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Fireflies, Honey, and Silk

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WALDBAUER, G. 2009. Fireflies, Honey, and Silk. University of California Press, Berkeley, CA. ISBN 978-0-520-25883-9, hardback, $25.95.

Insects are everywhere, a reality that entomologists enjoy but entomophobes consider with disdain and even fear. Because of global insect prevalence and thousands of years of human development, the paths of humans and insects have intersected innumerable times. These interactions often are negative ones, including those with disease-carrying mosquitoes, crop-destroying locusts, house-eating termites, and swarming African honey bees. In fact, negative interactions with these and other insects fuel the general public perception of "bugs", much to the detriment of the insects. However, as most readers of this book review will agree, insects often are beneficial and can play important, if not crucial roles in human persistence. Gilbert Waldbauer, the author of *Fireflies, Honey and Silk*, notes just that and spends 202 pages of text trying to convince the reader of the same.

Waldbauer is an emeritus professor in the Department of Entomology at the University of Illinois at Urbana-Champaign and an accomplished author who has written a number of general-interest books on insects. The book reviewed herein is another general-interest book written by Waldbauer, though in this book he explores a new topic: positive interactions between humans and insects. Before going into detail about the contents of the book, I note that this book should be of general interest to naturalists, entomologists, university students, biologists, and just about anyone curious about the contributions insects have made to humans throughout history. It is worth noting that this book is not an exhaustive reference for human use of insects through recorded history (surely, it is impossible to know all the ways humans have used insects), but it is a good general overview of the topic and could be referenced in appropriate manuscripts discussing the same.

The book contains 10 chapters, excluding the Introduction and Epilogue. In Chapter 1, Dr. Waldbauer discusses insects that people find cute and cuddly, like the ladybug beetle, butterflies (who doesn't like butterflies?), dragonflies, and lightning bugs (or fireflies), and those people tend to loathe (boll weevils and fleas). Dr. Waldbauer has a broad education in all things insects as he demonstrates by researching and including songs, poems, and words/phrases for various insects in other languages.

In Chapter 2, Dr. Waldbauer discusses the fashionable silk moth and its contribution to human wealth and wardrobes. Many people are aware of its use as a generator of fine silk, fabric of the wealthy, but I found Waldbauer's description of silk moth culture and silk harvest very enlightening. Of course, what good is fine fabric unless it is dyed vibrant colors? In Chapter 3, Waldbauer introduces the helpless but colorful cochineal, used by people around the world to dye fabric. I find the value of cochineal insects to their "keepers" remarkable and Waldbauer introduces this world in a colorful way.

Insects have been featured in human attire in other ways, most notably through insect-inspired jewelry (Chapter 4). Apparently, people around the world have tethered insects (live ones of course) to their wardrobe, much to the chagrin of the fashion-naive insect. Insects have inspired art (just go to your local shopping center to verify this statement), been objects of religious attention (the great scarabs of Egypt), and even have been used to generate noise (or music, take your pick) in various ceremonies.

In Chapter 5, Waldbauer discusses insect production of wax, shellac, and similar products. As a honey bee aficionado, I can appreciate Waldbauer's discussion of the importance of beeswax. Beeswax has been used through many millennia to embalm the dead, weld together loose ends of sewing thread, and make candles, though the bees themselves do not use the wax for these purposes. Although honey bees are not the only insects that produce wax (you will have to read Chapter 5 to discover the others), they are the most well known. Even today, their wax is harvested, processed and used for multiple purposes.

Among the significant achievements of the great civilizations is the development of written communication. If you look close enough, insects were right in the middle of print development, as Waldbauer shares in Chapter 6. Insects are featured in Egyptian hieroglyphs, produce substances from which ink is made, and have even contributed to the development of paper.

With all of the ways humans and insects have been shown to interact thus far, it should come as no surprise that insects feature prominently in the human diet (Chapter 7). Whether insects are eaten on purpose (as they are in Asia, Africa, and South America) or accidentally (as they are everywhere else), Waldbauer discusses, in scintillating detail, the importance of insects to human nutrition. From the tequila "worm" to chocolate covered crickets, Waldbauer explores many of the culinary delicacies that make even the most ardent entomologist a little queasy.

Of course, one of the most notable contributions of insects to human cuisine is the honey produced by honey bees, stingless bees, and even aphids (Chapter 8). We all are acquainted with that produced by the former but few people realize that aphids, those destroyers of gardens, produce honey dew. Waldbauer is not the only entomologist who has suggested that the Israelites'

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exodus from Egypt, as recorded in the Holy Bible, was made possible by the "manna", or honeydew, provided by aphids.

Maggots used to clean wounds, honey used as wound dressing, ants whose jaws are used to "stitch" wounds together, and a whole host of "cures and nostrums" are discussed in Chapter 9. Included, of course, are those cures and nostrums for which there is absolutely no evidence suggesting they work, but which make for good story telling nonetheless. Though not providing a remedy itself, *Drosophila* (the fruit fly) has aided human health in ways that are not fully appreciated since the discipline of molecular genetics (and classical genetics for that matter) was built on the back of this tiny insect. Score another one for the insects!

Waldbauer concludes his book in his 10th chapter: Insect Pests and Performers. After all, what is a discussion on insect/human partnerships without discussing the iconic flea circus? Contrary to what I thought, fleas actually were, at one time, used in flea circuses. And, did you know that cricket fights are popular in China? You can read about all of this and more in Waldbauer's treatise.

The book boasts a number of positive attributes. It is well written, informative, entertaining, engaging and fun. I do feel that Waldbauer's prose was scattered in a few places (jumping from one subject to the next without a clear linkage) but this is not terribly distracting and most readers probably will not mind. My only true qualm, though terribly picky, lies with something likely outside the control of Waldbauer but a common mistake nonetheless. The inside cover of the book is imprinted with hexagonal cells, no doubt to invoke the image of a honey comb. As in most instances where hexagonal cells are represented by people, the cells are oriented incorrectly (they are sideways). Admittedly, I am being picky, but at least this illustrates the quality of the book overall. If I have to comment on the inside cover, then the text itself must be above reproach. In conclusion, if you are looking for a delightful read that introduces the subject of insect/human interactions, this book is for you.

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