

ECOLOGY

To be a bee

A charming account celebrates the insects' idiosyncrasies and the people passionate about protecting them

By **Rachael Winfree**

We have bees to thank for some of the better features of our world, from the fruits and vegetables we eat to the world's flowering plants, which radiated alongside them during the Cretaceous. Nearly 90% of plant species require pollinators (an added benefit for anyone who suffers from wind-borne pollen allergies). Humans even seem to share aesthetic preferences with bees, insofar as the shapes, colors, and scents of the flowers we enjoy originally evolved to appeal to these and other pollinators.

Given the necessity of bees, the signs that they are in trouble are concerning. Although maladies of the domesticated honey bee (*Apis mellifera*), such as colony collapse disorder, have captured the most public attention, declines in the world's 20,000 wild bee species have the potential to be even more ecologically catastrophic. In *Buzz*, Thor Hanson deftly presents the predicament of bees today, in part by recounting conversations with scientists and practitioners who are leading the effort to understand and conserve bees. In only 304 pages, he successfully covers a wide range of topics, from bee evolution and natural history to the economic value of pollination.

Like all good naturalists, Hanson has a gift for seeing the world from his subject's point of view. At one point, he predicts the nest site preferences of a bumblebee queen (a boot, it turns out). At another, he empathizes with bees that won't pollinate alfalfa because the flowers' anthers bob them on the head.

In addition to his interest in entomology, Hanson also has an interest in etymology.

The reviewer is at the Department of Ecology, Evolution, and Natural Resources, Rutgers University, New Brunswick, NJ 08901, USA, and is on the board of directors of the Xerces Society for Invertebrate Conservation, Portland, OR 97232, USA. Email: rwinfree.rutgers@gmail.com



The sweat bee *Augochloropsis sumptuosa* is one of the roughly 20,000 known bee species.



Buzz
The Nature and Necessity of Bees
Thor Hanson
Basic Books, 2018,
304 pp.

Who knew, for example, that “dumbledore” is a historical name for the bumblebee? The book's bibliography reflects the diversity of topics covered, ranging from Virgil and Tolstoy to the scientific literature and CNN.

In one of the more surprising chapters (even to an ecologist who studies bees), Hanson presents evidence for the key role played by honey bees in human evolution. He begins with the honeyguide, an African bird species that feeds on bee hives but needs another, larger species to conduct the initial raid on the hive. The honey badger was long thought to be the honeyguide's original mutualist partner. Bringing some basic biology to bear, Hanson points out that honey badgers don't like to climb trees and in addition are nearsighted, hard of hearing, and nocturnal. By contrast, the Hadza people of Tanzania eagerly seek out honeyguides and harvest honey from wild honey bee hives—so much so that honey constitutes 15% of the calories in the Hadza diet. The availability of honey may even have furthered the evolution of our unusually large brains, the book reveals.

Hanson is an upbeat and often humorous guide, with a DIY attitude, the latter of which sometimes lands him in odd situations (such as sitting in a McDonald's, using tweezers to separate the bee-pollinated from the non-bee-pollinated components of a Big Mac). In another chapter, after reading that branched, pollen-collecting hairs are a distinctive trait that separates bees from their evolutionary forebears the wasps, he tests the hypothesis that minute particles adhere better to bees than wasps

by weighing a bee and a wasp before and after dipping each in flour.

Hanson also has a sharp eye for the idiosyncratic—which he doesn't have to look far to find among bees or among bee enthusiasts. In the first category, he describes bees that nest inside active termite mounds and others that construct “elaborate vases” made of flower petals. Still others carry pollen on their abdomens, making each bee “look like she's wearing a tiny, brightly colored apron” (as compared with most other bees, “whose pollen loads look more like stockings pulled up high on their back legs.”) In the second, are a retired insurance salesman who gives bees away as presents and an alfalfa farmer who slows his car to a crawl while driving so as to avoid killing even a single bee.

The only criticism I have of *Buzz*, and it is not a major one, is that the book underplays how little we actually know about bees. The chapter covering the decline and possible extinction of certain North American bumblebee (*Bombus*) species quite rightly focuses on the extent and causes of these declines. It doesn't mention, though, that *Bombus* is among the best-studied of the world's 443 bee genera. The conservation status of most bee species is simply unknown. In the United States, for example, there is no federal list of rare or declining bee species, and ad hoc assessment of which species are in trouble has been left to researchers and the Xerces Society for Invertebrate Conservation.

Overall, however, if you have time to read one book on what is happening with modern bees, you couldn't do better than *Buzz*. ■

10.1126/science.aat9250

Science

To be a bee

Rachael Winfree

Science **361** (6398), 137.
DOI: 10.1126/science.aat9250

ARTICLE TOOLS

<http://science.sciencemag.org/content/361/6398/137>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.