

Introduction

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Overview

The issue of evolution and creationism has a long history, but one of the central battles has long focused on the fossil record of evolution. Even though Darwin (1859) had little supporting evidence from the fossil record, by the late nineteenth century, examples such as *Archaeopteryx* and the evolution of horses had accumulated increasing support for notion of evolution. In fact, the evidence of life's evolution as revealed in the fossil record was not disputed and seldom addressed by most creationists even into the twentieth century (Numbers 1992).

This all changed with the more aggressive style of literalist “young-earth creationism” (Numbers 1992), pioneered by George McCready Price in the 1920s to 1960s and culminated by the “flood geology” model of Whitcomb and Morris (1961) and the writings of Duane Gish (1972, 1995). These works, and those by their imitators, blatantly denied that the fossil record showed evidence of evolution. They tried to convince their audience that the fossil record actually contradicted the notion of biological change through time. As discussed in my recent book (Prothero 2007), their tactics consisted of taking quotations out of context (“quote mining”), citing old outdated sources or oversimplified trade books (and even children's books), and misinterpreting what little bit of real science they did cite correctly. In no case was their “research” based on actual study and interpretation of real outcrops or fossils, since none of these creationist authors has any appropriate qualifications or training in paleontology or geology. Price was a high-school teacher with almost no college education,

and Whitcomb, Morris, Gish, and their ilk have advanced degrees in fields completely unrelated to paleontology. They may impress some of their audiences with the PhD after their names, but those of us within science recognize that the advanced degree does not prove you are an expert in everything but only in the specialty in which you are trained. As I often point out to audiences, we would not trust these guys on their interpretations of music theory or auto mechanics (they are not trained in those fields either), so why should we listen to what they write about fossils?

Nevertheless, by boldly lying about and distorting the evidence of the fossil record, these impostors have managed to convince a large percentage of the American population that the fossil record does not show evidence of evolution. For that reason, a number of paleontologists (e.g., Martin 2004; Prothero 2007; Shubin 2008) have tried to correct that false impression and set the record straight. This journal is yet another medium that allows us to spread the word about the fossil record and try to undo the mischief and deceptions pushed by the creationists. In the chapters that follow, we have asked some of the most distinguished paleontologists in the world to summarize the key evidence for evolution in the fossil record, especially in groups which are targeted by creationists and/or crucial to the idea of “macroevolution” from one major group to another. Thus, we have chapters dealing with the new evidence about the origins of major phyla, such as the arthropods, mollusks, echinoderms, and chordates. We also solicited contributions about some of the major transitions within the phylum Chordata, such as the origins of tetrapods, marine reptiles, dinosaurs, birds, mammals, whales, and hoofed mammals. This is by no means an exhaustive list of all the evolutionary transitions observed in the fossil record (see Prothero (2007) for a more complete account), but it should give the readers a more updated basis for understanding these transitions and for answering creationists with their

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outdated and out of context quotations and their misinformed interpretations based on absolutely no appropriate training or firsthand knowledge of the fossils.

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