but only just. 'A little poetry would be missing,' she writes. 'From the earliest times, bee colonies supplied humans not just with some of life's luxuries, but also with food for the imagination. Peering into the glowing hexagonal rows of the bees' home, men thought they should look and learn. Here was not just something delicious to eat, but a little society in miniature.'

For how long will there be honey still for tea? The present bee story may not necessarily have a terrible ending. The outcry that has accompanied their plight has made us appreciate them more; with patience and training, and the measured use of medicine, we may yet reverse a trend. Bees may benefit from the back-to-the-earth/allotment movement, or the selfish realisation of how much we stand to lose. Big business could do worse than follow the lead of Haagen-Dazs, who have reacted to the threat of losing their ingredients by launching a bee-health awareness campaign and a new honey flavour. Call it opportunism and clever marketing; how much would have Ben & Jerry's loved to have done it first?

If ice cream doesn't do it, the genome project might. At the end of 2006, the project to sequence some 11,000 genes of the honeybee was completed at Baylor College of Medicine in Houston, enabling the identification of diseased tissue and the potential to develop genetic resistance against future ravages.

Colony Collapse Disorder may at last find both cause and treatment. One DNA sequencer working on the problem in New York City recently referred to his work as 'CSI for agriculture'.

Back at the Gloucestershire bee sale, the star items are being inspected by Dave Maslin, a seasonal bee inspector. Maslin is a large, slightly wheezy man who does not find it easy to bend down to puff calming smoke over the bee frames and inspect the brood. He says he can make 600 visits a year, and his main targets are European foul brood and American foul brood, but he is also looking for small hive beetle, a native of South Africa. 'If we find small hive beetle it will be very exciting,' he says.

The first box contains about 10,000 bees, and they look to be in good condition. The queen is evident and active, the comb healthy. But as he moves along the row, there is evidence of varroa in several boxes, and some of the small 'nuc' sets show neglect and advanced decay. 'Oh dear... oh my goodness,' Maslin says. 'This is what I would call less than satisfactory.' He finds wax moth, mouldy pollen, a crowded messy floor, bees with deformed wing virus. 'A sad state. I wouldn't spend an awful lot of money on this one.'

Next to Maslin, in a matching white suit and veil, is Mike Hunt, a beekeeper for 33 years who runs a training apiary for new keepers. Today he is serving as both security officer and appraiser of the quality of the bees for sale, and he ticks attributes on a chart: 'People deserve to know what they're buying,' he says, 'whether the queen is laying, what the stores are like, if the combs are covered with brood.' Hunt is a mild-mannered man, but he is passionate about his pastime. 'This government doesn't understand farming, full stop,' he says. 'They're living in a cuckoo world.' And then he echoes the views expressed a hundred times on this sunny day: 'The days of leave-alone beekeeping are long gone.'

The conversation turns to great stinging stories. 'I once got stung up my nose,' one white-suited man says. Another asks him, 'Did it make you cry with pain?'

The beekeepers are then joined by Robert Coombes, a local man with three boxes of bees to sell. 'I'm a working man [in medical supplies],' he says, 'but when I go to the bee meetings I'm on the same level as surgeons and judges.' He has a handwritten note lying by the side of each of his boxes that reads like a school report: 'Full of bees, queen clipped and marked yellow, healthy, quiet.'

At home he has 15 hives, and he now covers his costs. He says he keeps bees predominantly as a relaxant, but he also supplies his local shop with about 60 jars of honey each year. 'They just go. They make great gifts.'

A few hours later, at the end of the auction, Coombes's three sets of bees were sold for more than £100 each. Some of the less healthy boxes earlier in the sale only made £30. 'It was more than I was expecting,' Coombes told me a few days later. 'I don't know the people who bought them, but they can contact me if there are any problems. They were good bees. They should be fine.'

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#### A bug's life: the bee in numbers

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**70** Crops in the UK that are dependent on, or benefit from, pollinating visits from bees

**300** Species of bee in the UK. No two species are able to inter-mate. There's only one species of honeybee

**1** Queen bees in a typical colony

**70,000** Female worker bees in the average colony. Wild colonies are much smaller

**300** Male drones in a commercial colony

**1,300** Meals a worker bee larva is fed each day

**6-8** Weeks' life expectancy of a female worker bee

**2,000** Eggs a queen bee lays everyday – the equivalent to twice her bodyweight

**1** Flights a queen bee will make during her life

**20** Drones a queen will mate with during that flight

**5** Years a queen bee can store the sperm she collects from her single mating flight

**4** Miles radius within which a bee will fly from its hive - though few will stray so far

**22** A bee's top speed in miles per hour

**75** Kilos of honey a colony will consume for use as food and building material during the year

**500,000** Grains of pollen a bee will return with after a single foraging trip

**33** Degrees Celsius – the constant temperature at which bees maintain their hive all year round

**2,243** The largest recorded number of stings to a single person. He survived

**2.25** The size in metres of the largest honeycomb found source:  
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