

even participate in its operation. Even our homes have distinctive microbiomes, mostly due to the microbiomes of the people living in them.

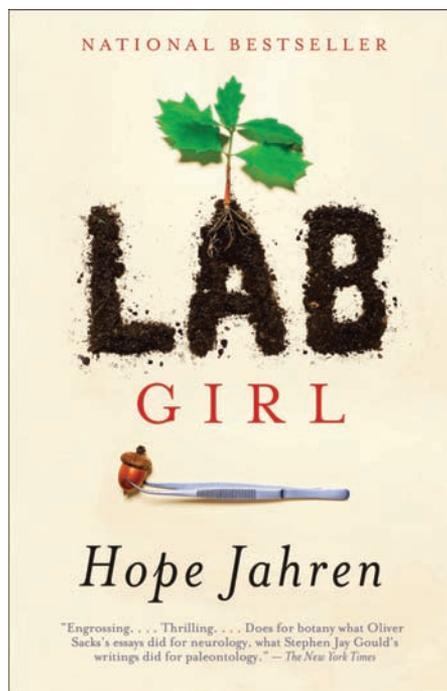
Beginning with Leeuwenhoek, the first human to see bacteria, Yong's story continues over four centuries to the present with his account of recent successes such as the use of fecal microbiota transplants producing phenomenal results in patients with stubborn digestive problems due to *Clostridium difficile*. He also comments that, as the book was going to press, clinical trials were beginning for a new multi-microbe treatment for IBD. He notes that microbiologists "find themselves racing to rewrite the relationships between microbes and their animal hosts." In his final chapter, "Tomorrow the World," he leaves the door open for the reader to peer into the future and consider what could be coming next. Yong sees great potential for microbiome medicine. He notes that different human microbiomes can actually influence the actions of medications from acetaminophen to digoxin to cancer drugs. He envisions a future where medical treatments might involve custom-made bacteria that will interact with the body's immune system and normal microbiome to tackle many medical issues. The unavoidable conclusion that one might make after reading this book is that "Microbes Rule!"

Yong tightly packs much significant content into the pages of his book. Sometimes, following a particular segment, the reader is almost compelled to pause, reflect, and process what s/he has read and consider whether they might need to reread it. He has researched his subject extensively and communicates his findings in a vivid and richly engaging writing style that, for the reader, is more like reading a well-crafted novel than a brilliant scientific treatise. Complex information is explained in lucid language, often with clever wit and the use of perceptive analogies. He is meticulous in citing his information and explanations in 29 pages of detailed endnotes and a 40-page bibliography. A comprehensive index is also included.

This book would be a valuable asset for the library of any high school or college biology department, where instructors would be well-served to become familiar with the information presented. It could change the way that microbiology, ecology, genetics, evolution, and other areas of biology are taught. Serious biology students would also find the book a valuable resource.



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WOMEN IN SCIENCE: BOTANY

Lab Girl. By Hope Jahren. 2016. Alfred P Knopf. (ISBN 978-1-101-87493-6). 282 pp. Hardcover. \$26.95.

Anecdotal evidence suggests that every biologist who pursues a doctoral degree spends the first thirty minutes of each family event trying to answer some form of the question, "Why are you still in school?" Hope Jahren's delightful book answers the question nicely: Because scientific research is complicated, and studying living things takes time and patience.

Jahren's book is laid out in alternating chapters of memoir and ecology trivia. Even though the topic is definitely scientific, the prose is that of a fiction novel, so the reader is easily drawn in to the story. The book follows Jahren's educational and career journey through an entertaining personal narrative. Much of the book describes the evolution of her close friendship with her lab partner and provides a sort of love note to their friendship.

The first chapter of the book describes her emotionally isolated upbringing dominated by frigid Midwestern winters. Jahren describes spending time in

her science professor father's community college teaching lab as the fondest memories of her childhood, and the indelible impression it made on her. She attributes the time she spent at the black lab benches, tinkering around on her own while her father did his work, as stirring a "deep instinct" to unleash her own inner scientist. Jahren spends a fair amount of time in the first chapter reminding us all why we love science and how each of us has created our own special home-away-from-home within our labs and classrooms.

Jahren writes beautifully, yet frankly, about her experience as a researcher. Maybe her writing resonates with me because I can relate so well to her experience as a woman in science. Jahren is able to write so descriptively about her experiences in the field and in the lab, and the challenges that she faces in a male-dominated field that some passages in the book elicited an emotional response from me. In Part Three, Jahren offers an honest reflection on her struggle to be respected and accepted by male scientists in her field. She writes, "In my own small experience, sexism has been something very simple: the cumulative weight of constantly being told that you can't possibly be what you are."

Jahren is also open about how her choice to pursue her career challenged her own notions of womanhood. After a long night in the lab that led to her first independent discovery, she finds herself waiting for the sun to come up so that she can share the news with someone. The fact that she did not have a partner to share the news with made it a very lonely wait. She writes, "The realization that I could do good science was accompanied by the knowledge that I had formally and terminally missed my chance to become like any of the women that I had ever known." I think that scientists of both genders can relate to the personal sacrifices made in pursuit of discovery.

The middle chapters of the book discuss how difficult it is to fund scientific research and the struggle of securing grants. Jahren explains how hard it is to recruit and keep graduate students and lab staff in such an uncertain environment. In one passage, Jahren mentions that non-defense-related scientific funding has been declining steadily for the past 30 years. She counters the oft-repeated idea that the United States doesn't create enough scientists with the notion that there simply isn't enough funding to support the work of the scientists that U.S. colleges and universities are producing.

This book is entertaining and educational. Admittedly, I eventually began to rush through the chapters espousing the virtues of seed growth and the wonders of the relationship between root and

soil to get to the memoir chapters. Perhaps someone with an ecology background would appreciate them more than I. Yet, I think this book would be a great addition to a college-level seminar, or even a common read.



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