The Herald
Section: Magazine
Edition: 01
Date: 27 April 2013
Page: 12,13
Circulation: 44445
Source: ABC Jul 2012
pressdata

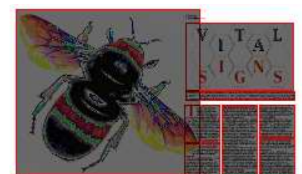
VITAL SIGNS

Dwindling bumblebee populations are a sure indication of mankind's rapacious plundering of earth's resources, according to a new book by Professor Dave Goulson. So is it too late to reverse the decline of bees and repair the damage wrought to the planet? By Mark Smith

There is something horrifying in Dave Goulson's lab in Stirling – the image of it lingers in the brain after you've left the room – but it isn't the animal skeletons arranged on the shelves above the desk. It isn't the giant beetles pinned to the wall – great, green creatures with legs like tree branches. It isn't even the tank full of cockroaches (he holds one in his hand and its antennae twitch and quiver). It's the map of Britain on his computer screen. "This is where the great yellow bumblebee was found in the first half of the 20th century," he says, pointing to a series of red dots scattered across the map. He switches to another map and suddenly there are only a few scattered dots, mostly in the far north of Scotland. "And this is where the great yellow bumblebee is found now."

That is the story Dave Goulson wants to tell me today: how the great yellow bumblebee has all but disappeared, how other species of bumblebee are going the same way, how it began and what it means for humans. It's a story that's intertwined with his own: the story of a conservationist, biologist and great lover of wildlife that started in the most unlikely way.

When he was nine years old, all he wanted for Christmas was a dissecting kit and when he got it he would go out to find roadkill,



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slice the bodies apart with great care and lay the organs out on the slabs in his garden. The most interesting animal parts he would pickle in jars and arrange on shelves in his bedroom. He was the kind of little boy most parents would worry about.

Goulson, now 47, was also, he is ashamed to admit, a collector of birds' eggs when he was a child. It was something many boys did in the 1960s and 1970s, he says, and, besides, it was part of the fascination he had for wildlife: how it lived, how it died, the wonder of it, the gore of it. While other boys made Airfix kits, he built his own butterfly net from an old coathanger and a pair of his mother's stockings. He also had a succession of pets that got increasingly exotic: guinea pigs, hamsters, mice, leopard frogs, tropical fish, terrapins, snakes and lizards.

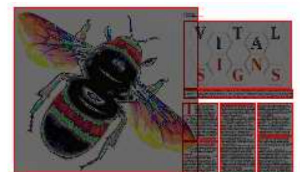
His first memory of bees is of a cloud of them on the big horse chestnut tree in the field opposite his house in the village of Edgmond in Shropshire. He remembers climbing the tree in spring and watching the bees visiting the little pyramids of cream and pink flowers. He also remembers the colony of white-tailed bumblebees that moved in under the garden shed. He would sit there and watch the workers flying back and forth, enormous balls of bright yellow pollen clinging to their legs.

Thirty years on, Goulson – now professor of biological sciences at Stirling University, founder of the Bumblebee Conservation Trust and author of a new book on bees called A Sting In The Tale – has a difficult relationship with those memories of his childhood. These days, the memories are accompanied by the sound of a klaxon, an alarm bell for the state of Britain's bees, the future of the planet and our entire attitude to wildlife.

"I remember catching bees in jam jars from the dahlias outside our front door," says Goulson. "I was about six or seven. Kids have a natural enthusiasm for bugs and beasties but these days they aren't allowed out much. It worries me.

"Lots of our undergrads here can't even name common birds. A coal tit would be a complete mystery to them – they could probably manage a blue tit but wouldn't be sure. They could just about name an oak tree but after that, they would struggle. I dread to think how little other people must know and it's worry because, if people don't know anything about it, they won't appreciate it."

Goulson says his upbringing was different – the son of two teachers, he went outdoors whenever he could – but what he didn't realise at the time was that his childhood coincided with a catastrophic period in the history of the British countryside. He remembers as a child walking about two miles from his house and crossing 15 fields, each bounded by a hedge. By his twenties, the same walk involved crossing only one field. All the hedges had been ripped out and in their place there was a sea of cereals sprayed with pesticides. These changes in farming, he says, were



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seen across Europe and drove the decline and in some cases the extinction of many creatures. If the planet faces a catastrophe, says Goulson, it lies not in a rogue comet from space or a nuclear button in Pyongyang, but in the way we feed ourselves.

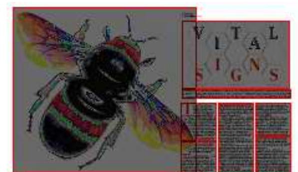
"Catastrophe is the right word," he says. "This endless drive to produce more and more food hasn't really ended – you could say the second half of the 20th century was the worst time. That was when, driven by the war, we were desperate to be self-sufficient. You can understand why we did that, but the fact is wildlife is still declining in this country, even now when we're trying to stop it happening. Butterflies, birds, bees, things that live on farmland are still declining quite rapidly, more or less all over Britain. So we're a long way from getting it anywhere near right – we might have stopped ripping out hedges but we're still doing something wrong."

In his book, Goulson tries to explain what we could lose if we don't start to get it right and it is an astonishing, gripping, beautiful, violent story. In one chapter, we follow a queen bee as she emerges from hibernation and starts looking around for a nest. In another, we delve deep into a working nest and discover the contradictions in how bees live. Philosophers have occasionally cited bees as a social ideal and certainly at times they are models of altruism and co-operation. But, as Goulson points out, the overpowering genetic drive of the female bee means it can also be a heaving mass of cannibalism, infanticide and murder.

The life of the male bee is just as interesting, and tragic. Goulson points to the hill that dominates the view from his window. It's Dumyat, one of the Ochils, and every Wednesday he jogs to the top of it. On one occasion, as he was getting his breath back at the top of the hill, he noticed a group of male bumblebees buzzing about. As they were buffeted about by the wind, they would stubbornly maintain their position. Goulson asked a couple of his students to find out what was going on.

The theory that emerged is that male bees head to the top of hills in the expectation that, when a female is ready to mate, she will simply head uphill, confident that there will be plenty of males waiting there for her at the top. Sadly, there is no evidence that females actually do this, which leaves the slightly pathetic sight of a bunch of males hanging about drinking nectar and waiting for some action, like men in a singles bar who never get lucky. As a biologist and as a man, Goulson finds the whole thing rather sad: male bees have only one purpose – to mate – but six out of seven will never do it.

What disturbs Goulson more is that we could lose all this wonder. Globally, there are 25,000 species of bees, but one species becomes extinct every 20 minutes and he is clear about what the endgame could be: little life on earth could survive without pollinators. He quotes biologist EO Wilson, who said "if insects were to vanish, the environment would collapse into chaos".



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Dave Goulson in Charente, France, where he owns a cottage and land, and is establishing a wild flower meadow to encourage bees

"The earth depends on biodiversity and if people don't understand that, we're in big trouble because we won't look after it," says Goulson. "The air we breathe, the water we drink, all the food we have, it all depends on the functioning of the ecosystems, and bees are one of the easiest ways to explain how species living out in the wild benefit us – pollination is something that even quite young children can get their head around. Here are these wild creatures that are giving us something for free. And we should look after them for that reason.

"There are some horrific examples already," he says. "There are one or two places in the world where farmers have to hand-pollinate crops – the south-west corner of China and more recently in Brazil – because there aren't any bees left because they're using way too many pesticides. There are many crops which can't be hand-pollinated, there aren't enough people in the world to do the jobs of bees, so if we reach a point where populations drop much further, then we will start to see a direct economic and welfare impact on us. There will be less food. I would guess we're pretty close to a tipping point but how quickly it's changing and how imminent is hard to say."

Goulson does admit there are some signs of hope. Scientific studies are revealing how best to combine efficient farming with looking after the countryside and a range of payments is available to farmers to support them in encouraging wildlife.

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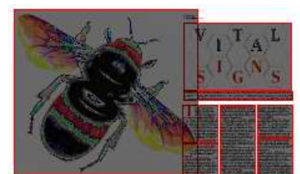

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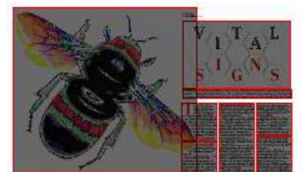

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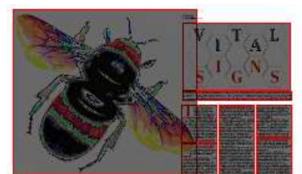

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