



ENVIRONMENT

INTRODUCING EVANGELICAL ECOTHEOLOGY: Foundations in Scripture, Theology, History, and Praxis by Daniel L. Brunner, Jennifer L. Butler, and A. J. Swoboda. Grand Rapids, MI: Baker Academic, 2014. 262 pages. Paperback; \$26.99. ISBN: 9780801049651.

Given this title, you might think that you are picking up a textbook. The title *does* accurately reflect the themes of the book, but it substantially undersells the voice(s). The content is solid, and the book serves as an introduction to the topic as well as a “shaking of hands” with a rich pool of historical and contemporary writers and thinkers. It is a treasure trove of quotes and opens up the scope of the larger discussion surrounding our theology of the created world. Coming out of the Reformed tradition and being familiar with the likes of Cal DeWitt, Fred Van Dyke, Wendell Berry, and Doris Longacre, I was pleased to be introduced to a diversity of other voices, including those from Eastern Orthodox and Pentecostal traditions.

This book feels like an invitation to conversation. The self-introduction of each of the authors and their description of their writing process leaves one with the feeling that you are listening in on a very careful, gracious, thought-provoking, and impassioned discussion. In the first section, they explain to the reader their motivations for writing the book, their hermeneutical approaches, and core biblical reasons for caring for the earth. The intentional inclusion of “Tension Points” among the authors lends depth to the book and further invites the reader to the discussion. They even go so far as to explicitly ask the reader to consider their own opinion on a variety of issues, both theological and practical. This is a great strength of the book. It is not a reference manual or textbook, though I have already used it in the classroom. The book has a bit of an episodic feel as the voices of each of the writers emerge. It feels a bit like eating a fruit salad; the flavors blend, yet heterogeneity is maintained. Rather than being disruptive, this promotes a reflective engagement with the material.

Throughout the second section of the book, “Exploring Ecotheology,” historical views of Christians are presented evenly. The ambiguity and periodic ambivalence of thousands of years of Christian thought on the relationship of human beings to nature is not reconstructed to portray Christianity and the church through time as a model of ecological sensitivity and creation care. They do an excellent job of clarifying and critiquing the roots of that ambiguity and show the interweaving of threads of many contemporary Christian positions throughout our theological heritage. They make it very clear that ecotheology is not some new fad but, rather, as they

quote Sallie McFague, “... nothing less than a return to our Hebrew and Christian roots” (p. 126).

The authors’ commitment to a gracious critique of history is obvious; they point out that as contexts and the needs of the world change, so must the church’s emphasis. The authors state, “Good theology ... is always resituating itself in response to the current situation of the planet and humanity” (p. 125). The authors are convinced and convicted that the multiplicity of ecological crises is the “next great work facing both humanity and the Christian faith” (p. 16) and that we bear responsibility for where we are and where we will go in the future. They quote Wendell Berry as stating, “The culpability of Christianity in the destruction of the natural world and uselessness of Christianity in any effort to correct that destruction are now established clichés of the conservation movement” (pp. 46–47). This must change.

Throughout the book, but particularly in the second section, the authors make it clear that our view of the creation is deeply interwoven throughout our broader theological understanding. The authors touch on the interplay between our theology of nature and theological concepts such as the image of God, the transcendence and immanence of God, the humanity and divinity of Christ, the trinity, sin, soteriology, eschatology, the problem of gnosticism, pneumatology, covenant, and many other theological topics. Importantly, the various parts of this discussion closely tie our desire for orthodoxy to our love for our neighbor, our calling to stewardship, and discipleship. Throughout the book, the authors substantiate their claim that “our common call to earthkeeping is a part of our call to discipleship, and our call to discipleship is nothing more than a call to Jesus Christ” (p. 5). This is another great strength of the book. The conversational feel of the book situates all of the addressed issues within real, whole people. Even though treated separately, theology, discipleship, practice, and experience are all tied together. The term “evangelical” in the title appropriately highlights overarching themes of conversionism, activism, biblicism, and crucicentrism.

The third section of the book, “Doing Ecotheology,” outlines the contours of activity situated in our love for God and all that he has made: our neighbors and our *oikos*—our home. The authors clearly articulate that orthopraxis shapes orthodoxy as much as the other way around; knowledge is insufficient. They cite research which demonstrates that there is no direct relationship between having more information and being more ecologically conscious. In parallel to the theological and philosophical connections made previously, the authors clarify the interrelationships between the *practices* of stewarding the creation, caring for our neighbor, and loving God repeatedly throughout the section.

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The “Last Things” section is only last in the sequential sense; in many ways it is the most critical. While most sections of this book are clearly directed to the initiate, this section will be worth revisiting over and over again throughout a life filled with confrontations with the degradation of God’s good creation. It is a calling to continually live in hope and a concise articulation of what that means.

This book is a valuable tool for Christians seeking to respond in love to a rapidly changing world and the ecological crises before us. It is unfortunate that, like many other well-written and timely books, it will likely not be read by those who could most benefit from it. The opening pages describe the impact of climate change on the well-being of a small community in the Gaza province of Mozambique. For climate change deniers, these could very well be the last pages that they read. Given the title, they may have never picked up the book in the first place. Hopefully, those who do read and embrace the message of discipleship deeply threaded throughout the text will put this book, or its message, into the hands and hearts of those who need it most.

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ETHICS

TO TOUCH THE FACE OF GOD: The Sacred, the Profane, and the American Space Program, 1957–1975 by Kendrick Oliver. Baltimore, MD: The Johns Hopkins University Press, 2013. 248 pages. Hardcover; \$39.95. ISBN: 9781421407883.

This recent book examines several possible connections between religious thought and the exploration of space, more specifically Christianity and the American space program through the Apollo moon landings and shortly thereafter. Having thought about this topic myself—and dismissed any such connection—I was not expecting much from this work. However, although the book shows that these connections might not be present or robust, it explores the issues with depth and insight.

In considering these connections, we can focus our thinking around a simple question: did religion motivate the space program, or provide a post hoc framework for its interpretation? The former might be seen in a general ethos on the part of key leaders or individuals in the trenches. This motivation is unlikely. Even Charlie Duke, who walked on the moon during the Apollo 16 mission and later became an active Christian evangelist, separates any religious drive from his role in the program (*Moonwalker*; Thomas Nelson, 1990). His religious conversion came later. He was driven, as were

many of the astronauts and engineers in the early years of the program, by the need to push boundaries; the motivation was as simple as that. Consider also that the Soviet Union was in space first, and now China has a very active space program—neither of these are known for overt religiosity on the governmental or institutional level (although admittedly we cannot know the inner motivations of the individuals involved). The second part of the question is of more interest and potential relevance: was the exploration of space, driven by whatever motivations, later interpreted through the lens of a spiritual or even religious quest? This is a question explored throughout most of the book.

The book’s introduction is an astute, literate, and readable setting of the culture of the time (the 1960s). This material is not fundamentally new, but it is presented with a different emphasis than in other works, and well done. More generally, the author is willing to look past simple answers. For example, the invocation of religious language (Kennedy asks God’s blessing at the start of the Apollo program) could well reflect cultural/political views, not religious views in any real sense. The author marshals an impressive array of research exploring many related and some tangential areas, such as the rise of evangelism and a look back to a time when technology was seen as a redemptive force for humanity. The religious question is raised early on: is our quest into space performed in praise of God, or rather does it preclude the need for God since we can now reach for the heavens on our own? This is the essential duality explored here: casting off the need for God through our technological prowess, or coming closer to him through our push into the heavens.

The overall modus operandi of the book is to present an example where religion seemed closely and uniquely connected to the space program, and then show that that connection is illusory, superficial, or transient. This is demonstrated through several key themes: invocation of religious language as a motivating force for human exploration of space, use of religious imagery to interpret the experience of space exploration, the religious experiences of the astronauts themselves, and the marshaling of public support for religious expression in the space program. In each case, it is shown that these connections between space and religion are tenuous at best, and history has shown them to be temporary. This is not to denigrate this approach, for it works well in keeping the reader’s attention by connecting with aspects of the program that were publicly visible and easily noted (by those who were paying attention to space through to the mid-1970s). In following these trains of apparent connection, the author brings to bear a wide range of sociological work on American religious and technical culture of the time. Despite the occasional tendency to

academic jargon and convoluted sentences—par for the course in much academic writing—the book serves its purpose well, even for a lay audience (provided that the readership is truly interested in religion and/or space exploration).

The first major theme, the role of religion as a source of motivation for the exploration of space, is a legitimate one in which to couch part of the book's development. By most personal accounts those who were most heavily involved—as administrators, scientists, engineers, or astronauts—were driven by secular and practical reasons. This is something that any engineer would find to be a moot point. Faster, higher, further, the next big thing—these are the drivers for many of those with a technical or adventurous mindset. The heady enthusiasm from being a part of such an adventure is known by anyone fortunate enough to have been involved in something of this stature, and the space program by virtue of its sheer size and visibility particularly lends itself to this sense of grand adventure. But this transcendent feeling on the part of the players is also present in sports and many other activities: the search for something larger than one's self. It is afterward that it may be seen as a religious quest, if so inclined. In fact, it was those left on the ground who seemed most anxious to infuse the endeavor with meaning (spiritual or otherwise)—to little avail, in the long run.

The second theme is the invocation of religious imagery to interpret space exploration—to place it in a larger context and meaning. The impact here is less than clear. Did access to space alter old concepts of the heavens? Was this a voyage to look for God or to destroy him (Norman Mailer poses this very question in *Of a Fire on the Moon*; Signet, 1971)? The question bears on the issue of extraterrestrial beings, UFOs, and the anthropic principle. What does the incarnation mean if there is life elsewhere? What about salvation? Space exploration raised questions, but again it seems there was little lasting change in the debate or in the concepts. (Again, see Mailer.) There was an “anticipation of cosmological effects” more so than actual effects (p. 70).

Theme three is centered on the experiences of the astronauts themselves. As wayfarers in the heavens—humanity's surrogate travelers to otherworldly realms—they were expected to convey back to us the immensity of the experience. But, for the most part, the astronauts were lacking in a language to match the grandeur of the undertaking. Any tendency to connect with larger issues was inevitably limited: they were technologists, not poets. The idea throughout is that they brought back what they took with them, and although there were many occasions to express wonder and awe, these were quickly subsumed by the operational tasks at hand and

tended toward the sense of Earth as a protective home rather than one of divine inspiration (with exceptions as noted below).

As support for this idea, it is interesting to observe that for the lunar landing missions of the Apollo program, it is the lunar module pilots, and not the commanders (both of whom landed on the moon in each mission), in whose lives one might see reference to any form of spiritual experience. (A point raised by Andrew Smith in *Moondust*; Harper Perennial, 2006.) For one thing, the lunar module pilots did not have the burden of command. More so perhaps, the commanders were temperamentally better suited not to have any such type of “ephemeral” experience, but rather to concentrate on the immediate needs of the mission. It is telling that of those Apollo astronauts who had the most overt spiritual or religious quests on their return to Earth, none were commanders and all appeared to have had at least some thread of a connection to religious or spiritual sensibilities before their journeys: most notable in this case was Jim Irwin who started the High Flight Foundation ministry, and Edgar Mitchell who began the Institute of Noetic Sciences. Again, in each case, they brought back what they took with them.

The final theme, public support for the space program, shows that people felt a religious component of space exploration was worth protecting, but perhaps due more to a general sense that, among other things, the battle for school prayer had been lost and that government would give in again if not put on alert. This then was not necessarily an effort to protect the religious component of space exploration per se but rather an effort to protect religion in public life.

In the end, Apollo and related efforts of the time were larger in *quantity* but not in *quality* than other events and activities. This explains why there was little-lasting effect on religious thought. It seems that there *should be* a space-religion connection but it is continually seen to be superficial or nonexistent. “The human condition has not been transcended by the passage to new worlds” (p. 134). Travel in space, in fact, resulted in a turn toward Earth, spurring the ecology movement through images such as the iconic Earthrise from Apollo 8 (a point made also by Robert Poole in *Earthrise: How Man First Saw the Earth*; Yale University Press, 2010). “It was the assumption of a cosmic destiny for mankind, not the claims of conventional faith, that now seemed most open to doubt” (p 168).

Overall, the book presents an even-handed view. The author seems to come to the conclusion reluctantly—as have I—that there simply is no fundamental connection between space exploration and religion. On a superficial level, perhaps. Books continue to come out

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on this topic: the technology, the politics, the people of the early space program. We continue to see something special in the Apollo program, but that could be because of the other many fascinating aspects, not solely religious or spiritual. In some sense, a program like Apollo (and its precursors) is so large and so unique that it looms in history like a spiritual quest. But in many ways the event—and the entire Space Age of the 1960s and early 1970s—was out of context. (This phrase is used to good effect in Al Worden's recent book *Falling to Earth* [Smithsonian Books, 2011], regarding the personal effort to deal with the return to mundane earthly life after a trip to the moon. The best approach is to place it in perspective as something that had no logical predecessor or successor: *sui generis*.) Fundamental and permanent cultural changes resulting from the space program have been—so far—rare, the ecology movement, as noted, being one possible exception. The fundamental point is that we take from space exploration what we bring to it, a religious connection that is fleeting at best, and exploration that has so far caused more of a turn to Earth than to God.

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iDISORDER: Understanding Our Obsession with Technology and Overcoming Its Hold on Us by Larry D. Rosen. New York: Palgrave Macmillan, 2012. 256 pages, notes, index. Paperback; \$16.00. ISBN: 9781137278319.

iDisorder, by Larry D. Rosen, is a short book with an intriguing premise: the extensive use of modern technology causes many people to exhibit symptoms of classical, common, psychiatric disorders. The book systematically goes through these disorders—communication disorders, ADHD, depression, obsessive-compulsive disorder, narcissistic personality disorder, hypochondriasis, schizoaffective and schizotypal disorders, body dysmorphia, voyeurism, and addiction—and cites countless studies demonstrating how technology enhances or draws out the symptoms of the disorders. As a professor of psychology at California State University, Dominguez Hills, Rosen is well acquainted with these disorders.

Note that the author does not argue that technology causes these disorders. He only argues that technology can cause (or enhance) symptoms that match the symptoms of people diagnosed with these classical disorders. Since the Diagnostic and Statistical Manual (DSM) does not cite technology and media as contributing factors to these disorders, the author refers to them as “iDisorders.”

One of the most accessible and convincing chapters is “Obsessively Checking in with Your Technology ...

24/7” in which the author describes how technology (especially the cell phone) often leads to compulsive behaviors. The author describes how people, including himself, compulsively check their cell phones for new messages, new texts, or missed calls. The chapter contains multiple anecdotes on how individuals get anxious when they travel into an area without cell phone reception. Some even refuse to travel when they know they will be “off the grid” for a time. The chapter relates results of multiple polls and surveys on technology usage during vacations, individuals’ “FOMO” (fear of missing out) and “disconnectivity anxiety.” The chapter then compares these symptoms to those of classically defined panic disorder and obsessive-compulsive disorder. It ends by giving useful advice on how to deal with an obsessive-compulsive iDisorder. This advice includes using settings on your devices to reduce the number of notifications the device triggers and doing a four-step process of Rethink, Reboot, Reconnect, and Revitalize (p. 58).

The other chapters follow this same pattern. The author defines the symptoms of the classical disorder, relates some anecdotes of how the symptoms are brought out by extensive use of technology (computers, cell phones, tablets, social media, etc.), cites studies and surveys implying a connection between the technology and the symptoms, and finishes with a refreshing section on how to identify, avoid, and/or treat the iDisorder in oneself or someone one knows. Some chapters also contain surveys to help readers gauge their own tendency to having an iDisorder. Each chapter is rife with citations—the endnotes of the book contain twenty-one pages of bibliographic references to journal articles, conference presentations, books, and websites.

The advice for treating an iDisorder is generally quite predictable. First, measure your dependence on the technology (how much time or money is spent using this technology each day) and determine how you feel when you do not have access to your technology. Then, avoid situations which may trigger symptoms of the iDisorder. Use technological tools (e.g., apps or plug-ins) to limit or change your use of the technology. Set aside time intentionally to meet others face-to-face, put away technology, and nurture real-world relationships. Be accountable to others as you try to change your behavior. In some cases, seek help from a therapist.

Rosen is not antitechnology and, in fact, stresses that he is a thorough and early adopter of many technologies. It is refreshing that he uses his own behaviors in some chapters as examples of symptoms of iDisorders (p. 50).

Rosen does not make any Christian or spiritual commentary on iDisorders. However, the book is relevant to Christians because it exposes and addresses the symp-

toms of these iDisorders, which can be exhibited by Christians and non-Christians alike. A common theme of these iDisorders is a person prioritizing relationships with technology and media over relationships with others (and for Christians this includes God). Knowledge of these iDisorders is useful for Christians to evaluate their own behavior. This knowledge may expose a Christian's dependence on technology instead of complete dependence on God. Christians might also discover that they exhibit behaviors which diminish their ability to minister to, have empathy for, and serve others in this technology-heavy world. For example, they may realize they are becoming less able to carry on long conversations with someone, they increasingly evaluate people by their looks, or they are becoming increasingly unable to meet appointments because of excessive time spent online.

The author makes the claim that the use of technology is irresistible. Thus, he never suggests that people avoid the iDisorders by simply getting rid of their cell phones, data plans, or social networking accounts. Calling technology adoption "irresistible" is controversial from a Christian perspective, because Christians are called to exercise freedom and responsibility. With God's help, a person can resist the negative impacts of technology. On the other hand, we Christians are called to engage, reform, and redeem culture, so avoiding all technology may hamper our ability to be witnesses of Christ in this world. Thus, a thorough investigation of the possible impact of technology on our thoughts and behaviors may be very useful, so that technology use does not become an idol but is instead used in service of God in our walk and work in this world.

I recommend this book. It is short and quite readable, apart from occasions when the author lapses into the use of psychology jargon that would not be understood by the average reader. The large bibliography may be a useful reference for anyone interested in exploring this area further.

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HISTORY OF SCIENCE

INFINITESIMAL: How a Dangerous Mathematical Theory Shaped the Modern World by Amir Alexander. New York: Scientific American/Farrar, Straus and Giroux, 2014. 368 pages, biographical summary of key historical figures, timeline, endnotes, index. Hardcover; \$27.00. ISBN: 9780374176815.

Five men in flowing black robes convened a meeting in the Collegio Romano to pronounce judgment on a dangerous idea which they feared might plunge their

world into chaos. On August 10, 1632, the Jesuit fathers condemned and prohibited the dangerous and subversive doctrine of infinitesimals, the proposition that a continuous line is composed of distinct and infinitely tiny parts. Their opposition to this mathematical theory was based on the belief that the world was an orderly place, governed by a strict and unchanging set of rules. Infinitesimals threatened to undermine the authority of established religious and political order.

In *Infinitesimal*, the author weaves a historical drama, with all the intrigue of an adventure novel, set in the context of the mathematics of the infinitely small. Its key actors include many well-known philosophers, religious leaders, mathematicians, and scientists of antiquity through the Scientific Revolution, from Plato to Thomas Hobbes, Martin Luther to the Jesuits, Pythagoras to John Wallis, and Archimedes to Galileo Galilei and Isaac Newton. It is a fascinating read, connecting the dots between the religious turmoil of the Protestant Reformation, the consequent political upheavals that swept through Europe, and the birth of the modern scientific movement, including the religious ban on the heliocentric astronomy of Galileo and Nicolaus Copernicus, and leading to the development of modern calculus by Isaac Newton and Gottfried Leibniz. The debate over infinitesimals, while relatively unknown in comparison with the controversy regarding heliocentrism, occupied the same historical and intellectual space and involved many of the same religious and philosophical concerns.

The concept of infinitesimals is that, just as a cloth is composed of many layers of fine threads, an object of two-dimensional shape can be thought of as a collection of an infinite number of infinitely small but discrete lines. A solid surface can be considered an infinite number of two-dimensional planes, while a one-dimensional line can be divided into an infinite number of points. For modern scientists and mathematicians, this concept seems obvious because we have grown up with calculus involving the summations of the infinitely small. But in the sixteenth and seventeenth centuries, this concept was the subject of an intense and vigorous debate, with the outcome affecting no less than the stability of the social order and the authority of the church.

Why was this mathematical theory, which is standard curriculum today, considered so dangerous back then? Martin Luther launched the Protestant Reformation in 1517 by posting his Ninety-Five Theses on the door of Wittenberg's Castle Church and openly defended his stand against Catholic authority in 1521 at the Diet of Worms. The Protestant Revolution that followed plunged Europe into a series of religious and political conflicts that seemed to rock the very foundations of the civilized order. In order to counteract the chaos and uncertainty caused by the schisms and to restore alle-

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giance to the authority of the church, the Papacy founded the Society of Jesus, known as the Jesuits. Among their missions was a strong emphasis on education; and thanks to the efforts of Christopher Clavius, their mathematical teachings were firmly established on the principles of Euclidian geometry.

Clavius believed that Euclidian geometry held the secret for restoring order to society and re-establishing the absolute authority of the church. He held that Euclid's theorems impose a rigorous order of logical proof that could establish the truth with undeniable certainty, proceeding from simple statements to ever-more-complex questions. This was in harmony with what the Jesuits were trying to accomplish—to impose a true, eternal, and unchallengeable order upon a seemingly chaotic reality—and Clavius believed that geometry held the key to other intractable problems in the scientific and religious debates of the time.

But infinitesimals threatened to challenge that rigid system of logical proofs. By dividing a line into an infinite series of infinitely small points, paradoxes and logical contradictions arose that defied the desired rationality and order of Euclidian geometry. If the parts are infinitely small, then the sum of their lengths should be zero. Or if they are not infinitely small, then an infinite number of them should be infinitely large rather than of a finite size. Comparing "all the lines" making up one shape with "all the lines" of another shape requires comparing infinity with infinity, which had been considered mathematically off-limits since the days of Zeno of Elea in the fifth century BCE. Consequently, in a series of judgments from 1601 to 1651, the Jesuit "Revisors General" denounced and finally banned as anathema the doctrine of infinitesimals.

Although in many ways an exact contrast to the Jesuits, Thomas Hobbes, philosopher and mathematician of the 1600s, also opposed infinitesimals for much the same reason. In Hobbes's philosophy (expressed in *Leviathan* and other works), the disorder in society needed to be brought under the control of an absolute ruler who would maintain and impose the sovereign will of society upon its dissenters. Hobbes opposed religious intrusion into matters of the state and held particular spite toward the Jesuits and the Catholic hierarchy, but agreed with them on the subject of mathematics: Euclidian geometry represented the solution of a rigid, unchanging certainty, order, and stability; but the problems with infinitesimals threatened that order and certainty, because their paradoxical results could just as easily lead one to a false result as to a true one.

On the other side of the question were leading intellectuals of the early modern age, including Galileo, whose final book in 1633 expounded the theory of "indivis-

ibles"; Bonaventura Cavalieri, whose name and books on geometry were often cited by later mathematicians; Evangelista Torricelli, who provided a rigorous defense and series of proofs using indivisibles; and John Wallis, who sparred with Hobbes's philosophies and mathematical claims for several decades through a series of books and pamphlets.

One interesting resolution to the paradox of the infinitely small was proposed by Torricelli. Construct a rectangle ABCD with a diagonal BD. Then construct a series of horizontal and vertical lines intersecting at a point E along the length of the diagonal, forming an infinite series of smaller and smaller rectangles. The number of horizontal and vertical intersecting lines is equal to one another, yet the horizontal or vertical space occupied by the lines in each dimension is different because of the differing length of the sides of rectangle ABCD. Torricelli boldly asserted that the answer to this paradox was that the intersecting lines, although infinitely small, were thicker in one dimension than the other, in proportion to the difference in the sides of the rectangle. He went on to apply this technique by constructing lines intersecting a parabola, enabling him to calculate the slope of the tangent at every point on the infinite parabola. Rather than avoiding the paradoxes, Torricelli sought to understand their mysteries and employ them in the development of a powerful mathematical tool. A generation later, the "method of indivisibles" would be transformed into the differential and integral calculus of Leibniz and Newton, revolutionizing the mathematical foundation of the modern scientific landscape. The book concludes with the establishment of the Royal Society of London and the lengthy intellectual debate between John Wallis and Thomas Hobbes, ending with Hobbes's death in 1679. Appendices provide short biographies of the key players involved in the struggle, plus a timeline of key events.

Although the development of calculus is mentioned in the book, this reader was left hoping for another chapter or two describing in more detail how Newton and Leibniz each used infinitesimally small divisions to finally develop the formal methods of calculus. For instance, what were the differences and rationale behind their approaches? Why did Newton employ infinitesimals but shy away from their use in his formulations, whereas Leibniz made them a central component of his notation? Another concern is that the author characterizes the subject not only as an intellectual controversy, but as an anti-Catholic and perhaps antireligious screed. The reader is left with the impression that Roman Catholic Italy was plunged into intellectual stagnation by rejecting modernity through its insistence on eternal and unchanging truths, whereas England became the bastion of scientific, intellectual, and economic progress

due to its openness to dissent and lack of strict religious doctrine. This caricature of post-Renaissance Italy (and by extension, religious conservatism in general) is certainly lacking in historical and philosophical nuance and may aid in perpetuating the modern “warfare model” of the science/religion dialogue.

But despite these relatively minor complaints, I would highly recommend this intriguing book to all who are interested in mathematics or the history of the modern scientific era.

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EARTH'S DEEP HISTORY: How It Was Discovered and Why It Matters by Martin J. S. Rudwick. Chicago, IL: The University of Chicago Press, 2014. 315 pages plus glossary, a section “for further reading,” and bibliography. Hardcover; \$30.00. ISBN: 9780226203935.

In 1972, British brachiopod paleontologist Martin Rudwick penned a judicious and revelatory volume, *The Meaning of Fossils: Episodes in the History of Palaeontology*. This book (now 2nd ed., University of Chicago Press, 1985) remains a treasure store of insight into the impact of discovery—as well as the communication of discovery—upon many individuals of talent during the sixteenth through nineteenth centuries. Many of these historical protagonists were devout Christians (for example, Conrad Gesner, John Ray). Rudwick explored their ponderings and their fraternal debates as to just what these remains meant.

More books followed; I count nine, including the volume under review. These included a volume of translation, from the French, of Georges Cuvier’s work on fossils (*ossemens fossiles*)—arguably the birth of vertebrate paleontology—and also a volume (*Scenes from Deep Time*, 1992) analyzing the impact of illustrations of “former worlds” revealed by these exhumed remains, during the eighteenth and nineteenth centuries. The scope of Rudwick’s coverage broadened, to include the history of fieldwork and deliberation upon the history of Earth as well as that of life. Collectively, his writings now comprise the most significant single-author corpus analyzing the history of the earth sciences. Rudwick brings his Christian faith to his scholarship.

The present volume, *Earth's Deep History*, summarizes the development of a history of Earth. It is written in an accessible style and sparkles with nearly one hundred illustrations, mostly reproductions of original illustrations or text pages from significant individuals ranging from James Ussher to contemporary astrogeologists. Along the way, the geological time-scale develops until it reaches its current scope and detail.

Rudwick painstakingly demonstrates why historical thinking is an essential component of Earth comprehension. Earth and its parts are four-dimensional objects. Rudwick cleanly narrates the step-by-step realization that Earth was an object with a long history. The explanatory power and practical utility of time in analyses were appreciated for two centuries prior to the development of radiometric dating techniques. In fact, through several incidents, Rudwick explicates how spatially—and geometrically—commonsense interpretations of the rock record demanded large volumes of time, and this in the face of opposition based on the “absence of a mechanism.” An example would be the development, over the course of several decades, of what would eventually become known as “plate tectonics” prior to the acceptance of the driving mechanism, mantle convection.

The apprehension of deep time during the eighteenth and nineteenth centuries, far from presenting obstacles to faith, was regarded as an ally:

Closely related to this sense of the providential designfulness of the natural world was a sense of wonder at the romance of vanished deep past that the geologists’ research was disclosing. So, for example, Mantell—who had discovered the *Iguanodon*, the first of the fossil reptiles to be classed later as a dinosaur—exploited a profitable vein of popular science by describing the *Wonders of Geology* (1838). The sheer scale and unanticipated strangeness of the earth’s long history was often treated as welcome evidence for the grandeur of God’s creation. Far from geology being in intrinsic conflict with religious faith, the science was widely regarded in the early nineteenth century as its ally and supporter. (p. 163)

A thread running through *Earth's Deep History* is the participation of earnest Christians in the development of the historical Earth sciences. Contrary to the wishes of some contemporary vocal atheists as well as some equally vocal Christians, faith and science have never been at war.

What is certainly untenable is any claim that the discovery of the Earth’s deep history has in the past been retarded or obstructed by “Religion” ... In the history of the discovery of the earth’s own history, as in the history of many other aspects of the sciences, the idea of a perennial and intrinsic “conflict” between “Science” and “Religion”—so essential to the rhetoric of modern fundamentalists, both religious and atheistic—fails to stand up to historical scrutiny. (pp. 306–7)

At several points during *Earth's Deep History*, Rudwick takes fellow geologists, or popular science writers, to task for falling prey to the temptation to frame a historical narrative in terms of a manufactured conflict metaphor.

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As a coda to this manufactured war, Rudwick provides a brief appendix on the late twentieth-century “young-Earth geology” movement. Having thoroughly documented the hard toil, physical and mental, of sincere and gifted Christians in the recovery of Earth’s deep history, he is taken aback at the “startling reinvention of the idea of a ‘young Earth,’ which the sciences of the earth outgrew for very good reasons back in the eighteenth century” (p. 309). He concludes, “Sadly, creationists are utterly out of their depth” (p. 315; last sentence of the volume).

For its comprehensive scope, intelligibility, delightful illustrations, and at times bluntly personal approach, this volume is a treat. I highly recommend it as a solitary read or as an introduction to Martin Rudwick’s other authoritative works.

Reviewed by Ralph Stearley, Professor of Geology, Calvin College, Grand Rapids, MI 49546.

PHILOSOPHY & THEOLOGY

PROCESS AND PROVIDENCE: The Evolution Question at Princeton, 1845–1929 by Bradley J. Gundlach. Grand Rapids, MI: Eerdmans, 2013. 374 pages, including bibliography and index. Paperback; \$39.00. ISBN: 9780802868985.

One does not have to be directly involved in science or religion to have been affected by the often divisive discussions surrounding the topic of creation versus evolution. It is a topic that has captivated western culture for nearly two centuries. For the most part, this debate is depicted as a battle between atheistic, rational science versus an antiquated religious folklore about the existence of a higher creative being. Having degrees in biology and geology as well as theology, I have been in the middle—often a target—of both sides of this conversation. The book reviewed herein elucidates how committed Christians have responded to this conflict from the genesis of the controversy.

One of the points of contention is the debate over evolution as a natural process versus God’s directional providence. It is these two supposed antithetical ideas that Bradley J. Gundlach, Professor of History at Trinity International University, Deerfield, Illinois, draws from for the title of his book *Process and Providence*. Gundlach takes a historical look at the rising cultural interest in evolution beginning in the mid-nineteenth century. He frames his exploration in the context of the variety of responses from faculty at Princeton, both seminary and university, between 1845 and 1929. Princeton was chosen, according to the author, because “Princeton was the most important center of conservative Protestant think-

ing on matters of science and religion in America” (p. 6). Gundlach notes that his approach to history was less of a systematic analysis and more of a historical narrative. He introduces the cultural context in each of the decades, outlining the emerging scientific ideas in evolution and the social implications arising from natural science’s philosophical conclusion that God can be rejected. As the book works through the emerging issues, Gundlach highlights key individuals at Princeton and presents, uncritically, their responses based on letters, lectures, and publications as well as Princeton’s larger reactions through faculty hirings.

Through this process, Gundlach’s book highlights the manner in which professors at Princeton—in the disciplines of both theology and natural science—avoided a reactionary, confrontational clash, but instead sought a collegial, critical dialogue with the direct and indirect issues arising in popular culture as a result of the proposed theory of evolution. Rather than rejecting outright these new proposals, as many Christians were doing, faculty at Princeton sought to affirm the scientific method and consider evolution, while at the same time upholding God’s providence. Even by the late 1860s, in the aftermath of Darwin’s *Origin*, Gundlach points out,

Only reluctantly did the Princetonians describe the relations of science and religion in terms of conflict. After all, their whole apologetical point was that knowledge was no enemy to faith, that the two were neither hostile nor indifferent to each other, but the closest of friends. (p. 51)

Gundlach even notes that the mechanism of progression was embraced, not only for changes seen in plant and animal life but also for interpreting developments in the biblical text as well as culture as a whole.

As thinkers began to draw philosophical conclusions from evolutionary thought, Princeton’s faculty sought to engage the metaphysical and epistemological implications (including the loss of teleology for creation and the rise of atheism along with the deterioration of long-standing morals and values). In an effort to encourage the church to confront the potential sociological ramifications of evolutionary theory, the military metaphor of war was used to describe this struggle. The counter-offensive to “science’s” destruction of Christian foundations consisted of five strategies: watch, detect, expose, confront, and overpower. The remainder of the book explores how this tactic played itself out over the next sixty years, focusing predominantly on the roles played by Princeton’s leading figures—Charles Hodge, James McCosh, and their “Bright Young Men”—as they continued to wage the war for a Christian perspective on evolution by “taking the best that science had to offer and bringing it back ‘under God’ at Princeton” (p. 160).

Princeton was, for the most part, successful in showing how careful thought about evolution did not betray the biblical narrative about God and God's providential role in creation. However, in the early quarter of the twentieth century, a renewed angst toward evolution arose from within the fundamentalist movement. With the death of people like B. B. Warfield and the departure of other Princeton scholars who were open to considering the positive nature of evolution, Gundlach outlines the "highly polarized situation of the 1920s uncongenial to the Old Princeton views of science and religion" (p. 273). He describes the multitude of underlying issues that pressured Princeton's faculty into taking a more conservative stand as the Scopes Monkey Trial neared. Gundlach concludes by recounting how, by 1929, the battle plan which began in 1865 was forcibly ended by the restructuring of the seminary by the Presbyterian Church in the United States of America over concerns about denomination strife due to theological error.

Process and Providence excels at elaborating the underlying issues of each time period as well as introducing the individuals who were important contributors to the discussion. These nuances help the reader understand the significance of the discussions that took place as Princeton sought to deal with evolution in a thoughtful, welcoming, but theologically critical manner. Gundlach also succeeds in allowing the historical record of the Princetonians to define and answer the question of evolution at their institution. While Gundlach abstains from offering simplistic answers or a systematized presentation of opinions from the highlighted faculty, it was obvious that despite there never being a clear consensus at Princeton on the question of evolution, the concern for all was finding a balance in the relationship between process and providence. However, even with a close reading of the text, the narrative was, at times, difficult to untangle. To clarify the intricate web of relationships, Gundlach would have done well to include a summary of this information in a series of tables.

Process and Providence is a dense read in terms of quantity of material, which could make reading it overwhelming for the historically, biologically, or theologically uninitiated. While this text would be best suited to those with a specific interest and background in one or more of those three topics as it relates to the question of evolution, it is nevertheless accessible enough to the more generalized reader who wants to explore the topic in greater detail. Furthermore, it could serve as an encouragement for those, like myself, that have found themselves in the middle of what has too often has become a one-side-or-the-other debate. Gundlach reminds us that we can stand on the shoulders of a cloud of witnesses who did

not sacrifice their belief in God's providence in order to accept the possibility of natural processes.

Reviewed by Neil Beavan, Palaeontological Consultant, Edmonton, AB T5R 3J2.

FROM NOTHING: A Theology of Creation by Ian A. McFarland. Louisville, KY: Westminster John Knox Press, 2014. 212 pages. Paperback; \$35.00. ISBN: 9780664238193.

In a memorable episode from the hit television series *Seinfeld*, Jerry and George are presented with the daunting task of pitching their pilot for "a show about nothing" to the executives of NBC. One suspects that Ian McFarland may have had a somewhat easier time convincing the editors of Westminster John Knox Press to publish his book, because in attempting to retrieve the classic doctrine of creation *ex nihilo* (from nothing), he has actually produced a book about everything that is and the God who freely creates out of the plenitude of the life that has been eternally shared between the Father and the Son in the Holy Spirit.

From Nothing: A Theology of Creation is a work of "systematic theology" in the best sense of the term. McFarland draws upon a chorus of voices from across the Christian theological tradition (e.g., Irenaeus, Maximus the Confessor, Anselm, Thomas Aquinas, Karl Barth) to present a nuanced and compelling defense of the doctrine of creation *ex nihilo*. The symmetry and elegance of the book's organization reflect something of both the marvellous ordering of creation and the book's central material conviction that the doctrine of creation from nothing is best understood within the context of the doctrine of the Trinity. The book is divided into two parts and, fittingly, each part is divided into three chapters. The first part is given the superscription *Exodus* (outflow), as it is primarily concerned with the rootedness of creation within the life of God. The three chapters in the first part are devoted to unpacking in succession the component parts of the statement, "God creates from nothing." Part Two, *Reditus* (return), marks a "shift from creation's rootedness in God to the contours of its existence under God" (p. xiv) and includes chapters entitled "Evil," "Providence," and "Glory." The two parts are bookended by a substantial introduction and a brief conclusion; the latter is followed by a thorough bibliography and helpful scripture and subject indices.

Following an introductory chapter that outlines some of the exegetical, historical, and contemporary challenges associated with the doctrine of creation *ex nihilo*, McFarland turns in the second chapter to the question of the identity of the God who creates from nothing. McFarland's recourse to the doctrine of the Trinity at this point will seem relatively uncontroversial to those

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trained in theology following the great Trinitarian revival of the twentieth century. However, this identification of the Triune God as the Creator and the corresponding implications of this identification are frequently overlooked or obscured in debates surrounding creation and the relationship between faith and science as they play out at a more popular level. While the doctrine of creation from nothing affirms that God was under no compulsion to create, the affirmation that the Creator is Triune God, who is intrinsically living, productive, and present, allows one to see that there is a certain fittingness to God's creative work, which helps to counter charges of divine arbitrariness and divine determinacy.

The existence of creatures called into being from nothing by the Triune God is characterized by a contingency marked by movement and place. The radical dependence of each created being upon the Creator is the great ontological equalizer, as reflected in the refrain of John of Damascus, which recurs throughout the book: "All things are distant from God not by place, but by nature." Echoing the diversity in unity which marks the life of the Triune God, God's desire to create naturally results in a glorious diversity of created beings which, in faith, can be perceived as participating in a larger and harmonious whole. This Trinitarian construal of creation from nothing allows McFarland to acknowledge the distinctive role assigned to human beings in the divine economy in a way that does not diminish the integrity and value of the nonhuman creation. The first part of the book concludes with a chapter that stands as the outworking of the Trinitarian commitments articulated in the second chapter through the lens of Christology.

If God is in no way limited in his creative work, as the doctrine of creation from nothing affirms, how then do we account for a world, which, as scientific evidence suggests, has been characterized by suffering and death from long before the first human beings appeared on the scene? The second part of the book begins with an exploration of this question. While McFarland contends that theodicies (attempts to provide a solution to the problem of evil) are mistaken, he does find in the biblical books of Proverbs, Job, and Ecclesiastes three distinct and mutually enriching accounts of evil from within the context of the doctrine of creation.

God's resistance to evil in the present for the sake of the creatures' attainment of their proper ends has historically been treated under the doctrine of providence and is the subject of chapter six. McFarland draws upon the scholastic categories of *conservatio* (preservation), *concursus* (accompaniment), and *gubernatio* (direction) to explicate God's providential activity. McFarland's exploration of the issues raised as a result of a wholehearted commitment to both divine sovereignty and creaturely

integrity may make this the most interesting chapter of the book for readers of this journal. For example, in his treatment of *concursus*, McFarland stresses that a proper understanding of the doctrine requires the recognition of the metaphysical discontinuity between God and creation. Recognition of this discontinuity allows for a noncompetitive understanding of divine and creaturely causation that allows us to speak of primary and secondary causation. This distinction can be brought to bear on Einstein's famous dictum that God does not play dice with the universe. In terms of primary causation, Einstein's assertion is obviously true, since all that exists depends upon God for its continuing existence. But from the perspective of secondary causation, God could very well play dice with the universe by bringing about created effects in the absence of any created cause, or what modern science has identified as the truly random event.

Since creation has been created for an end that lies beyond its inherent capacities, namely sharing in the life of the Triune God, McFarland includes a brief chapter devoted to the topic of glory. The glorification of creation is not merely an event that awaits us in the future. Even now, a part of the creation—heaven—is transparent to the glory of God. Eastern iconography and the Eucharist also serve as case studies for exploring a vision of glorified matter and the presence of glorified matter in the midst of the not-yet-glorified earth, respectively. As a result of this investigation, it becomes apparent that "the point of glory is not to negate the present form of creation but to perfect it" (p. 180).

At the very outset, McFarland makes clear that his intent is to provide a theological account of the doctrine of creation from nothing. As a result, he has very little interest in staking out a position within debates surrounding temporal origins. According to McFarland, the doctrine of creation *ex nihilo* is not the description of a process, but fundamentally "a proposal about the character of God's relationship to the world" (p. xiv). However, this does not mean that McFarland has no interest in the fruit of scientific exploration. At various points in both the body of the text and perhaps even more frequently in the footnotes, he is informed by and drawn into dialogue with the findings of various scientific disciplines. In fact, one of his major emphases in the book's conclusion is that a commitment to scientific investigation into the conditions of creaturely flourishing is a necessary correlate to the affirmation of creation from nothing. The reader lacking theological training may find *From Nothing* to be demanding reading, but for those who persevere, the theological payout is far from nothing.

Reviewed by Robert Dean, ThD, Wycliffe College, University of Toronto, Toronto, ON M5S 1H7.

ACTUAL CONSCIOUSNESS by Ted Honderich. New York: Oxford University Press, 2014. 402 pages. Hard-cover; \$55.00. ISBN: 9780198714385.

Often known as “the hard problem,” consciousness has been an issue of debate in recent years in the fields of religion and science as well as philosophy. In *Actual Consciousness*, Ted Honderich presents a summary of the major theories and discussions available, while working toward a possible solution. He sets his tone early in the book:

The informality of style, not always serious and impersonal enough for all professional philosophers in their working hours, is partly owed to and a reminder of the fact that the inquiry must be a kind of joint and mutual enterprise ... That's life, baby. (p. xv)

The book does follow this convention, and is quite conversational, from its scattered references to Tottenham Hotspur to its direct addresses to the reader.

The book is divided into eleven chapters, which build the author's argument while at the same time summarizing popular viewpoints on consciousness. The chapters read as follows:

- “Need for an Adequate Initial Clarification”;
- “Five Leading Ideas about Consciousness”;
- “Something’s Being Actual”;
- “Dualisms, Functionalisms, Consciousness-Criteria”;
- “Other Consciousness Theories, Criteria Again”;
- “What Is it to Be Objectively Physical?”;
- “Perceptual Consciousness—What Is and What Isn’t Actual”;
- “Perceptual Consciousness—Being Actual Is Being Subjectively Physical”;
- “Cognitive and Affective Consciousness—Theories, and What Is and What Isn’t Actual”;
- “Cognitive and Affective Consciousness—Being Actual Is Being Differently Subjectively Physical”; and
- “Conclusions Past and Present.”

With all that said, the book covers topics you would expect in a book on consciousness, such as a discussion of dualism, functionalism, and linguistic theory. All the while Honderich is building the argument for “actual consciousness.” On pages 67–68, Honderich presents a list of the characteristics of consciousness. He follows up with this description of actual consciousness:

We need a summary description for the characteristics assembled. Ordinary consciousness taken as having these characteristics, I shall henceforth say, is

actual consciousness, consciousness as something’s being actual, consciousness as the actuality of something. Whatever else may be the case with conscious states and events—for example the quite different fact that we have a hold on our own conscious states and events—they have this nature. (p. 69)

The approach to the discussion and the organization is helpful in a few ways. First, the book serves as a summary of current discussion on consciousness. Second, the text has many organized lists scattered throughout its pages, such as the one mentioned above, reminding the reader of what we do know about particular topics. For example, there are checklists on pages 184–86 and 231–32 that list the characteristics of objective and subjective physical worlds, respectively (two individual lists in the first case). These sorts of lists allow the reader to review quickly what is known about a subject and to follow the overall argument of the author, which at times can be difficult in a large monograph. On pages 328–29, there is a chart with lists that bring this all together. Third, the text is a long-running dialogue, and although a difficult topic, it does bring the reader into conversation with the author, keeping things a bit more engaged than many other monographs.

Overall I believe this to be a helpful book for those interested in the issue of consciousness, both in the professional and academic realms, as the author has intended (p. xv). Consciousness is a key issue in religion and science dialogue, specifically in the Christian tradition due to the long-standing ways in which theology has been tied to dualist conceptions of the person. In moving beyond (or defending) a dualistic conception of the person, a full knowledge of the field of consciousness is essential. For theologians, the issue is so connected to the idea of soul that it becomes a foundational point for argumentation. The text weaves both science and philosophy together in a way that leaves the reader feeling that the issues have been discussed, the author has made his case, and the argument holds. With that said, not everyone will agree with the author's conclusions, but hopefully all readers are left with a better sense of what the subject of consciousness entails and what subissues are relevant to this discussion. Make no mistake, this is a philosophy book, not a religion and science text, but readers in the field of religion and science may find it useful and an excellent resource.

Reviewed by George Tsakiridis, Lecturer of Philosophy and Religion, South Dakota State University, Brookings, SD 57007.

Along with all their other contributions, many members of ASA and CSCA publish important works. 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.

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Ψ PSYCHOLOGY

SEXUALITY AND SEX THERAPY: A Comprehensive Christian Appraisal by Mark A. Yarhouse and Erica S. N. Tan. Downers Grove, IL: InterVarsity Press, 2014. 356 pages, references, index. Hardcover; \$35.00. ISBN: 9780830828531.

Christians often flounder when faced with challenging questions about sexuality in themselves, their families, their communities, and seek clarity and guidance from psychotherapists or pastors. In *Sexuality and Sex Therapy*, Yarhouse and Tan survey and evaluate the current state of research and clinical practice, grounded in Christian theological beliefs in the goodness of our sexuality, the distortions of sin, and the promise of redemption.

The authors are leaders in sex research, theory, clinical practice, and training within the broad evangelical Christian umbrella. They are well qualified to write this book, and for the most part write it clearly, accessibly, and with a professional, thoughtful, compassionate, holistic approach.

The book is divided into four sections. The first lays out foundational perspectives—theological, sociocultural, biological, and clinical—and the last section returns explicitly to these worldview questions. These are the most helpful parts for readers who are not practicing clinicians. The middle two sections focus on the problems clients bring to sex therapy—sexual disorders and dysfunctions—and also issues around gender and sexuality identity.

In a combination text and workbook style, within each chapter the authors provide “application boxes” that raise issues and ask key questions, helping readers to identify their own attitudes, values, and beliefs around sexuality and to consider how these affect their interaction with clients. While the chapters that address specific sexual issues are a bit repetitive for someone reading from cover-to-cover, they are structured so clinicians can extract guidelines and ideas without re-reading the entire book.

The authors are up to date in their knowledge of research on sexuality, and have also included the most recent diagnostic categories for sexual disorders from the latest edition of the Diagnostic and Statistical Manual for Mental Disorders (DSM-5). They handle this information deftly and with a thoughtful, critical eye. Their sensitivity to limits and complexity will be of help to therapists and pastors who may not be equipped to do that evaluation themselves.

For people interested in science and religion dialogue, the book provides an example of how a particular set of Christian beliefs around sexuality might be expressed in the context of sex therapy. Yarhouse and Tan are not prescriptive about specifics; rather, they challenge readers to think about their own values, beliefs, and assumptions, and to consider how these affect their approach to clients seeking help in the area of sexuality. They also model good clinical practice in that they encourage readers to focus on their *clients'* values, struggles, and needs.

The authors are attempting to do several things with this book: provide an overview of current understandings of sexuality and its disorders and dysfunctions, possible treatments, appropriate professional practice guidelines, and the implications of Christian perspectives. It is impossible to do all of these areas justice in a single volume. The result is that in places the book is frustratingly vague. Descriptions of sexual dysfunctions, their possible causes, and treatment options are not sufficiently detailed for therapists who do not already have background in these areas. These sections might actually be more helpful for people experiencing these dysfunctions themselves or for pastors who wish for a bit of an overview. More importantly for readers interested in science and religion is the fact that the foundational chapters at the beginning and the end are not deeply integrated with the specific sexual issues described in the middle. To their credit, the authors structure the book to encourage readers to engage in their own processes of integration. Nevertheless, it would be helpful for the authors to be more explicit about the ways in which they see Christian faith making a difference in sex therapy.

The chapter on “Sexual Identity Conflicts” is an interesting and distinctive take on the topic of sexual orientation. Questions of sexual identity are highly conflicted and contested, especially among Christians. Yarhouse and Tan attempt to tread lightly, thoughtfully, and compassionately while at the same time suggesting that the claims of major US mental health organizations, such as the American Psychiatric Association and the American Psychological Association, are oversimplified. Such claims include the beliefs that sexual orientation is innate and immutable, something that one discovers rather than develops, and that attempts at prevention or treatment are harmful and unethical. Consistent with Yarhouse’s previous work on sexual identity, the authors distinguish among sexual attractions, sexual orientation, and sexual identity. They point out that people have choices about how they understand and respond to their sexual attractions, and when persons have sexual desires that expressed would put them in conflict with their own or their faith community’s beliefs, they may need support to navigate this struggle. Yarhouse

and Tan are careful to acknowledge that therapy rarely results in significant change in a person's sexual orientation or attractions. They focus instead on the importance of recognizing clients' social and cultural contexts, and helping them toward an integrated identity, one that takes into account the clients' beliefs, values, context, and desires.

While there is much to applaud in Yarhouse and Tan's deft exploration of Christian perspectives on sexuality and sex therapy, they clearly evince a view of Christian sexual ethics that is pretty standard evangelical American fare: Sexual expression is ideally exclusive to those in heterosexual marriage. For example, their discussion of sexual identity quite clearly implies that sexual attractions to any but the "other" sex are problematic to committed Christians and must be dealt with—not, to be sure, through enforced treatment, and not without deep compassion. While they encourage therapists to be open to the possibility that their clients may choose to adopt a "gay identity," the main message suggests that, for the committed Christian, there are better alternatives. Though I deeply appreciate their nuancing of the issues involved, I wish they had extended their focus slightly to include the communities within which people struggle with questions of sexuality. There is little here that acknowledges the profound anguish, heartache, and family struggles that are often associated with a Christian daughter or son identifying as gay. All the attention is on the person struggling with their sexual desires, when there may also be an important place for Christian therapists to speak to families and communities whose fears, attitudes, and beliefs often contribute significantly to their clients' pain.

This focus on the individual or couple is a general weakness of the book. While therapists' and pastors' primary concern is for the person or couple seeking their support, these clients live in a context, as Yarhouse and Tan repeatedly acknowledge. Yet nowhere in the book is there much suggestion that perhaps the context, not the client, is the problem. I was also disappointed that the foundational material in the first four and the last chapters did not make reference to some truly excellent work by scholars such as Margaret Farley or Lisa Sowle Cahill. While it is impossible to cite everyone who has weighed in on these topics, a broader range of perspectives would have deepened this material, and provided some food for thought regarding the possible limits of the "standard" evangelical view of sexuality.

Overall, this is a fairly accessible book that would be of use to Christian pastors and therapists who occasionally deal with clients struggling with sexuality. For those interested in science and Christian faith discussions and their implications for the "culture wars"

around sexuality, this book is worth considering. The thought exercises should stimulate critical engagement with the issues and help readers to thoughtfully digest other excellent books on these topics.

Reviewed by Heather Looy, Professor of Psychology, The King's University, Edmonton, AB T6B 2H3.



SEX ITSELF: The Search for Male and Female in the Human Genome by Sarah S. Richardson. Chicago, IL: The University of Chicago Press, 2013. 320 pages. Hardcover; \$45.00. ISBN: 9780226084688.

It seems that humans have an intrinsic compulsion to classify elements in God's creation: to express a taxonomic urge. Perhaps this urge is a result of God instructing humans to name each living creature from the beginning (Genesis 2:19–20), or perhaps it is a natural reaction to the overwhelming diversity in creation. Regardless of the origin or intent, the taxonomic urge includes classifying sex and gender. Sociologists attempt to determine the influence these two components have upon individuals in society. Psychologists attempt to assess differences in male and female brains. Biologists attempt to describe the molecular mechanisms involved in forming males and females.

Predictably, the topics of sex and gender have not escaped the church. Many of the major controversies in the Christian community circle around these topics, perhaps more now than ever before. Many denominations continue a multi-decade conversation wrestling with the implications of sex and gender for ordination and sexual orientation. Heading into these conversations, it is important to realize that even the scientific methods of defining the mechanisms of how we become male or female are blurred, perhaps more than the general population realizes. Our attempts have tended to work toward reducing complex issues into overly simplistic categorizations. In the book, *Sex Itself: The Search for Male and Female in the Human Genome*, Sarah Richardson highlights the biases and inadequacies that have influenced the formation of what it means to be male and female—even at a genetic level.

Trained as a developmental biologist, I began reading Richardson's book hoping for an in-depth examination of the genetic cases that defy current bifurcated gender categories. Instead, however, Richardson succeeds in accomplishing something different. Utilizing reviews of historical, philosophical, and gender studies, she brings to the forefront of the discussion the evidence that science is not immune to the influences of culture and

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society. She boldly argues that females have been portrayed as secondary to males, even in scientific attempts to elucidate the biochemical mechanisms which define the development of females from males.

She points out that the genomic approach of studying the sex chromosomes is too limited and riddled with gender politics. Such gender politics permeates the words we use to describe genetic pathways that cause differentiation of males and females. Terms such as dominant and default state have a hierarchical ring. Despite much talk about gender, "discourses around gender, discourses often framed by the expectation that the facts of biology would help to settle the matter of the hierarchy of the sexes once and for all" (p. 71), Richardson gives multiple examples showing that science, unfortunately, has had a hand in enabling negative gender stereotypes.

Richardson provides a helpful review and critique of how the approaches to assessing the nature of gender bifurcation among humans are riddled with biases. Specifically, she addresses several major areas including whether the X and Y chromosomes are appropriately named "sex chromosomes," the claim that Y chromosome is shrinking, and that from a genomic perspective, men and women are not that different—certainly not different enough to consider each sex as having their own distinct genome.

Sex Itself is a great primer to begin examining our history and current academic approaches pertaining to defining sex and gender from a genomic perspective through a historical and philosophical lens. To be aware that we explore genomics and molecular mechanisms of development with a bias is only the first step, however. By placing humans into a dichotomy that is attempting to explain a spectrum of sex or trying to undermine one end of the spectrum over the other, we do all a disservice. This book leaves us with a challenge to critique how current paradigms fall short.

Whether an individual is perceived to be male or female impacts what one experiences from a physical, reproductive, psychological, and social perspective. Our gender labels influence who we perceive ourselves to be and can influence the limits and goals we set for ourselves. Should Christians then focus our analytical abilities on the mechanisms that generate phenotypic differences in sex? Should we carefully examine whether there are distinct God-intended roles for men and women? Are we doing a disservice to ourselves and future generations by continually bifurcating ourselves into one of two categories? If these questions intrigue you, you should read *Sex Itself*.

Reviewed by Elizabeth Y. Heeg, Associate Professor of Biology, Northwestern College, Orange City, IA 51201.



TECHNOLOGY

BIG DATA: A Revolution That Will Transform How We Live, Work, and Think by Viktor Mayer-Schönberger and Kenneth Cukier. Boston, MA: Eamon Dolan/Mariner Books, 2014. 252 pages. Paperback; \$15.95. ISBN: 9780544227750.

The data trails we create do not disappear. They also do not remain dormant. Instead, they are aggregated and harvested to serve multiple purposes, many far different from the reason the data was first produced. This aggregated data can be used to predict flu outbreaks, predict who might be a potential terrorist, or locate city dwellings that have been illegally subdivided into multiple units. These applications and many more are possible due to the massive amount of data that exists. The culture and techniques that have recently appeared in this context are often called *big data*.

The book *Big Data*, written by Viktor Mayer-Schönberger (professor of Internet Governance and Regulation at Oxford University) and Kenneth Cukier (data editor of *The Economist*), is intended as an introduction for a general audience. It includes many interesting examples of how big data techniques are being used.

Rather than provide a precise definition of big data, the authors work from a more general statement:

Big data refers to things one can do at a large scale that cannot be done at a smaller one, to extract new insights or create new forms of value, in ways that change markets, organizations, the relationship between citizens and governments, and more. (p. 6)

They assert that big data is making fundamental changes in how we operate. Three changes are emphasized.

First, in the past, data was difficult or expensive to collect. Consequently, we used samples and sophisticated statistical analysis to reach meaningful conclusions. With big data, we are able to use data sets that approach comprehensive collections. For example, in 2004, Walmart used data-mining techniques to examine their old sales receipts for interesting correlations. They discovered that sales of strawberry pop-tarts increased seven-fold shortly before a hurricane. This discovery was possible because they looked for correlations in massive amounts of data with no preconception of what they were seeking.

Second, in the past, data needed to be collected carefully in order to minimize bias and increase the accuracy of the predictions. Big data can tolerate imprecise data and also data that are stored in different formats or using different units. The errors tend to neutralize each

other in the large mass of data that is processed. For example, in 2008 MIT economists Alberto Cavallo and Roberto Rigobon used web-crawling software to gather half a million US product prices each day. Comparing prices for common items is not easy since different web pages may describe the products using different words or phrases. Nevertheless, they used this mass of data to detect a deflationary trend in prices right after Lehman Brothers filed for bankruptcy in September 2008. The more traditionally derived CPI data was not able to detect this significant event until the November 2008 numbers were available.

Third, perhaps the most profound change is a diminishment in the search for causation. Instead, the big data culture seeks correlations. Sometimes this is sufficient; in other cases, causation may be explored once an important correlation is found. The authors state, "Knowing why may be pleasant, but it's unimportant for stimulating sales" (p. 52).

The book develops these ideas and also explores their consequences. The authors consider some potential societal risks and offer proposals to prevent or minimize the negative consequences. Although the book is not primarily focused on ethical issues, the authors do take a strong stand on the potential for using big data to predict the behavior of individuals. They are quite uncomfortable with using big data correlations for making a preemptive arrest of a particular person based solely on a high predicted probability that a crime will be committed. After noting that such a prediction can never be disproved (since the arrest occurs before any actual crime), they state:

Perhaps with such a system society would be safer or more efficient, but an essential part of what makes us human—our ability to choose the actions we take and be held accountable for them—would be destroyed. Big data would have become a tool to collectivize human choice and abandon free will in our society. (p. 162)

This strong assertion about the value of human free will is not grounded in any religious or ethical presuppositions or arguments; it is just assumed to be a universal value.

The authors state that "a single version of the truth" is no longer a useful goal. This assertion is made in the context of being able to query a data collection multiple times and get a consistent result, so we should not assume that they would make a similar claim about more profound kinds of truth. Nevertheless, in this context they state, "We are beginning to realize not only that it may be impossible for a single version of the truth to exist, but also that its pursuit is a distraction" (p. 44). I suspect that many readers may temporarily

forget the context and interpret this as a general assertion. That would be unfortunate since the biblical record is quite clear that truth matters. Jesus claimed to be the truth (John 14:6). In 1 Corinthians 15:12–19, Paul makes a strong case that the validity of our beliefs matters. He would not affirm the radical postmodern sentiment, "if it makes you feel good, it can be a truth for you."

There is passing mention of a few other topics that might be of interest to readers who are interested in the interplay of Christian faith and the big data culture. These include the nature (or existence) of causality, whether data-driven decisions may maximize profits but suppress creativity and artistic/human merit, resulting in a culture of mediocrity and a shift in our worldview. The worldview shift is to see information as primary: "With the help of big data, we will no longer regard our world as a string of happenings that we explain as natural or social phenomena, but as a universe comprised essentially of information" (p. 96). Readers who want an in-depth examination of this topic should read *The Information: A History, A Theory, A Flood* by James Gleick.

The assertions about big data in this book highlight the notion that technology is not neutral. How we collect data, how we analyze it, and what we do with the results are all shaped by our worldview. But the culture of big data will also modify worldviews and reshape society. For instance, collections of data may become one of the most valuable resources a company or institution owns. In some cases, it may be the *most* valuable asset. If their warning against preemptive arrests is not heeded, big data may also reshape our understanding of legal culpability.

This book is a quick, nontechnical, but useful introduction to the culture of big data. For those wishing to investigate more thoroughly, there is an index and extensive endnotes and a detailed bibliography. However, you will need to provide your own religious and ethical framework from which to consider the impact of big data.

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Letters

If Adam Did Not Exist, Who Else Did Not?

"Adam never existed" is the bold statement made by Denis Lamoureux in his article, "Beyond Original Sin: Is a Theological Paradigm Shift Inevitable" (*PSCF* 67, no. 1 [2015]: 35–49, 40). With Adam and Eve relegated