Environment

BETWEEN GOD AND GREEN: How Evangelicals Are Cultivating a Middle Ground on Climate Change by Katharine K. Wilkinson. New York: Oxford University Press, 2012. 256 pages. Hardcover; $29.95. ISBN: 9780199895892.

Creation care, neighbor care, and global climate care generate tortured debates among evangelical Christians and scientists. Evangelical Christians both champion and challenge these pressing contemporary "care" problems. The front between competing evangelical factions for control of these issues continues to change for a myriad of reasons. The primary aim of Katharine Wilkinson's *Between God and Green* is to describe the intersection of evangelicalism and global climate change from the perspective of a secular environmentalist. The author notes that the intersection between evangelicalism and global climate change was unforeseen, stating that "the environmental community may not have noticed action stirring in a more unexpected realm." This book is a good read that provides a well-organized perspective on the history, current status, and future importance of the engagement of global climate change care by those in the evangelical church.

Having had extensive historical involvement in efforts to convince the public of the need to mitigate global climate change, Wilkinson recognizes the importance of engaging the evangelical community for two primary reasons: First, evangelical Christians comprise a significant fraction of the electorate. For substantive US policy change to occur on this topic, a significant number of evangelical Christians will need to be supportive. Second, "religion … brings morality and ethics, beliefs and values into the debate" and, thereby, adds power to motivate sustained societal change while also instilling a sense of empowerment and hope. From my perspective as a biology professor at a Reformed Christian college, I resonate deeply with the author's desire to understand evangelicalism's past and current stance on these matters, in what direction they are trending, and what it will take for evangelicals to substantively engage in climate change issues.

In *Between God and Green,* Wilkinson carefully details key events in chronological order, and identifies factors at work among evangelical leaders. She begins with the roles played by Lynn White in "The Historical Roots of our Ecologic Crisis" and by Francis Schaeffer in his rebuttal to White's article. She then covers the efforts by Calvin DeWitt and the Au Sable Institute seeking to describe and instill a sense of "eco-theology" in evangelicalism. The story culminates by relaying conversations and the "conversions" of Jim Ball, Sir John Houghton, and Richard Cizik, that produced the influential Evangelical Climate Initiative, "Climate Change: An Evangelical Call to Action," signed by notable evangelical leaders in 2006.

Subsequent chapters of the book relate how various factions within evangelicalism responded to this "Call to Action" and the conflated topics of creation, neighbor, and global climate care. Wilkinson traces the development of the "Call to Action" by individuals and organizations in the expanding evangelical center with a pointed description of actions taken to counter this movement by the opposition on the far right of the evangelical spectrum. Wilkinson describes how the call is perceived by people of faith by outlining points of agreement and dissension as well as how the call may (or may not) have significant impact on efforts to mitigate global climate change in both short- and long-term time frames.

Three themes outlined by Wilkinson lend notable clarity to the issues at hand. First, Wilkinson takes great effort to develop an understanding of plurality among evangelical Christians. There is a focus on describing positions, thought processes, and rationales among those from both the evangelical left and right. Topics of congruence and disagreement are presented. Second, Wilkinson describes the "how and why" behind efforts to politicize discussions of global climate change. The informal, but deeply felt, liaison between the evangelical right and the Republican Party provides clear benefits to both groups, reinforcing a resistance to adopt aspects of the "Call to Action." Third, two different approaches at implementing the "Call to Action" are contrasted. The Evangelical Climate Initiative seeks to maintain its "grass tops" approach, pushing for short-term gains by advocating policy change by the government. In contrast, the splinter group "Flourish" strives for a "grass roots" approach aiming to "change [the] hearts and minds" of evangelical Christian skeptics. They "see the local church with great potential to engender a movement" over a longer time frame.

Chapter 5 ("Engaging People in the Pews") provides the results of conducting personal interviews of individuals in conservative evangelical churches. Wilkinson shares individual perspectives on both sides of global climate change belief, illustrating the plurality of opinion within and among churches, demonstrating the depth and rationales of disagreement while illustrating the challenge for the "grass

roots" change group. For the "Call to Action" to have its maximum impact (chapter 6, "Sowing Seeds of a Movement"), the author questions the wisdom of having both "grass tops" and "grass roots" approaches while acknowledging that both may have value.

The book reads well, although not always easily. The language can be a bit dense. The main points advanced by the author are presented in the book's conclusion, but their accessibility is rather difficult without a careful reading of the preceding chapters. The chapter order was sensible, but subsection divisions within chapters were overdone. Subchapter breaks utilized Bible passages heavily, a practice found a bit odd in that this book is written by a secular environmentalist. While appropriate passages were mainly used for these section heads, they were seldom developed within a section's content. At one point, mid-book, Wilkinson attributes a parishioner's quote ("let God worry about the climate") to "Calvinist theology that understands divine sovereignty to be absolute." A more Calvinist perspective might be to acknowledge a person's free will to choose or not choose to worry about the climate. A clearer understanding of Calvinism would have provided greater accuracy and helped the author make her point more clearly.

In conclusion, this is a very good book for Christians and secularists alike who want to deepen their understanding of evangelical Christianity, creation, and global climate care. The three related topics are woven together well and give one a helpful perspective as to why evangelicals have responded to environmental issues the way they have, why many evangelicals are increasingly embracing environmental concerns, and how increased future involvement in creation and global climate care by evangelicals could not only be possible but critically important for both climate and religious issues. As the author argues in her final chapter, creation, neighbor, and global climate care movements need evangelical Christians to provide "leadership, theology, ethics, alliances, and engagement" and, at the same time, the evangelical church needs "environmental issues [to] shape religion" as well.

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History of Science

AFTER THE MONKEY TRIAL: Evangelical Scientists and a New Creationism by Christopher M. Rios. New York: Fordham University Press, 2014. 260 pages. Hardcover; $45.00. ISBN: 9780823256679.

What happened to the relationship between science and evangelicalism after the 1925 Scopes Trial? One common answer is, "What relationship?—unless conflict and mutual suspicion can be regarded as a relationship." According to this take on the drama, most conservative evangelicals remained hostile to reigning scientific orthodoxies, despite the public humiliation of their fallen hero, William Jennings Bryan. As this story goes, evangelical anti-intellectualism, especially as manifested by stiff opposition to biological evolution, historical geology, and biblical criticism, endured well into the second half of the twentieth century when it resurfaced publicly as the young-earth creationism advanced by the Creation Research Society and popularized by the Institute for Creation Research. Ample evidence exists to support this narrative of evangelical opposition to modern science, and historians of recent decades have given it due attention, perhaps even too much attention.

Such fixation upon this version of the engagement between evangelicalism and science suggests that theologically conservative Christians simply cannot take modern science seriously, but rather, that they can only take up arms against it. This new book by Christopher Rios offers a corrective to such a conclusion as it considers episodes in the twentieth-century forging of a "new creationism" by theologically conservative evangelical scientists who "refused to take up arms against modern science—those who sought to show the compatibility of biblical Christianity and mainstream science, including evolution" (p. ix).

This book should be of keen interest to American Scientific Affiliation members. After all, what group is not interested in itself? Rios, now Assistant Dean in the Baylor University Graduate School and part-time lecturer in religion, has produced a very readable historical investigation of two groups of evangelical scientists, The American Scientific Affiliation (ASA) and the Research Scientists' Christian Fellowship (RSCF). Both organizations originated in the 1940s, the former in the United States, the latter in Great Britain. Accordingly, the book is set up wonderfully to offer a transatlantic comparative study of the twentieth-century's nonmilitary evangelical engagement with science. Although the two organizations began in distinct contexts, separated by an ocean,

and possessing differing founding aims and aspirations, by the mid-1960s they had found one another and begun to work together in the study of similar issues.

The setting of their first official contact—a moment Rios has chosen as a focal point in his narrative—was a small July 1965 conference in Oxford, England, the majority of attendees of which were members and representatives of either the ASA or the RSCF. Although Rios's account of the conference consumes barely five of the book's pages and he admits that "lasting effects of the conference are difficult to discern" (p. 127), the year 1965 functions nicely as a mid-way point in a book whose temporal focus begins in the early 1940s and concludes, for reasons that are not well explained, in 1985, the year that the ASA and the RSCF gathered for their first official joint meeting. The book's six chapters offer a tidy and, perhaps, too symmetrical arrangement. Following a brief introduction that situates his study with respect to its "creationist context" and that reviews the historiography of the "conflict thesis," Rios turns in his opening chapter to a sweeping and breathlessly hurried survey of evangelicals and evolution from before Darwin to the 1940s. The chapter reads a bit like the compulsory "background" material one would expect to find in a doctoral dissertation; this is understandable in view of the book's being a revision of Rios's Baylor PhD dissertation. This first chapter is quite good, given its ambitions, even if marred by mistakes that betray haste. For example, he identifies "the discovery of radioactivity in 1896" on page thirty-five and then on the next page refers to "the discovery of radioactivity in 1898." While lapses of this sort may be minor, the book contains them in sufficient number to distract.

The real meat of the study comes in the next five chapters: two on the period from the 1940s to 1965 (one each on the ASA and RSCF), and two focusing on 1965 to 1985 (again, one each on the ASA and RSCF). The pre-1965 chapters are separated from the post-1965 chapters by a brief middle chapter surveying the history of young-earth creationism from the 1960s to the 1980s. Although Rios notes the occasional points of contact between the ASA and the RSCF, their respective stories, especially before 1985, are largely independent. This renders not a single tale of evangelicals and science, but instead, dual narrative threads between the covers of one volume.

Still, there is a unifying concern. Rios's investigation clearly refutes the contention that theologically conservative evangelicalism entails antievolutionism. After reading the book, an old quip from H. L. Mencken came to mind. When asked if he believed in infant baptism, the journalist allegedly replied, "Believe in it? Heck, I've seen it done!" Similarly, this book functions as an answer to the question, "Can Bible-believing conservative evangelicals accommodate the teachings of modern science, especially evolutionary biology, and retain their faith?" Rios effectively says, "Yes! I've seen it done."

The stories of how it was done reveal that the task was not easy and often fraught with controversy. The ASA and the RSCF were both born in the post-War era during which the cultural hegemony of big science was waxing as increasing numbers of young people entered colleges. The perception that these changes posed theological threats was not unwarranted, given the long-standing evangelical concerns about evolutionism and the corollary fear that modern science underwrote non-Christian naturalistic philosophies. As these groups sought to defend traditional evangelicalism's compatibility with the day's best science, each was challenged to navigate between the extremes of fundamentalist Bible-science notions on one hand, and theological liberalism on the other. As an example of the former, a resurgent fundamentalist young-earth flood geology persistently challenged the ASA and its claim to the creationist moniker, while, as an example of the latter, the theological evolutionism of Teilhard de Chardin challenged the RSCF to resist the period's theological liberalism.

Among the mechanisms that these groups embraced to facilitate their respective accommodations of modern science, the concept of "complementarity," as articulated by C. A. Coulson and especially Donald MacKay, figured prominently. Rios does a nice job covering the subject, as he does with his consideration of the ways in which each group endeavored to maintain its high view of scripture amidst contentions that science might compromise belief in biblical inerrancy.

One undeniable truth about the leading characters from both the ASA and RSCF is that they were fascinating, highly educated, faithful, and serious Christians. Rios's book might have deepened readers' appreciation for this by more fully introducing his readers to these people as the colorful and atypical human beings that they were. Instead, the book relies rather heavily on published materials as it engages principally with their ideas. The result is an exercise in drier intellectual history than the story might otherwise have been. There are, of course, exceptions to this generalization that colorfully emerge from Rios's periodic engagement with archived correspondence.

As an attempt to fill a gap in the history of science and religion by considering mid-twentieth-century evangelical scientists, the book meets with real success, if not unqualified success. The very brevity of the book—only 175 pages of text following the introduction—demands that important material be omitted. For example, Rios's treatment of the ASA's consideration, in the late 1960s and 1970s, of social issues "beyond evolution" could have at least mentioned, if not considered in depth, the 1970 book prepared under the auspices of the ASA, *Our Society in Turmoil*. And following the success of Carl Sagan's book and television series, *Cosmos*, ASA leaders began in 1984 to plan a five-program response that they hoped would rebut Sagan's naturalism before a nationwide audience. Neither this effort nor the publication of the contemporary ASA booklet, *Teaching Science in a Climate of Controversy*, which was distributed to 60,000 teachers in 1986, was even mentioned in Rios's book. And while exploring the RSCF's association with Inter-Varsity Fellowship, he neglects to treat comparably the ASA's association with such entities as the Moody Institute of Science or with the Evangelical Theological Society, an organization with whom the ASA held numerous joint conferences during the 1950s and 1960s. Examples of such omissions are many.

Nevertheless, *After the Monkey Trial* deserves careful attention, especially by readers of this journal. Even if the book does not provide the last word treating the history of twentieth-century evangelical engagement with science, what it does provide is important and very interesting. Rios shows how these devoted evangelical men, and a few women, engaged with science, accommodated their faith to its claims, and wrestled with their young-earth Christian brethren who strove to deny them any right to identify as creationists while they embraced evolution with their evangelical hearts.

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THE SLAIN GOD: Anthropologists and the Christian Faith by Timothy Larsen. New York: Oxford University Press, 2014. 256 pages. Hardcover; $45.00. ISBN: 9780199657872.

Throughout its history, anthropology has had an uneasy at best, hostile at worst, relationship with Christian faith. Most anthropologists have been atheists, and the discipline has forbade theological speculation in its discourse. Anthropology sees itself as the rational, secular, and natural science of people. The exclusion of religious thought from critical analysis has been far from a benign division of labor. Anthropologists have a reputation for being openly hostile to Christianity. Their antagonism is especially strong for missionaries, who are deemed agents of the West, destroying traditional cultures. But, more than this, anthropologists find it difficult to relate to and understand religion as a whole, even the religions of the cultures they are investigating. As a result they have developed theories of religion that reduce it to functions of cultural arenas they understand better: cognitive uncertainty, psychological need, social unity, political legitimacy, symbolic meaning, and so forth.

Timothy Larsen is a historian at Wheaton College who studies nineteenth- and twentieth-century British Christian faith and thought. In this book, he examines six well-known British anthropologists, intertwining biography with anthropological theory. The six anthropologists studied are ordered historically, but also form a "ring composition" with regard to their individual relations to Christian faith, from atheists to believers to animist.

First is Edward Tylor, the founding "father" of anthropology in England. Tylor was raised as a Quaker, but gave up his faith and became openly antagonistic especially to Catholicism. He denied the existence of the spiritual world entirely in his attempt to create a positive science of people that would be legitimate in the secular academy. Larsen says that Tylor had locked religion and science into a "zero-sum struggle" (p. 25), and that once he had allowed reason in, "there was no apparent way to stop scepticism from undermining religion as a whole thereafter" (p. 35).

Next is James Frazer, the author of the popular classic in comparative religions, *The Golden Bough*. Frazer too had come from a Christian home, but embraced skepticism, "rationalism," and science as the replacement for religion. Larsen suggests,

> While Frazer was ostensibly … [making] savage practices more familiar and understandable, his covert intention was in all likelihood the reverse: to make familiar religious practices that his readers had always accepted as understandable come to appear strange and savage. (p. 48)

E. E. Evans-Pritchard, whom Larsen identifies as the center of the ring (p. 221), was a believing Christian throughout his adult life. He is a complex figure: the son of an Anglican clergyman who encountered real personal difficulties in adulthood (a drinking habit, a wife who committed suicide, and psychological war wounds), but who converted sincerely to Catholicism. His church attendance was not regular, but his faith included a strong personal devotional

life and an intellectual defense of religious belief and practice. This defense was conducted, first, by a demonstration of the rationality of so-called "primitive" religions; next, by a challenge to anthropology to reject positive science in favor of a humanist approach to social history (p. 110); and then, by a rejection of the notion that religion can be reduced to other arenas of life. "He who accepts the reality of spiritual beings," stated Evans-Pritchard, "does not feel the same need for such explanations" (p. 99).

Mary Douglas, Larsen's next anthropologist, was raised and remained a practicing and devout Catholic for her entire life. She especially defended the church and wove her commitment to it into her theorizing about the nature of hierarchy and its necessity for social life. Douglas is followed by Victor and Edith Turner, who began their adult married life as atheists, but converted to Catholicism as a result of their anthropological work on ritual in Africa. Victor Turner openly defended Christianity when describing his conversion:

> It seemed more reasonable to hypothecate a purposive somebody behind the structure of the universe than a purposeless something … if materialism be right, our thoughts are determined by irrational processes and therefore the thoughts which lead to the conclusion that materialism is right have no relation to reason. (p. 185)

Edith, however, wandered into quasi-animist thinking after Victor's death, and now defends the existence of the "supernatural" in ways that would have helped Tylor make his point that it is all nonsense. The ring is complete.

Larsen's book is helpful in providing background information for the history of the discipline and for demonstrating the complexity of its relation to Christian faith. The anthropologist La Fontaine had said, "Once you stop religious thought, you start thinking anthropologically" (p. 167). Yet, as Larsen points out, theology has been there all along as a conversation partner (p. 225). All of these anthropologists, whether hostile or friendly to faith, used biblical words, concepts, and analogies in their theorizing. Larsen concludes that "Christian thought continues to invite and repel anthropologists, to intrigue and to haunt them, even in the second half of the twentieth century and into the new millennium" (p. 226). Though a bit inclined to "purple prose," the book will be valuable to Christian students and scholars of anthropology who would like to find ways to incorporate faith into the discipline.

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THE TERRITORIES OF SCIENCE AND RELIGION by Peter Harrison. Chicago, IL: University of Chicago Press, 2015. 300 pages, including 100 pages of notes, bibliography, and index. Hardcover; $30.00. ISBN: 9780226184487.

A revised version of Peter Harrison's 2011 Gifford Lectures was recently published as a monograph under the title *The Territories of Science and Religion*. The book lays out an in-depth study of how the modern concepts of religion and science emerged in European history and grew to take on the prominent roles that they have today. Harrison identifies the medieval virtues of *religio* and *scientia* as important progenitor concepts, and by following the story of their evolution, he expands a historical narrative developed in his previous work. The lecture format makes for a bit of redundancy from chapter to chapter, but the interleaving themes are complex and merit repetition. In any case, the writing is crisp, the documentation is extensive, and the arguments are clear. One of the book's most original and important contributions is the recovery of a close historical connection between the world of value and moral normativity on the one hand and the world of factual knowledge and belief on the other. In the words of the author, the focus on virtues offers "an entirely new perspective on these issues" and allows us "to more closely relate the history of moral philosophy to the history of science" (p. xi).

As Harrison reminds us straightaway, our modern concepts of religion and science are not permanent categories that map neatly onto distinct territories or natural kinds of human activity. To use his geopolitical example from chapter 1, our concepts of religion and science are historically contingent in the same way that our concepts of Israel and Egypt are. It is meaningless to talk about the relationship between the nations of Israel and Egypt in the year 1600, because those nations did not exist at that time. Similarly, it does not make much sense to discuss the relationship between religion and science in 1600, because people then did not organize their thinking in this way. Of course, there were ideas, beliefs, and practices through which people served God and conceptualized physical reality, just as there were lands and territories in the region where the states of Israel and Egypt lie now. However, prior to the modern era, people's activities were not aggregated in ways that correspond to our current categories of religion and science. The use of our categories to explain those activities can only obscure our understanding of historical reality. The historian's job is to reverse the order of explanation, so as to show us where our modern concepts came from, and thereby to explain how we got from there to here.

One of Harrison's previously established theses is worth summarizing here. It starts with the Protestant Reformation, which rejected both the allegorical mode of interpreting the Bible and the related emblematic tradition that gave spiritual meanings to natural things and creatures. Prior to this shift, the two books of scripture and nature were understood to be consistent cross-references. The allegorical and emblematic hermeneutical strategies were mutually reinforcing. However, once these forms of reading were prohibited, Christians were left with only literal meanings in the words of scripture and no meanings at all in the things of nature. This crisis of meaning created a void that the newly emerging experimental philosophy was well suited to fill. Harrison's *The Bible, Protestantism, and the Rise of Natural Science* pursues these arguments in detail and establishes that the rejection of traditional hermeneutics played an important enabling role in the development of belief-testing empirical methods during the seventeenth century.

In *Territories*, Harrison rehearses this earlier thesis but focuses more intently on a second Protestant rejection—namely, the abandonment of the teleological framework of Aquinas's moral philosophy. As this framework dissolved, a comprehensive conception of Christian piety was lost, and virtues such as *religio* and *scientia* ceased to be parts of an integrated moral picture. Consequently, just as the denial of allegory left words and things with few ways of pointing toward divine meaning, the denial of teleology left individual people with no sure way of directing their capacities toward divine purposes. Moreover, without meaning or purpose to orient them, the essences of worldly creatures and human capacities became difficult to see. New uncertainties surrounded the notions of *what things are* as well as the notions of *what things are for*.

With meaning and purpose up for grabs, Protestant Europe became a "wild West" of Christian philosophy. Individuals and sects explored various forms of ra-tionality and piety, while governments, churches, and other emerging social institutions tried to establish new regimes of order. Although the political dynamics of this period are not Harrison's main concern, acknowledging them here may help to explain his central argument. In *Territories*, the shift that defines modernity is the relocation of moral and intellectual standards from the "internal" world of individual intentions to the "external" world of society and shared policies. Modern concepts of religion and science are both products of this externalizing shift. As such, they play key roles in defining and maintaining societal order.

The movement from *religio* to "religion" in the seventeenth century is the first case in point. During this period, new levels of social discord were fueled by doctrinal controversy and radical sectarianism. The adjudication of conflicts called for judgments based on acceptable criteria, and these were to be found in Protestant confessional documents and the evidence-generating methods of the emerging experimental philosophy. In this procedural context, the moral virtue *religio*, which previously steered the human heart toward God, was flattened into a mere willingness to accept certain doctrinal tenets. Creedal statements became the legal checks and balances of faith. Eventually it was understood that "one's religion" consisted in the system of beliefs to which one subscribed. Moreover, according to Harrison, there was a growing sense that personal faith could be properly directed toward God only if it were first directed toward (or through) correct doctrine, or "true religion." This development represents a decisive step in the creation of our modern concept of religion.

The historical path of *scientia* is also closely tied to social realities. Traditionally, this virtue corresponded to habits of intellectual rigor in studies of mathematical, geometrical, and logical demonstration. Its purpose in medieval moral philosophy was the cultivation of rational faculties that served the higher purposes of the theological virtues. In the seventeenth century, proponents of the experimental philosophy initiated their methodological revolution by combining the demonstrative elements of *scientia* with principles of observation and induction. The arguments supporting this "mixed methods" innovation took Christian moral philosophy in a new direction. The main goal was no longer the deepening of each person's relationship with God, but rather the advancement of knowledge and the betterment of society. Along with this change came a new calling for natural philosophers to contribute to a storehouse of knowledge that might be accessed by others and used for practical purposes. In these changes we see the seeds of the idea that science is an ever-growing body of knowledge that can exist independently outside of the human mind.

In these early stages, says Harrison, "the natural sciences gained considerable social legitimacy through their sharing of intellectual territory with religion" (p. 115). Indeed, the new territory that they shared was not only intellectual but also moral, for a new vision of human progress had taken root. The prospect of achieving societal peace and prosperity is what precipitated the view that religions are sets of doctrines, and it is also what drove the formation of institutions of science, such as the Royal Society.

Harrison suggests that this new vision of progress represents another modern relocation or externalization of human value. To medieval Christians, progress in matters of faith was related to one's internal, spiritual well-being; now progress meant the advancement of external, societal well-being. *Scientia* and *religio* had served the old kind of progress; science and religion would serve the new.

The Christian West spent the better part of two centuries growing into its new philosophical framework. In the absence of allegorical connections, the books of scripture and nature continued to be linked by way of a focus on their common Author. Natural theology took on the new complexion of physico-theology, which churned up new empirical knowledge and regarded the discoveries as indicators of the Creator's wisdom and power. Early modern sciences thus developed the aim of accumulating a storehouse of evidences that could be used for the purposes of theological reflection. As for explanations within the sciences, the rise of mechanistic causation gave footing to a new theological conception in the "laws of nature." With teleological explanations boycotted, natural objects lost their intrinsic causal powers. However, objects could still be understood in terms of their subjection and responses to divinely mandated universal laws. This conception aligned closely with the idea that humans, under the moral law, were called to decipher the laws of nature and to put them to work in fulfillment of the cultural mandate.

So goes the story of Protestantism's role in motivating the development of modern science and technology. However, Harrison points out that Christians were never unanimous in their support of the new kind of progress. In every age, there were those who suggested that something had been lost. Piety was compromised in the "'brain religion' that placed propositional belief ahead of God and neighbor" (p. 115). The moral shaping of individuals was shortchanged by a stunted sense of vocation that aimed at the mere accumulation of knowledge. The reality of human fallenness threw a persistent shadow of doubt on the reliability of empirical knowledge. And to top it all off, the societal benefits of "useful applications" were questionable. An important point emerges from these considerations—namely, that Christians have never been unanimous in thinking that science supports faith or serves society in ways that are thoroughly or unambiguously positive.

While the ambiguities of the modern mindset were disturbing to some all along, it was not until the nineteenth century that the concepts of science and religion were renovated once again to create the impression of a deeply antagonistic dichotomy. This movement was driven by a triumphalist advocacy of science and a low view of the aims of physico-theology. Harrison's primary example is the X Club, which was led by Thomas Henry Huxley and active from 1864 to 1893. This group sought to professionalize science through the exclusion of clerical ranks from the Royal Society and the elimination of God talk in scientific discourse. Owing mainly to such efforts, science came to be understood as religion's opposite, so that by the end of the century, it was easy enough to draw clear boundaries between the two concepts. Moreover, it became possible to construct a tale about their timeless and intrinsic hostilities toward each other, which were purportedly based on deep differences in their understandings of what knowledge is and what its purposes are. The narrative of conflict and warfare was immortalized in the well-known books written by J. W. Draper (in 1874) and A. D. White (in 1896).

The conflict myth haunts us today in more ways than we usually imagine. Harrison's account is important in this context, because it makes us aware of the myth's faulty assumptions and encourages us to avoid repeating the same mistakes. To those who would enter the fray of "science-and-religion," whether by reading or writing, *Territories* offers a number of cautionary lessons. First, the modern concept of religion emerged only during the seventeenth century while the idea of science was still gestating. As a matter of historiographic logic, neither term should be used uncritically to explain the historical situation prior to or during that period. Second, during the nineteenth century, the concept of science was reconstructed in opposition to religion, giving rise to a pairing that is parasitically dependent on the warfare metaphor. Consequently, anyone wishing to describe "the relationship between science and religion" as one of compatibility or cooperation must either struggle to redefine the concepts or remain content in making a category mistake. Third, throughout their history, the modern categories of science and religion have always served a "socialized" conception of human progress. Harrison draws attention to the fact that this conception, too, has a history that tends to be ignored in contemporary discussions.

All of this suggests that there can be productive and unproductive ways for Christians to engage in these discussions. Countering the conflict myth seems to be a worthy goal, but clichéd claims about the alliance of faith and science are unhelpful in this effort. Such claims may represent an attempt to recover physico-theology as a plausible project, but they are no more respectful of historical change than are other forms

of nostalgia. As Harrison says, "Advocates of constructive dialogue are thus unknowingly complicit in the perpetuation of conflict" (p. 198). Furthermore, they tend to disregard the principled objections that Christians through the ages have registered against the purported alliance. We may do better by letting these objections echo in the present day, so that our thinking about science and religion is done in full recognition of the possible downsides of accepting the modern idea of progress. Presumably, the notions of piety, vocation, fallenness, and servanthood remain important in Christianity. All of these are at stake in the way we conceptualize the goal of human progress, and therefore also in the ways we imagine science and religion to be serving that goal.

Territories leaves us with a difficult challenge. In principle, there is no single characterization of the science-religion relationship, nor any wholly positive or negative set of characterizations, that will suffice in the present day. We face this situation because the categories themselves are not direct mappings of an unchanging reality, but are, rather, products of the social conventions and politics of a tumultuous past. What they mean for us now is largely a matter of the meanings we have inherited from our immediate forebears. However, to some extent it is also a matter of what we are willing to accept. For instance, if we refuse to accept the terms of the conflict thesis, we should also resist making unreflective use of those terms—that is, the terms "science" and "religion"—when we want to make our case. In other words, if we wish to argue for a different way of carving up the territories that science and religion presently occupy, we have to change the terms of engagement.

This line of discussion creates an opportunity for studies of science and religion to make further contact with cultural history and ethics. Harrison begins to show the way by situating his project alongside those of Alasdair MacIntyre and Charles Taylor. MacIntyre is known for his characterization of modern moral philosophy as a makeshift collage of principles drawn from disparate traditions. Harrison likens his own view of science to this picture. Given that astronomy, biology, chemistry, geology, physics, et cetera, have such different histories, there is little reason to believe that an overarching principle should bind them together. Speaking of the situation of the nineteenth century, he says,

> The various strategies to pull together particular "scientific disciplines" were successful at rhetorical, political, and institutional levels, but, as a number of contemporary philosophers of science have observed, this does not necessarily confer any metaphysical unity on modern science. (p. 187)

Connections with Taylor's work, particularly with his signature monographs *Sources of the Self* and *A Secular Age*, are rich with possibilities. Harrison does not cite Taylor extensively but regards his idea of modernity's "new conditions for belief" as a key component in the story of the emergence of modern religion (p. 189). The projects of these two scholars have always been closely parallel but largely complementary. Taylor has concentrated on political and moral philosophy but has rarely paid careful attention to natural science. Meanwhile, until now, Harrison's work on science and religion has not brought politics or ethical theory to the fore. One can hope that *Territories* will succeed in initiating a sustained conversation between these two authors. There are gains to be had on both sides of the conversation if the history of science and religion can be integrated successfully into broader historical narratives that help us find our moral bearings in the modern world.

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DEALING WITH DARWIN: Place, Politics, and Rhetoric in Religious Engagements with Evolution by David N. Livingstone. Baltimore, MD: Johns Hopkins University Press, 2014. x + 265 pages, notes and index. Hardcover; $39.95. ISBN: 9781421413266.

Dealing with Darwin comprises the prestigious Gifford Lectures delivered in 2014 at the University of Aberdeen by David N. Livingstone, professor of geography and intellectual history at Queen's University Belfast, Northern Ireland. Livingstone is no stranger to religion's encounter with Darwin. Earlier books, *Darwin's Forgotten Defenders: The Encounter between Evangelical Theology and Evolutionary Thought* (Grand Rapids, MI: Eerdmans, 1987); *Adam's Ancestors: Race, Religion and the Politics of Human Origins* (Baltimore, MD: Johns Hopkins University Press, 2008); and a chapter en-titled "Situating Evangelical Responses to Evolution" in *Evangelicals and Science in Historical Perspective,* ed. David N. Livingstone, D.G. Hart, and Mark A. Noll (New York: Oxford University Press, 1999) gave ample evidence of Livingstone's intellectual interests.

Dealing with Darwin has been many years in the making, but well worth waiting for. It is a delight to read, both from a literary and intellectual standpoint. Elegant prose abounds giving evidence of the author's love of language, coupled with a penchant for alliteration (two of many choice examples may suffice: reading the historical record "I find complexity and contradiction, contingency and complication that defy simple typecasting" (p. 2), or, "place was

personally potent for Darwin" (p. 197). One can almost hear echoes of the author's mellifluous Irish voice as if these lectures were being delivered for the first time. We have a book that reflects Livingstone's long-time interest in developing a geography of scientific knowledge, which is to say, situating scientific knowledge. Signaled in his book *Putting Science in Its Place: Geographies of Scientific Knowledge* (Chicago, IL: The University of Chicago Press, 2003), we acquire a good sense of the framework shaping Livingstone's historical approach. There he argued that "Science is not to be thought of as some transcendent entity that bears no trace of the parochial or contingent" (p. 13). Rather, science needs to be qualified by temporal and regional adjectives. Site, region, and circulation are all intrinsic features of science and its making. So now the question can be raised: Do religious responses to Darwin similarly differ from site to site? And would this be true even in ecclesiastical communities bound by the same confession?

Dealing with Darwin is an answer to that pressing question. The subject of this well-researched book describes how Darwin's *The Origin of Species* was received by differently located religious communities, all within the orbit of Scottish-Presbyterianism. In his narrative, Livingstone wishes to avoid essentialist categories. There is no overt effort to delineate the definitive interaction of science and religion. Any claims to universality, any appeal to -isms, would call into question the inherent geographical nature of disparate communities' responses to science.

Chapter 1, "Dealing with Darwin: Locating Encounters with Evolution," delineates Livingstone's framework of interpretation. It employs two key analytical tools: "geographies of reading" and the "dynamics of speech spaces." Geographies of reading "… mean the different ways scientific proposals are read in different venues and how they are marshaled in particular places for particular projects." Speech spaces "… refer to how specific venues condition what can and cannot be said about new knowledge claims, how things are said in those settings, and, just as important, how they are heard. Location and locution are intimately involved" (p. 2).

Edinburgh, Belfast, Toronto, Columbia (South Carolina), and Princeton are the theological communities of interest in *Dealing with Darwin*. Why is the response so different in each of these five locations? One might not expect this particular result since these communities all hold to the Westminster Confession. However, as Livingstone shows, the local, the immediate, the social, and the intellectual temper of each Presbyterian community influence the specific response to Darwin in each of these five communities. Livingstone crafts a "double-dealing" with Darwin:

> … I am concerned to show how Calvinist communities in different cities *dealt* with the Darwin phenomenon … [And] … I am interested in exploring the different *deals* these communities struck with Darwin in order to maintain fidelity to their own traditions … On both counts, I will insist, place, politics, and rhetoric were decisive in how the encounter was conducted and how evolution was judged in these different venues. (p. 26)

Chapters 2–6 are devoted to a discussion of each community. The title of each chapter gives the reader a hint of the specific background: "Edinburgh, Evolution, and Cannibalistic Nostalgia"; "Belfast, the Parliament of Science, and the Winter of Discontent"; "Toronto, Knox, and Bacon's Bequest"; "Columbia, Woodrow, and the Legacy of the Lost Cause"; and "Princeton, Darwinism, and the Shorthorn Cattle." The narrative recounts a relatively facile accommodation of Darwin in Edinburgh; a hard-nosed, and rhetorically charged, denunciation in Belfast; a measured employment of evolutionary rhetoric (in teleological speak) for "both scientific and theological ends" in Toronto; a repudiation of Darwin's account of human origins (in an effort to maintain the structure of southern society) in Columbia, and a guarded toleration (a "Calvinizing" of evolution) in Princeton. In each setting, local contexts are highlighted in sophisticated detail. What was meant by Darwinian evolution differed from place to place. What was said, and could be said in debates, reflected local politics, new theological trends such as the rise of higher criticism, and affected the academic careers of various adversaries. Although Livingstone had described responses to Darwin in Edinburgh, Belfast, and Princeton in some of his previous scholarship, we now have a more mature account of not only these settings, but Toronto and Columbia as well.

In the last chapter (chapter 7, "Darwinian Engagements"), Livingstone reviews his narrative and extends his analysis to some other localities. He suggests that the "power of place" can be seen, as well, in the responses to Darwin of nineteenth-century Russian naturalists analyzing the Siberian wilderness or New Zealand evolutionists reflecting on their colonial setting. Livingstone also draws on two contemporary examples: Keith Bennett's questioning of the driving force of adaptation in evolutionary change at a meeting of the International Paleontological Congress in 2010, and Jerry Fodor's recent foray into cultural politics in *What Darwin Got Wrong* (New York: Picador, 2010), the book he coau-

thored with Massimo Piattelli-Palmarini. Reflecting on these recent brouhahas, Livingstone concludes: "If my suspicions are well founded, I believe it also shows just how pervasive—in one way or another—place, politics, and rhetoric continue to be in dealing with Darwin" (p. 207).

Dealing with Darwin is a book to be read by anyone interested in the reception of Darwin's account of evolution. We come to learn that the reception of new ideas by a community is far more culturally subtle and complex than we often admit. Could it also be true of the religious communities of which we are a part? As one reads this book, undoubtedly, parallel situations will come to mind since we are naturally embedded in our own unique cultural context.

Reviewed by Arie Leegwater, Calvin College, Grand Rapids, MI 49546.

Origins

LAYING DOWN ARMS TO HEAL THE CREATION-EVOLUTION DIVIDE by Gary N. Fugle. Eugene, OR: Wipf and Stock, 2015. 308 pages, index. Paperback; $35.00. ISBN: 9781625649782.

This book calls on conservative evangelical Christians to take seriously the well-supported scientific understanding that all living things are the result of an evolutionary process continuing over millions of years, never disrupted by a relatively recent global flood. The scientific community is also called on to be sensitive to people's spirituality when science is being taught. The author has excellent qualifications for this task: he is emeritus professor of biology at Butte College, Oroville, CA, with over thirty years of award-winning experience teaching biology, earned his PhD in ornithology at the University of California at Santa Barbara, and is active in his congregation of the Presbyterian Church in America.

After the foreword by Darrel R. Falk, former President of the BioLogos Foundation, which expresses the book's intent, Fugle opens with his testimony. Having lost interest in church as a youth, he came to faith in adulthood and is now convinced that both creation and evolution are true. Fugle affirms *evolutionary creation* and rejects *spontaneous creation* happening in either a young or old earth, as well as intelligent design, arguing that these concepts can turn people away from faith or prevent believers from understanding science.

Part II argues that an earth created recently but appearing old is deceptive. Fugle also argues that pain and physical death were not absent from the original very good creation. Spiritual death, not physical death, resulted from the fall of humankind. He uses a variety of writings from Augustine through the Reformers to nineteenth- and twentieth-century evangelicals to support his position. Part III focuses on scientists and science education, arguing that methodological naturalism does not exclude God from life, as philosophical naturalism does. Furthermore, science and faith cannot be non-overlapping magisteria, because the natural world is a subset of all reality over which God is sovereign. Fugle explains why young earth creationism (YEC) and intelligent design (ID) must not be taught as science. However, he asks for religious sensitivity from science educators. Unfortunately, educators outside the church are unlikely to pick up this book and get that message.

Having prepared readers to understand why evolution is important, Fugle describes how homology, fossils, biogeography, molecular genetics, and evolutionary mechanisms are explained by evolutionary theory in Part IV. He argues that YEC lacks this explanatory power. To help those with little background in science, Fugle uses well-known animals—especially whales—as examples. Part V addresses how the scriptural accounts of creation, the fall, and Noah's flood can be understood so that Christians can avoid being misled by advocates of YEC or ID. He offers as a precedent the way teachings on the heavenly bodies were reinterpreted after science showed that the solar system is centered on the sun. While the early chapters of Genesis can be seen as entirely figurative or symbolic, Fugle believes it is better to consider that historical people and events underlie them, and he favors the option "that Adam was singly taken aside by God from physically evolved humans and the image of God was divinely imparted to him." Later, humans abused the creation, and its "bondage to decay" (Romans 8:21) relates to their sinful, corrupt actions, rather than to the normal mechanisms of nature, which should not be regarded as dysfunctional. He suggests that the account of Noah's flood may have its basis in an inundation of the floodplain around the Tigris and Euphrates Rivers and that Sunday school lessons picturing pairs of animals coming from all over the world to the ark are inaccurate and can lead either to mistrust of science or to questioning the foundations of Christian faith. Finally, Fugle closes with a brief Part VI as a summary. He uses three hundred references (nine from ASA sources), and over one hundred scriptural passages are cited. The book includes a six-page index.

Laying Down Arms to Heal the Creation-Evolution Divide is good medicine to apply to a sore area in

the church. Among books advocating evolutionary creation, it has particular strengths: a strong concern for evangelism and pastoral care, practical advice for education both Christian and secular, and a lovingly respectful but firm attitude to readers who may be skeptical. Sensible solutions to difficulties with certain passages in the New Testament are offered. The book focuses on central issues, so that some topics, such as longevity of the patriarchs, are not discussed. Sharing his excitement and joy in knowing God better by understanding the wonders of evolution, Fugle succeeds in showing why evolutionary creation is a "wholly accurate, encompassing and positive view." ASA members should get this book into their church libraries, and encourage their pastors to read it.

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THE WORLD IS NOT SIX THOUSAND YEARS OLD—SO WHAT? by Antoine Bret. Eugene, OR: Cascade Books, 2014. 128 pages. Paperback; $16.00. ISBN: 1620327058.

There are many complicated background issues that contribute to the ongoing science-religion debates—enough to render simple resolution of disparate viewpoints difficult at best. I have often noted that even when talking with friends whose viewpoints are very similar to my own that we have radically different points of emphasis, foundational assumptions, and ways of communicating our best present understandings. Within the community of believers we have a responsibility to continue the conversation while we follow the advice of St. Peter as we discuss and argue with "gentleness and respect."

With such a pugnacious title, one might expect Antoine Bret's book to be a harsh polemic against the young-earth creationist (YEC) perspective. While Bret's concerns with YEC views are sincere and urgent, the reader will not doubt his genuine desire to "strengthen the faith of many." Bret, who has held university positions in Spain and France as well as serving as a minister in Madrid, is an excellent writer with a keen intellect and a great knowledge of the content and habits of thought in the field of physics.

This book provides a physicist's perspective on the narrow question that it considers. Bret makes peripheral reference to scientific issues outside his specialty area but throughout this brief book—whether addressing his conception of science, the particulars of scientific dating techniques, or even his discussion of biblical interpretation—he speaks with the voice of a physicist.

Bret begins by providing a clear confession of his faith, establishing his *bona fides* as a traditional Nicene Creed Christian. He then considers two issues of biblical interpretation before turning his attention to questions of physical law. In the first, he considers passages in scripture that attribute active roles for God in nature to which natural explanations can also be applied, as in the example of Matthew 5:45, "God causes his sun to rise." In this and many other examples in the Bible, God is said to be responsible for something that can also be explained scientifically. Considering scriptural examples across a range of scientific disciplines, Bret makes a providential case against the "God of the gaps" perspective, saying "the premise that any natural explanation means that God was not involved is *biblically* flawed," and that "God's role does not stop when the textbook starts. He is in the textbook as well."

Chapter two addresses the question of whether Genesis 1 should be read literally. First appealing to writings of early church fathers, including Origen and Victorinus, and then citing examples from both Testaments that are clearly symbolic or poetic, Bret argues that the Bible contains verses that must be nonliteral, and that others "are likely to be so and still others *may* be so." Sorting out which is which may be difficult, but "the reliability of the Bible is never at stake—only the reliability of its interpreter."

The third chapter discusses the nature of science in the context of some commonly held misconceptions. Bret's choice of topics in this section is thought-provoking and illustrative of the deeply personalized approaches to scientific philosophy that one finds among different individuals. He does not directly take on the question of "what is science?" that tends to divide theistic scientists in the YEC community from methodological naturalists, but works his way through an interesting discourse on the laws of nature that emphasizes their progressive development, discussing the principle that "new laws have to *contain* the old ones," the idea of a "validity domain," and the importance of the "supervisors" of new scientific developments: logic and observation. By citing examples of misconceptions, Bret defends the objectivity of the scientific community (specifically physicists)—a community that he asserts does *not* have any axe to grind against the Bible, that strives continually to *disprove* its own theories, and that utilizes a literature system that preserves the integrity of the enterprise. All of these discussions are illustrated with well-chosen physics examples along with diagrams and equations that strengthen the presentation.

The final two chapters make Bret's scientific case for an old earth. Rather than comprehensively considering the many arguments and pieces of data in their totality, Bret has prudently restricted himself to a more in-depth scientific treatment of just two issues, explaining that

> I won't review every single one of these evidences, for two reasons: first, I want to keep this book short, and second, I don't want to leave my area of expertise and so risk being inaccurate.

The two dating methods that he considers are starlight transit and radiometric dating. For a reader seeking knowledge about the science involved in determining the age of the earth, these final chapters provide a wealth of information—lessons taught by a master physics teacher whose instructional approach is entertaining and enlightening. Data is wielded, diagrams are marshaled, and the physics is illuminated. Being familiar with the YEC arguments in these areas, Bret addresses the question of whether the assumptions necessary for the veracity of the two methods, i.e., the constancy of light speed and radioactive decay rates over time, are valid or not. Along with reviewing the procedures used to determine astronomical distances, he argues that as we look back into the past that comes to us from distant starlight, we can observe the constancy of these values—because the values are intimately associated with the laws of electromagnetism and nuclear physics which can be seen to be proceeding then as now.

There is much detail to consider in Bret's scientific discourse—some of which is reserved for two appendices. Any scientific popularization must necessarily choose a level of presentation and some will find this book a daunting read in spite of the author's best efforts at clarity. It is for this reason that many who contemplate this debate within our Christian community end up trusting the authority of one author or another, probably identifying and agreeing with those with whom they feel a kinship. Bret has made a good effort to frame an objective presentation of these physical results, and it would be difficult to find many trained physicists who would question the technical merits of the presentation.

A brief but dense conclusion to the book makes it clear that Bret fervently wishes to change minds, hoping that believers are "able to look freely at the teachings of science on any topic without feeling that our faith is being threatened." While young-earth creationists have sincere concerns that naturalistic origins theories pose a threat to Christian faith, the motives of the old-earth group are likewise authentic, as Bret explains:

> In a similar way, thousands of people this year will commit spiritual suicide for nothing. They will read a book, watch a documentary, or go to college, and be confronted by the evidence for an old universe. Then they will remember the young universe theology they were taught and relegate the Bible to the level of an interesting fairy tale, at best. Thousands this year will lose their faith because no one has told them that both "God causes his sun to rise" and "the sun rises because the earth rotates" are *true*.

Perhaps some will read this quote as a contradiction of my earlier point about whether this book is a "harsh polemic," or may question the degree of "gentleness and respect" on display. But the YEC community must allow that Bret and other old-earthers are no Richard Dawkins, bent on stamping out Christian belief and other "harmful superstitions," but fellow children of God who want the best for their people—even as do they. The dialogue is difficult, but I would recommend this book to interested readers, regardless of whether they already agree with Bret or would be seeking out the other side of the argument.

Reviewed by Brent Royuk, Dean of Arts & Sciences, Concordia University, Seward, NE 68434.

PHILOSOPHY & THEOLOGY

FROM TEILHARD TO OMEGA: Co-creating an Unfinished Universe by Ilia Delio, ed. Maryknoll, NY: Orbis Books, 2014. 256 pages. Paperback; $30.00. ISBN: 9781626980693.

When Pierre Teilhard de Chardin died in New York City on Easter Sunday, 1955, the 73-year-old priest-paleontologist-philosopher was out of sorts with his church. The Vatican had repeatedly forbidden the publication of his philosophical works, and would continue to do so for decades to come; they further forbade the inclusion of his already-published books in Catholic libraries and bookstores. It is therefore doubtful that he or any of his close associates would have anticipated the degree of respect his name now generates, or the amount of scholarly work conducted, both inside and outside the church, to explore his ideas. Teilhard seems to be even timelier in the twenty-first century than he was in the twentieth, and is attracting a new generation of readers and fans.

From Teilhard to Omega: Co-creating an Unfinished Universe picks up a number of threads of Teilhard's ideas and attempts to advance them more fully. Issued by a respected Catholic publishing house,

written by a slate of respected Catholic scholars, and edited by the accomplished Ilia Delio, this embrace of Teilhard comes from within his own church. Delio is Director of Catholic Studies at Georgetown University and previous Professor and Chair of Spirituality Studies at Washington Theological Union. Much like Teilhard himself, Delio crosses the professional divisions between science and religion (holding dual doctorates in pharmacology and historical theology) but may be best known for her writings on spirituality. A lay Franciscan, she is a colleague and occasional copresenter with Father Richard Rohr, a New Mexico-based Franciscan spiritual teacher with a broadly ecumenical reach.

This volume is organized around the central Teilhard dictum that "the universe is still coming into being." It is Teilhard's evolving cosmos that is the focus here, along with the end to which it is evolving and the God who guides this process. For those unfamiliar or only casually familiar with Teilhard's arguments, the first chapter ("Teilhard de Chardin: Theology for an Unfinished Universe" by John F. Haught) lays a scholarly but accessible groundwork for Teilhard's evolutionary consciousness. Bemoaning a faith still moored in a premodern or early modern perspective, Teilhard sought to create a "metaphysics for the future" that encouraged a departure from static or even pessimistic visions of the future and instead offered the promise of an "omega point," where all things converge into each other and into Christ. Teilhard the scientist, Teilhard the historian, and Teilhard the theologian all looked forward "with hope and love" because the cosmos had a purpose toward which it was being continually created.

Part One of this collection of thirteen essays explores this union of "theology and evolution" and includes not only the chapter by Haught, but also explorations of "Sophia: Catalyst for Creative Union and Divine Love," "Evolution and the Rise of the Secular God" (by the book's editor), "Teilhard's Vision as Agenda for Rahner's Christology" (which explores the influence that Teilhard had on the influential mid-twentieth-century Catholic theologian), and "Humanity Reveals the World." As noted, the first chapter is both foundational and accessible.

Part Two addresses Teilhard's philosophical vision. The first chapter explores the relationship between the thinking of Teilhard and that of Bernard Lonergan, a Jesuit philosopher-theologian. The second chapter in this section explores the relationship between metaphysics and morality (particularly in the political realm) in Teilhard's thought, and the third defends him from the critiques raised by Sir Peter Medawar, the mid-century British-Brazilian Nobel Prize-winning biologist and atheist.

Part Three turns to "Spirituality and Ethics for a New Millennium." It includes chapters on "An Evolving Christian Morality," "Teilhard de Chardin and the New Spirituality," and Teilhard as "The Empirical Mystic," which might now be my favorite description of this unique polymath. But it may be the title of another chapter in this section that best captures the personality and, indeed, the life goal of Teilhard: "The Zest for Life: A Contemporary Exploration of a Generative Theme in Teilhard's Work" (by Ursula King).

Part Four consists of a single chapter: "Teilhard de Chardin: New Tools for an Evolutive Theory of the Biosphere" (by Luduvico Galleni), which attempts to deliver on the promise that the book be not merely a review of Teilhard's thought but also an extrapolation of it into new arenas and questions pertinent to our own generation.

It is doubtless true that fewer volumes of essays by multiple authors are being published these days, as they are often of uneven quality and lack thematic coherence. This volume does not suffer from those flaws. While I have called attention to certain chapters (and believe some are more germane to a discussion of Teilhard than others), the contributions here are surprisingly uniform in terms of the quality of their research and insights. There is an occasional hagiographical tone but one expects this from a volume dedicated to the thinking of a particularly influential individual. If one is looking for a biography of Teilhard, a review of his writings, or a general summary of his ideas, other previously published volumes will do that better. This one does what it purports to do: it examines Teilhard's themes to explore and extrapolate how we might continue to cocreate the unfinished universe in our own time.

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ADAM, THE FALL, AND ORIGINAL SIN: Theological, Biblical, and Scientific Perspectives by Hans Madueme and Michael Reeves, eds. Grand Rapids, MI: Baker Academic, 2014. 352 pages. Paperback; $26.99. ISBN: 9780801039928.

The debate over the historicity of Adam is well underway within evangelical circles, as witnessed by the *Christianity Today* cover article entitled "The Search for the Historical Adam" (June 2011 issue), Peter Enns's 2012 Baker book *The Evolution of Adam*, and Zondervan's publication of *Four Views on the*

Historical Adam in 2013. Questioning whether or not Adam existed certainly raises serious issues regarding the traditional doctrines of the Fall and original sin. A response by traditionalists and concordists was expected, and this book is just such an attempt.

Editors Madueme and Reeves clearly outline the intent of their book. "Our basic thesis is that the traditional doctrine of original sin is not only orthodox but is also the most theologically cogent synthesis of the biblical witness" (p. xii). The book unfolds in four parts: Adam in the Bible and Science, Original Sin in History, Original Sin in Theology, and Adam and the Fall in Dispute.

Of the fifteen contributors, there is only one scientist, a paleoanthropologist, whose contribution comes under the pseudonym "William Stone." He offers a good overview of the prehuman and human fossil record. However, a concordist hermeneutic ultimately directs his interpretation of the scientific evidence. "Stone" admits, "I expect the paleoanthropological record: a. to show that humans belong to a distinct 'kind' from other primates; and b. to be consistent with a single human lineage" (p. 55). Because of these presuppositions, he concludes that Adam and Eve were a "special creation" with "no ancestral lineage" to earlier creatures (pp. 55, 80) and places them "at the root of the *Homo erectus/ergaster* to *Homo sapiens* lineage about 1.8 million years ago" (pp. 78, 80). The obvious problem with this proposal is that *Homo sapiens* do not appear in the fossil record until 200,000 years ago.

The historical contributions are the most valuable part of the book and together they reveal that the Christian tradition fully embraced the doctrine of original sin and a historical Adam and fall. Peter Sanlon's examination of patristic theology underlines that original sin was not invented by Augustine, but was part of Christian tradition prior to him (p. 95). Of course, it was under Augustine's towering influence that the doctrine was explicitly defined and later incorporated into the Council of Carthage in 418 (p. 88). Robert Kolb presents an outline of Lutheran approaches to original sin. He notes that Luther assumed that "without [the doctrine of original sin] it was impossible to understand the Scriptures correctly" (p. 116). Luther contended that "the inherited sin" of Adam completely bound and corrupted the will of every human (p. 109). In this way, he reshaped and darkened the doctrine and rejected any "spark of positive potential in the inborn will" (p. 116). In reviewing the Reformed tradition, Donald Macleod sketches the emergence of realist and federalist views of the relationship between Adam and his descendants (pp. 137–38). The former is a biological concept that suggests every human was once in the loins of Adam. The latter, which became Reformed consensus, proposes that Adam was the representative head of humanity.

The third part of this book focusses on biblical theology and systematic theology. The central argument is that the coherence of these two theological disciplines is utterly dependent on a historical Adam and Fall and belief in original sin. In dealing with biblical theology, James M. Hamilton exposes the concordist hermeneutic that undergirds his views. He contends that in the early chapters of Genesis, Moses offers "a universal explanation of all things" such as "migratory ranchers" (Gen. 4:20), "musical artistry" (v. 21), and "bronze and ironwork" (v. 22, p. 193). Not only does Hamilton disregard the evidence of Pentateuch source criticism, he seems to be completely unaware of the archeological record, because these three cultural advances do not arise in one generation as stated in Genesis 4. Herding appears 10,000 years ago; musical instruments, 40,000; bronze, 5,000; and iron, 3,000. Regrettably, Hamilton's chapter is stained by polemical slurs against Peter Enns. For example, he contends that "Enns is tone deaf" (p. 197), his work is a "shallow attempt" (p. 203), and for Enns "the Bible bows the knee to the authority of evolution" (p. 196). These comments strike me as those of someone who has not read the work of Enns with any care or objectivity.

In presenting the implications of original sin for systematic theology, editors Madueme and Reeves press all the rhetorical alarmist bells. They contend that "rejecting a historical Adam and original sin would leave us without a recognizable Christian gospel" (p. 210). In addition, they claim that the doctrine of original sin is "an irremovable part of any truly Christian, truly good news" (p. 209). And the alarms ring out even louder when Madueme and Reeves proclaim that if "original sin is denied, the more Christ becomes an example or a teacher instead of a savior … No incarnation, death, and resurrection would actually be needed" (p. 223). And to conclude, they claim that dismissing the historicity of Adam and the effects of original sin "trivializes sin" and that "salvation need not entail a supernatural regeneration of my heart and very being, for I have no such need or incapacity" (p. 221). A pastoral chapter by Daniel Doriani continues the alarmist rhetoric. He asserts that the doctrine of original sin "must remain at the center of the church's preaching, especially its evangelism. If not for original sin, we would need no incarnation, no atonement, no gospel" (p. 258). As one who rejects both Adam and original sin, I found

these chapters inordinately disturbing in that they seem to view traditional systematic theology as inerrant.

The fourth part of the book includes, in my estimation, the best chapter—Thomas R. Schreiner's exposition of Romans 5:12–19. He begins by stating, "Clearly Paul believes Adam is a historical figure" (p. 271), and argues convincingly that "five times in verses 15–19 judgment and death are attributed to Adam's one sin" (p. 276). Schreiner contends that the "universal consequences of Adam's sin" were not limited to him only because "it introduced sin and death into the world," and he qualifies that "both physical and spiritual death are intended" (p. 272). In attempting to restrict the extent of death, Schreiner claims that reference to "the world" in Romans 5:12 "refers specifically to humans beings" (p. 272). With this being the case, it is not surprising that he completely dodges Paul's reference to the cosmic Fall in Romans 8:20–22. Of course, belief in the cosmic Fall has been falsified by the fossil record. Physical death has been in the world for billions of years prior to the entrance of human sin.

This book is an excellent demonstration of the entrenchment of concordist hermeneutics within modern evangelicalism. All the contributors assume that scripture reveals historical and scientific facts regarding human origins. None deal with the possibility that the biblical creation accounts and Pauline references to Adam are undergirded by an ancient Near Eastern conceptualization of origins, specifically the *de novo* creation of humans. This book also reveals the dictatorial power of Christian tradition and systematic theology, which, at times, seem to function like inerrant texts. It is worth noting that over half of the contributors have connections to Presbyterian theology, including training or teaching at Westminster Seminary or Concordia Seminary. The book might have been subtitled "Presbyterian Perspectives."

Interestingly, the introduction by editors Madueme and Reeves cites Article 31.3 of the Westminster Confession. "All synods or councils, since the apostles' times, whether general or particular, may err; *and many have erred*. Therefore they are not to be made the rule of faith, or practice; but to be used as a help in both" (xi; their italics). In the light of modern biblical scholarship and the evolutionary sciences, I conclude that *Adam, the Fall, and Original Sin* continues within the Christian tradition that "many have erred." Had this book been written in the sixteenth and seventeenth centuries when the most important evangelical confessions of faith undergirding systematic theology were composed by young earth creationists (e.g., Luther and Calvin), it would have been excusable. Despite my conclusion, I certainly recommend that evangelicals read this book, in the same way that I encourage my students to read Richard Dawkins and Ken Ham.

Reviewed by Denis O. Lamoureux, Associate Professor of Science and Religion, St. Joseph's College, University of Alberta, Edmonton, AB T6G 2J5.

CAN ANIMALS BE MORAL? by Mark Rowlands. New York: Oxford University Press, 2012. 274 pages. Paperback; $24.95. ISBN: 9780190240301.

In this well-written and carefully argued book, Mark Rowlands defends the claim that some nonhuman animals can, indeed, be moral. At the intersection of animal science, moral philosophy, and many faith-based perspectives on morality and human nature, this book is as much about what makes human animals moral as it is about what makes some nonhuman animals moral.

Rowlands is a much published analytic philosopher and the focus of *Can Animals Be Moral?* is primarily conceptual and philosophical rather than empirical and scientific. He does assume that the scientific evidence makes a *prima facie* case for the claim that some animals, especially social mammals, can be motivated to act by various emotions that have an identifiable moral content. These emotions are all species of concern for the fortunes of others, which he takes to be the hallmark of a moral attitude, such as compassion, sympathy, grief, courage, malice, spite, and cruelty. As a matter of fact, he himself believes that a wide array of animal studies provides us with a growing body of evidence that some animals do, in fact, experience such emotions and are motivated to act by them. But the concern of the book is not to present and evaluate the scientific evidence for such a factual claim, but rather, to clarify and explain the meaning of the central concepts involved in making such a claim; secondly, to develop an extended argument for the claim that some animals *can* be moral subjects but not moral agents; and finally, to defend that claim from philosophical objections that have been thought to be decisive by the vast majority of thinkers in the Western philosophical tradition. In the course of that defense he examines and rejects a deeply entrenched conception of reason and human cognitive functioning that has provided the basis for a widely held paradigm of what it means to be moral, a paradigm incompatible with animals being moral subjects.

The foundation for his larger argument comes in the second chapter, by far the most difficult chapter

in the book, in which he explains what it means to ascribe emotions to animals. Emotions are understood as intentional states involving propositional content which is both factual and evaluative. If I am afraid of the large dog that is charging toward me, there is a factual component: I believe that there is a large dog charging toward me who looks vicious. But there is also an evaluative component: this dog is the sort of thing that should be feared. Moral emotions have the same structure except that the evaluative component involves not a prudential "should" but a moral "should." When I act on compassion for the suffering of someone, I believe that someone is suffering and that the morally right thing to do, what I morally should do, is to help that person. How is it possible to ascribe such intentional states with propositional content to animals when, as far as we can tell, they seem not to be able to entertain or reflect on the relevant propositions in the way that we do, when we experience emotions? The difficulty here arises, according to Rowlands, because we do not understand how animals represent objects in the world to themselves. To deal with this problem, he distinguishes between the *tracking* of a true proposition and the *entertaining* of a true proposition. Emotions, to be legitimate, will track true propositions, but they do not require that the subject of an emotion entertain, or even be capable of entertaining, such true propositions. If this distinction is acceptable, the way is open to ascribe morally laden emotions such as compassion to animals and to argue that they are sometimes motivated to act on them, and to argue further that, when they do, they are acting for moral reasons.

The next step in the argument is to develop and defend a distinction between moral subjects, which animals can be, and moral agents, which animals cannot be. A moral subject is someone who is motivated to act by moral reasons. A moral agent is someone who is morally responsible for, and so can be morally evaluated (praised and blamed) for, his or her motives and actions. For Rowlands, all moral agents are moral subjects but not all moral subjects are moral agents. The concepts of moral subjecthood and moral agency are as distinct, he argues, as the concepts of motivation and evaluation. Thus some animals can be moral subjects without being moral agents. In the last chapter, Rowlands suggests that as moral subjects, animals are worthy of moral respect and that thinking of them in such a way will make a difference for how we feel about them and act toward them.

But there is a widely held view among philosophers of what it means to be motivated to act by moral reasons that is not compatible with this way of distinguishing moral subjecthood and moral agency. On this view, one's motivations and actions are not moral, and they have no normative grip on one, unless one has control over them. And secondly, such control is conferred by a certain metacognitivity that enables one to critically scrutinize one's motivations and actions and deliberately choose them just because they are morally right. On this view, the distinction between moral subjecthood and moral agency collapses, and animals cannot be moral subjects because they cannot have moral motivations. In a series of carefully argued chapters, using a series of effective thought experiments, Rowlands does a good job of challenging the connections between critical scrutiny and control and between normativity and control on which this objection rests. He calls the view that the ability to critically scrutinize our motivations and actions confers control over them a case of the fallacy of the *miracle-of-the-meta*. Any issue of control at the level of motivation and action, he argues, will also arise at the level of metacognition. And he develops a Wittgensteinian-style account of normativity that grounds it not in internal, psychological features of individuals but in participation in the practices of a community.

The final step in Rowlands's argument is an explanation of the concept of moral agency. Unlike moral subjects, moral agents are morally responsible for, and so can be morally evaluated for (praised or blamed), their motives and actions. According to his reconstruction of the concept of moral responsibility, the extent to which one is morally responsible, and hence, a moral agent, "is the extent to which one understands what one is doing, the likely consequences of what one is doing, and how to evaluate those consequences" (p. 240). On his view, responsibility and agency come in degrees because the understanding in question comes in degrees, "… and in the case of animals the degrees involved are small enough that, if we were thinking in all-or-nothing terms, we would be inclined to say they were not agents" (p. 241).

These comments on responsibility are very brief and will need further development if they are going to provide a minimally adequate account of responsibility that explains the distinctiveness of human moral agency. In the first place, people can be responsible for actions they do not understand and for the consequences of actions they did not foresee or intend. Furthermore, even if understanding our actions enables us to take *responsibility* for our motives and actions, it is not at all clear how and why simply understanding them *makes* us responsible for them

in the first place. It is also difficult to see how some account of the role of control can be avoided (perhaps an alternative to the critical scrutiny account rejected by Rowlands), if only to make room for the possibility of moral progress.

One of the broader theological issues here for Christian thinkers concerns how to distinguish humans as moral agents from other animals. Christian thinkers will likely appeal to the theological claim that humans are uniquely made in the image of God, if this is understood as involving a call to a certain responsibility before God. Is that view compatible with the view of reason, morality, human moral agency and animal moral subjecthood developed by Rowlands in this book? One virtue of this book for Christian thinkers is that it will encourage them to reflect on the extent to which their interpretation of biblical material has been influenced by traditional conceptions of the human found in Western philosophy and to reflect critically on those conceptions themselves. Furthermore, even though Rowlands's own views of the deep kinship between humans and other animals seem to be grounded in a form of evolutionary naturalism, there may be good reason for Christian thinkers to affirm a similar kinship on the basis of the biblical account of creation.

I highly recommend *Can Animals Be Moral?*, especially to Christian animal scientists and Christian philosophers. The author writes clearly and develops his arguments carefully with an understated sense of humor. Whether or not, in the end, you agree with Rowlands, reading this book will deepen your understanding of the issues it addresses and is sure to provoke you to an ongoing engagement with questions regarding your own relationship with animals.

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THE PHYSICS OF THEISM: God, Physics, and the Philosophy of Science by Jeffrey Koperski. Chichester, UK: John Wiley & Sons, 2015. 279 pages. Hardcover; $89.95. ISBN: 9781118932810.

Theologians and philosophers of religion are increasingly interested in science, especially physics. Subtopics of physics such as the fine-tuning of universal constants, quantum mechanics, relativity, and cosmology are surprisingly common subjects where religion is involved. Bridging the gap between these fields, however, has proven to be quite difficult. Those in religion and the humanities typically interact with the mathematical sciences only at a popular level, and physicists are often dismissive of metaphysics and religion. Fortunately, the philosophy of science provides a middle ground between these disciplines. In this book, Koperski provides a critical analysis of the ways in which physics is brought into play in matters of religion.

Jeffrey Koperski is a professor of philosophy at Saginaw Valley State University. In addition to PhD and MA degrees in philosophy, his education includes an undergraduate degree in electrical engineering. This training gives him the STEM (Science, Technology, Engineering, Mathematics) background to grasp some of the more complex issues in physics, but what stands out is the practical perspective of an engineer.

Koperski has written previously on the intelligent design movement, specifically the 2008 *Zygon* paper, "Two Bad Ways to Attack Intelligent Design and Two Good Ones." This book has the same even, scholarly presentation as the previous work. In this book, Koperski indicates largely what physicists and philosophers of science think and why they think the way they do, without passing judgment. Koperski comes across as someone who feels no need whatsoever to attack personally those with whom he disagrees. In fact, he writes, "Placing the black hat on one's opponent is no substitute for an argument" (p. 205).

Late in the book, he makes an observation which seems motivational for the enterprise.

> If methodological naturalism is supposed to be a no trespassing sign, scientists don't take it as such … it does appear that the boundary only works one way. Scientists can cross at will; those on the religion side must stay where they are. (p. 210)

By way of example, he quotes Mano Singham, who wrote in "The New War between Science and Religion" (*The Chronicle of Higher Education* [May 9, 2010]), that

> the scope of science has always expanded, steadily replacing supernatural explanations with scientific ones. Science will continue this inexorable march … After all, there is no evidence that consciousness and mind arise from anything other than the workings of the physical brain, and so those phenomena are well within the scope of scientific investigation. What's more, because the powerful appeal of religion comes precisely from its claims that the deity intervenes in the physical world, in response to prayers and such, religious claims, too, fall well within the domain of science.

In other words, naturalists may comment upon religious assertions, but the reverse is inappropriate.

Koperski is not entirely neutral and does write some things meant to correct errors in the current discussion. He gives under the heading, "Conventional Wisdom," the following examples of common errors:

1. Science and religion have been at war with one another since Galileo was tortured by the Inquisition.
2. The Catholic Church taught that the earth was flat until Christopher Columbus proved otherwise.
3. The scientific revolution finally freed Europe from the grip of religion.

Against these, Koperski responds, "As every historian of science knows, these three nuggets of conventional wisdom are false."

Koperski has listed a fine set of durably popular, but incorrect, beliefs. As another example, it can be exasperating for nonphysicists to hear the claim that time is an illusion based upon some characteristic of the universe observed within the laboratory. Koperski does not indicate that such a view is false, but he observes, "Ellis argues that even if spacetime theories do not contain an objective flow of time, much of the rest of science cannot do without one" (p. 137). For example, it would be impossible to compare the clock rates of various microprocessors if time were declared to be illusory.

The book leads with a gracious dedication to his family and is composed of seven chapters: (1) "Science and Religion: Some Preliminaries," (2) "Fine-Tuning and Cosmology," (3) "Relativity, Time, and Free Will," (4) "Divine Action and the Laws of Nature," (5) "Naturalisms and Design," (6) "Reduction and Emergence," and (7) "The Philosophy of Science Tool Chest." Within these chapters, Koperski addresses such topics as abductive reasoning, the strong and weak anthropic principles, atheism as an assumed fundamental precept of science, Boltzmann brains, determinism and free will, arguments and evidence regarding divine intervention, emergence and reductionism, evil, evolution, creationism and intelligent design, fine-tuning of the universe, and multiverse theories.

This is an excellent text for those interested in the philosophy of science within those areas in which science and religion bump up against each other. Koperski indicates that there are several models of the interaction of science, philosophy, and religion. He lists the four categories of interaction proposed by Ian Barbour, emeritus professor of Carleton College: *Conflict/Warfare*, as typified by the Scopes Monkey Trial and the point of view of Thomas Huxley; *Independent Realms*, as advocated by Stephen J. Gould and his concept of "nonoverlapping magisteria"; *Dialogue*, the "two books" perspective as advocated by Galileo; and *Integration*, the integration of all knowledge into one coherent whole, a recent consistent theme within process theology.

Koperski rules out the viability of the Conflict/Warfare model of the self-proclaimed New Atheists. He observes,

> Naturalism and theism are obviously incompatible, since naturalism entails atheism. But science is not synonymous with naturalism nor is religion only theism. While science influences our metaphysics, metaphysics cannot be reduced to science, or at least it would require some argument in order to believe that it does.

Koperski advocates calling science, philosophy, and religion "disciplines" and further recognizing that the quest for knowledge is an interdisciplinary one. He asserts, "I've called the interdisciplinary view 'my proposal,' but in many ways, it is just what's going on in the philosophy of religion and the philosophy of science these days."

Koperski retells the familiar in new ways. He discusses the fine tuning of the universe, but does not use the old chestnut that if a person survived a firing squad with fifty sharpshooters, he would be justifiably surprised that all of the riflemen (apparently) simultaneously missed. Koperski's analogy is,

> It's a bit like telling a skydiver that he should not be surprised that he survived after his parachute failed. True, if he had not survived, he would not be around to wonder about it. But so what? It's ludicrous to think he shouldn't be surprised as having lived through the experience.

Koperski does not provide the reader with an endless collection of quotes from previous works, though he cites classic sources such as Galileo, Maxwell, and Einstein, as well as popularizers such as Davies, Dawkins, and Craig. He cites as necessary to the more obscure technical literature that nonphilosophers are unlikely to read. He does not overwhelm the reader with mathematics either. Each chapter's end notes and references appear directly at the end of the chapter, which make the notes very convenient to access.

This book is not a tract; it does not push the reader in the direction of any particular religion or world view. Koperski writes as a learned observer and sometimes as a participant but not as a partisan. He clearly, but politely, disagrees with the views of the naturalists, holding like Thomas Nagel that many popular naturalistic claims, set forth as axioms, are untenable.

Koperski correctly defines the "no miracles" argument as not meaning that God has not dabbled in his own creation but rather that "it would be a miracle if science could be as successful as it has been and not more or less true."

Like an excellent teacher, Koperski gives examples which are accessible to the average reader. Here's one on free will:

> If the behavior of all things, including the atoms in our own bodies, is wholly determined by the laws of physics, then there doesn't appear to be any room left for free will. In such a world, a kicker doesn't choose to kick a field goal any more than the football chooses to go through the goal posts. It's all just a matter of the laws of physics working themselves out.

One last quote shows the practical orientation of the author:

> The Boltzmann brain story is a *reductio ad absurdum*. If one's physical theory indicates that the best explanation for my own subjective experience, including memories, is that I am a disembodied brain temporarily hallucinating in the void (rather than a real person currently sitting at my desk), that's a problem for one's theory. A set of beliefs known to be grounded on an illusion contains its own defeater. Any theory that leads to radical skepticism about one's experience would invalidate whatever evidence one had for the theory itself. In other words, once you believe it, you probably shouldn't. (p. 92)

The book is worthy of recommendation as an accessible text for undergraduates studying the philosophy of science. Many, perhaps most, of the perennially controversial topics are covered within the text. A worthy effort indeed.

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Religion & Science

THE SOUL OF THE WORLD by Roger Scruton. Princeton, NJ: Princeton University Press, 2014. 216 pages. Hardcover; $27.95. ISBN: 9780691161570.

"We live in an age of debunking explanations …" So begins Roger Scruton in his fine book which aims to rebut reductionist (ultra-Darwinist, neurobiological) accounts of religion, the person, and the arts, and to clear a space for a search for the sacred. Scruton demonstrates the corrosive effects of scientism and offers a powerful challenge to this sort of thinking. Seeking to preserve the integrity of these three areas of meaning, he argues that they occupy a different cognitive sphere, distinct, if not separate from, the impersonal, cause-effect realm occupied by the sciences. Borrowing a term from Husserl, he calls this sphere peculiar to humans, the *Lebenswelt*, "life-world," a term which marks the space of first-person expressions of symbolic meaning. Here, the third-person perspective of the sciences is out of place, while reductionist claims are positively violent in what they ignore.

Central to his project of rehabilitating the *Lebenswelt* is his insistence that human beings are not only objects in the world (the province of science) but also subjects. As subjects, they enjoy the unique, first-person perspective of self-conscious agency. Through this first-person perspective, persons enjoy the privilege of making statements about themselves that are immune to challenge by others (p. 63). This privileged standpoint, says Scruton, is necessary for the possibility of dialogue with each other, since if we did not enjoy this privilege, "we would be always describing ourselves as though we were someone else" (p. 63). The first-person perspective simply does not exist in science since its project is to place all things under the rubric of impersonal, universal laws. Against scientism's explanatory imperialism, Scruton seeks to retrieve the reality, integrity, and causal legitimacy of the *Lebenswelt*. This is especially present in his concern to appreciate the significance of the "I-You encounter" in which two subjects meet and the possibility of interpersonal dialogue opens up (p. 49). Such a meeting, says Scruton, implies the notion of accountability as each person struggles to know and be known, to give an account of what they lived for and why. While neuroscience is a powerful framework for exploring brain function, it is ill equipped to understand the nature or meaning of this first-person, qualitative exchange.

The ultra-Darwinist assumption that natural selection is the all-sufficient explanation applied, without distinction, to all living creatures is flawed, since, with *Homo sapiens*, there is "something new under the sun." Here, a way of being has emerged from nature that eludes a purely biological category of explanation. To signal the nature of this new emergent, Scruton proposes what he calls "cognitive dualism." He is not hearkening back to a Cartesian split between body and soul, fact and value. There is only one reality, says Scruton, but it is capable of being understood under two aspects: the impersonal, cause-effect mode of science; and the intentional, interpersonal mode of human beings. These are two orders of explanation. The two worlds are ontologically *continuous*, in the sense that the *Lebenswelt* emerges from the material world which the sciences

investigate, and so has ontological priority (p. 67). However, the two orders are explanatorily *discontinuous* since "we cannot derive from one of them a description of the world as seen from the other. Nor can we understand how one and the same object can be apprehended from both perspectives" (p. 36).

Ultra-Darwinists explain biological phenomena as strategies for survival and reproductive success. For them, human life is no exception to this totalizing explanation. For example, evolutionary psychologists view altruism as the most reliable strategy for the spread of one's genetic material into the next generation. This counter-intuitive claim is explained in terms of kin selection, in which an individual (usually one who has many genetically related individuals in the populace) will sacrifice or put himself at risk for the sake of the group. Thus, what appears to be concern for others is really a kind of concern for his genetic "investment." At any rate, an organism is said to act altruistically, "if it benefits another organism at a cost to itself" (p. 55). Scruton's problem with this definition is that it makes no distinction between nonhuman and human acts. Nonhuman organisms, responding to biological imperatives, may unconsciously or semi-consciously, act in accord with their "selfish genes," but is this true of human beings? Scruton thinks not. About the evolutionary psychologist's definition of altruism, he writes,

> The concept applies equally to the soldier ant that marches into the flames that threaten the anthill, and to the officer who throws himself onto the live grenade that threatens his platoon. The concept of altruism, so understood, cannot explain, or even recognize, the distinction between those two cases. Yet surely there is all the difference in the world between the ant that marches instinctively toward the flames, unable either to understand what it is doing or to fear the results of it, and the officer who consciously lays down his life for his troops. (p. 55)

As free beings existing in the "'space of reasons,' not in the 'space of law'" (p. 36), humans can be motivated by any number of reasons other than biological imperatives. They can choose to die for the sake of honor, love, or freedom. Evolutionary psychologists may counter that we only *think* we are acting for the sake of these noble abstractions, but in truth, are tethered to our genes and dance to their tune. But this is mere assertion based upon a faith that the third-person perspective of science alone does explanatory work. Such a position arbitrarily denies by *fiat* the first-person claim that we are personal agents freely intending certain desirable goals.

Along with fellow philosopher Mary Midgley, Scruton is opposed to what she famously called "nothing buttery" (p. 39). "Nothing buttery" is the reductionist habit of mind which insists that parts are more real and more important than the whole, and the whole is really "nothing but" its constituent parts, usually, physics and chemistry. For Scruton, reality is a multilayered affair, a nested hierarchy where higher order functions and powers emerge from their material matrix. An emergent reality is not "nothing but" the collection of things of which it is composed but a new and unexpected whole, inexplicable in terms of its constituent parts.

> There is a widespread habit of declaring emergent realities to be "nothing but" the things in which we perceive them. The human person is "nothing but" the human animal; law is "nothing but" relations of social power; sexual love is "nothing but" the urge to procreation; altruism is "nothing but" the dominant genetic strategy described by Maynard Smith; the *Mona Lisa* is "nothing but" a spread of pigments on a canvas, the Ninth Symphony is "nothing but" a sequence of pitched sounds of varying timbre. And so on. Getting rid of this habit is, to my mind, the true goal of philosophy … [it] is the first step in the search for God. (pp. 39–40)

Of course, if persons and human culture are reducible to the interplay of physics and chemistry, then there is really nothing to discuss beyond what the sciences have to say. Human persons are just gene machines. Culturally speaking, there would be nothing to *interpret* artistically since no deeper meaning could be accorded to things than what is uncovered by the sciences. For Scruton, artistic creations are the work of persons and, as such, embody acts of meaning, and are capable of exploring the nature of the human condition or the search for God. Thus, if the *Lebenswelt* is real, music is more than a "series of pitched sounds, one after the other, each identified by frequency" (p. 37). The third-person perspective, while necessary—there can be no music without pitch and frequency—is not a sufficient explanation of what music *is*. Concerning the theme of the opening of Beethoven's Third Piano Concerto, Scruton says,

> … you cannot describe what is going on in this theme without speaking of movement in musical space, of gravitational forces, of answering phrases and symmetries, of tension and release, and so on. (p. 37)

A little later, he ties his discussion of music into his larger themes:

> In describing a sequence of sounds as a melody, I am situating the sequence in the human world: the world of responses, intentions, and self-knowledge. I am lifting the sounds out of the physical realm, and repositioning them in the *Lebenswelt*, which is a world of freedom, reason, and interpersonal being … I am describing what I hear *in* the sounds, when I respond to them as music. (p. 66)

Like the *Lebenswelt*, the presence of God will suffer eclipse in a culture increasingly given to scientism. Interestingly, Scruton speaks of the "real presence" of God in the midst of the early Israelites as a kind of concealment. Such divine hiddenness may be necessary, according to Scruton, since God "lies outside the space-time continuum" (p. 9) and yet this raises a pressing question concerning how God's presence may be manifested in the empirical realm (p. 11). Chastened by this hiddenness, we must be aware that while human concepts and beliefs about God may disclose, they also conceal (p. 10). Nevertheless, scientism's denial of the *Lebenswelt* hopes to secure a permanent silence about the sacred which this powerful book seeks to repel.

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THE GAP: The Science of What Separates Us from Other Animals by Thomas Suddendorf. New York: Basic Books, 2013. 358 pages. Hardcover; $29.99. ISBN: 0465030149.

This is a book about the human mind, and how the human mind differs from that of other animals, including primates. We can envision the future (alternate realities), and we possess a mental framework to express these visions (language and culture). The author, Thomas Suddendorf, calls these "nested scenario building" and an "urge to connect." Suddendorf makes a case for these two facets of humanity as constituting the gap between the capacities of the human mind and those of other animals.

Suddendorf frames this book in the evolutionary context of what happened along the way from primitive ape to modern human being. As there are no Neanderthals around anymore, and we know little about them and our other forebears, he redirects his focus to our nearest extant relatives: apes. He then proceeds to discuss how we study the minds of apes and humans and highlights the limits of such inquiry. Suddendorf is very good in this respect. Throughout the course of the book, he continues to highlight the limits of scientific inquiry. He also does not shy away from contrasting the two opposing paradigms in which the observations are interpreted: a romantic paradigm that is poised to imagine human-mind likeness where there is none; and a killjoy paradigm ready to strip away humanness in favor of behaviorist explanations. Suddendorf tries hard to walk the middle of the road between the two paradigms while keeping the reader's options open.

Suddendorf focuses on six spheres of the human condition: language, mental time travel, mindreading (the ability to read body language and infer the subject's thinking), theorizing (the ability to conceive of abstract ideas *and* examine them), culture (the ability to learn and retain learning across generations), and morality. These he contrasts with the animal faculties of communication, memory, social reasoning, physical reasoning, tradition (yes! animals learn and that learning does seem to spread and be preserved in populations over time), and empathy. I will preserve for you the joy of reading the book by not elaborating much further on these points. Suffice it to say, the gap between these six qualities are, in Suddendorf's opinion, bridged by nested scenario building and an urge to connect.

The nested scenario building is, as Suddendorf explains it, the ability not only to retain memories and learning but to reimagine those memories and learning into new ideas. In doing so, we can project ourselves into the future (we can, for example, anticipate consequences from actions and so derive a sense of ethical accountability from empathy) as well as imagine new things and invent. These abilities, Suddendorf argues, are not visible in other animals. While apes may be able to "ape" humanness, their impression is, in his opinion, only skin deep.

Apes, and many other organisms, are social but humanity takes it further. We seek society; we want to make contact with others and share our experiences. I give, as an example, my hobbies of tropical fish keeping and orchid growing. Visit a society meeting and the average age is well over 60 years of age. This is not a particularly tech-savvy demographic, but if you visit the internet, there is no shortage of webpages, forums, and groups discussing these topics. We (whether we are 19 or 90) seek each other out to share our experience. What is more, we spontaneously organize to share information with like-minded people. With communication, we create culture where there previously was none. In part, the reason why young people cannot be separated from their phones is because there is a deep, inexorable desire to connect with others. Suddendorf discusses what makes us human and reveals our carnal nature that, left untempered by morality, can backfire into social self-destructive culture.

Who should be reading this book? I think if you are interested in moral philosophy, theology, and cognitive neurobiology, then this book will offer many insights into these fields. If Suddendorf is correct, experimenting on rats and mice and chimpanzees will not unlock the mystery of "humanness" as the mystery simply is not to be found in these animals. Also, if we aim to build a moral society, then we must know something of our nature that urges us to seek each other out. I just read an article by Rabbi Warren Goldstein ("Alternative Reality: Why We Misunderstand Faith" on Jewishworldreview .com) on the human desire to recreate our reality and communicate. Sadly, what Rabbi Goldstein describes as evidence for a divine human soul now seems less supernatural, but still, there is a large gap between animal and human nature that should lead us to understand that we are very special—and to whom much is given, from him much will be required—but I digress. Goldstein's point is that faith is our reimagining of reality into what God wishes us to become. Paul's emphasis on our carnal nature is also relevant as we bring with us, through our evolution, many potentially negative traits (*yetzer hara*, to borrow the Jewish idea) that can be put to good use (toward *tikkun olam*) but that can, without a sound worldview (a *faith*) in which to interpret reality, just as well be used to break and destroy our world (to cause *ra* and *rasha*). If we are to accept the Divine invitation to "let *us* [God and you, me, and others] make humankind" we must know and understand what our starting materials are.

Who would enjoy reading this book? I would think any biologist would find this book interesting. Psychologists and neurobiologists would also find it interesting and informative as to the human condition. Nonprofessionals with an interest in behavior or social pathology would find this a rewarding read, full of interesting material on human development and social experiments. I, as a new parent, found it fascinating to find the ideas of human development espoused by Suddendorf recapitulated in my growing son. The book does a great job of taking what little we know about the behavior of human ancestors and presenting it in the context of what it is to be human.

Suddendorf encourages us to know ourselves. I would like to echo this encouragement: read the book and get to know yourself a bit better.

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As space permits, *PSCF* plans to list recently published books and peer-reviewed articles related to science and Christian faith that are written by our members and brought to our attention. To let us know of such works, please write to patrick.franklin@prov.ca.

Science & Biblical Studies

NAVIGATING GENESIS: A Scientist's Journey through Genesis 1–11 by Hugh Ross. Covina, CA: Reasons to Believe Press, 2014. 298 pages, endnotes, indexes, appendixes. Paperback; $19.95. ISBN: 9781886653863.

In *Navigating Genesis,* Hugh Ross presents readers with his attempt to engage in a reading of Genesis 1–11 in a way that promises to "ultimately satisfy intellectual curiosity" (p. 13). While Ross's engagement with the conclusions of much modern scientific inquiry is often interesting and seems (from this outsider's perspective) to be well researched, his commitment to a particular way of reading the Bible, coupled with what appears to be a near-total disregard for academic biblical scholarship, makes this book profoundly frustrating to read. A complete list of the various problems in the book is far beyond the scope of this review, but I will present here several key issues indicative of the kinds of problems one finds throughout, and which, taken together, create a work that is fatally flawed.

From the beginning, Ross displays a tendency to brush aside or disregard significant problems in his argument regarding Genesis 1. For instance, he goes to great pains to indicate that, contrary to the entire interpretive history of Genesis 1, God did not *create* light and darkness on the first day of creation, but that light *appeared* (pp. 38–39). This is a necessary argument for Ross's conclusions, since he believes that Genesis 1 offers us a scientifically accurate (if not exhaustive) account of the beginnings of the world. If one is to suggest that the creation of light precedes anything that might produce light, as the text seems to suggest, one has a rather significant problem. Ross solves the problem in two ways, both of which are difficult to accept.

First, Ross proposes a (to my knowledge) unique reading of Genesis 1:1–2 that involves a shift in observer perspective (pp. 28–31). He suggests that the "observer's vantage point [in verse 2] is clearly identified as 'the surface of the deep' … over the waters" (p. 31). In point of fact, the text does not identify any "observer" at all, nor is there any clear indication of a shift in "vantage point" (or of the existence of an initial "vantage point"). The entity that broods over the waters is the *rûach 'elōhîm*, the spirit of God, and there is no indication whatsoever that this entity is narrating the account. In terms of perspective, all of Genesis 1 appears to occur from the divine perspective, or from what we would usually call a third person omniscient perspective. This

is the normal way for Hebrew storytelling to proceed. The narrating voice appears to know and see all, and reports on what occurs. There is no more an "observer" with a "vantage point" here than there is, say, in the narrative voice of the book of Ruth. The narrator is nowhere and everywhere. Ross's suggestion of a shift in location for the "observer" is thus implausible, in no way necessary to the flow of the account, has never been proposed by another interpreter, is not clearly indicated by the grammar of the text, and is not referred to in the text specifically. Unfortunately for Ross, his entire reading of Genesis 1 hangs on this thinnest of threads.

The second way in which Ross solves the sequencing problem in Genesis 1 is by attempting to create a clear differentiation between the semantic ranges of the various verbs used in the passage. He notes correctly that several different words are used to refer to God's activity in this passage, including *bārā'*, *hāyâ*, *'āśâ, nātan, rā'â*, and *yāṣā'*. He then attempts to argue that there is a significant difference of semantic range between *bārā'* and (especially) *hāyâ* and *'āśâ*. The former, he suggests, refers to divine creation out of nothing, and the latter to the act of making something come about, and fashioning or manufacturing something (respectively). Here the source cited is the *Theological Wordbook of the Old Testament (TWOT)*. This is the only lexical resource that Ross cites in the book, though he notes in the appendix that in the past he has drawn on various resources for his definitions and here he has used *TWOT* in order to simplify his presentation (p. 231).

There are several problems here. In the first place, while *TWOT* is a resource edited and produced by biblical scholars, it is of uneven quality, and it is badly out of date (it was published in 1980). Entries in *TWOT* did not represent the cutting edge of linguistic research into Hebrew at the time of their publication, and they most certainly do not represent current research today. With reference to the verbs in question, Ross overlooks or fails to note that many biblical scholars see these terms as being used more or less synonymously in this passage, and that over the past few years, a great deal of ink has been spilled over the semantics of *bārā'* especially (cf. Becking and Korpel, "To Create, to Separate or to Construct: An Alternative for a Recent Proposal as to the Interpretation of *bārā'* in Genesis 1:1–2:4a," *Journal of Hebrew Scriptures* 10 [2010]; van Wolde and Rezetko, "Semantics and the Semantics of *bārā'*: A Rejoinder to the Arguments Advanced by B. Becking and M. Korpel," *Journal of Hebrew Scriptures* 11 [2011]—and related bibliography). Even current work by scholars who accept a distinct definition/function for *bārā'* in Genesis 1 (e.g., Walton) is absent in Ross's discussion. Though a precise definition for the word remains, to a certain degree, a matter of debate, it is generally acknowledged that it does not refer to creation by divine decree, as *TWOT* would have us believe. However, for Ross, it is utterly vital to his reading that this traditional meaning of *bārā'* be maintained, and that it be placed in sharp distinction to the other verbs noted above. Ross is either ignorant of, or has chosen to ignore, the extensive scholarship available on this issue.

One of the most profoundly frustrating experiences I had while reading this book was examining the endnotes for this portion of his argument. Apart from *TWOT*, peer-reviewed biblical scholarship is entirely absent. I was even more profoundly frustrated when I did find references to works by relevant scholars such as Walton and van Wolde much later in the book, in reference to entirely different issues, which clearly indicated that Ross had read work that was material to this conversation, but did not engage with it.

On the subject of words, Ross also casually brushes aside the question of the meaning of the word *rāqîya`*, defining it as "expanse" (i.e., atmosphere) and not "vaulted dome" as is generally accepted among scholars (see the relevant entry in the *Hebrew and Aramaic Lexicon of the Old Testament*). Ross suggests that critics of this view cite Job 37:18 for support, and then pivots to dismantling an argument based upon Job. Not only does Ross fail to identify those with whom he disagrees here, but he also fails to actually engage with the question of the meaning of the specific word at hand. The word *rāqîya`* has been understood as a reference to a solid dome that covered the world since antiquity (both the Septuagint and Vulgate translate the word in this way), and this reading is consistent with all other instances of *rāqîya`* in the Old Testament as well as with cognate words in other ancient Semitic languages. Again, this reading completely derails Ross's attempt to bring Genesis into line with modern scientific cosmology.

These are not the only linguistic infelicities Ross commits. In the same chapter, Ross engages in a foray into the problem of the verbal system of biblical Hebrew. Here he suggests that "Hebrew verbs by themselves do not specify the duration of actions. Nor do they determine the time ordering of actions. Instead, the ordering of past actions is established most straightforwardly by word order" (p. 32). The only support that Ross cites for this view is Rodney Whitefield's *Reading Genesis One*, a self-published book written by a physicist. The verbal system of biblical Hebrew

is a topic of immense debate within the field of biblical studies, and anybody wishing to research the topic seriously should have no difficulty at all in finding ample resources written by researchers with specific training and expertise in modern linguistics and ancient Semitic languages (e.g., Cook, *Time and the Biblical Hebrew Verb*; Niccacci, *The Syntax of the Verb*; Buth, "The Hebrew Verb"; Buth, "Functional Grammar, Hebrew, and Aramaic"; Endo, T*he Verbal System of Classical Hebrew*; Arnold and Choi, *A Guide to Biblical Hebrew Syntax*; Joosten, "Do the Finite Verbal Forms …?"—and this is to say nothing of the many beginner and technical grammars available). The fact that Ross in no way engages any of this literature while depending heavily on the conclusions of an untrained, amateur Hebraist regarding verbal syntax and semantics simply beggars belief.

In fact, apart from his use of *TWOT* and passing references to a few scholars, Ross seldom engages biblical scholarship of any kind. He does not engage current thinking about the structure, theology, and message of Genesis 1–2, or of the primeval history (chaps. 1–11) as a whole, to say nothing of the overall literary structure of the book of Genesis. Walton and van Wolde each receive the briefest of mention and are brushed aside without meaningful engagement, and well-known evangelical scholars working actively in the book of Genesis, such as John Sailhamer, receive no mention at all. This absence is felt most keenly in chapter 20, in which Ross purportedly engages "Higher Criticism." Ross's engagement with what he calls "higher criticism" (a term that belongs more to the nineteenth century than the twenty-first) is badly out of date, and is only accurate in the broadest sense of the word. Here we find statements such as the following:

> Astruc, Eichhorn, and the emerging "higher critics" presumed that the order in which various creation events appear on the page represents the intended chronology in the text. For the most part, they ignored verb choice, verb forms, contextual cues, indicators of parenthetical comment, and virtually all other syntactic features. (p. 198)

No citations are provided to support this claim. First, most biblical scholars (and not merely the terrible "higher critics") do indeed read the Genesis 1 and 2 accounts as though they are presented in chronological order. For chapter 1 at least, the creation account is presented as an event proceeding in six successive days, each culminating in evening and morning. The suggestion that this somehow ignores the structure and context of the text is peculiar. Second, the suggestion that biblical scholars (whether in the seventeenth/eighteenth century such as Astruc, the eighteenth/nineteenth century such as Eichhorn, or the nineteenth/twentieth century such as most of those who called themselves "higher critics") ignore issues such as verb choice, syntax, and context is simply false. The briefest perusal of books, commentaries, and articles on the book of Genesis disproves this absurd claim immediately. No honest engagement with critical biblical scholarship is even attempted in this chapter. What we find here is little more than a dismissive parade of straw men.

Suffice to say that I find Ross's foray into biblical scholarship in *Navigating Genesis* wanting. Ross is dismissive toward the long history of scholarship on this ancient text, constantly submits the text to his modernist eisegetical presuppositions, and does not deal honestly and openly with those with whom he disagrees. The frank truth is that I cannot recommend this book to anybody, except as a case study in concordist hermeneutics.

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TECHNOLOGY

INFORMATION DOESN'T WANT TO BE FREE: Laws for the Internet Age by Cory Doctorow. San Francisco, CA: McSweeney's, 2014. 192 pages. Hardcover; $22.00. ISBN: 9781940450285.

"Information doesn't want to be free, people do," says Internet expert and prolific author Cory Doctorow in this provocative and timely book. If this phrase leaves you still a little murky as to what his thesis is, the subtitle says it better. In short, the Internet changes everything, so let's start changing copyright laws so that they work better for people in creative fields (and use existing laws to serve creators rather than their distributors).

Doctorow proposes three main "laws" for the information revolution when it comes to creative content (writing, music, visual art, etc.). By "law," he means a universally true observation; in particular, these are his observations about the current copyright situation whose implications he believes most Americans do not fully grasp.

First, locked formats such as DVDs that you cannot play on Linux, or Kindle books that you cannot read somewhere else, are not there for the benefit of consumers or artists. Second, having fewer distribution channels and more copyright liability for intermediaries such as YouTube or Internet providers is bad for artists and consumers. Third, and most critically, a copyright system that encourages providers to have

full access to our computers and other devices at all times (to catch any possible copyright violation) is worse than Orwellian because it is no longer just the government that is spying on you.

His "laws" are stated more pithily; the last "law" is quoted using his words at the beginning of this review. Some of the examples of this that he cites are quite disturbing. For example, in 2009, Amazon used a secret hook to delete legitimately obtained copies of *1984* from customers' hard drives; aside from this irony (which CEO Jeff Bezos apologized for), there is no reason that a malicious actor could not use the same facility to do far worse.

Now, I am not a lawyer, economist, Internet expert, or copyright aficionado so I cannot speak directly about the impact of most of these issues. However, I find much of it compelling. For instance, perhaps a mathematician and writer is a bit of a creative artist—and sure enough, while discussing the relative utility of fame, he describes my situation: "You can't pay for a copy of this book with fame. (Unless you're famous as a reviewer, in which case you can.)" So I will focus instead on the highlights most relevant to readers of *PSCF* with a technical bent.

First, anyone who knows anything about computers should be alarmed by software used for digital rights management, software that is legalized in the United States by the Digital Millennium Copyright Act. For many such "digital locks," it is illegal even to try to figure out how they work, though they often restrict legal activity on a customer-owned device. As an excellent example of how this plays out, one Sony product immediately cloaked any files beginning with "sys." Naturally, virus writers immediately started writing their "rootkits" to begin with this same string; one amusing result (among other things) was that World of Warcraft cheaters could elude detection.

Second, there is a *lot* of creativity out there in terms of how to make money from the vast array of small markets now available online. The book is full of examples, while making it clear that most artists will not be financially successful (this is nothing new). For open-source advocates like myself, it is encouraging to think of how such projects could make enough money to be sustainable without corporate sponsorship; however, I think that this is true for anyone engaged in creative ventures, from coding to writing praise songs.

Unfortunately, the author provides anecdotal evidence only. Persuasive as this may be, this is by no means a scholarly text, and it is very frustrating that one cannot actually quantify things such as a "chilling effect" of spurious cease-and-desist-type orders. Although I agree with Doctorow that finding hard data on this might be difficult, an example where it might be possible is quantifying how many free uploading sites are taken down due to such orders, or exactly how they have changed policies. (A similar annoyance is the essential lack of footnotes or any bibliographic references.)

Hearteningly, he also says that disagreeing with some rules does not mean disagreeing with rules altogether. So even if we might disagree on whether Napster was a good thing, there seems to be room for a common ground that respects humans as moral actors capable of making their own determinations of good and ill while also acknowledging that people are lazy and sinful and will often take shortcuts.

Finally, as one might expect of a successful sci-fi author, he is entertaining. I imagine Doctorow channeling the snarky Eloise (of the Plaza Hotel) when he says

> "Here are some other things that do not make money:
> - Complaining about piracy.
> - Calling your customers thieves.
> - Treating your customers like thieves."

Doctorow is *really* passionate and knowledgeable, and practices what he preaches. For instance, the book is published by McSweeney's, which is an indie press having (at this writing) a Kickstarter campaign to turn nonprofit. I do think that he is missing a key component to the argument—that all this is only possible in artistic domains which require relatively small infrastructure; I would have liked this to be addressed more concretely. I find it hard to imagine that a full staging of Wagner's *Ring Cycle* could rely solely on selling swag to pay the bills. Then again, I know that I would end up spending *more* money on organ music if I could do more via pay-what-you-want.

In summary, even if you are not completely convinced that the "copyfight" is a titanic battle to save us from a surveillance state (and after all, we have already given Facebook and Google all our information, why not the movie studios?), and even if you find that it is a bit of a stretch to compare this fight to the one over access for common folk to the text of the Bible (which he does more than once), this book is a worthwhile read, especially if you care about copyright and creativity for the future.

Reviewed by Karl-Dieter Crisman, Associate Professor of Mathematics, Gordon College, Wenham, MA 01984.

Book Reviews

ENHANCING THE ART & SCIENCE OF TEACHING WITH TECHNOLOGY by Sonny Magaña and Robert J. Marzano. Bloomington, IN: Marzano Research Laboratory, 2014. 195 pages. Paperback; $29.95. ISBN: 098589024X.

When is technology most effective at improving student achievement? What do educators need to know to enhance their instructional strategies with technology? How can teachers keep up with the blazing speed of technological change in their schools and classrooms? Teachers seek relevant answers to these questions as digital technologies continue to shape the future of teaching and learning. In response to the demand for timely, evidence-based instructional practices for incorporating technology in the classroom, Sonny Magaña and Robert J. Marzano wrote *Enhancing the Art & Science of Teaching with Technology*. The book is an addition to the series of books entitled The Classroom Strategies Series that aims to provide practical, research-based instructional strategies for teachers and administrators in elementary and secondary education. The authors organized the book with educators in mind, appealing to the need for practical information informed by research.

The book begins with the undeniably appealing and too often unarticulated message that teachers and teaching strategies, not technology, should lead the conversation. Technology's greatest potential can only be achieved when teachers leverage technology to supplement highly effective pedagogy.

The first chapter extends Magaña and Marzano's central theme by introducing supporting research. The chapter provides a very brief but helpful overview of some of the major theories, definitions, and research findings about educational technology that are the foundation for the strategies introduced throughout the book. Collectively, the introduction and first chapter provide the promise that by focusing first on effective, evidence-based research practices, teachers will develop a solid foundation upon which to integrate technology to best support teaching and learning.

Following the first chapter, the authors launch into the heart of the text. Chapters 2–10 each introduce specific research-based instructional strategies, provide practical examples of how to enhance teaching using a variety of digital technologies, and conclude with a detailed vignette of how a single teacher integrates technology tools into his or her unit or lesson. Each chapter also includes a series of questions to review content and foster comprehension. Answers to the questions are provided in an appendix. The consistency of format within each chapter and the supportive text features ensure that teachers and administrators make the most of the book.

The strategies introduced in chapters 2–10 are grouped into broad categories and include communicating learning goals, tracking student progress, celebrating success, establishing classroom rules and procedures, interacting with new knowledge, practicing and deepening knowledge, generating and testing hypotheses, engaging students, recognizing levels of adherence to rules and procedures, maintaining effective relationships with students, and communicating high expectations. Each chapter then introduces multiple strategies within each category. For example, the single chapter devoted to practice and deepening knowledge provides seven distinct strategies ranging from reviewing content to examining errors.

It is here in the heart of the text that Magaña and Marzano become too ambitious about what a single book can offer. The engaging promise of *Enhancing the Art & Science of Teaching with Technology* is that effective technology use is based on evidence-based teaching and learning strategies. Unfortunately, the authors then provide only a limited introduction to the strategies before diving into practical ways that technologies support the specific teaching and learning strategy. The chapters overflow with varied examples of how technologies such as videos, online graphic organizers, presentation software, polling software, screencasts, and more might support specific strategies. The focus on multiple technology examples for each of the forty-one teaching and learning strategies is simply overwhelming. Lacking more detailed attention to the underlying strategies as ways to inform technology use, the book begins to feel like another list of technology examples, tips, and tricks despite the authors' intentions.

Furthermore, some of the most important questions about technology are lacking in the book. For example, aside from two paragraphs in an epilogue, the book fails to provide insight to educators concerning when to use digital technologies and when not to, how many and which strategies should be introduced in the classroom, how many technologies should be introduced at any one time, and how to scaffold or support learning when new strategies or technologies are introduced. Such knowledge, which is the core of highly effective pedagogy, would ensure that even as technologies change with ever-increasing speed, administrators and teachers would be able to make informed decisions about technology in their schools and classrooms.

The deeper questions about pedagogy and technology are necessary for Christian educators to ask in the face of rapid technological change. Too few voices are asking questions or providing insight about technology in elementary and secondary schools. We should not only ask deeper questions in consideration of student learning, but also questions about how technology is shaping beliefs, values, and practices in Christian education.

Enhancing the Art & Science of Teaching with Technology offers great promise, but falls short. While written with administrators and teachers in mind, only a limited audience should read this book as a stand-alone text. Educators with well-developed knowledge about effective teaching and learning strategies may find the book useful as they seek examples of technology use in the classroom, but even they should ask relevant questions about what is missing. Educators with limited experience or lacking deep, conceptual knowledge about effective teaching and learning strategies should only consider *Enhancing the Art & Science of Teaching with Technology* if paired with Magaña and Marzano's more comprehensive books in The Classroom Strategy Series.

Reviewed by Kara C. Sevensma, Assistant Professor of Education, Calvin College, Grand Rapids, MI 49546.

GEEK HERESY: Rescuing Social Change from the Cult of Technology by Kentaro Toyama. New York: PublicAffairs, 2015. 334 pages, including notes, references and index. Hardcover; $27.99. ISBN: 9781610395281.

Why does applying technological solutions to social ills rarely work? Why do small-scale pilot projects succeed, but subsequent large-scale deployments fail? Can access to computers, the Internet, microcredit, and smartphones help raise large groups of the population from poverty to wealth?

Kentaro Toyoma asks these questions and more in his book *Geek Heresy: Rescuing Social Change from the Cult of Technology*. As a Microsoft researcher sent to India to open a research office there, Toyoma had a lot of experience building and deploying technology to solve social ills. His experiences caused him to ask himself why some technological solutions to problems seem to work, and others fail.

The "geek heresy" is, of course, that applying new technology to a social ill will not automatically and efficiently solve the problem. To make such a statement is to question the work of many well-funded high-tech companies, philanthropists, and technological utopianists. Making such a statement is probably not a smart career move for someone in the high-tech industry. Yet, the author makes the argument well, pulling many examples not only from the computer and smartphone world, but also from the realms of health, education, finance, agriculture, and so on.

To explain why some applications of technology to social problems work and others do not, the author defines the *Law of Amplification*: "Technology's primary effect is to amplify human forces. Like a lever, technology amplifies people's capacities in the direction of their intentions" (p. 29).

This Law of Amplification explains why giving computers to schools with excellent teachers and motivated students amplified their abilities to learn, while giving computers to schools with subpar teachers, students, and infrastructure only served to distract the teachers and students and actually led to less learning. It also explains why giving a child a computer outside of school only proved to amplify the child's stronger natural desire—to be entertained rather than to learn.

This definition of the Law of Amplification is useful, but it does not help the reader determine how to help fix the problems of the world. Part 2 of the book begins to answer that question. The key to fixing the world's problems is not to throw prepackaged interventions at a problem, but instead to "amplify people." The author found through his research that successful interventions always incorporated strong partners "on the ground." That is, the success of the project was determined by the qualities of the partner using a new technology, not by a technology itself.

A good partner exhibits three important qualities: good intention (heart), discernment (mind), and self-control (will) (p. 111). According to the author, heart, mind, and will "are necessary complements to packaged interventions. Even vaccines and medications—which are as close to a complete solution as packaged interventions ever get—require the heart, mind, and will of willing patients, caring nurses, and expert doctors" (pp. 112–13).

Where good partners do not exist, technological solutions to problems fail. The author gives an extended example using the inequality that exists in the US educational system. Many politicians believe that the inequalities can be fixed by equipping schools with more computers and better network access. However, the author's research shows that this is wishful thinking. Instead, "technology amplifies preexisting differences in wealth and achievement. Children with greater vocabularies get more out

of Wikipedia. Students with behaviorial challenges are more distracted by video games" (p. 117). The proper way to use computers to reduce inequality is to invest primarily in the people in the schools—teachers, administrators, and support staff—by training them to use the computers well. That is, you need not upgrade the technology, but you must "upgrade" the people.

The latter part of the book discusses the research about how best to invest in people. Chapter 8 discusses Maslow's hierarchy of aspirations in detail. Chapter 9 investigates mass intrinsic growth, or how entire societies have changed to solve societal problems. Chapter 10 discusses the importance of mentoring.

I don't know if Kentaro Toyama is a Christian or not, but the attitudes and recommendations of his book certainly should resonate strongly with a Christian audience. His recommendation to invest primarily in people, not technology, aligns with biblical themes that stress the importance of relationships. Toyama uses Christian terms, such as "idolatry," "discernment," and "wisdom" periodically in the book. For example, when criticizing technological utopianists for their indiscriminate application of technology rather than careful investment in people, he states, "To do so [...] is to make an idol of the easy part and neglect the rest—the finding or nurturing of the right heart, mind, and will" (p. 112).

And, of course, the entire premise of the book should resonate with Christians who see themselves called by God to be agents of change in the world. Christians are just as likely as non-Christians to look for quick, prepackaged solutions to the social ills we are called to address. Instead, Christians should concentrate on investing in people (i.e., loving), perhaps using technology where appropriate to assist along the way.

This book has caused this reviewer, a Christian and a computer science educator, to re-examine his work in computer science education. *Geek Heresy* has shown me that my work to build and widely deploy a better mechanism for computer science outreach programs in middle schools and high schools will necessarily fail if I do not invest heavily in the training of the people (i.e., the middle and high school teachers) who would be the partners, working with the students to learn computer science.

The book's title may be a little deceiving. Its topic is applicable and important not only for those in the tech industry, but also for any person seeking to work to restore shalom in the world. I recommend that international development organizers, relief workers, educators, and preachers should all understand the lessons from this book.

Reviewed by Victor T. Norman, Assistant Professor of Computer Science, Calvin College, Grand Rapids, MI 49546. ◊

Letter

Important Development Concerning the Impact of Fracking

PSCF published Bruce Beaver's piece, "Should we Frack?," in its latest issue (*PSCF* 67, no. 3 [2015]: 175–87). A number of articles have indeed blamed fracking for polluting ground water or creating mini-earthquakes, including those by the *The Economist* (see, for example, the issue July 4–10, 2015). Most people do not know that there is a more recent, alternate fracking technique that has proven to be more effective, is of much lower cost, and does much less damage to the environment. The technique uses a solid propellant, sent down the hole, which undergoes controlled deflagration shortly after shape charges perforate the horizontal section of the casing. The two major advantages of the process are that (1) it avoids the use of millions of gallons of pressurized water, and (2) it requires only 2–3 operators working for half a day, as opposed to hydro-fracking in which 25 operators are needed for 2–3 days, to produce the same amount of shale gas.

The propellant used is ARCADENE 489 (used in Stinger missiles). It is ignited circumferentially and produces gas at a specific rate to cause multiple fractures without entering the explosive regime. The deflagration is stable and environmentally safe, leaving no combustion products which may be harmful to the formation.

The process has been used successfully by Halliburton in over one thousand wells, producing more shale gas over a longer period than a comparable hydro-fracking technique. It causes no well bore or casing damage. A software using finite element analysis is employed to select the proper size of the propellant to meet the specific requirements of the formation to be fracked.

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