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Edward J. Larson. *Evolution:
The Remarkable History of a Scientific Theory.*

New York: The Modern Library, 2004

Trent D. Stephens and D. Jeffrey Meldrum
with Forrest B. Peterson. *Evolution and Mormonism:
A Quest for Understanding.*

Salt Lake City: Signature Books, 2001

Reviewed by William E. Evenson

The unifying biological concept of evolution, and particularly its implications for human origins, is of widespread interest among members of The Church of Jesus Christ of Latter-day Saints because questions of human biology and origins make contact with our sense of who we are and our relationships to one another, to other species, and to God. These two books provide a valuable foundation for exploring evolution: What is this scientific framework, within which all of modern biology is now viewed? How did it develop, and what are its relationships to other or supporting bodies of scientific knowledge and facts? What is the official position of the LDS Church with respect to these ideas? What of unofficial views of LDS leaders? Can evolution be reconciled with faith in a satisfying way?

Larson's book, *Evolution*, written by a prize-winning scholar with extensive publications in evolution-related intellectual and social history, gives valuable historical perspective for addressing these questions. This Modern Library edition, compact as is usual for this series, covers more than two hundred years of history in 286 pages of main text. It is a treasure of historical information, giving an excellent overview of the development of the ideas of evolution and natural selection and pointing the reader to sources for further information where desired. This book, like Larson's previous books, is gracefully written. It maintains scholarly integrity while flowing smoothly from Cuvier's pioneering precursor work in the late eighteenth century up to present-day issues. Larson does

excellent work in clearly connecting important developments in this history to their earlier roots. Furthermore, he is especially strong in weaving in personal histories and interesting biographical details of the scientists who figure in his history. Besides its readability, Larson's book can be recommended for its evenhandedness. The book is not a brief for or against evolution or any variant theory.

The idea of evolution had been gaining popularity since the Enlightenment. But the science was limited until the seminal work of Georges Cuvier in comparative anatomy in the late 1700s. Larson begins the story there. Cuvier set the stage for Darwin's ideas by recognizing the validity of fossils, the extinctions of species that the fossils suggested, and the possibility of reconstructing past natural history from geological evidence. Nevertheless, Cuvier, like most of us, was sufficiently a product of his time to have retained a strong commitment to the theory of "special creation," and he produced scientific arguments that were strong for his time in support of that theory. In fact, he introduced the idea of "irreducible functional complexity" to argue for special creation, an idea that has returned in modern "intelligent design" arguments, but ironically requiring strikingly different biological examples today because many of the cases cited by Cuvier have been understood and resolved through the progress of evolutionary science in the last two centuries.

From Cuvier, the story proceeds through the discovery of dinosaur fossils by William Buckland in the late 1810s, and then Gideon Mantell in 1821, to the early development of geology as a full-fledged science. Most of the early English geologists were committed Christians who naturally viewed their science through the lens of their understanding of the Bible. Another French scientist and colleague of Cuvier (though bitter intellectual opponent), Jean-Baptiste Lamarck, advocated continuous change of species and, seeking a mechanism for this, proposed the inheritance of acquired characteristics, a concept destined to recur in connection with scientific puzzles that turned up over the next century and more. Charles Lyell championed the now-dominant geological paradigm of uniformitarianism, the idea that the same natural processes have operated in the past as are observed today, a concept that proved crucial to providing Darwin sufficient time for evolution to operate.

The history continues with the voyage of the *Beagle* and Darwin's awakening to uniformitarianism and succession relationships among species. Darwin gradually came to view creationism as unscientific, a central argument used today against teaching "creation science" or its variants, including intelligent design, in science classes. The contributions of Alfred

Russel Wallace are discussed, both in connection with the initial public proposal of the mechanism of natural selection and his later science. Larson also looks carefully at the philosophical-rhetorical aspects of the growing influence of the ideas of evolution and natural selection. T. H. Huxley and Asa Gray were two staunch defenders who came from nearly opposite religious positions. By the early 1900s evolution was widely accepted in science, but the mechanism—how it worked—was still unclear, and natural selection was consequently much less accepted. The mechanism question would not be resolved until the rediscovery of Mendelian genetics and the eventual synthesis of population genetics with evolution by natural selection. Convincing discoveries of evolutionary relationships among fossils, gradually filling in so-called missing links in several lines (for example, birds, horses and, eventually, humans), were persuasive for scientists in the early 1900s.

Larson discusses the terrible misapplication of the idea of evolution by natural selection in the eugenics movement, then goes on to examine the anti-evolution crusades in America in the 1920s, culminating in the 1925 *Scopes* trial. He reviews the development of the modern synthesis of genetics and natural selection. I found it interesting that by the 1950s, Darwin's finches from the Galapagos had become the "prime evidence for the modern synthesis" (241). Yet, ironically, "Darwin never actually mentioned them in *Origin of Species*" (241–42). Larson closes the book with a review of modern cultural developments (chapter 11), including the rise of creation science and, more recently, intelligent design, followed by a review of recent scientific developments (chapter 12), such as the impact of the discovery of the chemical structure of DNA and the introduction of sociobiology. The discovery of the chemistry of DNA has allowed the amazingly fruitful exploration of molecular mechanisms of evolution. Sociobiology is still controversial but has led to very interesting research whose future impact will be fascinating to follow.

Larson's *Evolution* does not go into the biology in great detail, being content with brief sketches or allusions where necessary. Rather, it focuses on evolution as an idea and its impact on both science and the larger intellectual community. It is both reliable and successful as a study of the history of a remarkable idea.

If the Larson book supplies the necessary historical background for investigating the meaning and philosophical impact of the unifying biological concept of evolution, *Evolution and Mormonism*, by Stephens and Meldrum, is the best source known to me that is currently available to begin the study of the relationship of LDS doctrine to this important

concept. It provides a strong foundation of both religion and science to approach these issues. There are several reasons why I say this is the best current source: First, it is not insignificant that Stephens and Meldrum are both faithful and committed Latter-day Saints as well as respected scientists (biology professors at Idaho State University). The authors move in this work toward a synthesis of science and religion that is consistent with both LDS doctrine and recent science, and thereby construct a more productive synthesis than heretofore. Second, it is designed for LDS readers seeking an introduction that reviews relevant LDS doctrine as well as the basic science. Such an introduction is otherwise only available in bits and pieces, primarily in articles. Starting with this book, LDS readers can prepare themselves to pursue particular issues in more depth in other works. Third, this book is more ambitious than other currently available treatments of this subject; it goes beyond what anyone else has done, especially in remaining faithful to the scientific data. There are other, perhaps better, introductions to evolutionary science, but none better that also expound and take seriously the LDS doctrinal issues.

The authors find no conflict between their faith and science, and they attempt in this book to show why other Mormons need find no such conflict. They do this by considering interpretations of the scriptures and of scientific data and concepts that are consistent with one another. Of course, theirs is not the only possible way to view either the scriptures or the science. And such a path necessarily involves speculation. Nevertheless, in my view their effort is reasonably successful, particularly in forthrightly addressing the two major questions that are commonly seen as separating LDS beliefs from an evolutionary worldview:

- (1) If evolution is an entirely random process, as many evolutionary biologists say, how then can there be order in the universe? How could God have been in control of the process if the outcome was unpredictable? How could we have been created in God's image as the result of a random evolutionary process?
- (2) If Adam and Eve came into being as the result of evolutionary processes, how then could they have been immortal? If they were not immortal, how do we explain the Fall? If there was no Fall, what was the mission of Jesus? If there was no Fall and Atonement, is there then no Christianity? (xvii)

The thoughtful foreword by BYU professor Duane E. Jeffery nicely puts this work into perspective with the intellectual currents in the Church in the twentieth century. An appendix provides two important First Presidency statements on evolution and the origin of man (1909 and 1925) and an unsigned "Priesthood Quorums' Table" editorial instruction on the origin of man from the official Church magazine (1910).

The authors requested “an official declaration of doctrine” (7) from the First Presidency prior to writing this book. The response consisted essentially of the 1909 First Presidency statement “The Origin of Man” as reprinted in the *Encyclopedia of Mormonism*. I have personally seen ample evidence that Church leaders at various levels have not yet reached consensus on the means and methods employed in the creation of life on earth, although there is no lack of agreement concerning God’s overall plan and purpose. Thus, Church practice since these authors’ inquiry has been to respond to similar questions about evolution with brief, rather noncommittal statements, emphasizing by implication that the Church has no official position on organic evolution as a process for the development of life on earth.

Further insight is obtained by comparing the 1909 and 1925 First Presidency statements. Stephens and Meldrum point out that the 1925 statement “removed what had been construed by some as implicit anti-evolution sentiments in the 1909 statement” (44). Additional context is interesting: the 1925 statement was requested of the First Presidency by a major U.S. news organization that was collecting the positions of churches in America on organic evolution due to the interest in the *Scopes* trial. President Heber J. Grant and his counselors provided an edited version of the 1909 statement rather than sending the full 1909 statement itself as the official Church position.

Large sections of the book explore statements by LDS leaders, both official and unofficial. The authors approach the widely varying views generously. As the BYU Board of Trustees, consisting of General Authorities and officers of the Church, said in their 1992 cover letter to the BYU Evolution Packet, “Formal statements by the First Presidency are the definitive source of official Church positions.”¹ The official statements on evolution are those contained in that packet: 1909 First Presidency statement, 1910 First Presidency Christmas Message affirming the consistency of LDS doctrine with “true science,” 1925 First Presidency statement, and 1992 *Encyclopedia of Mormonism* article on “Evolution” containing a 1931 First Presidency instruction to General Authorities. With the exception of the 1910 Christmas Message, these official statements are reviewed in chapter 4. In addition, numerous unofficial views are reproduced. It becomes clear in this chapter that no single view of evolution has been held by Church leaders.

As the authors consider the scientific status of evolution, they point out that “over 90 percent of the evidence that we have available to test the theory of evolution today did not exist in 1960” (17). Furthermore, at

this stage of scientific knowledge, “the data overwhelmingly indicate that humans are not unique but are related to other animals. In fact, this similarity is so close that, at the cellular level and below, humans are largely indistinguishable from other mammals. There is no scientific evidence supporting the notion that humans are physically unique” (30). In dealing with the science of evolution they explore such questions as the following: What are the central claims of Darwin’s theory? What is the theory as it stands now, with our knowledge of DNA, for example? What is the evidence for evolution from molecular and cell biology? from fossils? What is the place of man in the natural world?

Stephens and Meldrum give in chapter 11 their personal interpretation of the creation story in Genesis, providing a point-by-point, verse-by-verse analysis. This chapter would have benefited from reference to B. H. Roberts’s analysis of these same issues in his book *The Truth, the Way, the Life* (which was not published until 1994). Unfortunately, it does not become clear until the last paragraph of the chapter why the authors judge this detailed argument/exegesis to be so important: there they clarify how their interpretation of Genesis allows a reconciliation of the scientific evidence with the role that Adam and Eve play in the scriptural account. There is an interesting attempt to reach a consistent understanding of science and the Genesis story because of their carefully detailed comparison of the scientific evidence and the scriptural text.

How can man be made “in God’s image” if evolution proceeds by random events? This question has been troublesome for religious persons seeking to deal seriously with evolution, and it is the subject of chapter 12. The basic answer given in this book is that natural laws provide constraints on evolutionary processes; only certain pathways are possible. The weakest part of this book from a scientific point of view is the impression given in this chapter that such constraints are already significantly understood and that the work of Stephens and his students on this topic is widely accepted. This is indeed an interesting line of work, but it is still not widely viewed as a major determinant of evolutionary development. Stephens may be correct, and he has not shied from vigorous defense of these ideas (nor should he), but it is unfortunate that a book of this kind for a general audience neglects to distinguish what is established and accepted in the scientific community from what is in its infancy and subject to varying interpretations. It would be unfortunate if readers are caught out should the science finally go in a different direction.

My major criticisms of this book are twofold: (1) the speculative science discussed in the previous paragraph, and (2) the idiosyncratic and

speculative interpretation of scripture to which the authors sometimes resort (see chapter 11, for example). Neither of these concerns is particularly damning since both issues can be understood in context, and judgment can be reserved. I would also love to see a book from this faithful point of view that deals with recent discoveries in neuroscience and the implications (if any) for the relationship of body and spirit. But that is clearly beyond the scope of the present treatise.

What has occurred in the nearly four years since *Evolution and Mormonism* was published that might change how we view these issues? The scientific evidence has only strengthened. Progress has been made with some of the challenges, such as the evolutionary history of whales and evolutionary pathways to bacterial flagella. Fossils of a remarkable new small species of human have been discovered (*Homo floresiensis*), leading to interesting reassessments of the branches of human evolution, but changing nothing fundamental in the relationships outlined in this book. The LDS doctrinal position remains undefined. In my opinion, this is wise. Humans cannot predict the course of science or where future insights will lead. Only clear revelation to the Church leadership would give direction that does not run the risk of requiring future major reinterpretation with accompanying embarrassment. Apparently, such revelation has not yet been received.

So what is the current state of evolutionary science? What of purported “holes” in the theory? In considering evolution as a unifying biological concept, I do not believe there are any major gaps in the data or in our understanding of it that might suggest the theory is inadequate or in crisis. The overarching concept accommodates both the well-understood data of science and the not-so-well-understood; there are no strong contradictions. So where is research being done? Are all questions already answered? Of course not. There are many issues still being explored: how particular organs may have evolved, under what environmental or competitive pressures, and on what evolutionary time scale, for example. On the evolutionary pathways for the development of particular groups of species, I commend readers to the book by Kenneth R. Miller, *Finding Darwin’s God: A Scientist’s Search for Common Ground Between God and Evolution*, in which a committed, believing Catholic and cell biologist examines the compatibility of evolution with his religious faith. Of course, there are gaps in our current knowledge (for example, what is the origin of Alzheimer’s disease, and how do we understand its evolution?), but the history of science is a history of filling such gaps. If we hope to find the place for God’s action in the world in such gaps, we play a dangerous game:

Where is God, then, when science finally explains the gap? What have we have chosen to rest our faith on?

LDS students of this profoundly significant subject would do well to read both of these books. I suggest that the Larson book is the place to start. Then *Evolution and Mormonism* will help put the unifying concept into perspective within our religious teachings. The thoughtful LDS learner will subsequently be able to approach additional questions in this area with well-informed views.

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1. BYU Evolution Packet (Provo, Utah: Brigham Young University, 1992), 3.