

as a boat's keel is a heavy beam that keeps the bottom of the hull at the lowest position under water and the boat vertically aligned, whereas the sail is a large but light item that extends above the waterline. So are the seed keel's position and function more like that of a keel or a sail? If the latter, then why call it a seed keel?

Wonders of the Plant Kingdom concludes with a wonderful description of how the remarkably beautiful and colorful images were produced and artistically altered to make this exploration of what is an almost invisible microcosm in the life and evolution of plants. It explains how the SEM specimens were prepared and how the photographs were produced and then colorized. Following the text are a glossary and indices.

I have two minor criticisms of the book. First, the authors state that "There is nothing in the life cycle of a spore plant that corresponds to a seed" (p. 25). I would maintain that in *Selaginella*, the megaspore wall, containing an endosporic megagametophyte storage tissue surrounding a diploid embryo with suspensor, corresponds quite nicely to a seed. Sure, the "coat" is just a thick cell wall as opposed to a multicellular integument, but other than this, it is structurally and functionally very similar to a seed.

Second, I have a beef with the usage, not only in this book but in biology in general, of the term "fertilization" (the authors use the British spelling, "fertilisation"), which suggests NPK mineral fertilizer or organic compost. In my opinion, all biology books should abandon this old "farmer language" for what is better called "syngamy" (literally the union of gametes). Like so many other books, this one refers to fertilization of eggs, fertilization of ovules, and fertilization of flowers. This simply does not accurately express the union of gametes. However, in spite of these shortcomings, this is a great book to give someone!



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ANIMALS

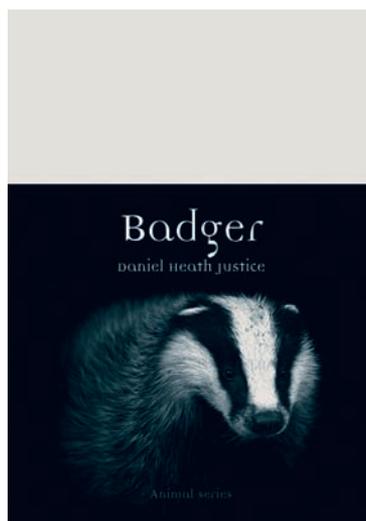
Badger. By Daniel Heath Justice. 2015. Reaktion Books. (ISBN 9781780233369). 224 pp. Paperback. \$19.95.

Mouse. By Georgie Carroll. 2015. Reaktion Books. (ISBN 9781780233390). 160 pp. \$19.95.

Walrus. By John Miller and Louise Miller. 2014. Reaktion Books. (ISBN 9781780232911). 199 pp. \$19.95.

These three books are part of a series devoted to the natural history of each animal and the animal's impact on human history, primarily as reflected in various aspects of human culture. The greater portion of each book is devoted to the role these animals have played in the arts, literature, and religion. Biology teachers may want to use this series to involve students who are not enthusiastic about biology but have an interest in history and/or the arts and literature. There are many quirky nuggets of information that you, the teacher, might want to incorporate in your teaching about ecology, conservation, and the process of classification of organisms.

The series currently includes 76 books. The animals studied include not only mammals but also insects, such as ant and bee; mollusks, such as octopus and oyster; reptiles, such as crocodile and tortoise; and birds, such as albatross and peacock. The authors are not professional biologists but, rather, specialists in literature or cultural studies. This provides a very different approach to the natural history and biology of these animals. At the end of the well-referenced text, there is a "Timeline" representing what is known about the animal and changes in the human response to the animal. A "Select Bibliography" at the end of each book provides a list of additional resources, including sources of biological information. Preceding each index is a list of "Associations and Websites." These are helpful for students looking for additional information about the particular animal.



Badger is a fascinating read. For this reviewer, who knew nothing about badgers before reading the book, the text and images provided a solid understanding of the nature of the animal. There are photos of the three groups of badgers. The author does a good job of explaining the relationship of these organisms to one another.

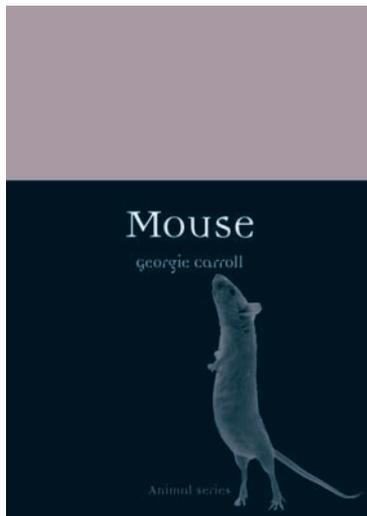
The appearance of each group is distinct. The honey badger (or ratel) somewhat resembles a skunk. The Eurasian badger has very distinctive facial markings, with white stripes on the sides and center of the face. The North American badger has a white stripe down the center of its forehead and a dark fur stripe on each side of the face, resembling sideburns. The ecology and importance of the badger in the various ecosystems are well described. The author demonstrates a special fondness for this animal and feels so strongly about the persecution of the badger that all profits from the sale of this book will be donated to the Nature Conservancy of Canada.

The cultural descriptions cover everything from the derivation of the naming of the badger to its role in the U.S. tradition of Groundhog Day and its place in *Harry Potter*, *The Simpsons*, and comic books. Evidence of the badger's relationship with humans is shown in various artworks, including paintings, lithographs, and jewelry. There is an excellent short film summarizing the information about the badger on the book's web page (<http://www.reaktionbooks.co.uk/display.asp?ISBN=9781780233369&sf1=series%5Fexact&st1=ANIMAL&ds=ANIMAL&sort=-sort%5Ftitle&m=6&dc=76>).

Most recently, in the journal *Science* (June 19, 2015, pp. 1312–1314), the badger's role in the dispersion of tuberculosis was discussed in relationship to how the "social acceptability" or the vector plays a role in how infection is controlled. This topic is also discussed in the book. As you might guess, the badger was seen as the problem – the carrier of tuberculosis. The response was to wipe out the population of badgers in the cow pastures in Great Britain.

This review cannot close without addressing the use of the verb "to badger," with its meaning to pester or continuously annoy someone. However, it is derived from what has been done to the badger. According to the author, all badgers "are targets of persecution for profit, protection or amusement"; "to be badgered is to be immobilized, brutalized, and overwhelmed by ferocious opponents (generally trained dogs) until mutilated and/or killed." The author summarizes this attitude: "The sad reality is that no matter how respected . . . they might be to any number of writers and artists, the baseline attitude of many humans toward these reclusive creatures is still one of suspicion, commercial exploitation or active persecution."

Since the North American badger habitat is the Midwest, teachers on both coasts may have difficulty introducing this animal, but the novelty of the organism and its role in our culture can be the net to capture the interest of students.



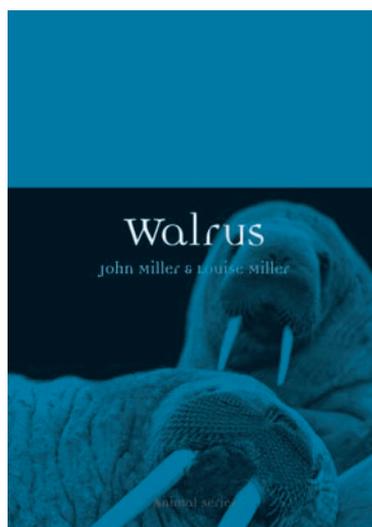
Mouse has a heavy focus on culture. When you think of mice, do fictional mice pop into your head? Mickey, for example? Or do you think small? Or do you think of laboratory mice? What about your computer's mouse? The author attempts to steer the reader through the many roles mice have played in history,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