

God as Engineer

A. Scott Howe and Richard L. Bushman, eds. *Parallels and Convergences: Mormon Thought and Engineering Vision*. Draper, Utah: Greg Kofford Books, 2012. 226 pp. Introduction by Terryl L. Givens. Paperback: \$24.95. ISBN: 978-1-58958-187-6.

Reviewed by Carl Glen Henshaw

Albert Einstein famously wrote: “I want to know how God created this world. I am not interested in this or that phenomenon, in the spectrum of this or that element. I want to know his thoughts. The rest are details.” Einstein did not believe in a personal God, of course, but A. Scott Howe and Richard L. Bushman do, and ask the same questions in their book, *Parallels and Convergences: Mormon Thought and Engineering Vision*. Written from the point of view of faithful LDS scientists and engineers, Bushman and Howe (an aerospace engineer at NASA’s Jet Propulsion Lab) attempt to tackle a question that has long fascinated me: what can we learn if we analyze God’s creations as the master work of the master Engineer? To the believer, after all, the universe is a grand tapestry attesting to God’s majesty and shows evidence of His existence in as direct a manner as any scripture, to which scriptures themselves testify:

But ask the animals, and they will teach you;
the birds of the air, and they will tell you;
ask the plants of the earth, and they will teach you;
and the fish of the sea will declare to you.
Who among all these does not know
that the hand of the Lord has done this?
In his hand is the life of every living thing
and the breath of every human being.
(Job 12:7–10 [New International Version])

The book comprises eleven essays written by LDS scientists and engineers and broadly examines parallels between LDS theology and new findings in science, parallels between LDS theology and transhumanism, and the spiritual implications of our increasing abilities in and reliance upon engineering. The first sec-

tion, "Physics and Engineering," attempts to reconcile some of the most speculative teachings of early Mormon leaders, including the nature of spirit and intelligence, the equation of light with truth, and free will and materialism, with our current understanding of physics. The second, "Philosophy and Engineering," details the parallels between LDS teachings on eternal progression with those of transhumanism, the idea that the human race is on a course of technical progress that will ultimately lead to unlimited lifespans, the technical solutions to virtually all of our current economic and social problems, and the fusion of ourselves and our machines. The third, "Practice and Engineering," examines the moral and spiritual implications of our increasing abilities in and reliance on engineering.

This is not a book for the faint of heart. It is densely packed with speculative theology, and requires careful consideration to fully appreciate. It also helps if the reader already has a background in the scientific and philosophical subject matter. Those who are already interested in transhumanism will find the discussion of its parallels with the idea of eternal progression fascinating, but non-experts may not find the introductory material sufficient. Similarly, those with some familiarity with quantum physics, software engineering, and scientific computing will find the discussion of possible physics or computational models of spirit matter interesting, but those without such a background may find them impenetrable.

Ultimately, I found the book both frustrating and fascinating. My frustration with the book includes the topics the editors choose to cover. For instance, two different essays are devoted to examining Joseph Smith's teaching that spirits consist of "more refined matter." Various scientific hypotheses are proposed for the nature of spirit matter, including the possibility that spirits reside in alternate mirror universes, that spirits are essentially data structures, or that spirits may reside remotely from physical bodies and communicate via a nearly instantaneous communications system. As an engineer and a believing Latter-day Saint, I believe that at some point our understanding of God will merge with our understanding of science and engineering. But in my opinion, in most areas our knowledge of both science and theology is too tenuous to make any reliable connections. While it may be interesting

to try to come up with a scientifically valid explanation for the nature of spirit matter, ultimately I do not have any confidence in the reliability of such arguments; we simply do not know enough, either about physics or spirits. And I do not find such speculation spiritually rewarding either; it does not tell me anything I can use about the nature of God or how I should live.

On the other hand, I found the sections of the book dealing with the parallels between transhumanism and the doctrine of eternal progression fascinating. Transhumanists believe that humanity is on the verge of almost inconceivable technological change. To different transhumanist thinkers the specific nature of these changes vary, but typically include the idea that in the near future we may achieve immortality, or at least vastly extended lifespans, due to advances in medical technology; that we may soon understand the structure of the brain well enough that we may be able to upload our memories and thought processes to computers, thus living indefinitely as simulations of our original selves; and/or that we may be able to replace our bodies with longer-lived, more capable robotic bodies. Some transhumanists also believe that technology will soon allow us to solve major problems confronting the human race, including climate change, clean energy generation, access to vastly increased resources via asteroid mining, and greatly improved agriculture due to genetic engineering. At first blush, transhumanism and Mormonism do not seem to have much in common. But transhumanism, in essence, is the belief that human beings and human society advance through gaining knowledge, and that those with sufficient knowledge will appear to be gods—or, if you are a transhumanist, a being indistinguishable from a god—to those who do not have such knowledge. Put this way, there is an obvious parallel to the doctrine of eternal progression. However, unlike LDS theology, transhumanism does not necessarily have a moral imperative and does not include the need for an atonement. The primary contribution of the book is the proposal that LDS doctrine and transhumanism are compatible, and that LDS thinkers have much to add to the transhumanist movement about the moral implications and requirements of humans gaining godlike power.

As much as I was intrigued by what was in the book, though, I

was equally disappointed by what was left out. In particular, modern science has led to findings that pose an apparently severe challenge for traditional Christian ideas about the nature of man and the universe. The most well-known of these, of course, is the theory of evolution, but they also include theories about the creation of the universe and about its possible ends, about whether omniscience and omnipotence are theoretically possible, and about the possibility of intelligent life elsewhere in the universe. Modern science is often understood to lead us away from God by showing that the universe is self-governing¹ and that our place in it is not privileged. Modern *engineering*, on the other hand, offers the potential of leading us back to God. Regarding evolution, for example, engineers have recently discovered that quasi-random processes can be harnessed as a very powerful tool for designing complicated systems, and have in fact openly borrowed from the theory of evolution to develop computer algorithms that are now used to design bridges, buildings, airplanes, and many other systems.² If we view God as the greatest engineer, it certainly should not be surprising that He would know about and use these techniques, and in fact engineers using evolutionary techniques might be seen by the believer as cribbing from God's best work. Furthermore, the fact that engineers find these techniques useful in designing what are clearly manmade structures should—to someone striving to reconcile the teachings of the scriptures with the findings of science—lead to an understanding of how the universe can appear to be self-governing yet still be created.

The idea that while science seems to be leading us away from God, engineering may lead us back is, unfortunately—and rather strangely—an idea that is mostly absent from the book. In the final section, however, William Pickett, Scott Howe, and James Young give a moving account of the spiritual experiences they have had in the course of their professions. As JPL aerospace engineers, Pickett, Howe, and Young have worked on several planetary exploration missions. They see this work as being intimately involved with man's quest for knowledge, and hence a spiritually rewarding and, in fact, a spiritually vital activity. They relate that they have seen inspiration strike many of their coworkers, most of whom are of different faiths, or of no religion at all. They inter-

pret this inspiration as God's hand helping those engineers who have prepared for it through "study and preparation." Thus, while they do not directly address the idea that we can see "God as Engineer" in the processes that shape our universe, they strongly believe that in trying to understand and apply the laws that govern the universe we emulate God—and, hence, help fulfill His work in bringing to pass the eternal life of man.

This book is fascinating, frustrating, but ultimately worthwhile; it should find its way onto many LDS bookshelves (and especially that of every LDS engineer). There is a great need for scientists and engineers to engage with, instead of criticize, the faith community. *Parallels and Convergences* might have been a groundbreaking work that greatly contributed to that engagement. It is not. But it is a very useful attempt.

Notes

1. Although Sir Francis Bacon would doubtless disagree, having been credited with the well-known saying: "A little science estranges a man from God. A lot of science brings him back."

2. See Mitsuo Gen and Runwei Cheng, *Genetic Algorithms and Engineering Optimization* (New York: Wiley-Interscience, 2000); John R. Koza, et al., *Genetic Programming III: Darwinian Invention and Problem Solving* (San Francisco: Morgan Kaufmann Publishers, Inc., 1999); Singiresu S. Rao, *Engineering Optimization: Theory and Practice* (New York: Wiley, 2009) and Aimin Zhou, et al. "Multiobjective Evolutionary Algorithms: A Survey of the State of the Art." *Swarm and Evolutionary Computation* 1:1 (March 2011): 32–49.

Rethinking the LDS Aversion to the Cross

Michael G. Reed. *Banishing the Cross: The Emergence of a Mormon Taboo*. Independence, Mo.: John Whitmer Books, 2012. 171 pp. Appendix ("Early Christians and the Cross"), index. Paper: \$19.95. ISBN: 978–1934901359.

Reviewed by Boyd Jay Petersen

Members of the Church of Jesus Christ of Latter-day Saints are often perplexed when they are accused of not being Christian. We