Marketing for Scientists: How to Shine in Tough Times.

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and the author to evolutionary events that occurred billions of years ago.

Time travel is a usual pastime for Brasier, who is a professor of paleobiology at the University of Oxford and a global hunter of fossils that span the Archaean and Proterozoic eons. Entertaining autobiographical notes of his field trips add to the adventurous mood of the book's narrative.

As with any good mystery novel, *Secret Chambers* entices its readers with multiple parallel and, at first, seemingly unrelated stories: surveys of coral reefs in the world's oceans, a close examination of algal and foramineran cellular structures, and a study of mass extinction patterns throughout Earth's geological history. After a brief historical foray into England during the Age of Enlightenment and later, during the Victorian era, to meet Robert Hooke, Charles Darwin, Robert Brown, and Charles Lyell, we are teleported aboard the HMS *Fawn* in the Sargasso Sea, where Brasier served as the ship's naturalist in 1970s. Here, we are introduced to a complex cell's internal structure, and we are faced with questions pertaining to its origin: Which events led to the creation of cellular compartments? When and where did it happen? Why did it happen only a few times, and why only in the distant past? What fossil evidence supports our conjectures? Answers to these questions eventually converge from the multiple threads of the narrative, although, as with many scientific investigations that are still in progress, we are left with only a partial and speculative understanding.

I applaud Brasier's attempts to explain complex topics with poetic and vivid metaphors, but I take note of some oversimplifications and mistakes that crept into these analogies. For example, when the author compares a mitochondrion to a ship's engine, he describes the burning of adenosine triphosphate (ATP)—the cell's "fuel"—as taking place within the organelle to release energy. In fact, the opposite happens there: ATP is made to trap the energy that is created from the oxidation of carbohydrates, fats, and amino acids. In the analogy of the Tree of Life using a mangrove, living entities are presented in a progression from bacteria (i.e., the roots of the mangrove) to animals and plants (i.e., the branches of the mangrove). Although the analogy helps to illustrate the multiple bacterial contributions to the eukaryotic cell, the Mangrove of Life has a greater resemblance to the genealogical view of eukaryotic ancestry than to contemporary visions of the Web of Life (Ragan 2009).

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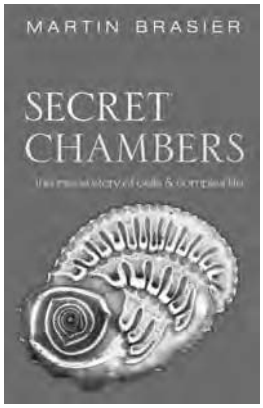

Another misstep of the book is that although the origin of chloroplasts is thoroughly covered, the origins of the mitochondrion and the nucleus are mentioned only in passing. It is the origin of the mitochondrion, however, that is at the crux of the ongoing eukaryogenesis debate, because many eukaryotes do not have chloroplasts, but they virtually all have mitochondria. The book's focus on chloroplasts leads to Brasier's failure to present the differing sides of the argument, a point of contention fueled in part by genomic and phylogenetic data and involving two rival models—the phagotrophy model, in which a protoeukaryote engulfs a bacterium, and the syntrophy model, in which an archaeon and bacterium merge to form a new type of cell (O'Malley 2010). Without mentioning this ongoing rivalry between two conceptually different eukaryogenesis propositions, Brasier inadvertently hides part of the history of the eukaryotic cell from the reader.

All flaws aside, *Secret Chambers* achieves what the author intended. It is a lively, partly historical, and mostly personalized account of the quest to understand the evolutionary history of the eukaryotic cell. Designed for the lay reader, the book also can be inspirational to high school and undergraduate students. Brasier weaves side discussions throughout his book about the usefulness of knowing how various approaches can be employed by scientists in order to find solutions to the puzzles of scientific queries. It is most likely Brasier's hope that students of various majors will read *Secret Chambers* and learn how the combined fields of paleontology, biology, evolution, and mathematical modeling contribute to the investigation of the origin of the eukaryotic cell.

Acknowledgments

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A MARKETING TOOL KIT FOR SCIENTISTS

Marketing for Scientists: How to Shine in Tough Times. Marc J. Kuchner. Island Press, 2011. 248 pp., illus. $19.95 (ISBN 9781597269940 paper).

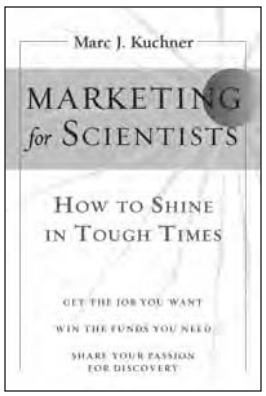
Ever wonder why automotive engineers design car doors to produce a particularly solid-sounding

thunk when you close them? It is all part of a marketing strategy that author Marc J. Kuchner believes can be applied to science and scientists as well. In his well-written book *Marketing for Scientists: How to Shine in Tough Times*, Kuchner offers scientists some career-building guidance using the principles of marketing that he learned from his experience as a country music songwriter. His insights into the marketing field have been retooled for the science community and applied to finding a position, seeking grants, and having an impact on the public's perception of science. Because learning the skills of personal marketing is not typically a part of the educational experience for PhD candidates, this book offers a unique perspective that scientists at all stages of their careers will find interesting and perhaps useful.

Kuchner is no slacker when it comes to success. Now an astrophysicist at the NASA Goddard Space Flight Center, he contributes to projects on the direct imaging of extrasolar planetary systems. He also coinvented the band-limited coronagraph, a tool for finding planets around other stars. Kuchner is a prolific researcher and an expert commentator, and in his spare time, he writes country music songs—that he markets, of course, in Nashville, Tennessee.

The selling point of the book is its potential to help scientists appreciate both the need for marketing and the way in which very specific marketing strategies can enhance their careers. Kuchner begins by reminding us that scientists are facing many obstacles: The general public has little appreciation for science, fewer jobs are available for new graduates, and funds in support of research are limited. Noting the parallel between scientists who write papers that are seldom read and songwriters who write songs that are seldom heard, Kuchner introduces the fundamental theorem of marketing: the idea that it is "the craft of seeing things from other people's perspectives, understanding their wants and needs, and finding ways to meet them" (p. 13).

Throughout the book, Kuchner offers very specific examples of successful marketing principles in action. Using analogies from the world of business, he introduces the reader to marketing principles with scenarios that relate to different moments in a scientist's career. He then changes his focus to identify who the actual "consumers" of science are and to propose a definition of the "products" of science that might surprise many in the field. Whereas previous authors have suggested that scientists market hypotheses, Kuchner asserts that it is the proposals themselves that are the actual "staple product of the scientific economy" (p. 111). He views presentations, papers, press releases, and conferences as marketing tools that allow scientists access to funding, fellowships, and positions.



To beginning scientists, *Marketing for Scientists* offers excellent advice on the process of developing and marketing proposals, although I expect that scientists at various stages of their careers might also find this useful. The text offers new definitions and nomenclature, such as the "signature research idea" and the "*Star Wars* approach" to giving a presentation. A consistent theme runs through the pages: Marketing is ultimately about understanding and creating a relationship with the "buyer." The reader is often reminded that "it's about them, not you," as the author relates stories from his country music career to illustrate his points and deepen our understanding of the principles involved.

Although much of the book is focused on providing scientists with the tools to market themselves, it also addresses the need to market science itself to the American public. Citing the 2010 National Academies of Science report *Rising above the Gathering Storm, Revisited*, the author reminds us that 49 percent of adults in the United States do not know how long it takes for Earth to revolve around the sun. He describes ways that scientists can change the public's perception of science, and he concludes his book by encouraging scientists to "start a movement" by marketing themselves and their field more effectively. Many readers will welcome this chapter, but some may wish for more discussion of this important topic.

Kuchner has done extensive reading and research in the field of marketing to make his arguments, and the book reflects this with detailed references in the final "Notes" section, listed by chapter, and with recommendations for further reading, organized by topic, following these notes. The Web site referenced in the book provides additional material that readers will find as interesting as the book itself.

The merits of *Marketing for Scientists* are many (the book is compelling and an easy read with useful illustrations and very clearly crafted prose) but one shortcoming is that it is written specifically for scientists in research positions. Its focus on activities that will allow a scientist to gain funding for proposals seems to limit its usefulness for other scientists who work in different types of organizations. However, with that one limitation, the general principles offered in the text describe skills that can—and *should*—be applied more broadly to professionals of any field.

The final piece of Kuchner's advice to scientists wishing to promote their work or their field can be borrowed from the title of one of his country

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music songs. If you check the catalog of tunes on his Web site, you will see "Start Now"—a fitting suggestion for us all.

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