For the Rock Record: Geologists on Intelligent Design

Jill S. Schneiderman and Warren D. Allmon (eds.)
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> 'If you believe in your cell phone, you have to believe in evolution.'

I use this statement in class discussions to frame the debate about evolutionary theory and creationism (including its most recent mutation, Intelligent Design, or ID), and specifically to acknowledge the complexity of the scientific process. This statement is kind of a double entendre; superficially the progression of cell phones resulting from technological advances can be useful to illustrate evolutionary lineages and the concept of adaptation. But as students often point out, cell phones require a designer, so wouldn't this analogy support Intelligent Design? The deeper, and more relevant, point for discussion is that the complex scientific and technological knowledge required to produce a cell phone is a result of the same method of enquiry used in all fields of science including evolutionary biology, paleontology, and geology. As creationists (or 'intelligent designists'…?) often claim, we can't see evolution happen—but we also can't see the cell phone signal transmitting data, and I am pretty certain that the vast majority of cell phone users do not fully understand how their little magic boxes of technology actually work. But as long as we can pick up that signal, we 'believe in our cell phone.' If there is a common process of producing knowledge in all scientific disciplines, why do people generally accept the results of some scientific endeavors so much more easily than others?

While achieving an understanding of the evolutionary process is based largely in the biological sciences, much of the evidence cited in the 'creationism vs. evolution' debates derives from observations about the rock record—the fossils that document the history of life and of past environments, and the geological deposits in which they are preserved. In *For the Rock Record: Geologists on Intelligent Design,* Schneiderman and Allmon (2009) produced an edited volume in which geologists respond to the arguments of Intelligent Design proponents. One of the central points of the book is that the ID attack on evolution is an attack on all scientific thinking because of the common objectives, method, and philosophy in scientific research—clearly a more concise and articulate statement of my cell phone analogy. This volume presents a compelling series of papers with thoughtful and refreshing viewpoints on the significance of the evidence for evolution, and concerning the history and philosophy of scientific thought. Some authors even challenge creationist arguments from alternate religious (Christian) perspectives! While the fundamental issues have been addressed previously, the difference in perspective and the detailed coverage of less commonly utilized sources of evidence contribute to a stimulating and readable book that would be useful to anyone who has a stake in teaching evolution. Many of the papers included would also be valuable references on which to frame discussions in upper-division undergraduate and Masters-level courses.

For the Rock Record includes ten chapters organized into three sections, the first of which is titled 'Rocks and Bones.' It is comprised of four chapters covering evidence from the geological and fossil record, covering (in order) the complexity of the inorganic rock record (Schneiderman), a discussion of creationist explanations of geology (Heaton), the fossil record for well-documented missing links (Prothero), and a comparison of scientific and ID interpretations of enigmatic fossil groups such as the 'dino-birds' (Tumarkin-Deratzian).

The material covered in these chapters is likely to be fascinating to any interested non-specialist, but I believe that many will need to look up terms and species names in order to *really* follow the text (i.e., I had to look them up!). While the articles are well-referenced, and there is a list of resources and websites for ID at the back of the book, the addition of a glossary of geological, paleontological, and other scientific information would have been useful. For example, the explanations of complex geological formations at both macro- and micro- scales presented in Chapter 1 require a fairly sophisticated understanding of rock formation processes, mineralogy, and chemistry—including a familiarity with terms such as the Fordham gneiss, protoliths, and ilmenite inclusions—as well as some knowledge of the extensive geological time scale over which such processes have operated.

After some thought, however, I cannot criticize the authors or the book on this point because it illustrates one of the important issues in the evolution-creationism debates. As discussed in Chapter 2, creationist explanations are crafted to be simple and follow a logic based on biblical authority (or some constructed extension of it) in order to appeal to a general, non-specialist (and probably religiously-oriented) consumer. Thus, young-earth creationists are able to incorporate unfounded 'geological events,' and to deny the importance of a deep time perspective which has been recognized since the time of Darwin and Lyell. Is it really necessary to point out that a valid portrayal of science is

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essential to any scientific understanding of geological and evolutionary processes? The fact is that useful scientific explanations are usually not simple, and simplistic interpretations may end up being unconvincing or even incorrect. Providing clear and convincing explanations of complex processes or phenomena, and overcoming the tendency for over-simplification, is perhaps the biggest challenge to the scientific community. But if we really want people to understand the world in terms of the natural sciences, we need to engage our audiences in the complexities of our scientific research. The necessity of reading chapters like these with a couple of textbooks at hand (or more likely, with our browser open to *Google*) is just the point.

Chapters 3 and 4 (on transitional fossils and the 'dinobirds,' respectively) are perhaps my favorite chapters in this section if not the book. Both are thoughtful, clearly written, and instructive about how to teach some of the complex issues of systematics using straightforward examples illustrating the concepts underlying evolutionary interpretations of fossils and of morphological variation. These chapters also address some of the conflicting approaches and definitions between evolutionary and creationist methods, such as the different treatments of transitional forms, and the approach to classification itself. Because it does not recognize evolving lineages, or the significance of mosaic morphology or transitional fossils, the creationist approach is to re-define any 'so-called' transitional forms to fit into one of the already-existing and neatly defined taxonomic boxes in a simplistic and self-satisfying typological approach to classification. If it needs pointing out, this approach was long ago abandoned in biology and paleontology. In this manner, the ID'ers obfuscate the system of biological classification to such a degree that there is no potential in their scheme for any fossil evidence presented to be interpreted in support of evolution.

The second section of the book, 'Education, Politics and Philosophy,' consists of four chapters (5–8) covering philosophical and historical issues in the understanding of evolutionary science versus creationist thinking. These chapter topics, again in order, range from a discussion of ID's Wedge Strategy (Terry), the role of the different metaphysical positions in ID and evolutionary philosophy (Mitchell), the proper understanding of methodological naturalism in science (Miller), and the logic and limits of science (Goldsmith). These chapters, like those of the first section, provide thought-provoking reading and clearly illustrate the philosophical chasm separating the dramatically different world views of creationists and evolutionists.

At the same time, in illuminating the profound differences in the knowledge process between scientific and creationist viewpoints, these chapters make for very disheartening reading as an educator and scientist. The intelligent design movement relies on the promotion of outdated (and again, simplistic) ideas including pre-enlightenment views of natural theology. ID relies on a system of 'explanation' that predates and therefore denies the validity of several centuries of scientific, philosophical, and technological progress—a historical period which has critically informed the modern understanding of the world and our ability to exist in it. This discussion again highlights the book's stance that ID is an assault on all fields of science.

On the surface, this position might be attributed to a perceived widespread public ignorance of modern scientific fields such as biology and geology. However, the notion that long-discredited explanations of the natural world should still be peddled with serious intention takes on a more pernicious tone when one realizes that the groups promoting ID or creationism have a political agenda.

Enter the Wedge Strategy. Chapters 5 and 7 demonstrate the manner in which the ID movement has constructed an information attack on science with the objective to introduce religious viewpoints into legitimate scientific discourse, and to change the content of school curricula and science textbooks. The problem is not that ID seeks to present alternate scientific hypotheses explaining the planet's past (it doesn't), but that the ID strategy is an attempt to change the limits of legitimate science to incorporate unscientific, untestable 'hypotheses' employing supernatural phenomena. If ID were to become [God forbid!] somehow accepted into mainstream science, it would become impossible to falsify any hypotheses invoking supernatural phenomena and thus render the scientific method we all use to be useless. This discussion, combined with that presented in Chapter 3, drives home the point that the ID arguments cannot be viewed as a serious rebuttal of any specific scientific findings; they constitute instead the promotion of a political agenda contextualized within a particular set of religious and philosophical views.

But it gets tricky here—most scientists would, presumably, argue firmly in support of the established scientific method as an essential process for producing knowledge about the natural world in which we live. Thus, it might be somewhat perplexing to read scientific rebuttals to creationist literature repeating the common claim that science does not actually pose a threat to theological understanding (as in Chapters 6 and 7). This line of reasoning usually states that science and theology by nature address different kinds of questions, and science therefore cannot address those of a religious or spiritual nature—since science and theology deal with different 'realms,' there can be no conflict. If this were really true, why all the fuss?

Historically, theological perspectives were influential in the ideas and writings of most early thinkers in many fields of science (think of Buffon, Linneaus, or Cuvier). Despite the acknowledged historical significance of such contributions to our understanding of our planet and its history, the development of modern scientific thought required the breaking away from such views as a result of a more naturalistic method of enquiry. One of the key features leading to the historical (and current) acceptance of Charles Darwin's *On the Origin of Species* was his methodological approach to scientific reasoning—but his methods were initially as controversial as his ideas (see Chapter 8).

In case the point has not already been made, science involves a specific method for the successful pursuit of knowledge and understanding about natural phenomena,

constructing competing hypotheses to test on the basis of available empirical observations. In contrast, theology pertains to religion and its influences on our interpretations of the world, and utilizes a different philosophy and logic, and different information sources. In reality, while we characterize science and theology as distinctly different philosophical systems for obtaining knowledge and understanding, scientists and theologians (i.e., people generally) share an interest in some existential topics relating, for example, to human origins or that of the universe. It is difficult in practice to categorically restrict either science or theology to specific realms of questioning, and it is possible for either to drift into 'areas where they do not apply' (Chapter 6, p. 109). Nonetheless, such disagreements are not equivalent to ongoing debates about competing models within a scientific discipline because—to repeat this point one more time—science follows a time-tested and proven method which aims to further our understanding about the natural world. When scientists have a debate, both sides utilize a common method of hypothesis construction, data collection, and analysis.

Given that many scientists do reportedly maintain some form of religious belief alongside their evolutionary understanding, the claim that science is no threat to religion may have some substance. However, this stance has been presented in response to the ID claim that science is atheistic by nature, and attempts to sidestep the political context of this discourse. Regardless of its intentions, the fact that scientific research supports evolution and not creationism does pose a threat to at least some people's religious belief systems.

This brings me to the final section of the book, which discusses different religious viewpoints concerning evolution and creationism. It consists of two chapters (9 and 10), one a personal account of the author's reconciliation of evolutionary and religious beliefs (Kelley), and the other a review of the spectrum of belief in God (Allmon). Taken together, these two chapters illustrate the many possible perspectives on religion, some of which completely reject evolution, and others which incorporate evolution and other scientific interpretations of the natural world.

While Chapter 9 offers some interesting and useful examples critiquing creationist explanations, I was ultimately somewhat dissatisfied with the author's explanation of her reconciliation of religious and scientific views. If I understand it correctly, it is simply that she has religious faith in religious matters, and relies on scientific understanding in scientific matters. The final chapter offers some elucidation, in that it presents so many different accounts defining the concept of God that it was impossible to come to any kind of objective conclusion. Perhaps this is the point—the God spectrum is so vast and variable that the relationship between science and religion can only be resolved at the personal level. As with many questions in science, given the information we presently have available we may not be capable of determining the ultimate truth regarding this issue.

In my view, this helps to understand the difficulty in resolving this confounding issue—science and religion start from different fundamental principles, but both may seek to understand some of the same phenomena about our place in the world we inhabit. Even while acknowledging that science attempts to produce objective explanations for our observations in nature, it does not prevent us from feeling awe at the power of the natural world during a thunderstorm or an earthquake, in contemplating the composition and physical vastness of the universe, or in seeking to wrap our minds around the passage of immense periods of time required to allow the evolutionary process to work. Just for a moment, imagine your own bones lying in a cave for millions of years, silently marking the passage of time and the transformation from the biological to the geological spheres, or examine the features of any fossil and consider how the inorganic rock in your hands could once have been a conscious, living creature. Even with our scientific understanding, these metaphysical musings can invoke feelings that can be described as 'spiritual' and take us into realms of thinking that evade our complete comprehension. Even as a big doubter and probable non-believer, I cannot explain to my own satisfaction how these thoughts differ from that entity which in a religious perspective is labelled 'God.' This might seem like a dangerous thing to admit to a creationist, but in fact, the issue is over the approach to understanding and seeking knowledge, not over the ultimate source of the awe we feel in contemplating Nature or our own existence in it.