

## Evolution, Just Say Yes: Prothero on Fossils

***Evolution: What the fossils say and why it matters*, by Donald Prothero.**  
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It has often been remarked that the fight against creationism resembles Heracles' battle with the mythological *Hydra*: chop off one of *Hydra*'s many heads and two more spring forth. The various manifestations of creationism over the last 50 years certainly support such a model. Indeed, in spite of creationists' opposition to evolution as a biological process, the group's ideology has shown a marked tendency to adapt and evolve when their goals are thwarted by legislative or other obstacles to proliferation: apparently, this is one of life's little ironies. To prevent the *Hydra*'s weird regeneration and fission, Heracles had to burn the remnants of each of the heads he bludgeoned. Do evolutionary biologists have any similar tools at their disposal as they confront creationism? One certainly is vigilance, from the local to the national level in various educational venues. Another tool is producing books and other publications (of which, of course, this journal is a prime example). These focus on providing readers, including teachers, compelling examples to hold in the pocket as it were as ammunition against false creationist claims; further, they elucidate the complexities of the religious arguments which supposedly, but do not really, underlie creationism. Finally, they provide a knowledge base on evolution suitable for a variety of backgrounds and levels. Two excellent and influential examples, from the many fine

books on this topic, are *The Monkey Business*, Niles Eldredge, New York: Washington Square Press, 1982, and *The Triumph of Evolution and the Failure of Creationism*, Niles Eldredge, New York: W. H. Freeman, 2000. Donald Prothero has added another splendid book to the Evolutionist's arsenal in the battle with the *Hydra*.

One of the real strengths of this book is the explicit focus on the fossil record and its significance for documenting and demonstrating evolution. In this respect, it fills an important and largely unoccupied niche, as books on evolution have typically strayed more towards the biological side. Combine this with the author's expertise on paleontology and evolution, and you have a highly useful and genuinely lucid and readable account of evolution and the history of life. Not only is Prothero an expert on fossils but he also has a deep understanding of religion and the Bible, as he nicely outlines in the book. This understanding gives his account real credibility from a theological perspective and adds to the utility of the book.

The book is divided into two major parts. The first broadly focuses on the nature of science and religion while considering various topics including the nature of science and creationism, the evolution of evolution, and the relevance of systematics to evolution. The second focuses on many concrete examples of evolution in the fossil record including the origins of life, the invasion of land by vertebrates, the evolution of dinosaurs and whales, and hominid and human evolution. The bulk of the examples do come from fossil vertebrates, although other topics are discussed, including the origins of life and the Cambrian explosion. It might, perhaps, have been nice to have a little more detail added to the discussion on the various episodes that we largely understand from the invertebrate side of paleontology, including the Cambrian explosion, especially

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given that this episode is often falsely presented as a fundamental challenge to evolution. Still, given Prothero's background and expertise, the organization and topics covered make good sense. Further, the vertebrate and other examples presented are certain to have immediacy, and ultimately, this minor quibble does not detract from the very successful character of the book.

In effect, I see books like this one as valuable on several levels. First, it provides useful examples for college and high school teachers as they seek to effectively teach students about evolution and come up with concrete

examples to combat creationist falsehoods. These examples run the gamut from creationist myths to actual transitional fossils. I can also see this book as a very useful textbook, especially in introductory college courses. Reading it will allow students to reflect in private about various contradictory creationist statements, while they pore over the persuasive bulk of paleontological examples supporting evolution. The book is a major service to the disciplines of paleontology, evolutionary biology, and the broader scientific community, and Prothero is to be congratulated on a job well done.