

morphology, and interactions are also the key drivers of community, habitat, and ecosystem dynamics and function. By extension, plants are also the major drivers of species and interaction diversity on multiple organizational levels. A textbook on plant ecology thus needs not only to convey knowledge of basic ecological and microevolutionary concepts, but also to attend to this special status that plants have in biological communities.

The new volume by Paul A. Keddy easily serves both functions and provides a comprehensive overview of major concepts and hypotheses in ecology in general and plant ecology in particular. Because of the presentation of the basic concepts, this textbook could easily function as a teaching tool for general ecology, using plants as a focus group, with leaving only some subfields, such as behavioral ecology, untouched. As a volume for a plant ecology class, it provides everything that biology or ecology students can wish for, most importantly a very solid conceptual framework for the organization of knowledge on the subject.

This framework is built with 13 chapters around classical concepts, reaching from plants as the major building block creating the biosphere (Chapters 1 and 2) over resource cycling (Chapter 3) and different types of biotic and abiotic interactions and stresses (Chapters 4–8) to population and community ecology (Chapters 9 and 10). The book is rounded up with chapters on gradients in plant communities (Chapter 11), biodiversity (Chapter 12), and conservation and management (Chapter 13).

Within this framework, the volume provides broad knowledge with enough detail to serve both as a solid guideline for a basic ecology course as well as a reference for experienced professionals when venturing into the study of new concepts. The many appropriate and carefully chosen citations that are provided at the end of each chapter allow for further and deeper research into the respective subject matter.

The author made a great and successful effort to provide historical context for each of the concepts described in the book by naming and explaining the scientific accomplishments of key researchers in the field. This approach has the effect that readers get introduced into the thinking process that led to the formulation of new concepts and hypotheses, which, in turn, will open up a reader's mind to come up with their own new hypotheses. This effect is most efficiently delivered by the strategically placed and very informative boxes throughout the volume and is certainly one of the most valuable attributes that a successful textbook could have.

Each chapter ends with a conclusion section, a number of thoughtful review questions, and a list of relevant further readings, all of which aid in a deeper understanding of the subject or the organization of a

new research project. The only thing that one might miss is further online material that would feed into the demands of a new generation of students and researchers. However, this lack of an online component is compensated for by the high quality and meaningful structure of the text that provides a solid framework from which readers can create their own conceptual network.

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ADVANCES IN TEA AGRONOMY.

By M. K. V. Carr; with written contributions from T. C. E. Congdon, R. H. V. Corley, G. K. Tuwei, C. J. Flowers, M. Upson, and M. Perez Ortola. Cambridge and New York: Cambridge University Press. \$99.99. xiv + 454 p. + 16 pl.; ill.; index. ISBN: 978-1-107-09581-6. 2018.

ROSE. *Reaktion's Botanical Series*.

By Catherine Horwood. London (United Kingdom): Reaktion Books; distributed by the University of Chicago Press, Chicago, Illinois. \$27.00. 238 p.; ill.; index. ISBN: 978-1-78023-013-2. 2018.

This volume is part of Reaktion's Botanical Series on 21 different plants. The author takes a fresh perspective on the subject from historical and botanical contexts tempered by her own interactions with and knowledge of specific rose varieties, including many grown by herself.

Horwood expertly organizes the book into 11 chapters plus a useful timeline of rose history that should be engrained into every rosarian's mind. Beautifully written and riveting at times, *Rose* can be read cover to cover, section by section, or simply opened to find a historical vignette about roses. Throughout the book, a refreshing hint of femininity comes through to offer new insights into this otherwise overdone subject, although the recipe section seemed like an afterthought.

The volume's strength lies in explaining how humans have interacted with roses in history, literature, performance, art, symbolism, economics, and society. In particular, the mystique of roses is emphasized by discussions of roses in love, secrecy, royalty, war, and culture. Readers will be intrigued by the section about the acceptance of roses—or lack of—in ancient religions, particularly Christianity. Unlike most rose volumes, two chapters cover the history and evolution of rose gardens in the world.

Considerable space is devoted to the breeding and development of modern roses. Rosarians may be aware of nearly all of the historical roses discussed but may wish space could have allowed discussion of more varieties. The author's London roots are

clearly apparent as there is a distinctly European perspective into modern roses and history, which is unfortunately too common in rose books. Mention of the development of cold-hardy roses, particularly Canadian roses, is regrettably nonexistent. Although amateur rose lovers will understand the logical progression that has led to the modern rose, they should be aware that the historical roses discussed have limited usefulness in the today's rose garden (except for 'New Dawn,' 'Peace,' and 'Queen Elizabeth').

Rose is not a typical rose book, which is welcome and fills a specific niche. Gardeners beware. There are no dedicated sections about rose varieties, no gardening tips, little to no scientific information (despite this being a botanical publication), and the photographs are largely historical. Still, this volume, written by a noted rose historian, would be as deserving of a place in a history section of a library as it would be next to yet another rose tome in the gardening section, but will likely be found as a go-to coffee-table book in the homes of rosarians.

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MICROBIOLOGY

PIONEERS IN MICROBIOLOGY: THE HUMAN SIDE OF SCIENCE.

By King-Thom Chung and Jong-Kang Liu. *Hackensack (New Jersey): World Scientific*. \$120.00 (hardcover); \$48.00 (paper). xxi + 576 p.; ill.; name and subject indexes. ISBN: 978-981-3202-94-8 (hc); 978-981-3200-36-4 (pb); 978-981-3200-38-8 (eb). 2018.

This volume, which aims to describe the human side of science, consists of 57 mini-biographies of prominent microbiologists. Starting with Antonie van Leeuwenhoek (1632–1723) and Robert Hooke (1635–1703), it covers four centuries of science, ending with five living microbiologists: Thomas Brock, Arnold Demain, Bruce Ames, Richard Crowell, and Peter Charles Doherty. Nearly all of the biographies are of men—the entries on Esther Lederberg (1922–2006) and Barbara McClintock (1902–1992) are exceptions. For that reason Chung and Liu refer readers to Chung's earlier book *Women Pioneers in Medical Research: Biographies of 25 Outstanding Scientists* (2010. Jefferson (NC): McFarland). Curiously, they claim that the selection of biographies was "entirely arbitrary," which might explain why prominent virologists such as Wendell Stanley, Alfred Hershey, and Salvador Luria and others like the prolific vaccine creator Maurice Hilleman are missing.

Pioneers in Microbiology was written by scientists not historians, which perhaps explains why there is little attempt to extract common themes in the history of microbiology beyond a brief six-page preface. Bordering on hagiography, the authors claim that there are three commonalities among pioneering microbiologists: first, they have a "prepared mind," by which they mean a dedication to a worthwhile goal; second, strong compassion toward life and human beings; and, finally, a determination to find the truth without being overly concerned with political power or wealth. Presumably, the intended audience is students working in the biological sciences; historians of science will be frustrated that there is little contextual analysis or connection with recent work in the history of science as is found in journals such as *Isis*, *Journal of the History of Biology*, and *Studies in History and Philosophy of Biological and Biomedical Sciences*. This is not to say that the book will be useless to historians; among the 57 biographies are microbiologists that are not well known outside of microbiology. Each entry includes a picture and they vary in length from three pages for René Jules Dubos (1901–1982), an environmental microbiologist, to 23 pages for Harold Boyd Woodruff (1917–2017), a soil microbiologist and successful antibiotics hunter. Louis Pasteur (1822–1895), Robert Koch (1843–1910), Sergei Winogradsky (1856–1953), Albert Léon Charles Calmette (1863–1933), Frederick Griffith (1879–1941), and George Beadle (1903–1989) all have longer entries. It also includes an entry on Paul Henry Kruif (1890–1971) known for his popular work *Microbe Hunters* (1926. New York: Harcourt, Brace and Company). Some of the entries include a very brief commentary and many include humanizing anecdotes. We learn that Edward Jenner (1749–1823) liked bird-watching; Agostino Maria Bassi (1773–1856) was a humanitarian; and Ignaz Philipp Semmelweis (1818–1865) was thin-skinned and identified too closely with his ideas. Overall, this is probably not a volume that one reads cover to cover or for historical scholarship, but rather one to be assigned as a reference work or as a supplemental textbook in a microbiology class.

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FUNDAMENTALS OF MICROBIOME SCIENCE: HOW MICROBES SHAPE ANIMAL BIOLOGY.

By Angela E. Douglas. *Princeton (New Jersey): Princeton University Press*. \$39.50. ix + 236 p.; ill.; index. ISBN: 9780691160344 (hc); 9781400889822 (eb). 2018.

"We are symbionts on a symbiotic planet, and if we care to, we can find symbiosis everywhere," as Lynn Margulis, one of the main proponents of