a person's thought processes. One manager is quoted as stating "[s]cientists embrace uncertainty; managers use it as a reason for inaction" (p. 36). The project team found that managers need to be integrated into the science team from the beginning, including helping to shape proposals, attending regular workshops and meetings to understand models and understand preliminary results, and coauthoring reports and scientific manuscripts.

A sobering observation is that at least 10 years of team and capacity building are needed to begin to handle the extreme climate and disturbance events that are becoming more frequent under climate change. This is troubling given the short-term nature of funding cycles in today's political climate (the project described in this book ran from just 2011 to 2016). A quick online search revealed archived data files, but no evidence of a continuing legacy of formal support for the integration of science and management forged by this project. Missing from this book was discussion of how managers deal with the climate change denial by many current politicians, and the consequent lack of funding, and winding back of programs to address impacts of climate change. I wondered how relevant some of the volume is under the current U.S. government, with its hostility to the very idea of anthropogenic climate change, let alone funding programs to mitigate its effects.

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EVOLUTION

The Science of Human Evolution: Getting It Right.

By John H. Langdon. Cham (Switzerland): Springer. $79.99 (hardcover); $59.99 (ebook). xxi + 220 p.; ill.; index. ISBN: 978-3-319-41584-0 (hc); 978-3-319-41585-7 (eb). 2016.

This is a very unusual, interesting, and useful book in which the author reviews a series of topics in human evolution that have been, or remain, characterized by alternative views, and how these issues have been addressed, or resolved, using the "scientific method." The 26 cases are quite diverse in their breadth and in the disciplines involved. They include broad philosophical topics such as The Darwinian Paradigm: An Evolving World View, Is Humanity Sustainable? Tracking the Source of Our Ecological Uniqueness, and What Science Is: A Cultural and Legal Challenge as well as narrower topics such as Checking the Time: Geological Dating at Olduvai Gorge or Reinterpreting *Ramapithecus*: Reconciling Fossils and Molecules. Each chapter ends with a series of questions for discussion and a short bibliography for additional reading. The volume is ideal for a seminar course at either the undergraduate or graduate level. I suspect most instructors would want to add additional, in some cases more recent, readings especially at the graduate level. However, the topics are all interesting and the debates real.

In a world overwhelmed with "fake news" and "alternative facts," as well as the presence on the Internet of endless information of varying quality about anything and everything, critical thinking is the most important thing that educators can teach their students. That task is the goal of this book, along with providing some insight into the history of research on human evolution and an appreciation of the diversity of disciplines involved in studying our evolutionary past. It is a great idea, and well executed.

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The Secret of Our Success: How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter.

By Joseph Henrich. Princeton (New Jersey): Princeton University Press. $29.95. xvii + 445 p.; ill.; index. ISBN: 978-0-691-16685-8. 2016.

As the author tells it, humans are a pretty wimpy species. We are not particularly fast or strong. We cannot climb trees well. Chimpanzees can perform equally well on certain intelligent tests and, more speculatively, even Neanderthals may have cognitively outperformed our ancestors. What has allowed humans to flourish and dominate the planet is culture; we are the first truly cultural species.

Perhaps it is easiest to explain *The Secret of Our Success* in contrast to what it is not. First, it does not explain cultural evolution as an analogous or parallel process to biological evolution; that is, explaining cultural evolution in the biological terms of variation, selection, and heredity, in the style of memetics. Henrich instead argues that culture has directly shaped our genes. This cultural-genetic link is not merely reflected in a few curious traits, such as lactose tolerance, but it has been the defining force shaping hominid evolution for perhaps two million years. Cultural evolution has whitened our eyes, lowered our larynx, shortened our intestines and, most importantly, we have become "self-domesticated." In this sense, cultural evolution is an extension of biological evolution and a significant, powerful, and novel evolutionary force in its own right.

Second, Henrich does not argue that our ancestors' intelligence was either the reason for the origin or advancement of culture, as the canonical view of evolu-

tion holds. This has the causal relationship backwards. Instead, human intelligence is largely a result of culture. It is through our collective brain, which is a feature of our shared cultural inheritance, where our heightened intelligence emerges and where such knowledge is promulgated. "[W]e are smart, but not because we stand on the shoulders of giants or are giants ourselves. We stand on the shoulders of a very large pyramid of hobbits" (p. 323). Try to start a fire, for example, without the aid of modern technology or training. Better yet, try to kill a seal on sea ice. As the author notes, you would first have to kill a polar bear in order to fashion the proper tools (and he wishes us "good luck"). No one person, or group, discovered the technological prowess to kill a seal. Rather, it was through the accumulation of small technological advances, passed on and enriched over generations, that enabled humans to achieve this feat.

Henrich presents a compelling case along with a thoroughly engaging read. He dedicates chapters to explaining what features, both at the population level as well as individual traits, are conducive to the transmission of culture. Behaviors as diverse as taboos, valuing affine relationships (in-laws), social prestige, and pair bonding evolved to be in service to the cultural transmission of knowledge. He also addresses why humans, as opposed to other beings, were able to cross the "Rubicon" of the cultural-genetic divide (once we have crossed over, we are unable to go back) and how cultural selection originated in the first place (there has to be enough information worthy to be passed on in order for cultural selection to convey a fitness advantage).

This view of cultural evolution joins a growing chorus, along with some proponents of developmental biology, niche construction, and epigenetic inheritance, that challenges the received view of evolution. Whether these threats ultimately constitute an extension of the evolutionary synthesis remains an open question. As this book persuades, however, we need to think harder about how culture has directly affected human evolution.

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NATURAL SELECTION: METHODS AND APPLICATIONS
By *Mario A. Fares. A Science Publishers Book. Boca Raton (Florida): CRC Press (Taylor & Francis Group).* $89.95. xii + 261 p.; ill.; index. ISBN: 978-1-4822-6372-5. [This book includes a Color Plate Section with 20 color plates.] 2015.

This volume offers an overview of methods to detect and interpret molecular signatures of natural selection. Although this book is composed of nine chapters, the first four chapters are solely authored by Mario Fares. The remaining five chapters are contributed by a range of authors, although Fares does coauthor Chapter 5 with Christina Toft on functional divergence in protein sequences and the final chapter with Juan Pablo Labrador on molecular coevolution.

Natural Selection is not a compendium of methods or an overly technical explication of models and theories, but each chapter offers an accessible perspective on the value of different approaches to various problems involving the detection and measurement of selection. In the first four chapters, Fares offers introductions to natural selection, how patterns in DNA sequences can be used to detect evolutionary change, why modeling of DNA sequence evolution is necessary to accurately detect differences in sequence evolution, and how statistical tests using sequence data can differentiate between neutral evolution and evolution by natural selection. In Chapter 5, Fares and Toft shift from DNA sequences to protein sequences. Building on the idea that selective constraints on proteins produce different rates of evolution, the authors describe detecting functional divergence in the heat-shock protein GroEL using the program DIVERGE. The use of nonsynonymous/synonymous substitution rate ratios to detect selection in DNA sequences is complicated in the next chapter by Miguel Arenas and David Posada, who describe how to incorporate recombination into standard estimation methods. These two methodologically oriented chapters are followed by a more conceptual review of the factors influencing rates of protein evolution written by David Alverez-Ponce. Although gene expression seems to have the strongest impact on evolutionary rates, the author offers a careful review of other factors and their interaction to produce a more complex assessment. This emphasis on interactions is amplified in Chapter 8, which surveys the basics of network science and applies to biological systems relevant to molecular evolution, such as protein-protein interaction networks and transcription factor networks. The final chapter examines molecular coevolution through the coevolution analysis using protein sequences (CAPS) model. Fares and Labrador then bring the results of this coevolutionary analysis back to the inference of protein function by explicating how coevolving amino acid sites provide information about adaptive evolution of protein functions.

Natural Selection: Methods and Applications offers an accessible overview of methods to identify the signatures of natural selection from protein and DNA sequences. It will be of value to graduate students and newcomers to molecular evolution who are seeking an introduction to this important topic.

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