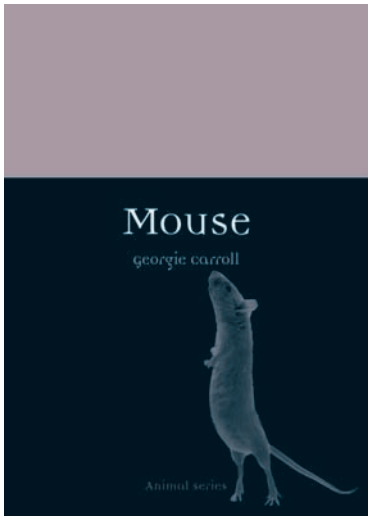
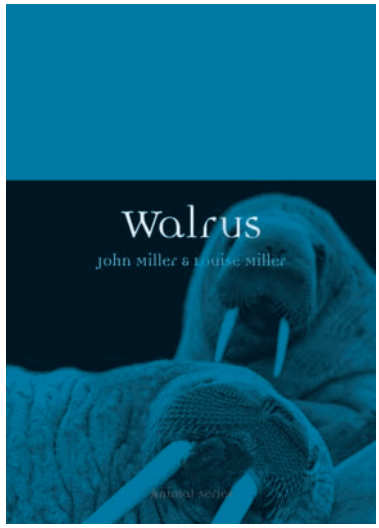


Mouse has a heavy focus on culture. When you think of mice, do fictional mice pop into your head? Mickey, for example? Or do you think small? Or do you think of laboratory mice? What about your computer's mouse? The author attempts to steer the reader through the many roles mice have played in history, arts, and interaction with humans.

These roles, both biological and cultural, provide interesting ideas that could be used to capture student interest. Here is an animal that is found on six continents and has been in space. Some of the biological milestones are laid out in the "Timeline of the Mouse" at the end of the text. As far back as 1905, mouse studies at Harvard University revealed that cancer had a genetic basis. The mouse has been called the "hero of science" because mice have been involved in the awarding of at least 17 Nobel prizes.

The first paragraphs of the text explain the relationship of the species name, *Mus*, with "mushroom," "humus," and *Musca* (housefly). The author suggests that the derivation of the name is related to fertility, both soil and reproductive. Reproductive fertility, with an emphasis on humans, is a key topic throughout the chapters. As a former high school biology teacher, this reviewer cautions the teacher to think of the maturity of your students before suggesting this book as a resource. This reviewer is not trained in cultural interpretations and was disappointed that 10% of the pages are focused on the representation of the mouse in culture through time as a figure with sexual connotations. Such things as the mouse in *Alice in Wonderland*, quotations from *Romeo and Juliet*, and several paintings are described with a sexual focus. The author links the mouse to humans in many ways. The final sentence sums up the author's attitude toward the mouse: "[S]omehow we identify with the mouse much more than we think . . . . Maybe this is because the mouse, in its multifarious ways, represents what we do to the universe."

There are some wonderful photos of genetically modified mice that glow green (p. 15) and a curly-furred mouse (p. 34). The author discusses the National Mouse Club in London, where breeders show their mice in competition, similar to the Westminster Kennel Club for dogs. The book contains many useful pieces of information, but from this reviewer's point of view, the book was a difficult read because of the high number of cultural references and not enough biological material. If you are looking for mouse biology and ecology, this is not the book for you.



Walrus begins with the uniqueness of the animal. The authors describe the walrus as a "mixture of weirdness and familiarity." The scientific name for the walrus is *Odobenus rosmarus* ("rosy sea tooth-walker"; "rosy" refers to the color of the walrus's skin when it is warm, a fact unknown to this reviewer). The history of walrus classification described in the first chapter might be a good way to introduce the problems of biological classification to an introductory biology class.

Human interaction with the walrus has been through hunting. The walrus has been hunted by many different peoples for different reasons. The indigenous peoples of the Arctic used the walrus for food and as a source of useful items, such as clothing, rope, tools, building materials, and hunting equipment, to name a few. Using the walrus skin to toss one another in the air is the invention of trampolining by Arctic indigenous people. The authors do a remarkable job of compiling the uses for walrus material, which go beyond ancient indigenous peoples. For centuries, walrus tusks and rope made of walrus hide were traded with Vikings, who distributed this material to many places in Russia, China, Turkey, and Arabia. From the 16th to the 19th centuries, Europeans used the blubber for heating and lighting, and the skins were used for machine belting during the Industrial Revolution. It was during the 19th century that European use almost wiped out the walrus population. The walrus tusks were still used for scrimshaw and false teeth. In the early 20th century, the use of oil from animals was pushed out by oil from the ground, and laws were put in place to protect the walrus. Now that walrus populations are gaining in numbers, they face other threats in the 21st century: melting of the ice flows and exploration for minerals and mining. Chapter 5, "Walruses in a Warming World," yields much good information about the impact of environmental changes on this one species and how that impact is magnified within the environment. The authors conclude with reference to the 2007 *National Geographic* film *Arctic Tale*, "in which walruses are placed with the polar bears as 'poster animals' for the climate change debate."

The place of the walrus in human culture is not neglected in this book. Chapter 4 traces the history of the presence of the walrus in paintings, folklore, and literature. One example is the walrus in Lewis Carroll's *Through the Looking-Glass*. The authors spend several pages explaining the significance of John Lennon's statement "I am the walrus." They use this example to show how the walrus intrigues people. Walruses have inspired mustaches, as illustrated by photographs of nine men with various versions of this facial hair. In a reference to more modern culture, the authors describe the walrus as "the Homer Simpson of the sea: slow, dense, fond of food and sleep, kindly and humorous." They have become lovable.

Teachers of ecology will find this book filled with information that is directly useful in the classroom; students can use it directly, or the teacher can extract fascinating stories to share, from classification to conservation. *Walrus* is an interesting read.

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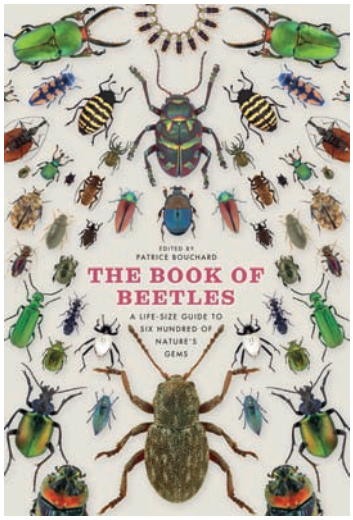
The Book of Beetles: A Life-size Guide to Six Hundred of Nature's Gems. Edited by Patrice Bouchard. 2014. University of Chicago Press. (ISBN 9780226082752). 656 pp. Hardback. $55.00.

Population geneticist J. B. S. Haldane wrote, in his book *What Is Life?*, that "The Creator would appear as endowed with a passion for



stars, on the one hand, and for beetles on the other, for the simple reason that there are nearly 300,000 species of beetle known, and perhaps more, as compared with somewhat less than 9,000 species of birds and a little over 10,000 species of mammals. Beetles are actually more numerous than the species of any other insect order. That kind of thing is characteristic of nature." Some have rephrased this to "The creator has an inordinate fondness for beetles."

The Book of Beetles celebrates this inordinate fondness in picturesque style. The images are focus-stacked, giving them extraordinary depth of field and great detail. There are (to date) about 387,000 species of beetles, or 25% of all known animal species. The book highlights 600 species, covering nearly all of the 211 families.

The first few chapters provide a general introduction to beetle biology and culture. Topics include morphology (distinguishing characteristics), classification, diversity, behavior, and conservation. A chapter is devoted to beetles in human society – for example, the use of sacred scarabs in ancient Egyptian civilizations.

The remainder of the book is devoted to the beetles themselves, grouped by the four suborders. Each page has two images: a life-sized picture and one that is magnified to show intricate detail. The only exceptions are the largest beetles, for which one image is sufficient. The family, subfamily, global distribution (map with colored areas), habitats, feeding habits, and notes are at the top of each page. The species and common names accompany the pictures, along with more details, including size ranges, close relatives, and distinguishing characteristics. There is a glossary, a classification guide, and an extensive resource list.

The Book of Beetles is a perfect gift for a budding entomologist and for anyone who appreciates these jewels of nature. It is easy to see why Charles Darwin and Alfred Russel Wallace were intrigued (some would say obsessed) with this fascinating order. The members of the Connecticut Entomological Society gave it two thumbs up, especially for the exquisite photographs and well-crafted references.

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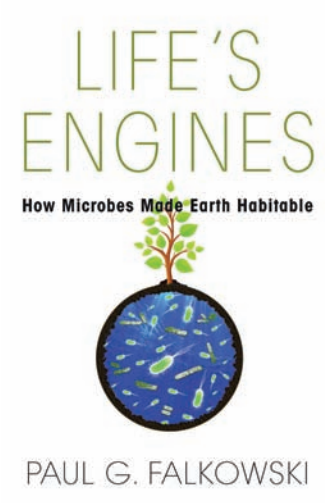

MICROBES

Life's Engines: How Microbes Made Earth Habitable. By Paul G. Falkowski. 2015. Princeton University Press. (ISBN 978-0-691-15537-1). 203 pp. Cloth. $24.95.

Not a microbial biologist, I approached this book with a bit of trepidation, imagining lengthy discussions of biochemistry. Instead, I was immediately engaged by Falkowski's conversational, fluid writing ("Let us take a look 'under the hood' to see how some of the machinery that makes these invisible creatures work"; p. 46), personal anecdotes ("It took me a few years to understand how this transition in the chemistry of the Black Sea . . . "; p. 83), and interesting choice of topics. The author easily distills volumes of relevant history down to the salient points to set the scene for the biology he relates. As such, the book is focused as much on the history of science, including the processes of invention of various scientific tools as well as famous people, as it is on advocacy of the long-needed recognition of the importance of microbes in our world. For instance, the story of evolution as it emerged in the 19th century, of Darwin's trajectory of thoughts on evolution by natural selection, is composed of only 10 pages, yet I didn't feel that any of the information that was important to Falkowski's story was missing. The author steps through some of this history to demonstrate his claim that "Microbes were missed because of our observational biases . . . [and yet] they played an outsized role in making this planet function" (p. 22). He effectively shows the progress that has been made in the field. He also highlights many of the unknowns – the still-to-be-done work, including current unsolved controversies within science.

By Chapter 4, the biochemistry comes in, with clear but not overly simplified diagrams, and Falkowski's writing remains understandable. Describing the formation of ATP, he explains, "As the shaft physically turns, it mechanically moves the larger proteins (the deck of the merry-go-round) which bind ADP and phosphate" (p. 59). Discussions of rising oxygen levels in the early atmosphere, RuBisCO, horizontal gene transmission, symbiosis and microbial communities, evolution of multicellularity, opsins, petroleum, the Haber-Bosch reaction, synthetic biology, and extraterrestrial explorations make you feel as if your biology courses are coming alive in a conversation with a master storyteller. Each chapter ends with a logical transition that leads to the next large topic, so you feel as if the entire book is one continuous, interwoven concept. At the end are a few extra readings suggested for each chapter and an extensive index. "In sum, the oversight of microbes, in both the literal and figurative senses, distorted our worldview of evolution for more than a century, and including microbes in our understanding of evolution is still a work in progress" (p. 12). *Life's Engines*, easily accessible to the lay reader but engaging for the scientist as well, will go a long way to boost that work in progress.

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