

CORRESPONDENCE

Observations of a wingless Bumblebee Queen

In early April 2017, I found a wingless Large Earth Bumblebee queen, and I could not have foreseen at the time that she would stay with me until September. Here I describe my observations made during this time, and the bond formed between us that would never have materialised had she been able to fly. I am neither a scientist or bumblebee expert, but I suspect my observations may be of interest to the community of entomologists.

Found early in April on a particularly wet and windy day, she looked rather poorly, being both cold and damp, so I gently picked her up and gave her a sugary water mixture and then left her sheltering in a patch of heather in my garden. I checked on her some hours later, expecting her to have crawled off, but she remained in the same place looking not much better, so I took her indoors that night due to the inclement weather. I kept her in the house for a few days, under a domed mesh cover with a base measurement of 30x30cm. Inside was a plastic box containing a piece of black soft cotton for her to hide, as well as a shallow plastic lid with sugar water. During these days, I contacted the Bumblebee Conservation Trust to enquire as to why she had no wings. I was informed that it may be Deformed Wing Virus, a disease that causes bees to emerge from the pupae with crippled or extremely reduced wings. I have since learned that there could be other causes as well after being in contact with Prof. Lars Chittka (Queen Mary University of London). It is because of my correspondence with Professor Chittka that I find myself writing this piece in which I will try to remain objective! This is quite difficult as Bee, as I named her, actually became my little pet.

I set up a garden for her in a large crate and covered it with a net to keep other bees from pinching her pollen and nectar. I provided her with sugary water and carried her to the wild flowers and brought wild flowers to her. The garden was not fully escape proof, but I felt that I had to take a chance and give her the opportunity of living as normal a life as possible. However, on the first day I put her in it, she disappeared from the enclosure!

I thought that this was the end of the story and that I had tried my best. Three days later she emerged, looking somewhat dishevelled and I and my husband were overjoyed to see her! She was thirsty, so she came onto my hand straight away and I let her drink some sugary water from my finger. Drinking from my finger was something she had done right from the very beginning. If I did not know before, then from this day I knew that I was responsible for the wellbeing of this bee.



Bee never behaved to me as if she felt threatened or aggressive. At no point did Bee attempt to sting me and the only time she lifted her middle leg (a defensive posture) was perhaps when I moved just a bit too quickly into her space. She was always shown respect but I have no fear of bumblebees so perhaps she felt this. Can bees sense your fear? Perhaps. It was noticeable that when other people took Bee in their hand, she appeared anxious to return to my hand, perhaps because of the familiar scent.

Being naturally sociable, she would sometimes look a bit “down” when she had been left on her own for a number of hours. One time was when I came home from work having left her in her garden, I went to look for her. I couldn’t find her at first and stood back to watch for a minute or so. Sure enough, she had felt the vibration and came out looking all bright and expectant with her antennae up and forward. She was neither hungry or thirsty but climbed into the palm of my hand and had a snuggle! On another occasion she was left for a while in her indoor retreat as the weather was dreadful. She was sitting with her back to me, so I scratched nearby so as not to frighten her and immediately it was as if her whole being lit up and she came right to me. She did spend a lot of time snuggled in my hand. I think that she probably appreciated the warmth and perhaps the natural rhythm of my body is like that of a bumblebee nest. Who knows!

In the early months she attempted to fly on multiple occasions, vibrating her wing muscles, and her legs would lengthen as if she was trying to push herself off the surface. She almost looked humiliated having failed to fly, and would crawl into my hand and hide her face for one to five minutes, almost as if she was embarrassed (a bit like us as humans). After a “cuddle” she was fine. By cuddle I mean that she would let me stroke her either with my finger or up close with my nose, and cuddle into my cheek. She would crawl onto my nose and clean herself. That must be a good viewing platform for a bumblebee! She didn’t really try to fly much later in the season.

She was meticulous in her grooming, even towards the end of her life. The morning routine consisted of grooming, then she would relieve herself and finally she had a drink. Of the various wildflowers I offered in the enclosure, she seemed to favour yellow flowers, especially buttercups. If she was on my hand I could tell when she needed to defecate. She would perform what looked a bit like a dance and looked around and made sure she put her tail end off my hand or arm or wherever she was. She would not “wee” on me. I don’t know if that was respect or if she saw me as an extension to her nest. Either way, if it landed on me, it was an accident. A house trained bee!

She made sort of clicks/buzzy sounds when she was in close contact with me and was happy to sit and groom, eat, drink and sleep on my hand. We were both very comfortable with each other, and many people admired this bond. She was totally relaxed with me. People have a bond with their dog or cat and even their hamster. I think I have proved here that you can have a relationship with an insect! She thrived with my care and company. It could be said that she just saw me as a place to receive her rewards, like flowers and a drink, but I do think she felt the security and affection. I will leave that for the reader to decide.

Bee was found on 11th April and stayed with me till she died on 15th September. I never expected her to live a few days in my care, let alone over five months! She far outlived healthy queens of this species, which typically die in the peak of summer. It is not without a tinge of sadness that she has gone, but I have learned so much from her, as have many people who have followed her story, and it was a real privilege to be able to have this bond with her.

You may read this with some scepticism or disbelief. I have tried not to be too sentimental and tell the tale as it was. But hear this – when you have been close enough to feel the warmth and smell the lovely waxy scent of her body, you too will know you have spent a wonderful summer with a very special bee.

Fiona Presly
Inverness

A bee as pet – a bee psychologist’s perspective

Fiona Presly contacted me in the summer of 2017, when her bee was still alive, and I was immediately captivated by her story. A friendship between a bumblebee queen and a human? A cynic might comment that it is unsurprising that a human might benefit from such a relationship – after all, even virtual and robotic pets can engage in human caring feelings and improve wellbeing. It might be that in humans there is a hereditary predisposition for looking after animals – e.g. primordial farmers who looked after animals kept for meat, dairy, clothes or guarding would have done better than those that did not. But what about the bee? Why would a bee queen suspend her natural instinct to view a creature many thousand times its size as an enemy, and instead seek its proximity? Is it conceivable that an insect could even recognise individual humans, let alone form an attachment to them in the way that domesticated animals do? Pet owners are often too ready to read human-like states of mind into their beloved animals, so there is a danger of misinterpreting animals’ behaviours towards the humans they interact with habitually. Humans are good at reading other (human) minds, to some extent, but in using this ability, they perhaps sometimes tend to anthropomorphise in reading animal minds¹– and indeed even many scientists studying animal cognition and emotions are guilty of this offence². But Fiona Presly does none of this. Her wording is very restrained – e.g. she acknowledges that the apparent affection displayed by the bee might have arisen because the bee had come to associate Mrs Presly’s hand with reward, and because its scent might have come to signify safety and warmth. In this interpretation, Mrs Presly’s reading of her bee’s behaviour is in line with that of most scholars working on invertebrate behaviour and learning.

It is now clear that bees are remarkably intelligent, and can display phenomena such as counting³ and simple tool use⁴. Yet for a long time, scientists have shied away from exploring the possibility that insects might have emotion-like states. Emotions are by definition subjective and in animals can only be diagnosed by making inferences from animals’ behavioural and

physiological states triggered by certain environmental conditions that are at least broadly similar to the conditions that would trigger similar states in humans⁵. Few people, however, have difficulties appreciating that a bee (or wasp) can be in an “aggressive mood” – and indeed the stimuli that can make a bee angry are not wholly dissimilar to those that can make a dog or human belligerent. And this illustrates an important case-in-point: emotions are survival-related (perhaps survival-critical) states that are not necessarily computationally complex and certainly do not require a large brain. Natural selection might not look kindly upon individuals that do not know fear, mothers who are indifferent to the loss of their offspring, or social animals for whom it does not “feel rewarding” to be in their social setting. A bumblebee queen’s natural biology directs it to found a colony in spring and raise daughters to assist with nest construction, provisioning and defence. It is therefore plausible that she should feel, in the broadest terms, a sense of reward from not being solitary.

Fiona Presly’s bumblebee queen, because of her winglessness, was deprived of founding a colony, but is it plausible that an insect might “find comfort” in the company of a human? Honeybees can be trained to recognise a photo of a human face⁶ – and indeed some wasps can recognise one another individually⁷, but while such individual recognition may be a key ingredient to forming a “friendship”, it is still a long distance from an “affectionate” mutual interaction. Yet most owners of “conventional” (mammal or bird) pets, and the scientists that study such interactions, would not hesitate to diagnose a form of emotion-like attachment. Conversely, entomologists, indoctrinated by the view that insects are efficient but hard-wired “reflex machines”, have been slow in exploring the possible emotional repertoire of insects. Sometimes it takes an outsider’s careful observations, such as Mrs Presly’s, to generate fresh views and prompt important questions.

Many animals’ “default setting” is to form attachments primarily to conspecifics and to greet members of other species with reservation. But pet-human interactions certainly show that these “default settings” allow considerable flexibility. Certainly associative learning – the provision of food, shelter, warmth, by the human (and the features identifying that human, be they visual or olfactory) – plays a crucial role in forming such attachments. But the interactions described by Mrs Presly are nonetheless far from trivial – how does a bee “know” that the nose belongs to the same “entity” as the hand that provides the reward? As someone who has had the unfortunate experience of being stung by a *Bombus terrestris* queen – the largest stinging insect in Europe – I would not advise anyone to place such a bee on your face unless you know that you have as good a rapport with that individual as Mrs Presly did!

References

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