

Altruism, as defined by Wilson, is “a concern for the welfare of others as an end in itself” (p. 3), which often incurs an unreciprocated cost to the one providing the benefit. As such, the behavior has seemed an evolutionary mystery in many respects. How could natural selection, which should promote traits that increase survival and reproduction of the individual, have produced altruistic behaviors? Behaving for the good of society typically does not maximize relative fitness within the group (even if absolute fitness might increase), and in evolutionary biology, relative fitness is what counts because evolution by natural selection results from fitness differences. Indeed, some scientists claim that there may be “seemingly altruistic acts but question whether they are based upon altruistic motives” (p. 3) – in other words, is concern for others really what drives the behavior? Wilson argues that the motives are irrelevant, only the resulting behavior matters, and the levels of selection are critical: one must examine natural selection acting both within and between groups. As he and E. O. Wilson succinctly stated: “Selfishness beats altruism within groups. Altruistic groups beat selfish groups. Everything else is commentary” (p. 23).

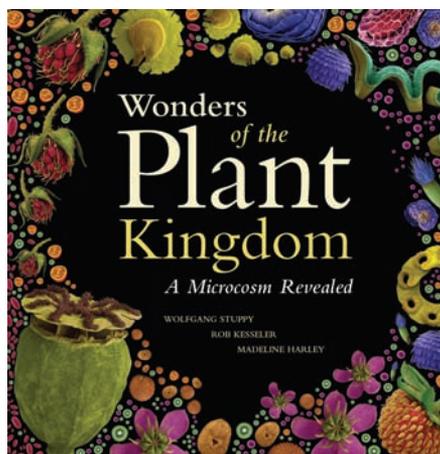
Wilson covers topics as wide as religion and economics, and smaller-scale issues such as what makes certain group-work successful. Still, I was disappointed that the book did not take on a wider range of species. Additionally, some of Wilson’s declarative statements seem easily arguable, yet he does not address those obvious protests. For instance, discussing the religion of the Hutterites, Wilson categorizes phrases in the text into a 2 × 2 table of effects on self × effects on others, and lists “obedience,” “sacrifice,” and “surrender” in the ++ category. It is clear as to why something like “brotherliness” would be in that category, but without an explanation as to why “sacrifice” has a benefit, his ensuing claim that “the top left quadrant of the table (negative for self, positive for others) . . . [was] empty” (p. 84 and fig. 6.1) falls flat. It is empty only because it appears he has misassigned behaviors, unless he explains his reasoning. Other claims that conveniently fit his trajectory similarly seem arguable: “There’s a world of difference between socially dominant individuals in most primate groups, who simply appropriate the best mates and resources for themselves, and high-status individuals in small-scale human societies, who must earn their status by cultivating a good reputation” (p. 49). This seems highly prejudiced (and overly optimistic) toward humans as a species. I can think of some powerful human leaders who seem to have also just “appropriated” what they wanted, regardless of reputation. I would

have liked to see some concrete examples to back up this claim. However, these small issues notwithstanding, most of Wilson’s arguments are laid out well.

There is much fodder for reflection on a wide variety of aspects of human society. Wilson argues that the question of why altruism exists is one that is just entering its resolution phase and will be something that future scientists look at and wonder how smart people could have floundered while pondering this straightforward question for so long. Wilson provides many chapter endnotes with a plethora of good-quality references for those interested in delving deeper into certain areas. While *Does Altruism Exist* is not a book to read in small segments or right before drifting to sleep, this is a work that will make you reflect on your own behavior and how evolution has influenced many aspects of human society, so much of which depends on group-functioning. For someone interested in reading biological philosophy (or philosophical biology): you will be intrigued.



Erika Iyengar
Muhlenberg College
Allentown, PA 18104
iyengar@muhlenberg.edu



PLANTS

Wonders of the Plant Kingdom: A Microcosm Revealed. By Wolfgang Stuppy, Rob Kessler, and Madeline Harley. 2014. University of Chicago Press. (ISBN 978-0-226-21592-1). 190 pp. Paperback. \$25.00.

The purpose of this square-format, large-page, paperback “coffee-table” book is to reveal “the evolution of pollen and seeds, two of the most crucial innovations in the history of all life

on our planet” (p. 7). The cover indicates that the images inside are enlargements of very small botanical objects: spores, pollen grains, flowers, fruits, and seeds. The images filling the book are mostly colorized SEMs (scanning electron micrographs) of small botanical specimens. Other images are extreme close-ups of flowers or fruits. The beautiful and colorful images float on black pages, which intensifies their visual impact. Between the images, the text tells the story of botany in pastel type. The font is small, but the informational content is dense, providing the reader with a good explanation of the natural history of spore- and seed-bearing plants. The vocabulary used is fully professional and not euphemized, except as is common in science books.

One has to wonder about a coffee-table book with paper covers; at first, turning the pages, it seemed like the spine was breaking as gaps appeared between the sheets. However, this is an intentional design feature: the pages are well sewn, and the stitching is loose so that the pages lie flat. It is a beautiful book, suitable for gift-giving to a friend or relative who is interested in plants.

The book opens with a discussion of the life cycle of spore-bearing and seed-bearing plants. The early chapters deal with spores, and later chapters move to pollen grains, then fruits and seeds. This is a natural progression through the evolution of the natural history of plants. Along the way, sections devoted to pollination biology are also beautifully photographed and described, sorted in the traditional syndromes showing the interaction between flowers and wind, water, bees, moths, butterflies, birds, and bats.

The book transitions through the philosophical question of the results of pollination: the fruit-or-vegetable debate. This book presents the arguments fairly and with citations showing how government decisions on fruit and vegetable classifications have come down on the side of “food science” rather than “botany.” Yet the book clearly supports the correct botanical nomenclature. A range of fruit types are shown and described nicely.

Getting “diaspores” or “propagules” or “disseminules” distinguished could be a bit cleaner, but the authors clearly have a wonderful discussion of the various mechanisms of distributing plant progeny into the environment. Seed or fruit dispersal by wind, on the outside or inside of animals, and by explosive propulsion or catapult are covered thoroughly. Water dispersal in *Heritiera littoralis* is described as a floating round seed with a “prominent keel, which acts like the sail of a sailing boat” (p. 89). This is confusing,

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!



Ross E. Koning
Eastern Connecticut State University
Willimantic, CT 06226
koning@easternct.edu

ANIMALS

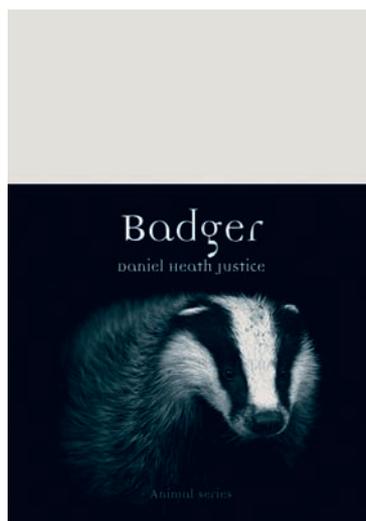
Badger. By Daniel Heath Justice. 2015. Reaktion Books. (ISBN 9781780233369). 224 pp. Paperback. \$19.95.

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.