

Book Reviews



ENVIRONMENT

MAKING PEACE WITH THE LAND: God's Call to Reconcile with Creation by Fred Bahnson and Norman Wirzba. Downers Grove, IL: InterVarsity Press, 2012. 182 pages. Paperback; \$15.00. ISBN: 978-0830834570.

This book is the seventh in the Resources for Reconciliation series published by the Duke Divinity School Center for Reconciliation and InterVarsity Press. As stated in the preface of this book, the purpose of this series is to address "what it means to pursue hope in areas of brokenness, including the family, the city, the poor, the disabled, racial and ethnic divisions, violent conflicts, and the environment." While the first six books in the series focus primarily on broken relationships among people, this book is centered upon the need to reestablish proper relationships between people and the land.

Each book in this series has two authors, one in the field of practice or grass roots experience and the other from a university setting with a background in theology. Fred Bahnson is a permaculture gardener, former director of Anathoth Community Garden in North Carolina, and a pioneer in church-supported agriculture. Norman Wirzba is a research professor of theology, ecology, and rural life at Duke Divinity School. He is the author of *Food and Faith*, *Living the Sabbath*, and *The Paradise of God*. In *Making Peace with the Land*, Bahnson wrote chapters two, four, and six, while Wirzba wrote chapters one, three, and five; so the chapters alternate between theology and practice.

One problem that this book addresses is the dream of the "abundant mirage." We in the United States have become so accustomed to an inexpensive, continuous supply of food that we have come to mistake this for reality, when it is actually an unsustainable dream that cannot endure past the oil age. This demand for inexpensive food is slowly but surely destroying life on our planet as well as the soil upon which life depends. One of the main causes of this problem is the separation of people from the land, which leads to "ecological amnesia." This separation takes two forms. First, many of us are physically separated from the land as far more people now live in cities than on farms. Today's forms of urban and suburban life make it likely that people will not appreciate where their food comes from or what processes have been used to make this inexpensive food available in abundance. The second form of separation is existential: the loss of practical, working relationships that can teach us about our dependence upon other creatures and the land and watersheds which support them.

The authors argue that today's churches are failing to address this problem because many Christians suffer from a "reconciliation deficit disorder." The source of this disorder is the belief that Jesus Christ came only to reconcile broken relationships between people and God or between people and people. But as the Apostle Paul writes in Col. 1:20, God has reconciled "all things" to himself through Jesus Christ; and again in 2 Cor. 5:19, God was in Christ reconciling the "world" to himself. On the basis of these and other passages of Scripture, Christians must come to realize that God desires all of creation—human and non-human, living and nonliving—to be reconciled with each other and with God. We were created not only for intimacy with God and with others but also for intimacy with the land.

How can the problems of the "abundant mirage" and "reconciliation deficit disorder" be solved? As far as the first problem is concerned, the book offers the solution of "regenerative agriculture" or "agroecology." The underlying idea is that the ecosystems in which we find ourselves are far more adept at growing things than we are. Making ourselves students of these ecosystems is what it means to serve and preserve the fertile soil that God has entrusted to our care (Gen. 2:15). This can be done by replacing monoculture agriculture with polycultures, through no-till farming and rotational grazing livestock systems, and with other types of regenerative agriculture such as permaculture, biodynamic agriculture, and agroforestry (p. 97). Several examples of organizations that are putting these methods into practice are described in the book. They include an agroforestry project called Sowing Seeds of Change in the Sahel region of Niger, a perennial, polyculture form of agriculture developed at the Land Institute in Salina, Kansas, and the Global Farm sponsored by the Educational Concerns for Hunger Organization (ECHO) based in southwestern Florida. The Urban Rooftop Garden developed at ECHO serves as a model for a movement that can provide food for the poor in cities around the world.

The authors also provide practical ways in which the second problem of "reconciliation deficit disorder" can be addressed. One suggestion involves converting our churches from places of consumption to places of food production. Examples include "church supported community gardens, permaculture parishes, transition churches, and apostolic farms that feed entire neighborhoods." In order to make this happen, seminaries need to train future pastors in the "agrarian arts, ecological literacy, and sunshine-powered living" (p. 109). Bahnson documents his own experiences with Anathoth Community Garden sponsored by a rural Methodist church in Cedar Grove, North Carolina, as

an example of how individual churches can become places of food production. Since gardening is a form of work that describes God's relationship to creation, participating with God in this work of gardening is something that Christians are encouraged to consider even in their own backyards.

As stated in the preface, the ministry of reconciliation is not reserved for experts. This book was written to equip all of God's people to be more faithful ambassadors of reconciliation in regard to the land. Study guide questions, along with notes and recommendations for further reading, are included at the end of the book to help accomplish this goal. Many Christians need to learn again how to live sacramentally in "God's garden." This book provides the biblical vision along with down-to-earth examples that can help to make this happen.

Reviewed by J. David Holland, Associate Professor of Biological Science, Benedictine University, Springfield, IL 62702.



AN INTRODUCTION TO EVOLUTIONARY ETHICS
by Scott M. James. Malden, MA: Wiley-Blackwell, 2011. 240 pages. Paperback; \$34.95. ISBN: 9781405193962.

Scott M. James's book is a fine and helpful overview of many of the issues pertaining to evolutionary ethics. James does a good job not only in presenting the various positions, but he also does so in a fair and unbiased manner. This enables the reader to consider the positions and make up his or her own mind regarding them. The book is divided into twelve chapters and two major parts. The first part discusses the nature of moral psychology after Darwin and the second part considers the so-called fact-value divide ("Hume's guillotine") and how this does or does not affect the construction of a moral philosophy after Darwin.

In chapter 1, James presents the evidence for evolution and explains the meaning of natural selection. He points to several sources of potential misunderstandings of these concepts. James makes it clear that he rejects both genetic and environmental determinism, stating that a central issue for evolutionary ethics is moral responsibility.

Chapter 2 is an extensive discussion of altruism and why it is both a problem and a challenge to explain within a Darwinian framework. The central issue is why does altruistic behavior persist when we would expect a world of pure egoists? James discusses and explains inclusive fitness, reciprocal altruism, group

selection, and the nature of Hamilton's Rule. He also furnishes an extensive discussion of the Prisoner's Dilemma, a fictionalized decision procedure based on contemporary game theory in which two individuals must determine whether to cooperate or defect in the light of the various cost-benefit pay-offs of each position. The dilemma highlights that cooperation delivers real benefits as long as others are willing to trust and play along.

In chapter 3, James furnishes us with a set of traits which make moral creatures moral. In addition, he traces an evolutionary story line in the emergence of our moral sense. He discusses what it means to say that natural selection does not necessarily have to select for what is intrinsically valuable. It can select for various intermediate goods (e.g., clear complexion, lustrous hair, full breasts) as a pathway to what is intrinsically valuable (female fertility). James suggests that the same holds true for morality. Our earliest ancestors did not have to calculate the long-term benefits of cooperative alliances (intrinsic good); they only had to resist the temptation, the pressure to refuse to cooperate (intermediate good).

So the adaptive problem in need of solution was this: design individuals to establish and preserve cooperative alliances *despite* the temptation not to cooperate. (p. 59)

Natural selection, says James, shaped us into the sort of beings who can think morally, that is, creatures who will overcome their suspicions and commit themselves to certain cooperative arrangements. James suggests that religion, in the form of religious rituals, may have evolved *in tandem* with ethics because religion usually involves some sort of "signaling" (p. 61) to others of his or her fidelity to the values of the community (via dress, cleansing, ritual, ascetic practices, etc.), and hence his or her trustworthiness. Religion, thus, promotes group identity and cohesion.

Chapter 4 is dedicated to the subject of punishment—what happens to those individuals who violate various social prohibitions of the community. He discusses when people punish, why they punish, how punishment benefits the individual and the group, and how punishment is related to reputation and feelings of guilt. In order to do this, he examines several psychological studies employing games related to punishment (the Ultimatum Game, the Dictator Game, and the Public Goods Game). The importance of "tit-for-tat" as a possible candidate for how moral thinking got off the ground is also discussed.

Chapter 5 focuses first on the relation of feelings to the development of the moral mind. James then moves on to the question of whether morality is learned or

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innate. Some argue that it is innate, that just as there is (à la Chomsky) a universal grammar, so also there is a universal moral sense. This, says James, would support the idea that morality is a product of evolutionary forces. Others doubt that this is so. Philosophers such as Jesse Prinz think that the diversity of moral codes and practices argues against this position. Prinz also thinks that children may have learned the moral rules that many take to be innate. James suggests that even if the position that morals are innate is vindicated, this does not, in itself, definitively show that morality is a product of evolution. He says that morality may be a side consequence of having bigger brains or it may have come into existence as a result of divine inspiration.

Chapter 6 begins the discussion about whether evolutionary ethics can bridge the supposed gap between facts and values first introduced by David Hume. Herbert Spencer contends that, in human beings, nature has evolved a moral sensibility that checks selfish conduct and leads to “‘permanently peaceful’ communities” (p. 125). Thus, the moral sensibility necessary to peaceful coexistence and the product of natural selection is identified as the good or “more evolved conduct,” and the bad is the “relatively less evolved” conduct (p. 126). Hence, Spencer virtually identifies what is natural (how we came to be what we are) with the good (or how we *ought to be*). Spencer simply assumes that there is no gap between what is and what ought to be, or that if it exists, he has bridged it.

The problem of deriving an “ought” from an “is” is considered in chapter 7. James does a very good job of explaining the nature of Hume’s claim and how it relates to evolutionary ethics, especially to the assumptions of Spencer as stated above. Hume’s basic claim is that prescription cannot be derived from description, no matter how exhaustive such descriptions may be. Hume was arguing for the autonomy of moral theory, namely, that disciplines outside moral philosophy cannot offer any insight into the nature of morality. The fact/value split would, James maintains, check any sort of arguments in favor of social Darwinism where descriptions of nature (e.g., “survival of the fittest,” “might makes right”) should be taken as premises leading to a conclusion of how we ought to live.

Chapters 8 and 9 are rather technical considerations of the philosopher G. E. Moore’s attempt to strengthen “Hume’s Guillotine” (the fact/value divide) in order to make the divide absolutely unbridgeable (p. 143). James explains Moore’s position in terms of what he calls the “open question test.” We need not delve into the details of this discussion, but James claims to show that both Spencer and E. O. Wilson commit Moore’s naturalistic fallacy in their implicit identification of

what is natural with what is good (pp. 146–8). He considers the proposals of philosophers John Searle and James Rachels to cross the fact/value divide, along with several criticisms of their attempts.

The last three chapters (10–12) deal with the topic of evolutionary antirealism, the position that, after Darwin, morality cannot claim any mind-independent objectivity. According to Wilson and Michael Ruse, our belief in the objectivity of moral standards is simply a trick played on us by natural selection to get us to cooperate with each other. Our moral standards are nothing but the “*idiosyncratic* products of the genetic history of [our] species and as such were shaped by the particular regimes of natural selection” (p. 170).

James discusses briefly the work of Richard Joyce and Sharon Street. Both of them affirm and extend the work of Wilson and Ruse. Both Joyce and Street advocate suspension of belief in moral principles and a general agnosticism regarding what our moral duties are.

James proposes and discusses several options for the evolutionary realist, as well as objections to the various realist proposals. James is well aware that objectivity is tricky for those who maintain that natural selection has played an important role in the development of moral consciousness:

If moral *realism* is to have a chance, then there needs to be a way of understanding, on the one hand, how natural selection played a critical role in shaping our moral minds and, on the other, how this can be reconciled with an account of moral facts that can sufficiently underwrite the distinctive character of moral judgment. (p. 208)

This is, indeed, a fair statement of the task of the evolutionary realist. Recommended for all undergraduate libraries in the sciences and humanities.

Reviewed by Lloyd W. J. Aultman-Moore, Professor of Philosophy, Waynesburg University, Waynesburg, PA 15370.



HISTORY OF SCIENCE

AMERICAN GENESIS: The Evolution Controversies from Scopes to Creation Science by Jeffrey P. Moran. New York: Oxford University Press, 2012. 196 pages. Hardcover; \$29.95. ISBN: 9780195183498.

In a 2012 speech, Georgia Congressman Paul Broun proclaimed that the world was only 9,000 years old and had been created in “six days as we know them.” He also declared his opposition to evolution, describing it as “lies straight from the pit of Hell ... to try to keep me and all the folks who were taught that from under-

standing that they need a savior” (Matt Pearce, “U.S. Rep. Paul Broun: Evolution a lie ‘from the pit of hell,’” *Los Angeles Times*, 7 October 2012). These remarks drew national attention, in part because Broun is a physician and a member of the US House Committee on Science, Space and Technology, which oversees both NASA and the National Science Foundation.

Although some commentators expressed concern that national science policy was being made by someone who held such beliefs, Broun’s views are consistent with the views of 40% of respondents in a 2010 Gallup poll (Doug Mataconis, “40% of Americans, Majority of Republicans, Reject Evolution,” *Outside the Beltway*, 18 December 2010). It seems clear that one of the most technologically advanced countries in the world also remains one of the most religious and most opposed to Darwin’s theory. This issue is often depicted simply as a conflict between science and faith, led by Christians who interpret the book of Genesis literally. Jeffrey P. Moran’s examination of the history of American anti-evolutionism, however, shows that social forces “have intersected with the antievolution impulse in ways that shed light on modern American culture” (p. x). Using sources such as speeches, newspaper articles, and the research of prominent scientists and religious activists alike, Moran (a professor of history at the University of Kansas) explores how social forces and anxieties about changes in society shaped the various ways that Americans responded to Darwin in the early twentieth century and over the last fifty years.

Moran begins with a brief overview of the historical relationship between faith and science, arguing that for many centuries the two peacefully coexisted and even supported each other. Although natural selection posed a challenge to this relationship, many mainline religious leaders and upper-level educators in the United States initially embraced a notion of theistic evolution. By the 1925 Scopes trial, however, America had become a hotbed of antievolutionism due to unique national characteristics. The Protestant majority was hostile toward anything that contradicted a literalist interpretation of scripture, viewed antievolutionism in the context of broader cultural concerns, and used the democratic process to enact its concerns into law. After this introduction, Moran examines antievolutionism through the lenses of gender, geography, race, morality, and higher education. At each turn, he shows both how activists were motivated by these broader identity concerns, and how women, African Americans, southerners, religious leaders, and educators themselves were involved. Although the early chapters focus on the Scopes era, they also briefly describe how these issues persist into the present day.

As the 1920s brought an expansion of women’s voting rights, public high school education, and cultural experimentation, religious conservatives saw antievolutionism as a way to cling to tradition, especially the notion of women as domestic defenders of morality. Ironically, the passage of the twentieth Amendment also empowered conservative women to take a more active role in the movement. Furthermore, the combative discourse of antievolutionism was shaped in part by Protestant male anxieties about the emasculating effects of modern society. Resistance to Darwin was also important for regional identity. While antievolutionism began in the North, southern activists used its ideas to assert a traditional, populist southern identity and to reject the values of their northern opponents, who, for their part, saw this as evidence that the South was backwards and intolerant. The racial lens of antievolutionism, Moran continues, also included a power struggle within the African American community between religious leaders and intellectuals. Both sides saw the issue in the context of racial uplift. While many ministers endorsed traditional values as a way to display black respectability, intellectuals viewed white southern antievolutionism as “part of a larger structure of white southern repression” and a fear that Darwin’s notion of common human descent was a challenge to white supremacy (p. 81).

Moran’s fourth and fifth chapters focus on the last half-century of developments in antievolutionism. Darwin’s theories triggered spiritual fears that the “disbelief in Genesis would ultimately undermine the faith that Jesus had come to earth once and was to come again to redeem mankind from sin” (p. 94), especially since science could also be used to discredit the biblical narrative of Jesus’s life. The movement’s resurgence during the 1960s was further spurred by Supreme Court rulings about religion in public schools. Many members of the next generation of antievolutionists embraced young-earth creationism or eventually intelligent design (ID), which emerged in the early 1990s as a movement that eschewed overtly religious attacks on evolution for a more science-centered approach. Antievolutionism also remains an issue in academia, the focus of Moran’s final chapter. Through an examination of secondary sources, he debunks the common claim that higher education erodes the religious faith of college students, but he also affirms the equally frequent charge that scientists are less religious than other Americans. The antievolution controversy has had little impact on their work, except in the case of scholars at leading religious institutions, antireligious scholars such as Richard Dawkins, and organizations such as the National Center for Science Education. The battle continues to the present day, even in Moran’s book.

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Although *American Genesis* takes a clear stand against antievolutionism in all of its various forms, the book is also critical of secular scholars who use the debate to attack religion itself and of northerners who stereotyped the South during the Scopes trial. Moran also acknowledges that some engineers and scholars in the field of science and technology studies have rejected, or at least challenged, Darwin's ideas, thus refuting the common perception that all antievolutionists have substituted religion for legitimate scientific inquiry.

Overall, this is a profoundly even-handed book that seeks to explain a historical movement without merely attacking it or falling into the false equivalency trap of giving it equal footing with science. There are, however, some questions that remain unanswered. The book's short length and clear prose make it accessible to specialists, college students, and the general public, but it also leaves out a large portion of the twentieth century. Moran argues that antievolution activism was largely dormant in the years between the Scopes trial and the 1960s, but one is still left to wonder how events such as the Depression, World War II, and the Cold War affected it. Furthermore, at the same time that the movement regained momentum, ideas about race, gender, regionalism, and morality were being challenged through the Civil Rights Movement, feminism, the counterculture, the white southern shift to the Republican Party, and other major events. It would have been appropriate to ask if these historical moments affected antievolutionism, given that in Moran's argument, comparable events in earlier times clearly did.

Similarly, his discussion of the last twenty years is not as well contextualized as other chapters; the reader is left to wonder about the effect of the massive cultural changes of the 1990s and 2000s. Finally, the discussion of black Christianity focuses on Baptist and Methodist churches, but more could be said about the role of Pentecostalism, which was rapidly growing during that time. It rejected modernity even more fervently than other black churches, and was often disparaged by black scholars as the worst kind of superstition and cultish anti-intellectualism. These, however, are relatively minor concerns about an excellent book that sheds new light on the history of America's response to evolution, on common misconceptions about the issue, and on the segmented nature of American society itself.

Reviewed by David Brodnax Sr., Associate Professor of History, Trinity Christian College, Palos Heights, IL 60463.



Upcoming ASA Conferences

July 19–22, 2013: Belmont University
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ORIGINS & COSMOLOGY

EVOLUTION AND BELIEF: Confessions of a Religious Paleontologist by Robert J. Asher. New York: Cambridge University Press, 2012. xxiii + 300 pages. Hardcover; \$24.99. ISBN: 9780521193832.

In *Evolution and Belief: Confessions of a Religious Paleontologist*, University of Cambridge paleontologist Robert Asher argues that evolution by natural selection is the major driving force that explains the diversification and interrelatedness of all life on Earth, while also contending that a proper understanding of evolution does not rule out the potential for a deity existing behind the natural process. Based on the title of the book, a reader might expect to find equal parts scientific discussion and theological exposition, with a healthy dose of integration between the two, but for the most part, the author does not venture very far from his scientific areas of expertise.

Asher is a respected paleontologist known for his research on the evolution of mammals, including work on endemic African groups and the reconstruction of interrelationships among mammals, using both fossil and molecular data. His expertise is clearly on display throughout the book, as he spends the vast majority of it making a case for the validity of evolution by natural selection. It is here that he is most successful. He discusses how evolutionary biology, while possessing a significant historical component, nonetheless operates on principles observable in the world today and is subject to testing just like any other branch of science. The theory of evolution by natural selection generates innumerable hypotheses that can be potentially falsified by observations from the natural world, and over several chapters, Asher illustrates specific predictions and observations involving character distributions in living organisms, the fossil record, development, and molecular biology.

This section of the book is outstanding, particularly the chapters with a paleontological focus. Topics include the evolutionary origin of mammalian middle ear bones from reptilian jaw bones, the mosaic accumulation of diagnostic features in the early relatives of modern elephants, the ever-growing fossil record documenting the transition made by early cetaceans (whales, dolphins, and porpoises) as they adapted to aquatic life from terrestrial ancestry, the use of DNA sequences to reconstruct the phylogenetic relationships of living organisms, and how the study of developmental pathways can provide insights into the evolution of biological complexity via natural selection. These examples (and others not mentioned here) are dis-

cussed in a manner that is scientifically accurate and thorough, yet still largely accessible to a nonscientist, and many cases are supplemented with helpful illustrations and photos. In addition, Asher makes a concerted effort to provide readers with the means to verify the claims he makes. The text is meticulously annotated with frequent endnotes and copious citations to the literature (including a bibliography of over 470 books and journal articles) for readers who wish to consult the original source material. He even provides step-by-step instructions for how to access DNA sequences using online repositories of such data and how to analyze it using open-source software. Throughout these chapters, Asher's enthusiasm for studying evolution and paleontology is abundantly clear.

However, for all that this book has to offer in terms of well-explained examples of compelling evidence for evolution and common descent, it lacks what I suspect many readers may have been hoping for—a novel, thought-provoking integration of a religious worldview with an evolutionary understanding of life on earth. Asher actually devotes comparatively little space in this book to discussing religious belief, and the “confessions” he makes therein are basically limited to the fact that he is religious and to the idea that he does not see any inherent contradiction between his work as a paleontologist and his belief in God. Throughout the book, Asher repeatedly argues this latter point by discussing the difference between *cause* and *agency*, which are often conflated with one another. He uses several different conceits to illustrate this, one of which involves Thomas Edison. An understanding of just how the filament in a light bulb emits photons has nothing to do with the existence of Edison (its inventor). Likewise, understanding *how* biological change occurs via evolution by natural selection (cause) says nothing about the potential *who* or *why* behind it (agency). Thus, evolution cannot rule out belief in God.

Asher makes it clear, however, that, at least for him, science and rationality do rule out belief in some things that are typically associated with orthodox Christianity. Asher was raised in a Presbyterian church in western New York by a Jewish father and a Christian mother. Currently, he often attends Anglican services in Cambridge, and because he still believes in God, he considers himself religious, going so far as to call himself a Christian. But even Asher admits that much of what he believes “disqualifies [him] as a theistic Christian by most evangelical standards” (p. 25). For example, he considers miracles (when defined as the temporary suspension of natural laws by a supernatural entity) to be irrational, including the virgin birth of Christ. He writes, “Everything that I understand about human biology indicates that [Jesus], too,

had a biological father” (p. 25). He clearly contrasts himself with other religious scientists in this regard, quoting Francis Collins as an example of someone who holds that God can occasionally act in the natural world in ways that appear miraculous. Asher regards such beliefs as superstitious and calls them “incompatible with evolutionary biology or any other rational, data-oriented science” (p. 20). However, he sees his religious beliefs as compatible with evolution because he does not “base [his] religious faith on peculiar human myths about some extraterrestrial spirit breaking the laws of nature” (p. 26). Despite all of this, based on reasoning that he admits is nonscientific, Asher deems Christ and his father to be “inspired individuals” and Christianity to be “a legitimate account of the agency behind life” (p. 25).

I appreciate Asher's frankness in discussing some of his specific beliefs even though some key topics, such as Christ's resurrection, are notably absent, but I think they might make it more difficult for him to make his case for the compatibility of evolution and Christianity—at least for some readers. In the prologue, Asher writes that he hopes he can convince both Christian and atheistic skeptics that his belief in God and his work as a paleontologist are fully compatible. Christians who are opposed to evolution will undoubtedly use his particular beliefs about miracles and Christ as examples of how belief in evolution simply erodes away one's faith, while philosophical naturalists are unlikely to be convinced by a belief in God that, as Asher admits, is based on his own intuition and not on any scientific evidence. For those who already agree with Asher that evolutionary science and Christian faith are compatible in principle, they first must address the fact that Asher's particular religious faith might be very different from their own and that different aspects of his case for compatibility might be problematic for many Christians, including those who are open to evolutionary scenarios.

I think one could easily make the case that Asher presents more of a deistic perspective than a theistic or Christian point of view, but I hope that this will not prevent Christians who disagree with some of his personal beliefs from reading this book. Despite the fact that it offers relatively little in the way of how to integrate an evolutionary perspective of God's creation with an orthodox Christian worldview, *Evolution and Belief* does many things well. For readers interested in where evidence for evolution comes from, Asher's cases are impeccable and clearly written. For those seeking insights into philosophical aspects of evolution, his discussions of cause, agency, contingency, and the limits and nature of science provide a good deal of food for thought.

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Finally, Asher reminds us that as humans, we have the unique and awe-inspiring privilege of studying and understanding the intricacies of the world around us. He concludes the book by noting, “This fact brings me to my knees every time” (p. 231). I cannot help but enthusiastically concur with this sentiment.

Reviewed by Ryan M. Bebej, Assistant Professor of Biology, Calvin College, Grand Rapids, MI 49546.

CREATING LIFE IN THE LAB: How New Discoveries in Synthetic Biology Make a Case for the Creator by Fazale Rana. Grand Rapids, MI: Baker Books, 2011. 235 pages. Paperback; \$17.99. ISBN: 9780801072093.

How did life begin? This book uses research efforts in synthetic biology to address this question and to support an intelligent design perspective on biological origins. A reader looking for detailed, current scientific examples to support an intelligent design argument will appreciate this book as an addition to the collection of books supporting this perspective. Readers who are unconvinced by intelligent design arguments will likely remain unconvinced after reading this book.

Rana begins his exploration of the question of life’s origin by looking at the creation of artificial life forms, which he characterizes as a top-down approach. He presents the work of Craig Venter’s research group as exemplifying this approach. Venter’s group is attempting to define the minimal genome using a knock-out scheme, systematically eliminating all genes that are unnecessary for life from *Mycoplasma genitalium*. As Rana describes this work, he is very intentional about emphasizing the complexity of this simple cell. Then, in extraordinary detail, Rana lays out the biochemical steps necessary to add genes back to this minimal genome to create an artificial life form. The biochemical detail forms the basis for illustrating that the creation or transformation of life is an astonishingly arduous task—one that he argues cannot be accomplished without intelligence and design. By extension, he continues, original life could not have come into existence without similar intelligence and design. In this section, Rana weaves an irreducible complexity argument. He suggests that the biochemical and genetic complexity of *Mycoplasma genitalium* is of such intricacy that undirected processes could not give rise to even this simplest of life forms.

A bottom-up approach, described in the second section of this book, also asks how life began. Exemplified by Jack Szostak’s work, a bottom-up approach starts with the raw materials for life and builds complexity. Szostak’s group is attempting to form protocells by designing membrane-bound vesicles and working to

incorporate nucleic acids and other metabolic components into these vesicles. Additionally, Szostak’s group is working on artificial and reengineered enzymes. Other research groups are exploring methods of making the building blocks for RNA molecules and assembling them under prebiotic conditions. Rana also describes how experimental systems that attempt to mimic the geochemical reality of early Earth have been used in efforts to produce prebiotic materials. Rana provides current scientific details and offers scientific critiques of many of the bottom-up experimental approaches. Because scientists cannot go back in time and know with certainty the geochemical conditions of prebiotic Earth, he questions the relevance of the experiments. He expresses concern about energy sources and the presence of oxygen on Earth when life emerged. An irreducible complexity argument is raised in a brief discussion of restriction modification systems. Throughout his presentation of bottom-up experimental systems, he intentionally points out how carefully each experiment was designed by trained, intelligent scientists. Predictably, Rana concludes that these experimental systems point to an intelligent designer. He argues that the bottom-up experiments were as carefully designed by extensively trained and extraordinarily gifted scientists as were the top-down experimental systems. Then, he extrapolates from the necessity of intelligent scientists designing these bottom-up experiments to the necessity of an intelligent designer in the origin of life.

Rana writes as a knowledgeable, enthusiastic, and optimistic supporter of science. He argues throughout his book that advances in science, even advances in synthetic biology, can lead to outcomes that are beneficial for humanity. The science presented in this book is accurate and detailed. Readers looking for evidence to support intelligent design will find detail at a level sure to please. Nonscientist readers and scientists whose discipline is not biochemistry should find this book accessible; an appendix is provided for those who need a refresher course in basic biochemistry.

Quotes from Mary Shelley’s *Frankenstein* begin each chapter and, along with pointed questions that emerge as he discusses various aspects of synthetic biology research, Rana touches on the important ethical issue of boundaries in science. These questions are often posed with an ominous tone that seems inconsistent with his general undertone of enthusiasm and optimism for scientific advances. I would have liked to have seen Rana explore this question in greater depth, but perhaps that is a project for another book. He also sets up an unnecessary creation vs. evolution dichotomy throughout this book that I wish he had avoided.

The arguments Rana presents for intelligent design theory rest primarily on the depth of scientific detail he provides. He holds to a definition of intelligent design theory that is consistent with the definition expressed by *Reasons To Believe*, which states that features of the universe and living things are best explained by the involvement of an intelligent creator. However, I was surprised at how often Rana slipped into a God-of-the-gaps argument in this book. In one form or another, he repeatedly asks the question, "Would this make God unnecessary?" This troubling slip into a God-of-the-gaps theology—placing God in areas where we lack understanding or, alternatively, using gaps in our knowledge as evidence for the existence of God—feels particularly dangerous in a book with as much scientific detail and optimism as this one. The optimism and detail leaves the reader with the impression that answers to many of the questions about life's origins are within reach of research science. As those answers emerge, the gaps narrow, making God, if God is placed in those gaps, less necessary. Similarly, as Rana explores synthetic biology, he slips into an irreducible complexity argument. This argument also risks making God less necessary as scientific knowledge leads to a more complete understanding of biological complexity. The God-of-the-gaps problem is not adequately addressed in this book.

I found the brightest piece of this book was the brief description Rana gave about his encounter with a scientist with whom he had strong disagreements on origin-of-life models. He describes a dialogue at a scientific meeting over the course of several days that was respectful and humble. In that spirit, this book can serve as a voice in an ongoing, respectful dialogue with the greater scientific community around the topic of biological origins.

Reviewed by Sara Sybesma Tolsma, Professor of Biology, Northwestern College, Orange City, IA 50141.



LAKE VIEWS: This World and the Universe by Steven Weinberg. Cambridge, MA: The Belknap Press of Harvard University Press, 2011. 259 pages. Paperback; \$18.95. ISBN: 9780674062306.

Lake Views is an engaging collection of essays by Nobel laureate physicist Steven Weinberg. As might be expected from a Nobel laureate who is an often sought-after speaker, Weinberg has provided us with a fascinating book that has many interesting rabbit trails. Most of the essays are lectures or articles published within the last decade, the latest of which appeared in

2008. Fortunately, he usually provides a few pre- and post-comments to bring each essay more up-to-date. The subjects range from discussions on physics to political advice, but all relate to science in some way. Rather than providing a chapter-by-chapter summary which would be somewhat unwieldy, I will first make some general comments about my impressions, mentioning a few chapters which piqued my interest, and then discuss three essays that focus more on science/religion issues that should be of particular interest to the readers of this review.

The essays reveal that Weinberg is Jewish, yet an atheist, though he seems to try very hard to be fair in discussing his religious perspectives, at least from his own point of view. In that sense, a Richard Dawkins he is not. He also appears to be reasonably aware of philosophical and historical issues pertaining to science, even though at times he seems to inflate what science actually can accomplish. He is, however, occasionally a little sloppy with his terms. For example, in his first essay, he lays out his idea of a "final" theory as one that is mathematically consistent and "governs" all of the seemingly arbitrary facts of physics that we observe, including "the deepest questions of cosmology." I find it curious that he uses the term "governs" in this context. After all, governing implies a governor, and who would that governor be? With God not an option for him, apparently Weinberg has the laws themselves or something material in mind.

In his second essay, Weinberg takes a "reluctant" excursion into the philosophy of science, in which he wrestles with such issues as what constitutes a more "fundamental" theory, and just how much science can explain. While his reference to many historical details of science makes this essay an enjoyable read, he occasionally makes surprisingly inaccurate statements. For example, he says that "the value of the proton mass is entailed by quantum chromodynamics," when, in fact, that theory contains an additional parameter that is not determined from within the theory but does determine the proton mass. He knows this full well; it is difficult to account for such an oversight.

Several of Weinberg's essays deal with political issues such as whether we should have a manned space program, and whether we should work harder to dismantle the world's nuclear weapons. On the former, Weinberg has a fairly strong opinion, that for the cost, so much more science could be done with robots. I find his reasoning quite convincing, but he also reluctantly admits that the public would hardly be enticed to fund such robotic expeditions without the glamour of manned spaceflights. Concerning nuclear weaponry, the thrust of his argument is that only the existence of the Russian nuclear arsenal offers a threat to the United

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States from which we could not recover. Since anti-missile strategies cannot reliably avert the danger, he considers it imperative to negotiate arms reduction. On such a topic, it is interesting to hear from someone who is a consultant on such matters, and therefore has obviously spent much time thinking about the issues.

Just to mention a few other essays, I enjoyed his essay “Is the Universe a Computer?,” a review of Stephen Wolfram’s book, *A New Kind of Science*, in which Wolfram suggests that the fundamental laws of nature could arise from cellular automata. I enjoyed entering the world of Wolfram’s computer experiments, touching on such topics as Gödel’s theorem and Turing machines, while at the same time finding support for my suspicion that Wolfram claims a bit too much from his efforts. In referring to the simplicity of equations as compared with Wolfram’s picture, Weinberg closes the essay by saying, “In the study of anything outside human affairs, including the study of complexity, it is only simplicity that can be interesting.” The essays also include entries concerning scientific figures such as J. Robert Oppenheimer and Albert Einstein. In Weinberg’s enjoyable reminiscing, he recounts Oppenheimer interrupting him in a talk he was giving, saying that he reminded him of himself at that age. Weinberg thanked Oppenheimer for the comparison, but Oppenheimer immediately responded, “It wasn’t a compliment.” Concerning Einstein, because of the recent discovery that the universe is accelerating in its expansion, it now appears that the general relativity equations need an additional term known as the cosmological constant. It is famously known that in search of a steady state theory, Einstein included such a term, but later considered it his greatest mistake. In an essay entitled “Einstein’s Mistakes,” Weinberg quips that “Einstein’s real mistake was that he thought it was a mistake.”

Finally, let me turn to three essays that explicitly deal with science/faith issues in some way. In all three, Weinberg expresses his atheism and the consequences thereof, but from different vantage points. An essay entitled “Living in the Multiverse” contains an interesting assessment of the relation of the multiverse theory to the anthropic principle (in support of fine tuning). There is an often-repeated claim against an anthropic principle, that perhaps our universe is just one of many possible ones that happens to have the right laws of nature. Support for this comes from the huge number of possible superstring theories (more than 10^{100}) out of which the universe could be “chosen.” However, Weinberg recognizes that this is not enough; the probability of the ones viable for life has to be rather high for the argument to make sense. Thus he considers what criteria would be needed for assessing whether the “shape of the string landscape” supports a multi-

verse argument. Though it is evident that he thinks the conclusion warranted, it is also clear that he realizes that the argument is not completely convincing. In another humorous quip, he quotes Martin Rees as being confident enough in the conclusion to bet his dog’s life on it and Andrei Linde confident enough to bet his own life on it, whereas Weinberg says that he is just confident enough “to bet the lives of both Andrei Linde and Martin Rees’s dog.”

In an essay entitled “A Deadly Certitude,” a review of Richard Dawkins’s book, *The God Delusion*, he generally agrees with Dawkins’s thesis, and reveals a little more of his materialist prejudices. In a sentence as illustrative as any, while assessing one of Anselm’s arguments, he says,

The idea of an ultimate cause is deeply attractive, and indeed the dream of elementary particle physics is to find the final theory that we think lies at the root of all chains of explanation of what we see in nature. The trouble is that such a mathematical final theory would hardly be what anyone means by God. Who prays to quantum mechanics?

On the other hand, he takes Dawkins to task for targeting only Christians when Islam could be perhaps a much better target.

Weinberg’s final essay in the volume is entitled “Without God.” In this essay he makes the supposed observation that the more society embraces science, the less it continues to embrace religion. His premise is that insofar as science “explains” things, there is no longer a need for religion. While the premise may be disputed, Weinberg finds it inevitable that religion will eventually cease, and his real point is to ask the question, how will it be possible to live without God? His arguments contain a mixture of genuine insights, common misconceptions about science and religion, and unscientific speculation. It is nevertheless an interesting essay for peering into the thoughts of someone coming from his perspective and wrestling with such questions. Perhaps it is not surprising when he ends this essay with a comment that is strikingly similar to Jean Paul Sartre’s existentialism:

Living without God isn’t easy. But its very difficulty offers one other consolation—that there is a certain honor, or perhaps just a grim satisfaction, in facing up to our condition without despair and without wishful thinking—with good humor, but without God.

Though Weinberg is evidently overconfident about his own assessment of the matter, it is nevertheless sobering to see the essay end in such resignation.

The book is a highly engaging and interesting read, and probably almost anyone of this readership would

find it enjoyable at some level and revealing in many ways. Particularly I recommend it for physicists who understand the theories he is describing, and also for those who enjoy reading about those theories. It goes without saying that reading such collections of essays should help us to engage with our scientific peers who have similar perspectives on the science and religion issue.

Reviewed by Donald N. Petcher, Covenant College, Lookout Mtn., GA 30750.



PARADISE LUST: Searching for the Garden of Eden by Brook Wilensky-Lanford. New York: Grove Press, 2011. xviii + 291 pages. Hardcover; \$25.00. ISBN: 978-0802119803.

In this witty narrative, Wilensky-Lanford details the folly of literalism. In the beginning God created the Garden of Eden somewhere in the Persian Gulf, but on the other hand, it could have been at the North Pole, or underneath Cincinnati. We meet a variety of characters, some sincere and theologically savvy, others less so, as they search for a literal Eden. *Paradise Lust* explores the irrational things educated, intelligent people can literally *choose* to believe. A wider question is *why* the literal geography of Genesis 1-3 is so important to so many.

Wilensky-Lanford, a freelance editor and writer of essays, studied religion at Wesleyan and writing at Columbia. In this, her first book, she artfully ties together disciplines as diverse as history, archaeology, religion, science, and politics while exploring eccentric personalities.

The book's major contribution may be to provoke thought on how a few verses from Genesis can be used to support such disparate and sometimes absurd interpretations. Some exegetes intended to promote their unique theological perspective and others their unique geographical locality. Some were out for fame, some more clearly for fortune.

My attention was caught at the outset by William Warren, first president of Boston University, a professor of theology, and a Methodist minister. Published in 1895 and enduring eleven printings, *Paradise Found: The Cradle of the Human Race at the North Pole* rested on five hundred scholarly sources. Warren recognized that Eden was destroyed by the deluge; thus he placed it in a desolate region inaccessible due to changing climate. His version of concordism did at least further the cause of science by capturing public interest in funding Arctic

exploration. Nevertheless, he was not deterred by the resulting evidence and retained his theory to the end.

More conventional in approach were Assyriologists Friedrich Delitzsch and Archibald Sayce, longtime friends and amicable competitors. Delitzsch, who placed Eden near Babylon, was friend of the Kaiser and son of biblical scholar Franz Delitzsch. Sayce, an Oxford professor who resided for years on a houseboat on the Nile, chose a more southerly spot near Eridu. They continued for decades to spar over the exact location until WWI truncated their friendship.

South of the areas suggested by Delitzsch and Sayce lies the city of Qurna. Wilensky-Lanford's fascinating historical account follows the region from Ottoman to British to Ba'ath rule and present desolation. John Calvin also placed Eden in this region. Others chose California, Ohio, Berlin, Mongolia, or Sri Lanka. Joseph Smith revealed that Eden had been in Independence, Missouri. Lena and William Sadler, an obstetrician and psychiatry professor respectively, were former Seventh-day Adventists disappointed with Ellen White's evolving revelations. Although the Sadlers debunked all other forms of psychic phenomena, they relied on revelations from extraterrestrials to produce *The Urantia Book*, which places Eden near Crete. Finally, in 1956, Eden was discovered in Florida by a politically conservative lawyer convinced the serpent was, in his words, "a Communist or a welfare-statist" (p. 171).

Juris Zarins, now retired from Southwest Missouri State University, conducted years of field research in Egypt and the Arabian Peninsula. He contends that Semitic languages arose in an Arabian nomadic setting during a period of changing climate. In an aside to his scholarly work, Zarins proposes that the garden story is based on the migrations around 5000 BC of these foraging nomads to Mesopotamia where agriculture already flourished. The resulting cultural upheaval led to an oral tradition taking the nomadic standpoint, which portrayed agriculturists as taking God's knowledge into their own hands to exploit the power of creation. As the Gulf continued to rise, the agriculturists were forced out of Eden. Using LANDSAT photos, archaeology, linguistics, and geology, he situates Eden underneath the present Persian Gulf. Wilensky-Lanford considers this the most credible garden theory, although it has not been embraced in academia as contemporary scholars show little interest in the geography of literal creation.

Iranian Azerbaijan is the location chosen by David Rohl, a musician, film producer, and founder of a journal dealing with Velikovskian chronology who has some partial graduate training in Egyptology. His Discovery Channel documentaries on biblical research are

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widely popular, although his work lacks acceptance in the academic world. Another contemporary “biblical archaeologist” is Michael Sanders, founder of Mysteries of the Bible Research Foundation. According to his internet website, his scientific background is largely limited to research with parapsychologist J. B. Rhine. Sanders situates Eden in Turkey.

The author also devotes one chapter to American fundamentalism and contemporary evangelicalism, often conflating the two. For this chapter, she visited in Kentucky the Creation Museum associated with Answers in Genesis and Ken Ham. In spite of their “brazenness,” she credits them for admitting that localization of Eden is incompatible with flood geology. Creationism is now a litmus test for evangelicals, and “either the brain secretes thought like bile, or God washes your mouth out with holy soap” (p. 205). An interview with Lee Meadows, teacher of science education at the University of Alabama, and input from Ron Numbers provide more moderate perspectives.

Wilensky-Lanford feels that the essential interest in locating Eden lies in our longing to undo the exile from paradise. It therefore represents the existential human quest “located both in the original past and in the idealized future” (p. 92). “That’s the essential paradox of the search. Eden has to be erased in order for it to be Eden. A paradise isn’t paradise until it’s lost” (p. 253). It is an illustration of the varieties of religious experience.

Historical research is a strong point in this book, which is otherwise short on biblical, scientific, and archaeological detail with few sources in those areas. The author also fails to evaluate adequately the professional credentials of the modern theorists, although she alludes to their “Indiana Jones” quotients. And unfortunately there is no index. For the most part, the book is exceptionally well written; nevertheless the ample hyperbole and irony occasionally fall flat. All in all, however, I definitely recommend this book to ASAers looking for some fun reading. Members of the general public will also find it instructively amusing.

Reviewed by Judith Toronchuk, Psychology and Biology Departments (retired), Trinity Western University, Langley, BC V2Y 1Y1.

THE BLACKWELL COMPANION TO SCIENCE AND CHRISTIANITY by James B. Stump and Alan G. Padgett, eds. Malden, MA: Wiley-Blackwell, 2012. xix + 644 pages. Hardcover; \$199.95. ISBN: 9781444335712.

When thinking about the conversation between science and Christianity, many imagine hostility and antagonism. However, this book makes clear that this is not,

nor has it characteristically been, the case. The 54 chapters (divided into eleven sections) compiled by James Stump and Alan Padgett represent a diverse spectrum of authors and demonstrate, for the most part, the mutually informing dialogue that exists across a range of disciplines between science and the Christian faith.

The book begins with five chapters devoted to a summary of the history of the debates between science and the Christian faith. Three of the five chapters focus on the impact of Charles Darwin and various theological and philosophical controversies surrounding evolution and a biblical understanding of creation. A fourth chapter summarizes an earlier controversy in the church concerning the scientific work of Galileo. The fifth chapter in the introductory section highlights the reconciliation of science and the Christian faith as represented by four women of the early modern period: Margaret Cavendish (1623–1673), Anne Conway (1631–1679), Aphra Behn (1640–1689), and Mary Astell (1666–1731).

Part Two is devoted to discerning appropriate methodological approaches befitting the objectives of science (to study and understand the natural world) and theology (to study and understand God’s involvement in the world). The focus is to identify the goals, sources of authority, and methods for each discipline, recognizing their considerable differences. The conclusion is that each ought not to reduce the other to being inferior or unnecessary; both disciplines can benefit from the insights of the other.

Part Three evaluates the potential roles and pitfalls of natural theology. Focusing more than Part Two did on philosophical and logical implications, its chapters pose the questions: Can the existence of God be “proven” by exploring the natural world? Can the scientific exploration of the physical universe and its laws reveal a creator? The contention of four of the five contributing authors is that while the natural world does not definitively demonstrate the existence of God, it also does not cast a significant shadow of doubt. Therefore, it is reasonable to conclude that there may be a “Being” responsible for creation. The lone dissenter rejects this conclusion, judging that empirical arguments against God’s existence (especially the widespread existence of evil) overwhelm the natural-theological arguments for God’s existence.

The topic of Part Four is cosmology and physics. In this section the chapters are more diverse in content, ranging from the complexity of subatomic particles to the vastness of the universe. They offer multiple explanations for the role and activities of a creator in the origins and continuity of physical matter. Four of the five authors conclude that the evidence from their

field of study does not provide sufficient grounds to discount a divine being responsible for creating and sustaining the universe. However, to keep readers on their toes, the editors provide an opposing voice. One secular-humanistic author, while acknowledging that science is not about proving things, argues,

Attempting to explain the natural world by appealing to God is, by scientific standards, not a very successful theory. The fact that we humans have been able to understand so much about how the natural world works ... is a triumph of the human spirit, one of which we can all be justifiably proud. (p. 196)

Part Five, which contains seven articles on evolution, is the longest and most diversified of the sections (as a paleontologist, I appreciated this), spanning macroevolution to DNA formation and replication. Five of these chapters present arguments against both the evolution-denying fundamentalists who insist on a literal reading of the Bible and the atheistic belief in life-by-chance. They conclude that there is no conflict between a Christian theology of creation and observed biological processes. However, in arguing for essentially the same conclusion, these authors refute the proposals of their Christian colleagues while arguing for different, God-ordained processes. For example, chapter 23 makes the case for "intelligent design as ... currently the best scientific explanation for the origin of biological information" (p. 280), whereas chapter 24 presents the pitfalls of ID and concludes that "design of organisms need not be attributed to the immediate agency of the Creator, but rather is the outcome of natural processes" (p. 282). Nevertheless, two chapters (22 and 27) were much less welcoming of a theological perspective. These chapters contend that Christian assumptions about the God-ordained process and results of evolution are not without inconsistencies and faulty logic, and therefore not reasonable explanations for life on Earth.

The middle third of the book include sections that examine the human sciences (psychology, sociology, and economics), Christian bioethics, metaphysical implications, and the mind. The first two chapters of Part Six challenge the ability of psychology to provide scientific evidence of a creator. The first takes a moderate view, suggesting that cognitive scientists have the potential to discover insights into human nature and thereby work with theologians to explain patterns in religious practices. The second argues more forcefully that psychology demonstrates the purely mechanical nature of humanity and thereby actually poses "deep problems" for the Christian faith (p. 342). The chapter on sociology provides a general overview of the domains in which sociologists have studied religion,

while the chapter on economics suggests that a market economy reflects and builds Christian values.

The section on bioethics covers a cross section of contemporary issues, such as shaping human life at the molecular level, stem cell research, using technology to improve the human condition, and ecology and the environment. Each chapter reviews the various positions on the respective issue and offers constructive proposals for how Christians can move forward.

The chapters in the metaphysics section investigate the philosophical relationship between science and the Christian faith. Each essay notes that the dialogue between the two disciplines can be strained because of their different goals and methods. While making honest judgments concerning the challenges that science poses for traditional Christian beliefs about the world, these authors conclude that science does not render faith mute in the conversation.

Like the previous section, the chapters that evaluate how research on the human mind impacts our understanding of faith and religion note that there is an array of opinions on the mind-body relationship and what comprises "personhood." While each author varies on the spectrum as to whether present scientific research renders traditional Christian beliefs antiquated, they all conclude (contra the authors of two chapters in Part Six) that Christian perspectives are consistent with recent findings in this field of study.

The final two sections of the book give an opportunity for the other voice in the conversation, namely theology, to have its say on the relationship between science and the Christian faith. Part Ten opens with a chapter that discusses the differences in how science and theology provide theories through the gathering of "facts," noting that theology's task is much more difficult, because "God transcends us while we transcend the physical world. Often theology has to be content with circumscribing the domain in which truth must lie, without being able to offer a detailed map of the terrain" (p. 531). The following chapter evaluates and critiques science's "natural" explanations of the miracles described in the Bible. It offers a range of explanations for how God could demonstrate his reign without suspending or interfering with the observed laws of nature to accomplish a divine objective. This is followed by a chapter that suggests how modern science and theology can work together to gain a better understanding of the eschatological expectation of a new heaven and new earth (transformation by a radically new act of God, p. 544). The section ends where it began, with a discussion on the similarities and differences in the methodological approaches of science and

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theology to the study of their respective topics—this time focusing on philosophical considerations rather than on practical tasks and concrete sources of evidence.

The final section of the book contains six essays highlighting twentieth-century theologians who have been influential in their contribution to the science-Christianity conversation, summarizing and evaluating their strengths and shortcomings. These include Pierre Teilhard de Chardin, Thomas Torrance, Arthur Peacock, Ian Barbour, Wolfhart Pannenberg, and John Polkinghorne.

This volume of the *Blackwell Companion* series is intended to contribute to the ongoing conversation about the relationship between science and religion. Each of the chapters provides an overview of contemporary scholarly work in an effort to introduce the reader to the important themes in this discussion (p. xiii). Unfortunately, some topics such as evolution are over-represented, whereas other scholarly topics of interest, such as ethics, sociology, and economics, are under-represented.

A majority of the articles were sympathetic to the complementary nature of the discussion. However, several of the topical sections also included chapters that contained opposing perspectives, for example, that there is no (and cannot be any) meaningful relationship between the sciences and religion. While this was, at first, a surprise in a book intended to foster a hopeful and productive conversation between the two, such less optimistic appraisals were, nevertheless, a welcome contribution. By expressing doubt (and, in some cases, outright rejection), these conflicting opinions challenge the reader not to become too comfortable with the notion that this is a friendly, mutually informing conversation. Those interested in participating in this dialogue must remain vigilant in their motives for engaging in the discussion, as well as vigilant in the logic they employ in finding points of resonance between the findings of modern science and Christian biblical interpretation and practice.

The target readership is intended to be a broadly academic but nonspecialist audience. For the most part, I found that the contributors were successful in making their respective essays readily accessible to a reader well informed on the larger themes of the debate. However, while admitting my lack of exposure to certain topics (I have a background in vertebrate paleontology, practical theology, and sociology), there were chapters—especially in Parts Eight and Nine on Metaphysical Implications and The Mind—that failed to engage me to the same extent as those in other sections. Admittedly, this may be due to my own interests as much as

to the authors' recognition of the target audience and their ability to present their topic.

Overall, the book is geared toward those who are serious about a detailed exploration of the relationship between faith and religion. It is not recommended as an introduction to the topic as a whole. Other than the chapters in Parts One and Eleven, this collection, which is written at an advanced level, would be difficult reading for the nonexpert. It is best suited to those who have a command of at least one of the scientific disciplines highlighted in the book and have some familiarity with the significant issues that exist between that specific field and Christian theology. For those who have such a background, this book will be a valuable asset for orienting themselves in the broader conversation.

Reviewed by Neil Beavan, interim pastor of Edmonton Japanese Christian Church, Edmonton, AB. Neil is also a consultant who does paleontological environmental assessments.

GOD AND THE COSMOS: Divine Activity in Space, Time and History by Harry Lee Poe and Jimmy H. Davis. Downers Grove, IL: InterVarsity Press Academic, 2012. 292 pages, illustrations, indices. Paperback; \$24.00. ISBN: 9780830839544.

One of the significant areas of concern across the spectrum of those interested in the science and faith conversation is the question of whether and how God acts in space and time. Poe and Davis, respectively theologian and chemist from Union University, tackle this subject in their fourth coauthored book in the area of science and Christianity, after *Science and Faith* (B&H Publishing, 2000), *Designer Universe* (B&H Publishing, 2002), and *Chance or Dance* (Templeton Press, 2008).

The first of the book's two parts is entitled "What kind of God interacts with the world?" It begins by pointing out that in the West the cultural situation of this question assumes the personal theistic perspective of the Abrahamic faiths. Broadening the focus, the authors examine in some detail how this question is considered from within the wide range of theological positions taken within each of the religions of Hinduism, Buddhism, Judaism, and Islam, before turning to Christianity. They argue that among world religions only Trinitarian Christian theology offers a full-orbed view of how God relates to the world: the Father ruling with authority and will, the Son incarnationally identifying with the world, and the Spirit holding reality together, tri-personally transcendent, immanent, and omnipresent.

Then follows a discussion of the powerful influence that philosophical traditions (Plato, Aristotle,

Descartes) had upon both pre- and post-Reformation Christian theology, including how the ideas of William Perkins led to new forms of Calvinism being articulated by both the Synod of Dort and the Westminster Assembly. Perkins's conception of the eternal decrees of God in election and reprobation led naturally to an effective deism, for his dichotomist thinking could only conceive of a God who governs created reality in uninvolved transcendent eternity *or* a world which unfolds of its own accord. In this vein, Darwin so accepted the Aristotelian immutability of forms that only two options occurred to him: "God either created all species immutably by a special act of creation or he was not involved in the development of life at all" (p. 88), and again, "either God had done everything or God has done nothing beyond setting the laws of nature in motion" (p. 233). Apparently in the church today, many remain in the "jaws of the Perkins dilemma" (p. 88), over-emphasizing the model of God as King to the exclusion of other scriptural models and lacking even the breadth of Jesus's descriptions of the kingdom of God.

After a clear and concise description and rejection of process theology, the authors also briefly deal with the god-of-the-gaps notion, their critique suffering somewhat from a lack of definition of nature. Often "nature" means "created reality," but Poe and Davis usually locate humans as above nature and capable of changing it. This section also gives a too-simplistic distinction between science (the "how" questions) and metaphysics (the "why" questions), for science certainly does seek to explain and not just describe.

The transition to Part Two, "What kind of world allows God to interact?," is made by pointing out that laws of nature at one level (e.g., physical) are not "violated" or "suspended" but "mitigated" or "trumped" by us (e.g., mind operating on matter, genetic engineering), and conclude that "God is at least as free and able as humans to interact with the universe" (p. 137). The authors describe the world as open to influence from outside the world, citing the examples of quantum physics and chaos, including the "openness of DNA" (p. 245). They go into some detail on the big bang, development of stars and galaxies, and biological evolution, seeing behind these the agency of the Creator, as well as demonstrating that the claims that such emergence is evidence against a Creator are unscientifically metaphysical. As one of the authors is a chemist, I was disappointed that only examples from physics and biology, the two fields in some sense bracketing chemistry, were adduced. In fact, my recognition of a number of physics and astrophysics errors (e.g., the idea that stars formed first and then these grouped into galaxies, as well as inaccuracies on quantum physics

and chaos [see below]) made me unsure about their treatment of biology.

The title of Part Two, and its various articulations, are problematic. The authors say that the recently discovered openness in creation "*create[s] corridors* though which God may ... participate in the world" (p. 147), "God's activity is *facilitated* by [genetics]" (p. 180), "features of the universe ... *provide the means* for God's operation in the universe" (p. 180, emphases added). Surely, as Creator, God does not depend upon the creation to *provide* means for his interaction with it, but in our scientific discoveries we can begin to *see* ways in which he engages.

The book ends with a creative section on human imagination as indispensable partner to empirical and rational forms of knowledge, tying together valuable "poetic" themes running throughout the book on human conceptions of reality, including well-placed critiques of the tendency of the modern mind to reduce both natural and spiritual reality to models thereof. They argue that imagination is not only the crucial starting point of scientific knowledge, later filtered by the scientific method, but that it also mediates human-divine interaction.

The book suffers from many editing blunders, including words incorrectly spelled or used. These include "principle" (p. 60), "teaming" (p. 172), "breaking" (p. 175), "predications" (p. 193), "consensus" (p. 196), and "discreet" (p. 205). Many figures are quite unclear or incorrect (pp. 184, 185, 193, 286, 287). The authors' description of chaos, particularly on the logistic map (pp. 193f.), is so full of errors that the uninitiated reader must turn to other sources. They err in the physics and etymology of wave function collapse, writing,

one does not necessarily get the same answer on each occasion that the measurement is made. This process is called collapse of the wave function since the Schrödinger equation does not predict how this solution is reached. (p. 186)

The term "collapse" is actually understood not as failure to predict, but as a transition from distributed wave function to single observed value. The phrase "not necessarily" misleads; in fact, the resulting answers follow a probability distribution and the chance of a duplicate measurement is vanishingly small. And the "s" in the 2s orbital indicates (spectroscopically) "sharp" transitions, not its "spherical" shape (p. 185).

Despite these and other errors, I highly recommend the book for its approach to a current topic. For me the most valuable aspects of the book are its in-depth

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discussion of the enduring influence of the Perkins dichotomies in Protestant Christianity and its constructive critique of the modern western worldview, which has sidelined the epistemological value of imagination and poetry as if empiricism and reason are sufficient.

Reviewed by Arnold E. Sikkema, Professor of Physics, Trinity Western University, Langley, BC, Canada V2Y 1Y1.

GOOD NEWS FOR SCIENCE: Why Scientific Minds Need God by Davis A. Young. Oxford, MS: Malius Press, 2012. 349 pages. Paperback; \$14.50. ISBN: 978-0982048610.

I am convinced that any member of the American Scientific Affiliation (ASA) could profitably read Davis Young's book, *Good News for Science*. However, Young (a retired geology professor) is writing to scientists and those interested in the sciences that are not Christians to persuade them that his worldview, that of a Christian, is powerful, true, and good news. Chapters 2 and 3 attack materialism, which includes agnosticism, atheism, or any other form of naturalism. Chapter 4 covers creation and the Creator. Chapter 5 argues that accepting the existence of a Creator gives meaning to the practice of science. Chapters 6 and 7 introduce the concepts of God's holiness, humanity's sinful nature, and justification for those who accept Jesus. Following this groundwork, Young then attempts to establish an evidential basis for creation (chapter 8), the Bible (chapter 9), and the life and resurrection of Jesus (chapter 10). In chapters 11 to 15 he argues that the Bible, Jesus, and the story of his resurrection are historically reliable accounts. In the final chapter, he encourages those who accept Jesus as their personal Savior to join a church, giving tips on how to choose one, and to join the ASA.

The book's clear purpose is to serve as an evangelistic witness to "scientific minds." As such, one could ask if his witness will be effective. Young writes in a conversational style. His style also includes raising several questions that could be asked about many of the topics. This may appeal to a mind that is comfortable with or enjoys questions. He also nuances several of his points, all of which may dispel the specter of dogmatism and could make reading the book easier for one prejudiced against Christianity. Moreover, he notes that "*the Bible was written in times and cultures that are very different from those of the modern western world*" (p. 162, emphasis is Young's). Young employs this principle of interpretation most effectively when he assures his readers that they can accept the scientific evidence for evolution, the Big Bang theory, and other consensus points in mainstream science, and still believe in the Bible. However, Young then labors to show that the Old Testament is historically reliable. This work would have been less-

ened if he had used the same principle of interpretation when it came to the Bible's recording of history.

So will it be an effective evangelistic tool? Will people accept his challenge to consider the historic orthodox Christian faith seriously? I suspect that unless the non-Christian reader has a fair amount of existential angst regarding his or her mortality, the book will fall on deaf ears. *Good News for Science* could be compared to *Among the Creationists* by Jason Rosenhouse. Rosenhouse claims to be an atheist but the reader comes away with a much different impression of a "materialist." Rosenhouse does not seem to be one who worries about Young's motivation: giving "genuine meaning to the universe or to humanity" (p. 47 of Young's book). On the other hand, Young's book is a great gift to give to a young Christian entering the study of science (perhaps in late high school or university). It provides enough material to support the reasonableness of a Christian worldview that also incorporates a scientific outlook. The book can also be used as a springboard for discussion among Christians who are interested in science. It would be interesting to see how many would argue over the historical reliability of certain accounts. Be that as it may, I enjoyed it and recommend it.

Reviewed by Bruce Buttler, Canadian University College, Lacombe, AB, Canada, T4L 1N9.



SCIENCE EDUCATION

WONDERS IN OUR WORLD: Insights from God's Two Books by Cheryl Touryan, Kenell Touryan, and Lara Touryan-Whelan. Littleton, CO: Family Foundations International, 2012. 108 pages, index. Paperback; no price indicated. ISBN: 9781881189640.

The back cover of the book states its purpose and structure succinctly:

Wonders in Our World was written particularly for young people who are asking questions about the world around them as well as questions about meaning and purpose in life. The book weaves descriptions of natural phenomena together with biblical insights in a way that shows the complementarity of both aspects of reality – the physical world and the spiritual world. It is organized around three basic questions: Who is God? Who am I? and How Can I Follow Jesus? Each chapter includes suggestions for hands-on activities that help the lessons come alive as well as questions to foster discussion. This book explores God's Two Books, the Book of Nature and the Book of Scripture, looking at reality from both perspectives.

The authors of this book are all scientists. Kenell Touryan, whose name will be familiar to ASA members, has a PhD in mechanical and aerospace engineering. His wife Cheryl, who is the principal author, has a degree in anthropology, and their daughter Lara has a PhD in materials science.

The three basic questions—Who is God? Who am I? How Can I Follow Jesus?—constitute the three main divisions of the book. Each division is divided into chapters. For example, the division Who is God? has chapters on God the Designer, God the Creator, God is Spirit, God is Eternal, God is Three in One, God is Sovereign, God is Love/God is Just, God is Light, and God is Truth. Most chapters contain four sections: (1) Insights from God’s Book—the Bible, (2) Insights from God’s Book—the Physical World, (3) Insights gained from trying to integrate God’s Two Books, and (4) Fun with Science, though this pattern is not followed in every chapter.

Wonders in Our World is well organized for its purpose. The basic questions are fundamental and the chapter topics are well chosen to answer them. The four-fold chapter format is also well conceived. The execution of the authors’ plan, however, is spotty. Some of the “Insights from God’s Book—the Bible” have no scriptural support. For example, the Bible incidents cited in the chapter entitled “I am Unique; I Belong,” simply do not make the point of the chapter title, true as it may be. The science facts cited in “Insights from God’s Book—the Physical World” are almost always interesting enough in their own right, but the sections attempting to integrate God’s two books are sometimes forced. The “Fun with Science” sections often live up to their name: middle school teachers will want to try them with their students.

Some of the book is controversial. The authors devote a well-written section to showing that the earth is as old as geologists maintain. This will be welcome to those who lament the fact that most Bible-science books for young people are written from the viewpoint of creation in six 24-hour days. The chapter, “God is Sovereign,” will raise a few eyebrows. The authors state that “God is at work in the world, but he is limited by the choices his people make” (p. 32). Also, Reformed or not, some will object to the statement, “When people long ago chose to reject God, he did not give up on them, but developed a plan whereby all people could come back into a relationship with him” (p. 31). One need not be a Calvinist to believe that the plan of salvation was not Plan B!

The book contains two patent scientific errors. In a footnote labeled (appropriately) “Science Trivia,” the authors ask, “Who was the famous Russian scientist

that set back the biological sciences in the Soviet Union by using the scientific method inappropriately?” The book answers, Levchenko. The correct answer is Lysenko. The more significant error is found on pp. 33–4. The authors correctly explain double-slit interference in light in terms of the wave properties of light, but then assert that a single slit does *not* yield an interference pattern. Single-slit diffraction patterns are studied in every good high school physics course.

A serious pedagogical failing of the book is that it often introduces technical terms and concepts without defining or explaining them. Middle school students, for whom the book seems to be intended, will not know terms like string theory, space-time continuum, closed system, RNA polymerase, stratosphere, nucleotide—and there are many more. The failure to define and explain such terms seems strange to me. The authors clearly made an effort to make their biblical material understandable to young people, avoiding theological language and going so far as to quote most of their Bible passages from an easy-to-read paraphrase, *The Message*.

I salute the authors for their good intentions, the overall plan of the work, and their creativity. Still, I cannot recommend this book as it presently stands. It needs revision. I do not expect the authors to change their theological approach, but they need to remove the scientific errors and render the technical language of the science sections age appropriate.

Reviewed by Robert Rogland, retired science teacher at Covenant High School, Tacoma, WA 98465.



SOCIAL SCIENCE

THE SCIENCES OF THE SOUL: The Early Modern Origins of Psychology by Fernando Vidal, translated by Saskia Brown. Chicago, IL: The University of Chicago Press, 2011. 440 pages, 3 halftones, 14 line drawings, 8 tables, 3 appendices, bibliography, index. Hardcover; \$55.00. ISBN: 9780226855868.

In his 1908 textbook on psychology, Hermann Ebbinghaus stated that “psychology has a long past but only a short history.” Most students of psychology have only been introduced to the short history that traditionally begins with Wilhelm Wundt’s laboratory in Leipzig, Germany, in 1879. Fernando Vidal, in *The Sciences of the Soul* attempts to lay out the oft-neglected long past, arguing that this is where the fault lines developed that gave shape to our current conception of the discipline. The primary focus of the book is on the development of “psychological inquiry” during the

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period from the sixteenth to the eighteenth centuries, especially examining the shift from the classic Aristotelian soul-form to the more modern soul-mind. The material in the nine chapters is extensively researched and well documented with footnotes.

In the early chapters, Vidal discusses the shift from *scientia de anima* to *psychologia* in the sixteenth century, which set the stage for the transition from an Aristotelian framework to a sense of the soul as that rational aspect of the human united to the body. He covers the distinction between a more metaphysically inclined pneumatology with its attendant religious/spiritual overtones and a “physics of the soul” with its emphasis on the soul’s faculties.

In many ways, the core of Vidal’s thesis is to be found in the chapter, “Psychology in the Age of Enlightenment.” While noting the differences that existed among “French *philosophes*, Italian priests, Spanish Jesuits, or German and Scottish academics,” Vidal comments on the commonality of the study of the interactions between the soul-body composite in humans both in psychology and in anthropology. Kant had argued for empirical psychology as an autonomous discipline in the university curriculum, and here is where the groundwork for just such an endeavor was being laid.

In the middle portion of the book (chapters 5, 6, 7, and 8), Vidal covers a wide range of topics including issues of historicity in the development of the discipline, Homeric and Hebraic psychology, and the manner in which the Paris and Yverdon *Encyclopédies* shaped the contours of the developing discipline. Vidal’s scholarship is extensive on these topics and some readers, not familiar with the overall trends and major ideas from this time period, may find it difficult working through the mass of names and details. If one persists, however, the conclusion is rewarding. The *Encyclopédies*, and the Yverdon *Encyclopédie* in particular, link

... knowledge of the soul to knowledge of the ultimate destination of the individual and humanity. Humans are obliged to perfect themselves because the Creator endowed them with perfectibility. By revealing how thought, appetites, and affects function, psychology assists man in fulfilling his higher purpose.

It is in this sense that the Enlightenment may be referred to as the “century of psychology.”

Readers of this journal may well find the final chapter (“Psychology, the Body, and Personal Identity”) the most interesting since it speaks to issues that continue to animate current discussions regarding the relation-

ship of psychology and Christianity. Vidal argues that eighteenth-century psychology had become an empirical psychology, but not a materialist one. Metaphysical questions about the nature of the soul and its immortality were no longer addressed in psychological inquiry. What were addressed were the functions of the soul, and these could be known only in relation to its unity with the body. The emphasis was on soul-body unity, not duality. This had implications for notions of personal identity and even the place of the body in resurrection. Most importantly, these developments laid the groundwork for what Vidal refers to as the “cerebral subject,” the notion that ontologically the brain is the person. Through nineteenth-century phrenology and then physiological psychology to current neuroscience, this has become a dominant theme in the discipline of psychology.

The book is well suited for graduate-level study in the history of psychology. Readers with a background in seventeenth- and eighteenth-century European thought will also find the book stimulating. Originally published in 2006, this English translation appeared in 2011. The book ends with a discussion of the “cerebral subject,” a topic Vidal has pursued, including his excellent article, “Brainhood, Anthropological Figure of Modernity,” *History of the Human Sciences* 22 (2009): 5–36.

Reviewed by Wayne D. Norman, Simpson University, 2211 College View Drive, Redding, CA 96003.

RELIGION IN HUMAN EVOLUTION: From the Paleolithic to the Axial Age by Robert N. Bellah. Cambridge, MA: Belknap Press of Harvard University Press, 2011. 606 pages, plus notes, and index. Hardcover; \$39.95. ISBN: 9780674061439.

Robert Bellah, perhaps best known as the sociologist who authored the essay “Civil Religion in America” and the book *Habits of the Heart*, has done it again. In this magisterial work—with extended forays into child development, cognitive psychology, biological evolution, social evolution, and political history as well as evolution of religion—he forges a coherent and comprehensive understanding of religion’s development in its biological, social, and political contexts. No wonder it takes over six hundred pages.

In developing the book’s overall argument, Bellah includes anthropological case studies from all over the world, past and present. Some of these are relatively short while others are actually small monographs that could stand on their own. He divides the social development of religion into three eras: tribal, archaic, and

axial. In his discussion of tribal religion, Bellah details the Kalapalo of central Brazil, the Walbiri of Australia, and the Navajo of the southern US. For the transition from tribal to archaic religions, Bellah gives the cases of the Pintupi of Australia, the Tikopia of the Solomon Islands, and the early populations of Hawai'i. As examples of full-blown archaic societies, he profiles the Uruk period of ancient Mesopotamia, the Old and New Kingdoms of ancient Egypt, and the Shang dynasty through the Western Zhou of ancient China. These already impressive case studies, however, are dwarfed by the *de facto* monographs about the axial religions that follow: the premonarchical tribes through post-exile prophets of Ancient Israel, highlighting Jeremiah; the early society through the downturn of Athens of Ancient Greece, highlighting Socrates and Plato; the fall of Western Zhou through the Warring States period of Ancient China, highlighting Confucius; and the Early Vedic period through the Mauryan dynasty of Ancient India, highlighting Siddhārtha Gautama, the Buddha. These twelve major and extended case studies, in which Bellah details the codevelopment of societal structures and religious practices, alone make the book worth reading. They are astonishing in depth of scholarship and clarity of narrative.

But this is not yet to address the more ambitious and overarching purpose of the book, namely, a narrative about how religion developed in the context of human evolution. Drawing on Clifford Geertz and Emile Durkheim, Bellah frames religion as a symbol system for making sense about a general order of existence that anchors long-lasting moods and motivations (p. xiv) and as a set of beliefs and practices that unite groups into a moral community around a sense of the sacred (p. 1). These point to the emergence of language as a condition for religion, as well as the intertwining of cognition, emotionality, and social action. To outline religion's nature and development, Bellah's introductory chapter includes an extended foray into psychology, focusing particularly on three modes of representation in the development of young children: enactive, symbolic, and conceptual. These, Bellah argues, are recapitulations of the stages of religious development that he seeks to trace in human history—ritual, myth, and theology—which correspond roughly to the book's three sets of case studies—tribal, archaic, axial.

The most unusual and interesting part of the book is the chapter on religion and biological evolution. Here Bellah is most clearly going beyond the confines of social sciences. In his search for the origin of religion in biological and cultural evolution, he begins with the Big Bang and cosmological evolution, and then moves to an extended discussion of the emergence of life on earth, including single cellular and multicellular variants. His aim in this is to uncover the emergence of

new capacities in the movement from simpler to more complex life forms, while simultaneously highlighting the conservation of core processes in that development. Bellah's assumption is that even as new capacities emerge, older ones continue, albeit in modified form. He is after uncovering what in our biological capacities might give rise to and support the emergence of ritual and symbolization, both of which are central to his idea of religion, even when they are seemingly eclipsed by cognition and theorizing. He traces their emergence in our anciently situated nurturing of our young, which perhaps began with the dinosaurs, is clear in birds, and is most evident in mammals. He thinks that emergence of parental care is "basic to the development of empathy and ethics ... and ultimately religion among humans" (p. 70). But he also suggests that the phenomenon of play, which he argues could only emerge in a field somewhat protected from natural selection pressures (i.e., parental protection during relatively vulnerable early life), is also a precursor and precondition for the emergence of ritual, which is crucial for social bonding and community life. In turn, ritual continues as a central, conserved core of religion, even when it is seemingly eclipsed by myth (narrative and the symbolic) and later theology (the conceptual and theoretical).

Ritual, myth, and theology frame Bellah's story of how religion develops in human evolution. The three types of case studies—tribal, archaic, and axial—are meant to exemplify how religion develops from pure ritual (mimetic), to mythical, to theoretical. And in that development he seeks to show how core social actions and meaning are conserved (albeit transformed and submerged) in the transition to the new stage. The four ancient societies and figures that dominate the text—Israel (Jeremiah), Greece (Socrates), China (Confucius), and India (the Buddha)—each are meant to show religion's turn toward the universal, the theoretical, the critical. The axial turn, as he calls this, is a breakthrough in which religion is no longer only used to justify and maintain the unjust status quo of a hierarchical society, but instead it also transforms religion into an ethical and universal way of living, one critical of the inequalities of society, including critiques of the legitimation functions of official, court-tethered religions.

I am impressed with Bellah's ability to forge these various strands into a single narrative while maintaining a high standard of scholarly rigor. Rather than treating religion and science as two opposing forces that require harmonizing, he paints the sciences (natural and social) and religion as a seamless whole. If there is to be a criticism of the book, it is that, as a single scholar, Bellah cannot have equal command of every discipline and field upon which he draws. As a result, he does the next best thing of drawing on the central

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and thus more conventional insights of the various fields: biological evolution, cognitive psychology, scholars of ancient India and ancient China, religious studies. Thus, it may well be that cutting-edge scholars in any (and perhaps all) of these fields might disagree with the research he is drawing from. Perhaps in biology the emergentists might find fault, in psychology the enactivists might quarrel, religious studies scholars might question the Buddha's existence, or argue for the invention of world religions during the romantic period, or even question whether there actually were axial turns. However, Bellah's genius is not that he goes to new and daring paradigms to make his case, but that he brings together the best of traditional scholarship into a new synthesis, telling a plausible story about how religion might have emerged in human biological and cultural evolution. In it, he resituates religion, away from being reactionary and outmoded, requiring eclipse, toward understanding religion as part and parcel of the warp and woof of being human.

Reviewed by Clarence W. Joldersma, Professor of Education, Calvin College, Grand Rapids, MI 49546. ✉

Letters

Evidence for an Earlier Nativity

James A. Nollet, "Astronomical and Historical Evidence for Dating the Nativity in 2 BC" (*PSCF* 64, no. 4 [2012]: 211-19), offers his reading of evidence to support the date of 2 BC for the Nativity. There are alternative readings of the available evidence.

The Census in Luke

According to Luke 2:1-3:

In those days Caesar Augustus issued a decree that a census should be taken of the entire Roman world. (This was the first census that took place while Quirinius was governor of Syria.) And everyone went to his own town to register. (NIV)

But according to Josephus (*Antiquities* 18.1-2), Quirinius took the census in AD 6. During this census, Judas of Galilee caused a disturbance (Acts 5:37). According to Josephus (*War* 7.253), "Judas ... induced multitudes of Jews to refuse to enroll themselves when Quirinius was sent as censor to Judaea."

The passage in Luke presents several serious problems. It is argued that

1. There is no evidence of a universal census taken at the same time in the Roman Empire.

2. A Roman census could not have been carried out during the reign of Herod, a client king.
3. Under a Roman census, Joseph and Mary would not have been required to travel to Bethlehem.
4. Josephus does not refer to a census during Herod's reign, but does refer to the noted census under Quirinius in AD 6 (*Antiquities* 17.355; 18.1-2, 26).
5. A census under Quirinius could not have been held under Herod, as Quirinius was not a governor until later.

To these objections, conservative scholars have responded:

1. Luke's language is hyperbolic. It is significant that Augustus initiated periodic empire-wide censuses in Italy and in the provinces, which were carried out in different ways at different times. Edict III from Cyrene in Libya refers to a census dated to 4 BC.
2. After 8 BC, Herod had fallen out of favor with Augustus, who no longer treated him as a "friend" (Josephus, *Antiquities* 16.290-3). It was therefore possible that the Romans required a new census.
3. Unlike the case in Egypt, in Syria (including Judea) women were to be enrolled also. A reference in Eusebius (*Ecclesiastical History* 3.20) records that Jesus's family at the time of Domitian possessed land in Bethlehem. The requirement for Joseph to return to his ancestral home in Bethlehem has been illustrated by an edict of G. Vibius, the prefect of Egypt (AD 104), which reads,

Because of the approaching census it is necessary for all those residing for any cause away from their own districts to prepare to return at once to their own governments, in order that they may complete the family administration of the enrolment ...

Another parallel is a document from Babatha, who was one of the Jews who fled during the Bar Kochba Revolt (AD 132-135). In 127 Babatha recorded that she traveled to declare her possessions before the Roman commander at Rabbath-Moab because "a census of Arabia was being held."

4. An earlier census may not have interested Josephus, as much as the more important census of AD 6, which started events which culminated in the great Jewish War, which was the focus of his histories.
5. Some have argued that the Greek term referring to Quirinius may not necessarily mean that he was the "governor" of Syria, but may refer to his role as an administrator in the area. However, attempts to appeal to a broken inscription that some have