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Karin Alton & Francis Ratnieks

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Roof Top Hives: Practical Beekeeping or Publicity Stunt?

By Karin Alton^{ID} and Francis Ratnieks

Working at the Laboratory of Apiculture and Social Insects (LASI) at the University of Sussex we receive all kinds of enquiries about bees and beekeeping. These range from someone's impractical idea for killing parasitic Varroa mites (for example, using laser beams at the hive entrance) to sensible queries about which plants to grow to provide nectar, how to control honey bee diseases, or how to get started in beekeeping.

One question that comes up regularly is the suitability of roofs for keeping hives. There are plenty of media and news stories that feature roof top hives. This probably reflects the fact that hives on the roof of a famous building in London make better publicity than backyard beekeeping in Luton. Organisations such as the London Stock Exchange, Fortnum & Mason, and The Royal Lancaster Hotel have installed apiaries on the roofs of their headquarters. The Scottish parliament building in Edinburgh very publicly installed a hive on their roof. Here the purpose seems to demonstrate their green credentials by helping to save the "endangered honey bee", as it is frequently referred to, even though the honey bee is a very common insect.

As a result of this media attention, many people may now think that roofs are ideal locations for keeping hives. But is this

actually the case? Here we address some of the advantages and disadvantages of keeping hives at ground level vs. on roofs. We also discuss issues regarding roof top beekeeping, including the desire of many organisations to showcase their "green" credentials via bee hives.

Bee Hives on Roofs: Beekeeping Considerations

Many of the challenges faced by a roof top urban beekeeper will be the same as experienced by beekeepers keeping hives at ground level, for example in a garden. Both locations require the beekeeper to carry out routine and seasonal management, including regular hive inspections, disease control, swarm prevention, honey harvesting, and winter preparation.

Most experienced beekeepers would prefer to keep hives at ground level vs. on roofs, because of convenience. Bee hive equipment is bulky and can be heavy. Moving a whole hive is often a two person job, and hive boxes filled with honey are never light. Carrying hives and beekeeping equipment across a garden or piece of flat land to a shed or vehicle is a lot easier than carrying the same items through buildings and onto a roof, especially when

the route includes stairs, lifts or even ladders.

Spring is a busy time for beekeepers, who make frequent inspections at this time of year. Spring is also the swarming season. Swarming is a natural part of a honey bee colony's reproductive cycle. Trained beekeepers take measures to prevent or stop swarming, but even a good beekeeper will lose some swarms. A prime swarm, which comprises about 2/3 of the bees in a hive, will normally settle within 20 yards of the hive in a bush and from there seek out a permanent nest site to move to within a few hours to a few days. One or more "after swarms" may also be produced in the next two weeks.

Swarms from roof top hives may descend to ground level and cause problems. Mark Patterson, of the London Beekeepers Association, recounts some examples. In 2013, a roof top hive on Air Street, near Piccadilly Circus, swarmed three times in 10 days, each time settling at ground level, disrupting local businesses, and leading to panic among shoppers. The first swarm caused a local city business to lose £4,000 in revenue by disrupting trade. The second swarm flew in through the entrance of an eating establishment, causing them to lose a whole day's trade. Diners fled the premises without paying for their meal.

Another problematic incident happened in 2014 when a swarm from hives near London Bridge alighted half way up Guys and St Thomas Hospital. In this instance, the swarm was too high up to retrieve. In May 2014, KPMG, a London accounting firm, added two hives to its 14 storey Canary Wharf roof top. In June of the next year, the colonies swarmed and settled 200 feet up a neighbouring sky scraper. Swarm collectors had to borrow a window washing platform to access them.

These incidents could have resulted from any urban hives, based on the ground or on a roof. But it is likely that ground hives would not have been kept in such built up and central areas. In addition, the fact that the Air Street hive swarmed 3 times (presumably one prime swarm and two





after swarms) shows that it had not been managed. The chance of following and retrieving a swarm of bees is probably significantly higher from a ground hive than a roof hive, particularly if on a tall building. Patterson, from his five years of experience collecting swarms in central London, suggests that swarms originating from ground hives usually settle within easy reach. But swarms from high up, although descending to lower heights, may still be too high to be reached by conventional methods. Abseiling down buildings, calling in the fire brigade, using window washing platforms and cherry pickers are all methods which have recently been used to access central London swarms originating from roof hives.

Some roof apiaries may be hard to access, and this will hinder a beekeeper from making regular inspections and carrying



out required hive management, whether for swarm prevention or anything else. However, limited access may also reduce the risk of both vandalism and theft. Beekeeping equipment is costly and thefts are frequently reported in the media. Vandalism is probably the greater problem.

The first challenge facing most would-be roof beekeepers is finding an appropriate location, as few will have a suitable roof of their own. Roof apiaries are also often used by organisations. For both private and organisational beekeepers, the choice between ground and roof hives may depend on where you are located. In central areas of major cities, such as New York and London, ground level locations may be in short supply. But many organisations could have ground hives. The Body Shop Foundation headquarters is in Littlehampton, and in the extensive grounds around the main building they have established a normal ground-level apiary.

Once a potential building has been identified, gaining permission is the next step. James Fischer, a leading beekeeper and educator of New York City Beekeeping, notes that this may first require negotiations with the building owner. Once permission is obtained, you still need to have access to the roof apiary. In some cases this means first finding the janitor or manager to unlock the access route. This can be problematic if an individual with appropriate access credentials must be located every time a visit is made.

One of us (FR) did keep hives on a small roof adjoining his office in Giannini Hall on the campus of the University of California at Berkeley. It was quite a challenge to relocate the hives. They had to be taken to the top floor in the small elevator, which was done in the evening when few people were around, and then passed through the window. The reason the hives were kept there, rather than in the main apiary 2 miles away, was because they were being used in an experiment which required a brief hive inspection several times per day over a long time period.

In his book, *The Urban Beekeeper*, Steve Benbow recounts being stuck in a lift with a hive leaking bees, resulting in him getting stung many times. He also describes the effort needed to carry hives up to the roof of the Tate Modern art gallery building in central London via a labyrinth of chambers, lifts and corridors, before a final ascent up four long flights of stairs onto the roof. When a honey crop is made, heavy hive boxes full of

honey must be carried down. Jo Hemesley of the Lancaster Hotel agrees, commenting "The apiary is located on the office roof, accessed by a vertical ladder from the car park – so in practical terms this can prove a little challenging to get equipment to and from the apiary. Especially during the harvest." Most beekeepers would consider climbing vertical ladders carrying beekeeping equipment and even hives as impractical, dangerous or even impossible. But there are always people willing to climb Mount Everest, just because the challenge is there. Most commercial beekeepers consider an apiary location to be unsuitable unless it has full vehicle access. But for some people their reward is in the effort they make overcoming obstacles, as much as in the harvest.

Safety is also a concern. Roofs are inherently hazardous locations due to the risk of falling. Are there guard rails? Is the roof slippery? Falling items may also harm people at ground level. Roofs themselves can be damaged by beekeeping. Even if the roof is structurally strong, is it sufficiently durable to handle beekeepers walking around? Many roof coverings, such as mineral felt, are not designed for foot traffic. Would dead bees and beekeeping debris clog up drains, increasing the risk of leaks? Some roofs however, are designed for more than just keeping the rain out. The Fogg Building at Queen Mary University in London houses the biology department. The roof, 5 stories up, has greenhouses, ecology experiments using pots and tanks, and even an apiary. It is designed for this, with access via a door, sturdy concrete construction, and a low perimeter wall with guard rails. The apiary is located in a corner, where it is shielded from other roof using biologists, and as a bonus has a great view. At Queen Mary, it would be hard to do bee research without this roof apiary.

Roof hives may also inconvenience other people who need access to the roof, either for maintenance of the roof itself or of air conditioning equipment, TV antennae, and utility cables etc. located there. Roofs may also be used for dining, sunbathing, or growing plants, and people who enjoy roof access not wish to have their use curtailed by stinging insects that most people fear. Bee inspectors may also need access. Although bee inspectors would not be afraid of the bees, they might be put off by difficult access.

Roof hives will usually be subject to more extreme environmental conditions than ground hives. One British beekeeper who had taken the precaution of placing 15 kg

weights on his strapped-down roof hives reported that during a storm they were almost blown off their stands. At ground level this is not dangerous (although not good for the colonies), but on a roof it could result in hives or parts of hives falling off the roof. Some roof top beekeepers, including the beekeeper at the Scottish Parliament building in Edinburgh, move their hives to ground apiaries for winter.

Honey bee colonies at any height or location need water, which they use to cool the nest and as part of their diet. New York City beekeeper James Fischer suggests that most suburban or urban beekeeping problems start with unwanted water collecting bees appearing at dripping outdoor taps, ponds, Jacuzzis, and swimming pools. In NYC, a beekeeper who neglects hive water requirements can be reprimanded or fined. In our own lab apiary, on the University of Sussex campus, we use large plastic tubs with aquatic plants in them. The bees can easily gather water without drowning or going to sources used by people. Hives in rural areas can usually use existing water sources without causing problems. In the 2nd Street District of Austin, Texas, 10 roof top hives on the 37-story Block 21 building must be shaded and regularly misted with water to prevent heat damage. To ensure colony survival, the hives are rotated with other hives and rural locations. Walter Schumacher, the beekeeper, relocates the hives so the bees can have “respite from honey production”.

What Do the Bees Want?

So much for the beekeeper and beekeeping. What about the bees themselves? Are roofs suitable locations to keep bee hives? Do bees prefer a certain nest height? And how will extreme weather conditions affect colonies placed on roofs?

Living at ground level is not natural for honey bee colonies. Tom Seeley, a honey bee biologist and Professor at Cornell University in New York State, has shown that swarms have clear nest site preferences. By attaching plywood nest boxes, known as bait hives, in various combinations to adjacent trees he has shown that cavities of 40 L attract more swarms than smaller (10 L) or larger (100 L) cavities. Swarms also reject cavities that have entrances that are very large or small, and prefer south facing vs. north facing entrances. Swarms are picky. Professor Seeley’s research has also shown that swarms also select bait hives 5 m above ground vs. 1 m.

Close to Cornell University is a large forest, the Arnot Forest, in which Professor Seeley has carried out research on the wild honey bee colonies that nest there at a low density in hollow trees. Finding the colonies is challenging, but possible using an old technique called bee lining in which foraging worker honey bees are captured and fed with syrup at a feeder. By observing the direction that the departing bees fly, and by progressively moving the feeder in that direction, the nest can eventually be located. Overall, he has discovered many nests in the forest by bee lining. Interestingly, the average height was 9.7 m, with a range of 5.3–17.3 m. By contrast, wild nests in the Cornell area, which he has been shown by local people who have discovered them, have an average height of only 3.0 m, with a range of 0.2–5.7 m. It seems there are many wild honey bee nests above the heights that humans easily observe them. Bee lining lets us find high up colonies as easily as those lower down.

From Professor Seeley’s work it seems that honey bee colonies would prefer to nest at approximately the height of the roof of a 1–3 storey building. He is not sure why swarms prefer to nest above ground level, and thinks it may be as protection against bears (or even humans), or that height in some way helps overwintering perhaps by making it easier to take wintertime cleansing flights in the cold New York climate.

Because honey bee swarms only select quite large volume cavities, the fact that the highest natural nest found by Professor Seeley was at 17.3 m, the height of a 5-storey building, does not necessarily mean that swarms have an aversion to even greater heights. It may simply mean that suitably large tree cavities are not common high up, given that trunks and branches get smaller and younger the higher they are from the ground, both of which would reduce the chance that cavities large enough for honey bee colonies will form.

Currently we do not know if height per se is a problem for honey bee colonies. To a bee, flying level or flying vertical, should be about equally difficult, as air resistance, not gravity, will be the main thing to overcome. All things being equal, if a bee has to fly an extra 10 m or even 100 m to get to a roof top this is probably of rather little consequence given that honey bees can forage as far as 12 km from their hive, and routinely fly a kilometre or more. Indeed, when bees are flying they do not fly at ground level but several metres or more above the ground. It is more likely the environmental factors that come with height, such as increased wind exposure,

will cause harm. In urban areas, buildings may cause the wind to form unusual draughts and eddies. In a forest, colonies living in tree hollows may not be greatly affected by the wind even if quite high up provided that there are even higher trees and branches to provide shelter. Many areas are hilly, and bees may often need to fly up or down by hundreds of metres between their nest and foraging locations.

James Fischer believes that locations high on buildings make life difficult for honey bee colonies. He is of the opinion that hives above 10 stories are “speculative ventures”, and hives at 15 and above, are on “life support”. Fischer, a roof top beekeeper of 10 years, concludes that given a choice, he would much prefer back yard beekeeping. As beekeepers, we would rather keep hives at ground level as it makes things so much easier and more practical. The honey bees probably don’t mind too much if their hive is up a few storeys high, as in nature they often live that high in a tree cavity. But buildings and trees are not the same. Beekeepers know that windy locations are not good for ground-level apiaries, and many roof tops are very windy. But it is not impossible that living in hives high above ground level may interfere with honey bee navigation to and from flowers. As we scientists say, more research is needed.

Helping Bees or Beewash?

In the UK, hives are not only placed on roofs, but also on very high roofs, and often on iconic buildings. Installing high rise hives could well be a growing trend. The hives located on St. Paul’s Cathedral enjoy a panoramic view of London from 52 metres up. Putting honey bee hives on international banks, restaurants, hotels and businesses has attracted a great deal of attention in the press. Some of these projects have been initiated by well-meaning executives or staff members under the impression that this would help our declining bee population. But what is the real motivation? Is it to help bees or is it more of a public relations exercise?

For commercial beekeepers, urban hives may be good for business. Pots containing 250 g of London honey now retail at £10.00 a jar, compared to £5 for 1 lb (454 g) jars of Leicestershire honey, or even Worcestershire honey for sale in 30 lb buckets at £2.75 per lb, which is still much greater than the cost of imported honey that can be purchased for just £1.45 per pound at a supermarket. Honey from

hives on famous buildings, is reckoned to be worth double according to Fischer.

In 2011 Magners, the Irish cider producer, as part of a campaign to “save Britain’s 1.5 million urban honey bees”, placed a hive on Regis House 160 feet above London Bridge. It also offered 25 Magners’ Facebook fans the chance to become urban beekeepers with their own bee hive and beekeeping equipment. Was this just a marketing initiative to promote their project, with the link to bees being provided by the fact that apples need pollination? When we contacted Magners in July 2014 for an update, no information regarding the bee campaign was known. In any event, giving away hives is no way to help honey bees. Many towns, and especially London, probably have as many hives as the available flowers can support. By encouraging people with no experience to take up beekeeping, and by increasing the numbers of bees that need to be fed, initiatives like this increase the risk of spreading bee diseases, annoying neighbours, and overstocking an area with bees.

The media continues to be peppered with news articles detailing how companies and organisations install 20,000–40,000 bees (i.e., one or two hives) on their roof top in the hope of “saving” honey bees. Examples include the London Stock Exchange (The Independent, August 2011) and a city hotel in Bristol (WalesOnline in August 2013). In June 2014 the BBC reported that the Scottish Parliament now has a hive of bees on its roof and included a photograph of no less than seven press photographers, all dressed up in nice new bee suits, cameras poised to record this momentous occasion. At our lab, we have been visited by a number of local MPs who have represented Labour, Conservative, Liberal Democrat, and Green Parties, all expressing their interest in bees. Bees are a potent symbol of threatened nature, and “helping” the “endangered” honey bee a good way to boost green credentials. One cannot help but be cynical that the real motivation for the hive on the Scottish Parliament building was simply to give politicians a better image. As a way of helping honey bees it is of no value, and may well have had the unintended consequence of reinforcing the now widely held impression that politicians seem more concerned with spin over substance.

In November 2014, the UK government followed suit. A bee hive was hastily placed on the roof of the Environment Department’s

(DEFRA’s) Central London building the day before the release of the National Pollinator Strategy (NPS)! DEFRA stated that it was making its own contribution to combat bee declines by installing hives on the roof top. The London Beekeepers Association, concerned about the limited amount of available forage in Central London, declined to assist with this venture. It is noteworthy that beekeeper groups are generally side-lined in these schemes. The reality of beekeeping is often less attractive than the dream. It is ironic, and also quite revealing, that a quixotic token gesture was made to coincide with the unveiling of the NPS.

The Lancaster Hotel in London has roof hives, originally installed in 2009, although colony numbers have fluctuated over the years. The idea apparently originated from the company’s corporate social responsibility programme to help signify the “right on” attitude of the business to the environment, and, of course, to publicise it. However, the staff who joined the beekeeping team report genuine benefits. It has allowed them some contact time with nature, something unusual in a big city. However, they have also found that beekeeping is not easy, as all their hives were dead when we contacted them in spring 2014.

KPMG, a leading provider of audit and tax advisory services, installed hives to demonstrate their support for biodiversity in the local community. Marianne Fallon, UK Head of Corporate Affairs at KPMG said “This project is a logical next step using the green roofs which crown many of the buildings across Canary Wharf,” and added that KPMG are keen to increase the number of bees in London. KPMG have also hosted a series of seminars across the country to educate their employees on what they can do in their own gardens, and they have also committed to something that would actually help bees: planting pollinator friendly plants across their estate.

Given that London probably has more than enough hives already, it might have been better if KPMG had simply focused on more flowers rather than more hives. Other businesses have taken this approach to helping bees and other pollinating insects by encouraging the planting of bee forage. Ashurst, an international law firm, did this by placing two empty hives on a balcony near the company’s reception desk to highlight that more bees in Central London were not needed. Ashurst are keen to focus not only on pollinator food and nest site requirements, but also to engage with their staff and the general


public about issues affecting bees. Ashurst, breaking with what appears to be common practise, chose not to draft a press release bragging about their activities, but instead support beekeeper training and planting projects with the London Beekeepers Association.

In conclusion, roof hives are not a single phenomenon. They range from the extremes of being a practical and understandable response by beekeepers to a shortage of apiary sites in urban areas to what might be called “bee wash” – misguided attempts to help the “threatened” honey bee, which appear to be largely motivated by the desire of an organisation to show its green credentials, with bee hives being a handy way of doing this. It is perhaps to be expected, therefore, that parliament buildings have been involved.

With the surge of interest in urban sustainability, food security, the environment, and many other important issues, it is not surprising that urban beekeeping is becoming increasingly popular. Bees are now an environmental symbol and people want to join the band wagon. Cities, with their many gardens, allotments, parks, and waste land, can provide the pollen and nectar needed to support honey bees as well as many other species of bees and flower-visiting insects. However, one should always question the motivation for keeping or promoting bees. Beekeeping is an activity that can be very interesting and rewarding. But it can also negatively impact other people, and when there are too many hives in an area adding more will also negatively impact existing beekeepers and bees. Keeping hives on roofs appears to be more about the needs of people and organisations. At the organisation level it appears often to be a way of showing green credentials and social responsibility, by boosting the population of the “threatened” honey bee. But placing additional hives in locations which might already be more than sufficiently stocked with honey bee colonies will not help bee decline (Alton & Ratnieks, 2013).

Reference

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Karin Alton and Francis Ratnieks
Laboratory of Apiculture and Social Insects, University of Sussex, BN1 9QG, UK
Email: karin.alton@sussex.ac.uk
 <http://orcid.org/0000-0002-7870-4804>