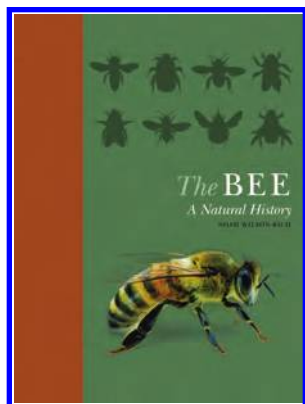


brings in a fascinating new perspective on what makes music.


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The Bee: A Natural History. By Noah Wilson-Rich. 2014. Princeton University Press. (ISBN 978-0-691-16135-8). 224 pp. Hardcover. \$27.95.

If a teacher could own only one book about bees for a classroom or personal library, this volume would be an excellent selection. It definitely is a “go to” source for comprehensive information on these fascinating insects. There are about 20,000 species of bee, and arguably they are the most important insects on the planet, because they cross-pollinate 90% of the world’s plants.

Ancient carnivorous wasps evolved into bees that thrive on plant nectar. Many of these insects have become highly specialized, with long tongues, hairy bodies, combs, and pollen baskets to facilitate their nutrition as well as their jobs as pollinators. Bees are somewhat unique in that males “have no fathers, but do have maternal grandfathers.” Their anatomy, immunology, life cycle, and genetics are among the many topics discussed in detail in this book.

The book’s hero is the honeybee, the species most important to humans. Detailed descriptions of their dances disclose how vibrations, sounds, and scents are incorporated into movements that allow bees to communicate the “directions, distance and food quality” of a potential food supply. There is even a two-way communication in which a bee colony member head-butts the dancing bee, passing on the message to avoid a particular location “because a danger has been spotted there.” Bees release an alarm pheromone when they sting. Smelling like

bananas, this chemical attracts other bees to help in an attack. The authors point out that this is the reason that “a beekeeper should never eat bananas for breakfast!”

Throughout *The Bee* are wonderful gems that will pique reader interest. For example, some bees exhibit sleep patterns, and it is suggested, from the observation that their antennae sometimes wiggle, that they may be dreaming or perhaps picking up danger signals. Worker bees’ jobs depend on their age. While young, they are active in hive jobs such as tending the brood and the queen, building combs, and cleaning and guarding the hive. Older bees actually leave the hive to collect pollen, nectar, and water. Bees also have a unique way of fighting infections in the hive. Known as “behavioral fever,” the process involves the colony’s bees raising their temperature as a group and wiping out fungal infections that could contaminate larvae. Fascinating information, as in these examples, will inspire readers to keep reading.


Bees have been important to humans for centuries. Hippocrates and Aristotle acknowledged the benefits of bees, and books about bees were printed as early as the 1600s. Aside from pollination and honey production, bees are useful in many other ways. For example, they are used in research on age-related conditions. By studying relationships between aging, memory, and behavior in bees, scientists are learning things that may help us understand Alzheimer’s disease. Research is being done with mellitin, a component of bee venom, which can “destroy HIV-infected cells without killing non-HIV cells.” The U.S. Government has even funded research on the use of bees to track land mines. Bees are also used for studies in epidemiology, communication, genetics, sociology, and other fields.

In addition to extensive information on the evolution, anatomy, and behavior of bees, this lavishly illustrated book also describes their relationship to humans in the areas of beekeeping and the challenges that bees face in the modern environment. Each chapter is like a full plate of food, divided into different topics that can be tasted and consumed in small bites. The bites consist of two-page spreads that include informative sidebars with interesting supplementary information, clearly labeled diagrams amplifying text material, and striking photography.

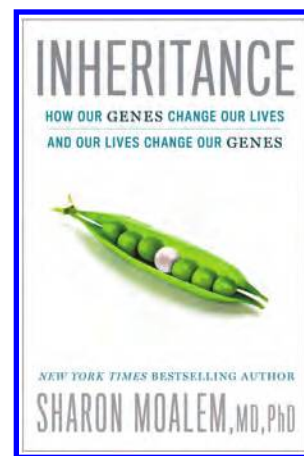
A valuable feature is the directory highlighting 40 species of bees. Each bee is showcased on a full page with a large colorful illustration of the bee, a silhouette showing

its actual size, a brief description, a detailed discussion of its behavior and life cycle, a list of food sources, and its habitat and status.

The information is thorough and detailed enough for college entomology courses and would be appropriate for supplemental use in high school classes. Some of the less technical portions would appeal to middle school students with an interest in bees. The book includes a wide-ranging bibliography, a list of websites, a comprehensive index, and author biographies.


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HUMAN GENETICS



Inheritance: How Our Genes Change Our Lives and Our Lives Change Our Genes. By Sharon Moalem. 2014. Grand Central Publishing. (ISBN 1455549444). 272 pp. Hardcover. \$20.20.

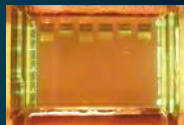
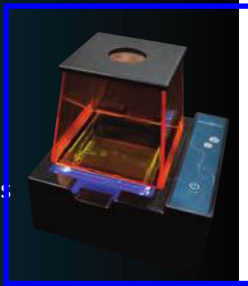
In this new book, Dr. Sharon Moalem leads the reader through the personal stories of men, women, and children with genetic diseases in order to argue that it is the interplay of nature and nurture that can most accurately explain basic human biology. Through these cases, he details “what our genes do to us and what we do to our genes,” giving the audience a better understanding of epigenetics and why each of us is more than just the sum of our individual parts. He is the author of several books, including *Survival of the Sickest* (2007) and *How Sex Works* (2009), as well as the cofounder of two biotechnology companies that focus on improvement of human health.

Moalem begins his most recent book by making analogies between our own past experiences, such as the “smell of the

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cafeteria on sloppy joe day” or “the ache of your first crush,” and how these encounters leave indelible marks in our DNA. Through these correlations, the reader is drawn in by believing that something relevant and significant about oneself will be revealed. Moalem’s description of epigenetics or “flexible inheritance” reveals not only that it is more than our genome sequence that is responsible for who we are, but that one can purposely alter the course of one’s life with simple lifestyle changes (after reading of the positive health effect of betaine in spinach at the genetic level, I predict that most readers will likely begin to include it in their daily diets). He emphasizes, multiple times, that very small changes often lead to drastic transformations in the state of one’s health. He demonstrates this idea primarily through the use of clinical case studies of people with inherited genetic diseases. He presents many examples gathered from his own experiences with his patients, leading the reader to appreciate that Moalem’s expertise comes through personal involvement rather than “book learning” alone. He even goes so far as to personalize this book by including the story of a friend who asked for the author’s surreptitious help in determining whether his fiancée carried the marker for Huntington’s disease (Moalem refused to help this friend collect the woman’s hair samples and sequence her DNA without her knowledge).

In a few instances, Moalem gives the reader the historical background behind the discovery of a particular disease. One such story is that of a Norwegian mother, Borgny Egeland, and her moving quest to rescue her two children, Liv and Dag, from their severe intellectual disabilities. This dedicated mother, certain that her children were not born with the infirmity, sought out the aid of a local physician-scientist, Dr. Asbjorn Folling. He, along with others over the next several decades, were able to identify the causative

agent of the children’s problem – that is, an inability to break down phenylalanine because of the inherited metabolic disorder now known as “phenylketonuria.” Although too late to reverse the damage done to Liv and Dag, this work paved the way to saving millions of children to this day. At other times, Moalem uses unrelated historical references or ancillary analogies to introduce cases. Often, these are convoluted and might lead the reader astray. The cases themselves are well chosen and can stand on their own without such distractions.

I began this book thinking that Moalem’s goal was to describe epigenetics with regard to human health and medicine. Instead, I quickly realized that he was weaving together a connected and fascinating series of genetic tales in which he ultimately argues for the equal influence of nature and nurture in determining who we are and who we can become. Although writing for the layman, Moalem does not oversimplify the science to the point of being condescending. For readers with an interest in genetics, human health, and evolution, the book is an interesting and easy read that will lead them to seek out additional information on these topics.



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