BOOK REVIEWS

AMANDA L. GLAZE, DEPARTMENT EDITOR

ANIMALS

The following four books are part of Reaktion Book's ambitious *Animal* series, which presents various animals from a natural and cultural history perspective. These exhaustively researched volumes are appropriate for college or advanced high school readers. They would be valuable additions to a classroom library. Each volume is well- illustrated with captivating photographs and includes timelines, extensive end note documentation of the text, a bibliography, a list of associations and websites, and an index.

Beetle. By Adam Dodd, 2016. Reaktion Books. (ISBN: 9781780234885). Paperback. $19.95.

Beetles, among the oldest, most diverse, and most abundant species on Earth, are really not among the most understood. Classified in the Order *Coleoptera* (sheath wings), beetles possess chitinous forewings that guard the more fragile hindwings. About 25 percent of all known living species are beetles, with an average of four new species being discovered daily for the past 250 years. Entomologists think we are not even close to uncovering all the beetle species in the world. Biologist J.B.S. Haldane, when asked what nature showed about the preferences of the Creator, answered "an inordinate fondness for beetles."

Following the Permian-Triassic mass extinction of insects, beetles were among the first to make a comeback. Today, beetles inhabit numerous terrestrial and aquatic environments. Beetle anatomy is not unusual for insects. Covered with a chitin exoskeleton, they have a pair of antennae that help detect food and pheromones. Their eye structure depends on their environment, with some cave-dwellers having no eyes at all and others have large compound eyes. Mouthparts are adapted for defense, killing prey, and gnawing. They reproduce sexually with some species being parthenogenetic, and they go through a complete metamorphosis.

Beetles have appeared in scientific works for over 2000 years. Aristotle's *History of Animals* discusses numerous beetles, and Pliny's *Natural History* noted the wing structure and the facts that beetles don't have stingers but often have long horns. By the sixteenth century, British naturalist John White documented and illustrated many beetles including some he discovered on voyages to America. His description of the firefly was "a flye which in the night semeth a flame of fyre." As natural history progressed, new beetles were found worldwide. The last attempt to account for every beetle in a single volume was William Junk and Sigmund Schenkling's 1940 *Coleopterorum catalogus*, which documented nearly a quarter million species.

Many beetles are pests of humans. A couple of excellent examples are the Colorado potato beetle and the boll weevil. The potato beetle lived on buffalo bur, a grassy weed in Colorado. It was inadvertently introduced to the potato plant, an important crop. It was so successful that it migrated in large numbers to the eastern United States. At one point, a railroad track was covered with the beetles, causing train wheels to lose friction and slip. Another important American crop, cotton, was attacked by the boll weevil, which led to financial ruin in southern plantations. Plantation workers even wrote a song, "Ballet of the Boll-Weevil," which has been performed by many twentieth-century artists, including Woody Guthrie, Patti Page, and Brook Benton.

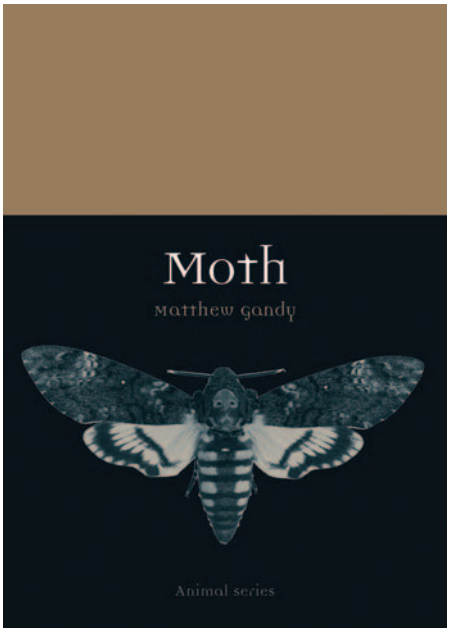
Beetles are frequently found in cultural settings. The scarab beetle is found in many cultures as a symbol of creation, renewal, and rebirth; the "lady" in ladybug represents the Virgin Mary in several cultures; in Irish folklore, the rove beetle is described as the Devil incarnate; Egypt has a sculpture of a giant scarab; in Albrecht Dürer's *Adoration of the Magi*, a stag beetle is depicted; the lady-bird is mentioned in Shakespeare's *Romeo and Juliet*; a Sega video game is called *King of Coleoptera: Bug King*; the Disney film, *The Love Bug*, features the Volkswagen Beetle; there is a Beetle Bar in Brisbane, Australia; and *The Beatles* musical group was originally named *The Silver Beetle*.

This book is packed with fascinating material, including many interesting stories such as this one from Charles Darwin's autobiography: Darwin wrote about removing some bark and finding two rare beetles. Holding one in each hand, he then saw a third new kind. So he put the beetle from his right hand into his mouth. It immediately produced an "intensely acrid fluid," which burned his tongue. Promptly spitting it out, he lost it as well as the new beetle he had found.

Moth. By Matthew Gandy, 2016. Reaktion Books. (ISBN: 9781780235851). Paperback. $19.95.

People typically don't know a lot about moths, thinking that they are only evil creatures

The American Biology Teacher, Vol. 79, No 3, pages. 246–248, ISSN 0002-7685, electronic ISSN 1938-4211. DOI: https://doi.org/10.1525/abt.2017.79.3.246.



that eat holes in clothing. Moths and butterflies are grouped together in the Order *Lepidoptera* (scaly wings), which makes up about 7 percent of all life on Earth. Much discussion and debate on the taxonomic classification of butterflies and moths continues, with some butterfly families including species that are intermediate in form. An interesting exposition of the etymology of scientific names for moths uncovers some fascinating reasons for their nomenclature.

There is an appealing diversity of moths in size, shape, colors, wing spans (0.2–30 cm), and wing patterns. Some moths are pests—the brightly colored, poisonous day-flying moth, moths whose larvae devour fruit, and the clothes moth larvae that can digest keratin found in hair, wool, and skin. One group of moths, the silkworm moths, has been domesticated for the production of silk fibers.

Historical writings on moths go back more than 2300 years to Aristotle's *Historia animalium*, which includes several moth species. Through the centuries, other written works on insects (including moths) by notable scientists and naturalists including Malpighi, Swammerdam, Redi, Réaumur, and others demonstrate the international roots of our knowledge of these creatures. Accompanying the descriptions of these significant works are beautifully detailed illustrations from the works themselves.

The author includes detailed discussions of moth diversity, life cycles, physiology, and behavior. An interesting story involves French entomologist Jean-Henri Fabré's first observation of the effects of moth pheromones and wondering whether they had a hidden form of communication. Recently, there has developed a concern regarding a drop in moth diversity because of ecological threats from habitat destruction as a result of agriculture, tourism, climate change, and other ecological challenges.

Moths are widely used as subjects and symbols in literature and the arts, and a significant portion of the book showcases a variety of examples. As the author acknowledges, "Moths seem to flit between the arts and the sciences." References to moths are found in the biblical books of Isaiah and St. Matthew, and they also make appearances in Shakespeare's *Coriolanus* and *Merchant of Venice*. A book of essays by Virginia Woolf is titled *The Death of the Moth*. The painting *Moth and Candle* (Louis Busman) and the drawing *A Moth Trap in the Woods* (K.A. Doktor-Sargent) are examples of visual art, and Sir Harrison Birtwistle's *The Moth Requiem* is a musical piece written for eleven female voices, three harps, and an alto flute. Many works of art and literature revolve around the attraction of moths to flames. Goethe's poem *Ecstatic Longing*, for example, depicts the moth refusing to recognize the hazards involved in moving toward a flame.

There is much more to be found in this captivating volume. For example, in some countries caterpillars are important sources of human nutrition. And Eri, one unique form of silk, is manufactured by the Ailanthus Silk Moth, the production of which varies from other silks. Often referred to as the "fabric of peace," it is used by religious denominations that do not want to kill insects. Also, scientists are now using DNA barcoding of short genetic sequences instead of morphological differences to untangle some of the moth taxonomic problems. Carefully researched, this book presents a provocative and stirring view of moths as living organisms with many fascinating biological features and cultural connections.

Scorpion. By Louise M. Pryke, 2016. Reaktion Books. (ISBN: 9781780235929). Paperback. $19.95.

Few people would include scorpions on their top ten favorite animals list. They have a harsh reputation as creepy, mysterious, and disgusting. There are more than 1800 known species of scorpion, with many yet to be discovered and classified. They are found in numerous environments from deserts to seashores to rainforests and are part of the most successful group of animals on Earth—the arthropods. Complete fossils of scorpions are rare, but they have been found in numerous countries. They show very little change from their

prehistoric ancestors, dating back to the Silurian Period, to the present. They are the earliest terrestrial animals in the Southern Hemisphere.

Scorpions have mouthparts lined with teeth used for grabbing and crushing prey. They have four pairs of legs, as is characteristic of all arachnids. A pair of pincers extends from the front of the body, and at the end of the abdomen is a stinger. Scorpions have a long life span with some living up to 30 years. After complex courtship rituals, they give birth to living young and provide maternal care to the offspring.

Many examples of scorpions as they are represented in human thought and civilization are presented. Much Egyptian mythology involves scorpions, with the Egyptian goddess Serket originating as a deified scorpion. She is predictably depicted with a headdress shaped like a scorpion. "Scorpion" is one of the most challenging poses in yoga, requiring great strength and balance. Scorpions are often associated with weapons of war. Ancient shields and swords are often depicted scorpions. A Nigerian Army leader called The Black Scorpion was involved in numerous deaths. There are confirmed reports of scorpions being used in biological warfare, and a Chinese realtor in 2011 allegedly used scorpions as weapons in a property dispute. The Textron Airland Scorpion is a tactical jet now being developed.

Scorpions make many appearances in the arts and literature. The oldest art works in the United States, 6000-year-old Native American cave art in Tennessee, contain drawings of scorpions. In Islamic art, scorpions can have a "positive symbolism suggesting triumph over evil." In Stanley Spencer's *Christ in the Wilderness: The Scorpion*, Jesus cradles a scorpion in his hands.