ENVIRONMENT

TRUE NORTH: Christ, the Gospel, and Creation Care by Mark Liederbach and Seth Bible. Nashville, TN: B&H Publishing Group, 2012. 173 pages. Paperback; $19.99. ISBN: 9781433676888.

It seems that everywhere we turn, environmental discussions are clouded by fear and hopelessness. These are the driving factors used to motivate action to combat climate change, reduce environmental degradation, and live responsibly. In *True North: Christ, the Gospel, and Creation Care*, Mark Liederbach and Seth Bible aim to reorient the Christian creation care movement by centering our "moral compass" on Christ instead. Their three goals are (1) to ground the creation care discussion in scripture, orthodox doctrine and theology, and biblical reasoning; (2) to construct a Christian framework for discussing environmental ethics; and (3) to illustrate how "biblical and theological teachings about the person of Christ" lead us to a lifestyle of worship which includes honoring him in "the way [we] treat and care for his universe" (pp. 3–4).

Liederbach and Bible accomplish their first purpose well, using scripture, doctrine, and biblical reasoning to argue for Christian creation care. Throughout *True North,* they root every explanation or argument in a biblical text. This scripture-based approach centers their argument on "serving God" instead of "saving the planet." They use a variety of Old and New Testament texts and consider verses within the context of the surrounding passages, making their biblical analysis robust and rounded. The authors do very little of their own exegesis; they rely on the work of a variety of theologians when analyzing a passage. Employing plausible and well-explained interpretations, they summarize and demonstrate how biblical texts form our understanding of creation care. Their critique of interpretations is logical, scripture-based, and respectful to other authors. Doctrine also supports their arguments. For example, Christ's full humanity and bodily resurrection are discussed at length to affirm the goodness of the physical world and to support our need to protect it. Overall, Liederbach and Bible's approach is easy to follow, logical, and biblically grounded, giving the reader a persuasive, focused, specifically Christian argument for creation care.

Developing a Christian framework for engaging creation care is the authors' weakest point. In a sense, the framework for Christian environmental ethics has already been established by multiple other authors, and *True North* mainly summarizes the recent literature; however, Liederbach and Bible's Christocentric perspective, rather than the human or Earth-centered arguments found even in some Christian environmental literature, adds to creation-care theology and enhances the "framework." The authors also clearly state why the incarnation affirms creation care. "Creating" the framework is stretching what the authors believe they have done, but "enhancing" or "clarifying" the current framework to focus on Christ, worship, and obedience is certainly true.

The greatest achievement of Liederbach and Bible is the way in which they address their third purpose. Their entire book focuses intensely on Christology and how understanding who Christ is and how he works should shape our understanding of creation care. Chapter 1 orients the reader toward Christ as *True North* and the center of our worldview. The authors capably critique and redirect the "crisis mentality" espoused in secular environmentalism and the "disembodied doctrine" of Christians who try to separate evangelism from creation care, arguing for a holistic, worshipful perspective that places Christ above crisis and unites preaching with action in gospel witness. Chapters 2 and 3 establish Christ as Creator, the inherent value and purpose he gives creation, and humanity's unique position as image bearers in the created order. Liederbach and Bible illustrate that because Christ creates, owns, and values his creation and calls us to imitate, worship, and obey him above all else, caring for creation becomes part of a fulfilling human existence. In chapter 4, the authors explore the importance of Christ's redemptive work on how we approach creation care. They address the Fall's effect on creation and explain the importance of Christ's death and resurrection in affirming the goodness of the created order, realigning humanity to God's example of headship, and imbuing all of creation with the hope of restoration. In light of that hope, chapter 5 addresses eschatology and the fate of creation when Christ returns. The authors reject the interpretation of 2 Peter 3:10 that insists the world will be destroyed by fire, arguing that scripture instead affirms its continuity in the end times. The final chapter asks the question: "How, then, shall we live?" Liederbach and Bible conclude that we, as God's people, must recognize the value Christ has given his creation and live as creative stewards—caring, investigating, enjoying, and enlarging creation (p. 156).

True North is well written, well organized, and easy to understand. I have a few criticisms. First, the writing can be wordy. Some chapter introductions and the gospel presentation seemed too long. Second, the

authors clearly state their focus on Christ, but in light of their desire to build a Christian framework for discussing creation care, I felt a conspicuous inattention to the roles of the Father and Holy Spirit. Finally, the main goal of this book was the Christ-centered perspective on creation care. The first two purposes the authors listed, while central to the aim of the book, support this main goal rather than stand on their own.

I recommend this book for anyone seeking a Christ-centered perspective on environmental ethics, especially for students in theology or environmental biology. Because the authors avoid jargon and clearly explain concepts and terminology, the book is easily accessible to people of multiple backgrounds. On a personal note, I deeply appreciated the earnest, rich message conveyed by the authors. In a culture driven by fear of environmental change and a tradition sometimes marked by ignorance and neglect for creation care, Liederbach and Bible make an excellent case for creation care filled with worship, hope, and Christ as part of a fulfilling lifestyle and holistic gospel witness.

Reviewed by Erin K. B. Vander Stelt, Holland, MI 49424.

ETHICS

COVENANTAL BIOMEDICAL ETHICS FOR CONTEMPORARY MEDICINE: An Alternative to Principles-Based Ethics by James J. Rusthoven. Eugene, OR: Pickwick, 2014. 314 + xv pages, including bibliography and index. Hardcover; $36.00. ISBN: 9781625640024.

In the early 1980s, Mayo Medical School asked me to help set up and teach a newly required course in medical ethics. The faculty overseeing the course—physicians all—did not feel qualified to teach the course, but they definitely had already chosen the textbook—*Principles of Biomedical Ethics*—which was also the name of the course. I was comfortable with using it, but I wondered how they chose the textbook. "Because the title conveys that there are accepted principles of medical ethics just as in the sciences, and our students need to see that," they said. The book by Tom Beauchamp and James Childress, then going into its 2nd edition, has now reached its 7th edition (Oxford University Press, 2012) and has become the most widely used text in medical ethics courses as well as in the many workshops offered to medical professionals.

James Rusthoven would like to pour a little water on this flame. As his subtitle indicates, he advocates for a covenantal ethics that he thinks is truer to the practice of medicine and better for nurturing medical practitioners because it is rooted in the transcendent God and God's revelation and not merely in what he sees as a baseless and minimalist common-denominator morality. His book is an impressive achievement. Rusthoven is a medical oncologist with a part-time clinical practice, and he is also a professor at McMaster University. Some time ago he decided to pursue his interest in ethics by enrolling at the University of Toronto Joint Centre for Bioethics; this book is a version of his PhD thesis.

Part One (four chapters) discusses the rise and dominance of principles-based biomedical ethics (usually called "principlism"). The author refers to most of the heavy thinkers in the debates since the late 1970s, and discusses the adequacy of Beauchamp and Childress's "common morality" approach, which located four principles that can serve as agreed-on considerations relevant to most biomedical debates—autonomy, nonmaleficence, beneficence, and justice. Utilitarians, Kantians, and natural law theorists will have different ways of justifying these, but they—and anyone using common sense—can converge on them as middle-level principles applicable to particular ethical decisions. Of course, these principles have to be specified when applied, and also balanced and prioritized when not all of them can be satisfied to the same degree in a given case; the devil is in these details.

I served on an ethics committee at our local hospital for a number of years, and these four principles were laid out as the framework for our decision making (introduced as "the accepted principles for medical ethics"). Often the committee could reach agreement on what to do in a given case, though it was not always clear how members linked their decisions to the principles. Most of the disagreements were actually over empirical issues such as whether the patient was competent and what would happen if a given decision or policy were implemented, but when the disagreement was normative, it was often over such matters as whether the patient's decision should be honored even if did not seem to be in his or her best interest. This, of course, is a difference over how to rank autonomy and beneficence, and Rusthoven is right in noting that there is no overarching principle to help decide.

That American individualism, as well as its legal system, promotes autonomy as the trump card is hardly a moral justification. Rusthoven covers quite comprehensively and perceptively the secular debate over the usefulness of the principles approach. Soon

after its introduction, its critics claimed that it served merely as a soothing mantra, or at best as a checklist of things to keep in mind, while providing no clear decision-making procedure. Rusthoven notes that most of the critics do not provide one either. In a well-informed survey of faith-based approaches, especially those of Paul Ramsey, H. Tristram Engelhardt, and Edmund Pellegrino, he provides a sympathetic account of their views, but even Pellegrino, whom he really likes and who provides "benevolence-in-trust" as an overarching principle (grounded in the dynamics of the physician-patient relationship), allows his Thomistic dualism to prevent a full-bodied Christian alternative (p. 255).

Part Two (four chapters) provides "a modest proposal for a biblical covenantal biomedical ethics." A covenantal approach includes an appreciation of the role of relationships in ethical thinking, an awareness of the effects of sin on our thinking, and an appeal to the *imago Dei* (and to God's care for all humans and the rest of creation) for grounding human dignity, so it is well equipped for ethical decision making, especially since covenants are such an important part of life in general and medicine in particular.

Rusthoven gives a clear and sympathetic explanation of earlier efforts at covenantal ethics, including those of Joseph Allen, William F. May, and the co-authors of *Christian Faith, Health, and Medical Practice* (of which I am one). He likes Dooyeweerd's social philosophy and thinks that it illuminates the role of relational networks in medicine; the sections on the latter especially reward careful reading (pp. 220–30). Jesus's basic teaching of agape love, as illustrated in the parable of the Good Samaritan, provides the key to biomedical ethics and also the context for interpreting and applying the four principles. One of the final chapters is titled, "The Four Principles Revisited." Rusthoven seems offended when Beauchamp and Childress see Pellegrino's and May's contributions as private moralities that can helpfully supplement the common morality for certain faith communities but not replace it (p. 243); he periodically says that the principles approach is itself a private morality, sometimes adding that it is a more widely accepted one because of its minimalism (p. 243). (He also sometimes says principlism is anchored in faith in reason alone [p. 122] while elsewhere noting that Beauchamp and Childress defend it as a common morality that is not grounded in reason [p. 244]).

The relationship between minimal and maximal values involves an ongoing debate, as Rusthoven indicates. Some have argued that minimal values are those necessary for social existence, so, of course, they are common and can be used as a check on those maximal values that can go beyond, but not against, the minimal values. In actual societies, the minimal (thin) and maximal (thick) values do not come in separate categories; the former are nurtured as an integrated part of the religious and cultural outlooks that include the maximal values that inspire and motivate people. Minimal values are teased out only when there is some conflict or issue that requires reducing commitments to whatever overlapping consensus there may be. The Belmont Report, well discussed by Rusthoven, is an example.

The question is whether such a reduced set of agreements can do any substantive work in a pluralistic society without being integrated into a more full-bodied ethic such as Pellegrino's Thomistic virtue ethic or Rusthoven's Dooyeweerd-influenced agape ethic. I think it can, as do Beauchamp and Childress, but even if it cannot, and it requires integration into a richer outlook that includes religious ideals, one could see the latter as less of an alternative than an interpretative context. Rusthoven could be clearer on which it is, alternating between "contrasting" principlism with his approach (p. 241) and seeing "principlism as contextualized through the spectacles of a biblical covenantal ethic" (p. 247). I see the latter as more than merely a supplement, but not really as a contrasting alternative. I think this point shows a helpful way to read Rusthoven's rich chapter on "The Four Principles Revisited," and one that either dovetails with or challenges (depending on how swiftly he came up with it) his labeling it a "modest" proposal.

Rusthoven argues that there is a universality in appealing to the transcendent God in one's ethics, but recognizes that it requires a nonuniversal belief. However, he plausibly points out some universally appealing aspects of a covenantal approach that "is generalizable for all humankind in practice" (p. 4) and claims that, when "engaging those of non-Christian faith beliefs, the idea that all of humankind is bound covenantally, based on common vulnerability and need, can be an attractive starter for dialogue" (p. 236). He is confident that when dialogue is conducted in a deliberative way, it can be productive: he even asserts that "differences in faith beliefs should be shared as sources of wisdom from each tradition rather than as impediments to care" (p. 238). A similar attitude should apply even within the Reformed Christian community, as not all will be persuaded by his arguments about, say, the moral status of embryos (p. 261).

There is a lot to like in this knowledgeable and wide-ranging book. It is true that Rusthoven sacrifices

depth for breadth; his effort to be comprehensive in treating other thinkers results in a conciseness that too often quickly summarizes a contribution and even more quickly evaluates it by simply noting that another contribution cautions us about the former. However, his interpretations are generally fair minded and perceptive. I thought an exception might be a misleading interpretation of Robert Audi on p. 115, but he interprets Audi correctly on p. 269, though even here Audi is dismissed rather quickly by citing another author. Moreover, frequently the book does have the flavor of the PhD thesis that begot it. The style of writing and terminology used may be fine for academics, but I do wonder how most health-care practitioners will respond to sentences, such as "However Pellegrino's Thomistic elevation of rationality is challenged by O'Donovan's caution that the rationalist tradition tends to move toward a reductive immanentism and premature eschatological fulfillment …" (p. 8; restated, but not much more clearly, on p. 249), or to Dooyeweerdian phrases such as "enkaptic interlacement" (p. 222). For nonacademics, I recommend beginning with the final few chapters (worth the price of the book), and then deciding what else to read. Some of it is slow going, but it is good work.

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FLOURISHING: Health, Disease, and Bioethics in Theological Perspective by Neil Messer. Grand Rapids, MI: Eerdmans, 2013. 256 pages. Paperback; $35.00. ISBN: 9780802868992.

Theologian and ethicist Neil Messer (University of Winchester) has produced a thorough and thoughtful review and analysis of the various theories and approaches to foundational issues concerning human health, disease, and disability as they relate to the concept of human flourishing. As such, this book will be of interest to anyone seeking a greater understanding of the major questions and contemporary discussions in these areas.

The first two chapters of the book could serve as a stand-alone text for addressing major modern theories of what constitutes health, disease, and illness and how best to evaluate and differentiate these concepts. In the first of these two chapters, Messer provides a particularly fine overview of several prominent evolutionary theories of what constitutes health and disease, including discussions and critiques from within the community of scholars espousing variations of these interpretations. Contrasting and relating these views to "the Good," as conceptualized classically from an Aristotelian framework, he helpfully illustrates both the strengths and weaknesses of the evolutionary perspective when applied to human health; these serve as a foundation for later theological discussions. Those not well versed in bioethics may find these chapters helpful in appreciating what the secular academy and the philosophical bioethics community contribute constructively to the broader bioethical discussion, and how these contributions can be given more substantial meaning, depth, and coherence within an explicitly theological framework.

Of particular interest to those coming from a background in neuroethics, rehabilitation, or psychology is the inclusion of the respective topics of mental health and disability within the broader discussion of human flourishing. Messer considers the concept of disability from several angles: as disease, as extreme examples of natural human variability, and within the broader social context in which members of a society can impede another's flourishing by their reactions to such variations. Once again—as with health in general—what constitutes disability still appears to be, at least intuitively, based upon an essentialist (Aristotelian) understanding of what constitutes normative human bodily and mental functioning. An intuitively understood normative functioning serves as a vantage point from which to determine what is also likely to constitute bodily and mental disease or disability. As will be apparent to many, philosophical concerns and questions have bedeviled medical and mental health ethics for some time. For instance, at what point does diversity and variability become pathology?

The third and fourth chapters of Messer's text constitute the major theological emphasis of the book, with chapter three providing the basic theological foundations and chapter four providing the application of the major theological ideas. Messer is explicitly indebted to the work of Swiss Reformed theologian Karl Barth and medieval theologian Thomas Aquinas, providing links to the thought of Magisterial Reformation Christianity as well as to the historic Western church and the Roman Catholic tradition. Messer draws heavily from Barth's "ethics of creation" and pairs this approach with the Aristotelian/Thomist emphasis upon teleology and essentialism, especially as teleology and essentialism apply to human beings and their characteristic functions as beings of a particular kind. From this "Barthian Thomism," Messer's main thesis in the second half of his book is that the ends, values, goals, or "goods" that evolutionary approaches found so elusive in the first half of the book can only be properly found in a Christocentric anthropology wherein health is seen as the "'strength

for human life': the God-given ability to answer the summons to flourish as an embodied creature of this particular, human kind" (p. 155). "Our flourishing, as creatures of a particular kind, consists in the fulfillment of the ends proper to that kind of creature" (p. 167). Within this framework that views each human life lived "as creatures of a particular kind," health and human flourishing (physical and mental) are viewed as proximate ends embedded in and given proper context and meaning within the ultimate ends provided in God the Father's revelation in Christ. Thus, the insights of various branches of human learning "can be critically assimilated to this theological understanding" (p. 170).

I believe that Messer's text can be extremely helpful in providing Christians with a lens through which to view analytically much of contemporary culture's focus on health and longevity as ultimate—rather than proximate or penultimate—goals. A focus on health for its own sake may actually keep people from engaging in activities that could contribute more fruitfully and fully to "being human" and relating to others through valued action and compassion.

A recurring element in the second half of Messer's book is Barth's notion of health as the "strength for human life." As someone with professional interests in psychology and neuroscience, my mind immediately went to possible conditions which could be considered threats to such creaturely flourishing from a mental health perspective, notably those conditions that impair our ability to see the good in day-to-day existence and impair our ability to take joy from our relationships with others and from our work.

I recommend Messer's book and hope that it is widely read by ethicists, clergy, and medical and mental health professionals. In addition to helping Christian bioethicists and philosophers to dialogue more constructively with the broader bioethics community, I believe that Messer's text will be very helpful in assisting those in the church (clergy and laity) to understand more profitably the concepts of health and disease from a distinctively Christian point of view.

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AN IMAGE OF GOD: The Catholic Struggle with Eugenics by Sharon M. Leon. Chicago, IL: The University of Chicago Press, 2013. 226 pages. Hardcover; $45.00. ISBN: 9780226038988.

This book offers a detailed account of how American Catholics emerged as the fiercest opponents of sexual sterilization over the course of the first half of the twentieth century. Sharon Leon offers a close reading of texts produced by high-ranking American Catholics in concert with the texts of leading local eugenicists to trace a complicated relationship that at moments overlapped, but over time evolved into a contentious and deeply divided set of views over the sanctity of human life and its reproduction. It provides historians of medicine, eugenics, and Catholicism with a rich study of these high-level debates.

Leon concentrates on some of the leading figures in these discussions and covers nearly four decades of its discourse. In doing so, her study focuses on the period in American history when eugenics and sterilization have been presumed to be in their ascendency. Many scholars suggest that after the Second World War, the discussions changed dramatically, with the concurrent international attention to Nazi eugenics and human experiments, and a contemporary shift in discourse surrounding voluntary birth control, which dramatically altered the course of eugenics. Although historians of medicine such as Rebecca Kluchin, Wendy Kline, and Johanna Schoen have begun to problematize this chronological framing by demonstrating that eugenics programs had a much longer reach and maintained a more complicated relationship with both medical experimentation and birth control, Leon adheres to this periodization. The result is an in-depth look at how Catholic thinkers positioned themselves against eugenicists, and how Catholicism wrestled with eugenic science for the upper hand in moral authority over the modern family.

At its core, this book is an exploration of the battleground between eugenic reformers who harnessed science (however pseudo or incomplete it was) in their efforts to shape American society, and Catholics, who expressed religious and theological explanations for human behavior, and later politically reinserted the church into the domain of welfare and charity. Leon points out, however, that both Catholics and eugenicists borrowed interpretations and strategies from one another as they attempted to shore up support for their positions. At times, this jockeying meant that eugenicists shared or even borrowed perspectives from Catholics, namely support for pronatalism and positive eugenics. Conversely, while Catholics agreed on elements of pronatalism, in practice (whether or not this was consistent with papal doctrine), some even agreed in principle with the need to intervene on issues of mental deficiency

and later on anti-miscegenation laws. While the differences are evident, Leon is careful to draw attention to more subtle points of convergence that complicate our understanding of this contested past, and remind us of the overarching issues that brought these groups into the same arena.

The subtext behind this contest is less explicit. It appears that while the eugenicists and Catholics squared off over the subjects of eugenics and sterilization, the state loomed large in this wrestling match. Eugenicists often appeared to have the upper hand in working with the state to design eugenic laws, while Catholics, in Leon's account, resented what appeared to be an encroaching state that increasingly intervened in American lives, whether on points of secular marriages, welfare, or moral guidance regarding family life. The underlying wave of secularization brought Catholics together in defense of their place in American society. The state, which is more often an implicit player in this account, created another rallying point for Catholics, who appealed to a particular feature of Americanism that decried the paternalism of a secular state.

By paying close attention to the high-level discussions, the voices and actions of lay people—whether patients or parishioners—are largely absent. The nuances in discourse are very well established, but the local interpretations of that advice as it made its way into civil society are less clear. Did families, for instance, adopt one interpretation universally, or did they select pieces from the eugenicists and Catholics as it suited their individual circumstances?

This book addresses a considerable gap in the literature on eugenics, and provides compelling evidence to support the oft-made claim that Catholics were the primary opponents to eugenics; Leon explains why. She delves into the murky science of heredity that shifted under the weight of religion and failed to prove that disability and feeblemindedness were indeed threatening, subhuman categories. Catholics, she shows, did not combat this view with religion alone, but engaged in the science of eugenics and joined intellectuals in their pursuit of understanding degeneracy. Only after reasoned consideration did Catholics emerge firmly against the popular wave of support for more interventionist approaches to designing families. This is not, therefore, a simple story of religion triumphing over science, but rather one of reason over unreason, and in this case, conservatism over change.

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History of Science

A CHOSEN CALLING: Jews in Science in the Twentieth Century by Noah J. Efron. Baltimore, MD: Johns Hopkins University Press, 2014. 149 pages. Hardcover; $26.95. ISBN: 9781421413815.

Does a religious community's attitude toward science really matter? By illuminating the importance of science and technology for disparate Jewish communities throughout the twentieth century, Noah Efron's *A Chosen Calling: Jews in Science in the Twentieth Century* raises a number of questions that are important for anyone engaged in the science and religion conversation to consider. Why do religious communities adopt certain attitudes toward science? What might those attitudes say about the communities who hold them? How might they influence whether their members pursue scientific professions?

Efron is a historian and philosopher of science at Israel's Bar-Ilan University, a familiar commentator on Israeli politics, and an established science and religion scholar, being particularly known for writing *Judaism and Science: A Historical Introduction* in the Greenwood Guides to Science and Religion and a 2011 *Huffington Post* blog essay on the everyday meeting of science and religion. In short, although Efron is not writing about Christianity and science, he writes from a knowledgeable, unique, and valuable perspective. Those *PSCF* readers who are willing to consider how his approach and ideas might apply to the relationship between Christianity and science both globally and in particular church communities should find much to value in Efron's work.

Published as part of the Medicine, Science and Religion in Historical Context series, edited by Ronald Numbers, *A Chosen Calling* grew out of Efron's 2007 Gustave A. and Mamie W. Efroymson Memorial lectures at the Hebrew Union College–Jewish Institute of Religion in Cincinnati, Ohio. In this rather slim but well-produced volume, Efron seeks to address the disparate representation of Jews in the sciences in the twentieth century—a topic that has been debated both by ordinary Jews and intellectual luminaries as diverse as Thorstein Veblen, C. P. Snow, Norbert Wiener, Nathaniel Weyl, and George Steiner. Efron largely rejects the hypotheses of these thinkers who variously attributed Jewish success in science to such factors as outsider "skepticism towards received pieties," social structures that genetically favored breeding for scholars, and habits of thought derived from Talmudic disputation that emphasize creative

interpretation, critique, and "the ordering of all phenomena." None of these factors, Efron notes, explain why Jews were modestly represented in science prior to the late nineteenth century, or why most eminent Jewish scientists eschewed Talmudic study and rejected traditional Judaism for modern thought.

For Efron, the central question is not why Jews were disproportionately preeminent in twentieth-century science but rather why there was a sudden upsurge in Jewish enthusiasm for science in the late nineteenth and early twentieth century. Efron's answer is that Jews flocked to science because science provided a means for nationally and culturally alienated Jews to contribute to and find a place in the modern world. Aware that such a simple thesis runs the risk of imposing an unjustified metanarrative on the historical record, Efron spends the bulk of the book showing how science provided Jews with an opportunity to find a place in their world under widely differing circumstances—liberal capitalist America, the Soviet Union, and Zionist Palestine, the three great "destinations" pursued by Jews in the twentieth century.

After introducing the importance of science for contemporary American Jews by recounting his experience visiting Kentucky's Creation Museum with a vanload of rabbinical students and providing a brief introduction to the problem of Jews' "ridiculously disproportionate" contributions to twentieth-century science, Efron spends each of the book's three main chapters describing their experience in each "destination."

Chapter one tells how American Jews held "high the torch of civilization" in twentieth-century America. The meritocracy of science opened a path for Jewish immigrants to contribute to American progress and served as the exemplar of American liberal democracy, the latter in being a sphere where Jews could participate without fear of religious discrimination and an opportunity for Jews to make America more hospitable for Jews by resisting fundamentalist attempts to impose their beliefs onto an ideally nonsectarian American public life. In short, America provided Jews with opportunities both to participate in American society and to reshape it to be even more hospitable for Jews. Chapter two discusses the prominence of Jews in Soviet science due to a combination of anti-Jewish discrimination under the tsars, the appeal and opportunities introduced by the Soviet egalitarian ideal, and the importance of science as a pathway for Jews to contribute to Soviet society. Chapter three discusses the role science and technology played in Zionist enterprise, both as a reflection of the "science equals progress" mindset of the times and later as a way for Jews to use their modernizing of Palestine to justify their resettlement of the land in a sort of Zionist appropriation of colonialism.

So, in the end, has Efron demonstrated his thesis? Not really. Given that Efron spends the vast bulk of the book's 104-page argument focusing on the attitudes of Jewish communities and only rarely addresses the reasons why individual Jews pursued scientific eminence, perhaps he never really intended to demonstrate his thesis in any rigorous sense. Efron seems content to lend his thesis credibility by explaining how science was viewed as important and valuable among twentieth-century Jews—a task in which he succeeds admirably.

PSCF's readers can benefit from Efron's insights, though they may find that applying them to issues of science and Christian faith is far from simple. Aside from the usual difficulties associated with drawing lessons from history, Efron is not writing for Christians or even a general science and religion audience. Rather, he writes primarily for fellow Jews interested in understanding their communities' engagement with science. Moreover, since Efron justifiably considers Judaism as a cultural affiliation rather than as a devoutly held belief, the application of his insights to communities that emphasize personal faith commitments is far from clear. What, for example, are we to think about twentieth-century American Jews' embrace of science and technology, knowing that it also represented an embrace of modernity at the expense of traditional Jewish observances and beliefs? Nevertheless, Efron has given us something valuable—the voice of an experience that, while not our own, is one we can learn from.

It should also be noted that *A Chosen Calling* has merits beyond Efron's argument itself. Science and religion writers who put forward and critique various origins proposals could benefit from imitating Efron's humble, gracious, and fluid style, while scholars will appreciate the extensive endnotes and index.

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NEWTON AND THE NETHERLANDS: How Isaac Newton Was Fashioned in the Dutch Republic by Eric Jorink and Ad Maas, eds. Amsterdam: Leiden University Press, 2013. 256 pages, index. Paperback; $37.00. ISBN: 9789087281373.

A number of recent historical studies have shown that place and locality matter in the reception, discussion, rhetoric, elaboration, and circulation of scien-

tific ideas and concepts. This collection of nine essays written by ten historians of science (all Dutch, but for Rob Iliffe, University of Sussex), provides an important contribution in understanding the response to Newton's work in the Dutch Republic. The Dutch were some of the first on the continent to adopt, adapt, and propagate Newton's natural philosophy. In this particular case, this book aims to locate eighteenth-century Dutch encounters with Newton. But, certainly, not in a way that simply parrots the "master," once described as "the miracle of our time" by Herman Boerhaave (1668–1738). A chapter section heading expresses it succinctly: "not all roads lead from London" (p. 172).

Two underlying patterns, descriptive of the Dutch assimilation of Newton, are identified in the introduction by Eric Jorink and Ad Maas: (1) Newtonianism was "not a stable, coherent system, originating in Britain and waiting to be implemented on the Continent, but a philosophical construction, adapted to local problems and circumstances"; and (2) the dissemination of Newton was a process in which "natural philosophy, religion and cultural factors, propaganda and practical concerns, and personal benefits, fear and precedence interrelated in a fascinating manner" (p. 8). The other nine chapters provide historical details in support of these theses.

The major historiographical issue which serves as a thread throughout these chapters asks: What does it mean to employ the term Newtonian? Is the concept Newtonianism empirically, that is scientifically, accurate or is it a term best used only when providing historical narrative? (All of these questions parallel issues in the discussion surrounding the term Darwinism and its use in more contemporary times.) In chapter 6, "Low Country Opticks: The optical pursuits of Lambert ten Kate and Daniel Fahrenheit in early Dutch 'Newtonianism,'" Fokko Jan Dijksterhuis argues that 'Newtonianism' is an extremely vague term. Upon examination, it is not just a physical theory, say, in this case, a specific optical theory. In his view, Newtonianism also functions as "a theological/philosophical concept that should be carefully distinguished from astronomical, physical, or chemical theories (p. 174). This point is echoed by Henri Krop in chapter 9, "Newtonianism at the Dutch Universities during the Enlightenment." We need, he argues, to carefully distinguish the "philosophical Newtonianism supported by the universities from a more popular Newtonianism of a markedly religious nature, which has the societies of enlightened burghers as its institutional background" (p. 228). In addition, the employment of a term like Newtonianism tends to neglect or downplay the contributions of others (for example, Robert Boyle, Leibniz, or Wolff), and it often assumes that there is nothing but one-way intellectual traffic. It does indeed seem to be increasingly difficult to identify the essential core of Newtonianism.

Other chapters describe how Dutch experimental physicists such as Willem Jacob 's Gravesande, Petrus van Musschenbroek, and Daniel Fahrenheit appropriated Newton and gave it a local interpretation. Rina Knoeff has contributed a chapter (3), "How Newtonian Was Herman Boerhaave?" about Herman Boerhaave, an influential Leiden University medical and chemistry professor, reflecting his initial use of Newtonian mechanical imagery in physiology. However, he later became increasingly disenchanted with its explanatory potential in chemistry and medicine.

Two of the chapters, 1 and 7, highlight situations which resonate in contemporary discussions. Chapter 1,"The Miracle of our Time: How Isaac Newton Was Fashioned in the Netherlands," by Eric Jorink and Huib Zuidervaart, provides a review of the historical context in an attempt to understand the ready acceptance of Newton's work in the Dutch scene. They attribute this welcoming environment to (1) an existing tradition of empirical research founded in Leiden in the early seventeenth century into which Newton fitted, and (2) a scientific culture characterized by an intense "circulation of knowledge." Dutch intellectuals and Protestant refugees from the Spanish Netherlands, Scandinavians, and Germans escaping the Thirty Years War, as well as Sephardic Jews and later French Huguenots were involved in these discussions. The Netherlands, at the time, was the publishing heart of Europe. This diversity of thought was not overly encumbered by a long-standing scholastic tradition, which was not cemented in the recently established universities (Leiden, 1575; Utrecht, 1636). This encouraged universities to be more innovative and open to new curricular and intellectual approaches, and attracted many foreign students and professors. There was also a stunning array of non-university groups (for example, Amsterdam mathematical enthusiasts and Mennonite enthusiasts) which routinely discussed the latest scientific findings. In addition, Dutch society displayed a stunning pluriformity of denominations and sects. This also stimulated discussion. The role of the Reformed church and its adherence to the Belgic Confession (1561), Article II, viewing nature as God's creation in which God reveals himself, was also crucial in stimulating scientific investigation and discussion. Many people interested in natural theology and physico-theology saw an ally in Newton, since

he seemed to pose no religious threat and could be employed to respond to the rationalism of Descartes as well as Spinoza's attack on the authority and trustworthiness of scripture.

These last concerns are echoed in the contribution by Rienk Vermij, "Defining the Supernatural: The Dutch Newtonians, the Bible and the Laws of Nature" (chapter 7). Vermij argues that the Dutch fascination with Newton (in his various guises) was occasioned by a complex social and intellectual context (1) to find an answer to the confessional strife of the seventeenth century, (2) to respond to and find an alternative to Cartesian philosophy, and (3) to deliver a decisive blow to Spinoza. It was a search for "social and religious peace" in which some form of harmonization would hold. But "in the end the issue that mattered most was the authority of the Bible. Purely philosophical problems were secondary" (p. 186). Was there a way of understanding the relation between God and nature which gave reassuring answers to both scientific and religious demands?

A complex "cocktail of ideas" and practices are adduced by Vermij: (1) invoking universal gravitation (nonmechanical forces) meant mechanical principles could not explain everything (a direct appeal to Newton's 2nd edition of the *Principia* and particularly Roger Cotes's preface to this edition); (2) an argument from design and the rise of physico-theology; (3) a long tradition of experimental philosophy which challenged Cartesian speculation and Spinoza's thorough geometrical way of reasoning; and (4) an element of theological voluntarism. Newtonian natural philosophy seemed to offer a way to maintain an active divine presence which encouraged a search for "a definition of laws of nature which left room for divine miracles" (p. 191).To deny the reality of miracles implied a denial of the biblical narrative and an undermining of all religion. But in the search for this definition, they, as well as many moderns, face a paradox: the supernatural was defined, delimited, circumscribed by what people deemed to be natural, explainable, nonmiraculous, and scientific.

This book is one for readers with a keen historical interest. Reading it carefully, along with the extensive research that supports the theses advanced, will make one more aware of how theories function in complex social, intellectual, and ecclesiastical contexts. Historical echoes of this eighteenth-century struggle are all around us today in our deliberations about evolution, miracles, and natural law.

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ORIGINS

EXPLORING FAITH AND REASON: The Reconciliation of Christianity and Biological Evolution by Bruce Glass. Houston, TX: DBG Publishing, 2012. 296 pages. Paperback; $13.25. ISBN: 0578110474.

I had high hopes when I began Bruce Glass's book, *Exploring Faith and Reason: The Reconciliation of Christianity and Biological Evolution*. Part 1, entitled "Christianity and Evolution," lives up to the title. Here, Glass skillfully defends a belief in a personal God and the divinity of Jesus in light of the evidence for evolution. Parts 2 and 3, "The Theory of Evolution" and "The Evidence of Evolution," comprise over half the book and give a broad overview of the overwhelming evidence supporting evolutionary theory. Although Glass claims to have written a book for people of all views, the majority of the book speaks to Christians who are unfamiliar with evolutionary theory and the evidence supporting it. These sections are probably less interesting to *PSCF* readers, as most will be well versed in this science already. Part 4 goes through the history of "intelligent design" theory and creationism in the United States, and the misuse of Darwinism to defend racist delusions. While these chapters are interesting to those who want to have a fairly comprehensive overview of the important role of Darwinism in our society, they contribute little to the book title's goal of showing that faith and evolution are altogether compatible.

Part 1 discusses how God's providence and transcendent nature are fully compatible with biological evolution. Glass first notes that "Christianity declares that the physical universe is separate and apart from God" (p. 50). God created the universe and is therefore above, not part of creation. Glass quotes Thomas Aquinas who described God as the "first cause" because God created the physical universe from nothing, and that anything within that creation can happen as a result of "secondary causes." This perspective allows for an independently changing natural world with space for biological evolution, evil, and the "free will" to accept or reject God's grace by confessing Jesus as Savior. Glass notes,

> Christianity teaches us that the natural world, therefore, is the foundation or the platform from which we must rise and exercise our free will in accepting and obeying the call of Eternal Truth … He is active in our own lives when we invite him into them. But we know that God is not in direct control of everything that happens in the world … because such a notion would implicate him as an

> accomplice to the evil that we see around us and that we perpetrate. (pp. 67–68)

Glass explains that this idea hinges on the premise that the Bible is not a scientific encyclopaedia but rather a collection of divinely inspired writings in which the character of God and his plan for humankind is revealed. The narrow literal interpretation of the Bible and of the six-day creation story in particular precludes acceptance of natural causes of the living world. Glass talks about the unprecedented literalism in scriptural interpretation, starting with the Reformation and having taken firm roots in certain groups of Christian believers. He argues that more truth can sometimes be gleaned from allegorical interpretations of certain passages in the Bible, and that Jesus himself used many parables to reveal deep truth. He reminds us that we do not need science to confirm our belief in God. Likewise, no scientific discovery can refute the existence of God because the Christian God is incomprehensible and not constrained by creation.

I enjoyed reading this section as it provides a fresh and compelling case for reconciling faith and science. Glass's tone is pleasant. He describes himself as an agnostic and therefore an impartial observer, refraining from cringeworthy rhetoric that one often finds in books on either side of the topic.

In Parts 2 and 3, the author shares the most important cases supporting the theory of evolution and explains the scientific method. While this broad overview is written in concise and generally accessible prose, most chapters are disappointing for several reasons.

First, Glass's attempt to be comprehensive resulted in a long list of various lines of evidence for evolution and natural selection that lacks clarity and depth. An explanation of the imperfect "design" of the human eye covers almost two pages. After reading it a second time, I did not learn much more than that the light-sensitive rods of the retina are located behind the nerves and blood vessels, which is imperfect from an engineering standpoint. I found myself wishing that more explanation was given as to what evolutionary steps led to this imperfect design.

Second, the cover of the book shows the DNA helix, which refers to one of the most important revolutions in the history of science—the advent of molecular biology and its rapid progress in recent years. Glass chose to be light on genetics and molecular biology, though he does give a list of genetic evidence in his chapter entitled "Tree of Life." A figure would have been helpful to explain some of these difficult but very compelling cases (similar to the way Francis Collins illustrates the relationships between very different vertebrates based on chromosome anatomy and genome structure in his excellent book, *The Language of God*). This is a missed opportunity because molecular evidence for evolution and the signatures of our evolutionary past in our genomes is absolutely stunning, but it requires more explanation to appreciate its significance.

Third, the book is flawed with respect to several important biological concepts. For example, genetic recombination does not occur only when germ cells fuse and parental chromosomes combine, but also during meiosis by chromosomal crossover. Also, Glass discusses Darwin's book *Pangenesis* in which Darwin reintroduces the old Lamarckian idea of the inheritance of acquired characteristics. He goes on to describe it as Darwin's "great blunder" (p. 107). Although Darwin was indeed wrong about the precise mechanism of inheritance and his theory was highly speculative, some of Darwin's pangenesis principles do relate to heritable aspects of phenotypic plasticity. It has been known for a long time, and recently more widely accepted, that characteristics acquired during life, resulting from environmental or social stressors, can be transferred to the next generation without necessarily altering the DNA code but by the way genes are activated. This so-called epigenetic transgenerational inheritance adds an entirely new dimension to understanding evolutionary change, and perhaps Glass chose to ignore it to make his case more concise.

Throughout the book, Glass accumulates a lot of evidence supporting evolutionary theory, which is not difficult because there are "Clues All Around," as the title of chapter 7 says. He refrained from laying out some weaknesses of the theory that are often overlooked by the majority of scientists. The enormous complexity at many levels of biological organization, ranging from complex cellular processes to the working of the human mind, is truly amazing. Showing evidence that this was formed by spontaneous events and the forces of evolution—and the evidence is indeed overwhelming—is not the same thing as explaining exactly how such a complex structure or cellular process evolved. In other words, we have evidence that all life shares the same origin. We also know how genes and characteristics change at the molecular level, but we cannot revisit our evolutionary past. While Glass refers to this issue, I found myself wishing he had taken a stronger stance against the arrogance with which the evidence is often presented—as if scientists have or will have all the answers to life's problems and questions.

Finally, evolutionary theory can only illustrate how life changed and diversified over time. It cannot explain how life came into existence. While Glass acknowledges this, I would have preferred a more explicit statement that we do not know how self-replicating entities evolved from nothing. I am always surprised to hear that most people think that science has all the answers, in spite of introductory biology textbooks being very clear about this. More generally, I am not proposing that we imply divine action in this or that area where scientific understanding is currently lacking ("God of the gaps" approach), nor am I negating the evidence for evolution. I think Glass could have presented a more balanced case, clearly pointing to areas where science does not have all the answers to date.

In Part 4, "The Politics of Evolution," Glass covers a brief history of creationism and the ID movements. The last chapter entitled "Darwinism" talks about the misuse of Darwinian theory. Herbert Spencer coined the phrase "survival of the fittest" and took it to the next level by claiming that the poor were unfit and inferior. Darwin's half-cousin Francis Galton came up with eugenics. His idea was supported by many prominent people including Winston Churchill, Theodore Roosevelt, and Adolf Hitler. Glass notes that "Today, thankfully, such ideas are seen as horribly immoral" (p. 266). This part of the book is an interesting read and places Darwinism in a more historical perspective.

Glass's compelling case for evolution's compatibility with Christianity in Part 1 of the book is an enjoyable read. The remainder of the book is a fairly comprehensive introduction to evolutionary biology; it might be of benefit to those who are unfamiliar with evolutionary theory and the evidence that supports it but not as compelling as other books on evolution. However, the fact that the evidence is presented by an impartial observer makes it suitable to readers of all viewpoints.

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BIOLOGICAL INFORMATION: New Perspectives
by Robert J. Marks II, Michael J. Behe, William A. Dembski, Bruce L. Gordon, and John C. Sanford, eds. Hackensack, NJ: World Scientific Publishing, 2013. 584 pages. Hardcover; $178.00. ISBN: 9789814508711.

This volume contains the proceedings of a symposium held May 31, 2011, through June 3, 2011, at Cornell University. Since the famous 1967 Wistar Symposium on "Mathematical Challenges to the Neo-Darwinian Interpretation of Evolution," the mathematical and biological challenges posed to the modern evolutionary synthesis (neo-Darwinism) have not been resolved. As far as I know, this symposium is the first to address these challenges, incorporating the intelligent design perspective as a possible *scientific* approach. All contributors are active researchers from reputable institutions who question the conventional perspective of neo-Darwinism that natural selection accompanied by mutations is capable of generating new information in the biosphere.

Section One: Information Theory and Biology
The first authors define biological information theoretically as what enables the narrowing down from prior uncertainty to later certainty. Using human language as an analogy, Oller suggests biological information has to be generated and comprehended by intelligence. Random mutation and natural selection lead to pruning of pre-existing content. Basener applies mathematical dynamic modeling analysis to evolution based on an extinction of human civilization and in vitro Qβ replicase experiments. They predict that either evolution runs its course to the equilibrium or the system will continue to repeat some state infinitely often. As a result, no new information is generated.

Ewert, Dembski, and Marks II examine the computer program Tierra that simulates the creation of artificial life with evolution. It is characterized by an initial period of high activity producing a number of novel adaptations followed by barren stasis. New functional instructions are generated but these are dwarfed by the size of other changes. Long-term evolutionary progress is dependent on the generation of new information as exemplified in the Cambrian Explosion, which is not explainable by the Tierra model.

Montañez, Marks II, Fernandez, and Sanford demonstrate that DNA in higher genomes is often optimal and poly-functional with nucleotides being used in overlapping genes. Thus, using analyses of the balance between beneficial versus deleterious mutations and the multidimensional analogy with crossword puzzles, beneficial mutations necessary for directional evolution are extremely rare. Sewell addresses the thermodynamic improbability of an open earthly system amenable to evolution from molecule to human. While this may be an argument of the improbability of building order, the need for capturing sunlight energy into usable biological energy is the crucial challenge to abiogenesis. McIntosh contrasts bottom up, materialist, emergence models with top down, nonmaterial, constrained models. He aptly identifies the weakness of the former models as the need

for the conversion of free energy in an open system into usable biological energy necessary for the compensation of the increasing disorder of earth, namely, conversion of sunlight energy into ATP by a machine such as chlorophyll. He proposes the third model in which nonmaterial information constrains the local thermodynamics to be in a non-equilibrium state of raised free energy.

Section Two: Biological Information and Genetic Theory
Wells presents evidence for the functionality of nonprotein-coding DNA to refute the concept of "junk DNA." This includes pervasive transcription of the genome, conservation of many nonprotein-coding sequences, sequence-dependent functions of RNAs transcribed from introns, pseudogenes, repetitive DNA, functions almost independent of the exact nucleotide sequence, chromatin topology in gene expression and centromere placement, and the light-focusing property of heterochromatin in inverted nuclei.

Sanford and others use numerical simulation of evolution by random mutation and natural selection by a population genetics program, Mendel's Accountant. Applying realistic levels of biological noise such as the actual mutation accumulation with the H1N1 influenza virus, they show an ongoing accumulation of low-impact deleterious mutations, with deleterious mutation count per individual increasing linearly over time that will not generate new information. Typical functional nucleotides in a large eukaryote genome have contributions to fitness much smaller than is necessary for the origin of these nucleotides. They contrast their results with another evolutionary simulation program, Avida, which leads to production of genetic information by the neo-Darwinian mechanism of mutation and natural selection. The apparent disparity between the two programs results primarily from differences in default settings. When settings reflecting biological systems are applied to both, they reveal barriers that can prevent the progressive evolution of novel genetic information. The theories of mutation count and synergistic epistasis that accelerate selection against deleterious mutations are falsified with realistic biological conditions. To demonstrate the efficacy of their Mendel Accountant simulation program, they report that it models the observations that most strains of influenza appear to routinely go extinct because of natural genetic attenuation due to mutation accumulation in recent viral outbreaks in Asia and Africa.

Seaman compares the human genome with computer codes. Data visualization reveals that executable codes regularly make extensive use of tandem repeats that exhibit similar visual patterns in higher genomes. These suggest convergent evolution constrained by design algorithms. Johnson presents the new fields of biocybernetics, the study of life's hardware and software systems, and biosemiosis, which studies biological systems made of two independent worlds connected by the conventional rules of a code. He uses the artificial synthesis of a bacterium by Craig Venter's team to illustrate that when the operating system (DNA) was replaced, the interacting computers in the cell (ribosomes, ER, etc.) remained intact and were able to function by using the replacement software. Thus, neo-Darwinian theory needs to provide scientific explanations of the origin of cellular information compatible with information science.

Section Three: Theoretical Molecular Biology
Macosko and Smelser present recent evidence that the Standard (genetic) Codon Table is optimally tuned for the transmission and maintenance of biological information. If design is considered without materialistic bias, the discovery and future research of its optimization may be accelerated as compared to the discovery of the Rosetta Stone in deciphering hieroglyphs. Dent proposes that the high fidelity and efficiency of intracellular processes and the molecular motion in the cytoplasm is not truly random, but is vibrationally directed and coherent due to a community of oscillator structures within chromosomes and proteins. Even though no surface vibrations were detected by laser-Doppler vibrometry in living cells, DNA vibration evidence may suggest future productive research.

Behe examines experimental work in recent decades and current genomic studies of adaptation in natural populations. They attest to the importance, even dominance, of loss-of-function mutations in short-term evolutionary episodes, thus threatening the progressive evolution of new traits that depend on the accumulation of gain-of-function mutations. Wells reviews the evidence that two- and three-dimensional information-carrying patterns in membranes are likely to entail more specified complexity than the one-dimensional information in DNA sequences, making beneficial "mutations" in such patterns much less probable than beneficial mutations in DNA.

Axe and Gauger review the systematic difficulties that a bottom-up Darwinian process of a metabolic pathway faces, from the multiple levels of gene expression to causal metabolic interactions networks. They propose tentative principles that assume a top-down paradigm consistent with biomimetics, reapplying biological innovations in human technology, and sys-

tems biology, performing measurements on whole systems instead of their isolated parts to replace it.

Section Four: Biological Information and Self-Organizational Complexity Theory
Noted self-organization theorist Stuart Kauffman boldly proposes that no law entails the detailed evolution of the biosphere and the end of a physics worldview. He uses self-organization as a kind of "natural magic." The spontaneous assembly of molecules interacting with selection creates the biosphere. It seems to echo James Shapiro's natural genetic engineering, a form of vitalism.

Finally, acknowledging the challenges posed by developmental biology and the evolution of complex systems, Weber advocates an emergentist position, in which both the upper and lower levels are with causality. He and Kauffman seek a possible fourth law of thermodynamics and see progress being made under the Darwinian Research Tradition. He seems to represent the paradigm of current thinking in meta-evolution that emphasizes the evolution of mechanisms that assist evolution.[1]

This volume is a milestone in the scientific discussion of the origin and development of biological information not encumbered by a commitment to methodological naturalism (MN). Even though many Christians believe that a commitment to MN is not the same as a commitment toward philosophical naturalism, some argue that in the realm of origins science, philosophical commitment directly influences the direction of research.[2] Since MN is a *provisional* and not a *necessary* requirement for scientific research,[3] this volume should serve as a stimulus for others who question the efficacy of neo-Darwinism to persist in their effort to find new solutions in the controversial origins of biological information.

Notes

[1]L. Caporale, *Darwin in the Genome: Molecular Strategies in Biological Evolution* (Columbus, OH: McGraw-Hill, 2003).
[2]P. Pun, "Response to Professor Alvin Plantinga's article on 'When Faith and Reason Clash: Evolution and the Bible,'" *Christian Scholar's Review* 21, no. 1 (1991): 46–54; N. Geisler and J. K. Anderson, *Origin Science: A Proposal for the Creation-Evolution Controversy* (Grand Rapids, MI: Baker, 1987).
[3]A. Plantinga, "Methodological Naturalism?, Part 1 and Part 2," *Origins and Design* 18, no. 1 and no. 2 (1997), http://www.arn.org/docs/odesign/od181/methnat181.htm; http://www.arn.org/docs/odesign/od182/methnat182.htm.

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Religion & Science

IN PRAISE OF DARWIN: George Romanes and the Evolution of a Darwinian Believer by J. David Pleins. New York: Bloomsbury Academic, 2014. xviii + 294 pages, chart, appendix, notes, bibliography, index. Paperback; $34.95. ISBN: 9781623565947.

Some books do not fit neatly into genre categories. J. David Pleins offers us an excellent example of a multidisciplinary work with *In Praise of Darwin*. It is part history, part literary critique, part philosophy, and part theology.

The book begins with a chapter exploring the personal history of George John Romanes. Romanes, a lesser-known figure amongst the giants of Victorian science, was the youngest of Darwin's close friends, and the heir apparent to Darwin's work at the time of his death. The opening chapter sketches Romanes's personal struggle with faith and his relationship with Darwin. Stricken by grief and existential angst after the death of his mentor in 1882, Romanes crafted over the following years a 50-page *Memorial Poem*, wherein he struggles through the questions of life, death, love, and faith.

Pleins found the full version of this poem, long thought to be lost, and has published it here for the first time. The heart of *In Praise of Darwin* is a five-chapter, poem-by-poem exposition of the composite *Memorial Poem*. Pleins calls the whole piece "one of the most daring treatments of the relationship between faith and science to come to us from the nineteenth century" (p. 14). The savvy reader, after the opening chapter, will not proceed directly to chapter 2, but will flip to the book's appendix and read the full *Memorial Poem* to experience the raw passion and power of the piece at once.

Chapters 2–5 each explore a different theme that groups the short poems of the larger work into sections. Chapter 2 explores the poems relating to Darwin's funeral in Westminster Abbey, which serve to shed further glory on the already-immortal figure of Darwin. Chapter 3 contains poems of the passionate struggle with the finality of death, including what Pleins calls an "anti-sermon on greatness and grief" in which Romanes chastises those who extolled from pulpits Darwin's great accomplishments without having known or loved the man behind the work. These reflections lead naturally into chapter 4 on the nature of fame. To pursue it is folly, yet—paradoxically—fame still stands as a sure marker of greatness.

Chapter 5 expounds upon the poems that emerge from Romanes's return to Down House a year after Darwin's death. Once again he struggles through his profound sense of loss and the emptiness of the world without his beloved mentor. Yet, he realizes that now he sees nature through Darwin's eyes, with evolutionary lenses. Thus Darwin lives on and nature is enlivened anew.

The reader, at this point, will emerge with a rich picture of the private sides of both Romanes and Darwin. Particularly evident is Romanes's passionate hero-worship of Darwin, and the momentous effect of his death. These are not philosophic treatises on the relationship of science and religion; they are a poignant reflection on the nature of grief, love, life, and death. Each short poem is divided from the others by Pleins's commentary. His exposition is interspersed with contextual details, short anecdotes, and letter excerpts that help illustrate what Romanes might have been alluding to in his poetic musings. Yet much of the commentary is simply breaking down the poem:

> With "Reason" as the anchor, the unsettling "chaos" of line 2 is tamped down by the steadiness of "calmness" of line 3. The poet scatters throughout the quatrain a smattering of "s," "sh," "c," and "ck" sounds, like so many bricks strewn around a collapsed building. (pp. 171–72)

Chapters 6 and 7, however, contain perhaps the most interesting parts of the book for the scientifically minded reader. Chapter 6 contains the last part of the poem, in which Romanes reflects openly on the question of natural selection and the ubiquitous suffering in the evolutionary process. He anticipates, by more than a century, Holmes Rolston III's concept that nature's suffering is "cruciform"—that the great goods of evolution emerge directly out of the great harms, and that this emergence is analogous to the redemption found in the death and resurrection of Jesus. He ends with a vision of science and religion as bride and groom and recognizes that great mystery is involved in every part of the human search for truth.

Chapter 7 moves on from the *Memorial Poem* and traces Romanes's ongoing struggle between rationality and faith, both in the public sphere and in the private. Drawing from letters, poems, articles, and lectures, Pleins presents the most sensitive and nuanced account of Romanes's inner journey now in print.

If one small criticism is to be made, it is that where other historians have been too quick to dismiss Romanes's journey toward theism (such as Frank Turner and Joel Schwartz), Pleins presents sometimes too unproblematic a view of that journey. Pleins does not make enough of Romanes's statements of disbelief, at least not in the main text. The nuance of the poet's doubt is left largely to those who delve into the detail of the endnotes and have access to compilations of Romanes's letters. And, occasionally, Pleins downplays the importance of the shocking nature of some of the doubts Romanes expresses in his *Memorial Poem*. For example, when Romanes claims "Love, thou art God, and God is love," and two poems later writes, "Almighty Death! … love made not thee; thou madest Love," the implication that Romanes is saying that God is simply the creation of the human response to death is not perceived.

Some will want to read this book because of the poignant reflections on grief and loss. Some will be enriched by Romanes's vision of the compatibility of science and religion. Others will appreciate the light it sheds on Romanes's much-contested faith journey. Whatever else this book achieves, historians will now have to include the *Memorial Poem* as Romanes's fourth great theological work, alongside the other already-recognized three: *Christian Prayer and General Laws, A Candid Examination of Theism*, and *Thoughts on Religion*.

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THE BODY OF FAITH: A Biological History of Religion in America by Robert C. Fuller. Chicago, IL: The University of Chicago Press, 2013. 231 + xiv pages. Hardcover; $35.00. ISBN: 9780226025087.

The first blurb on the dust jacket asks: "What would a history of American religion look like if it were grounded … in the genetics, hormones, sexual organs, bilateral structures, and sensorium of the human body? That is precisely what Robert C. Fuller gives us …" (Jeffrey J. Kripal). The expectation was not fully met, and could not have been at this time, because we do not yet know enough. But Fuller has made a worthy attempt.

This volume is part of the Chicago History of American Religion series. I am not a historian, but even this biologist has heard of the work of the University of Chicago on the history of religion in the US.

Body of Faith is about Christianity, and religions related to Christianity, in the US. It barely mentions Canada and other parts of the New World, or Native American religions, in spite of the subtitle. With these limits, it does describe much of the important history of religion in America.

The author says little about the supernatural aspect of religion. Instead, he is concerned about the political, social, psychological, and geographical influences on belief. He is convinced that religious behavior, at least in part, is the result of natural selection. The title, like the blurb quoted above, implies that the book will show that diet, blood pressure, and the like also influence religious belief and practice. They probably do, but the author's case is not strong. He dwells on emotions and sets considerable store on their influence. "Distinct emotions have distinct biological functions …" (p. 39) but "identifying specific emotions, however, is neither easy nor precise" (p. 39). That is an understatement.

The discussion of the history of the Mormons was fascinating. As Fuller says, "The Latter-Day Saints were bold and adventurous," and had "little … concern for conformity …" (p. 66). But that does not describe them now. Why? Fuller does not have a solid biological explanation for this. But he does say that Joseph Smith, the founder, inspired awe, an emotion, and that there may have been selection for conformity among Mormons as time passed.

Fuller also discusses the history of the Great Awakening and the Second Great Awakening. He mentions African-American religious practice. He realizes that more women than men are involved in religious bodies, and suggests that the reason has to do with the desire for stability, which is stronger in women than in men. Religious practice is usually comforting and provides a sense of security.

Fuller writes about the decline of liberal church attendance and the increase in attendance in more-conservative churches, attempting to explain this by our need to be bonded into social units. He considers the relatively high level of participation in religion in the US, compared to Europe, and concludes that people in the US are under more stress than they are in the Old World. This seems highly speculative.

The book has an appropriate scholarly apparatus with lots of notes. But the author does not always treat his sources well. On page 49, the author quotes Charles Grandison Finney, noted revival preacher, as saying that a conversion "is not a miracle or dependent on a miracle in any sense … it consists entirely in the right exercise of the powers of nature." Yes, Finney said that, but, in the original, Finney was not discussing conversion, but revival. In the same lecture, Finney also said,

> Religion is the work of man. It is something for man to do. It consists in obeying God with and from the heart. It is man's duty. It is true, God induces him to do it. He influences him by his Spirit, because of his great wickedness and reluctance to obey. If it were not necessary for God to influence men—if men were disposed to obey God, there would be no occasion to pray, "O Lord, revive thy work." (Finney, *Lectures on Revivals of Religion*, Lecture I; Public Domain, http://www.ccel.org/ccel/finney/revivals.iii.i.html)

The author's statement indicates that Finney believed that all that was necessary for conversion was to manipulate the emotions. However, Finney clearly believed in the necessity of God's supernatural work, based on the second quotation from the same work. Finney's point was that the church should not sit back and expect God to revive it, but that the church should do those things that lead to revival, so that God can work. Fuller took a few words out of context to support his thesis, when the original source does not.

As another brief example, on page 90, Fuller says that the book of Revelation portrays the Antichrist. Not by name, it does not.

The book is a decent enough history of religion in the US. The author's idea that our emotions, and even our genetic history, may influence our religious practice is probably valid, at least to some degree. It is also true that the rituals of religious practice (whether formal or informal) are important. Movements and utterances by participants and the sense impressions accompanying various activities within a church probably influence us to become part of a religious body and to stay within it. Fuller is to be commended for pointing all of this out. But that should not be the whole story of Christianity, and the book almost leaves the impression that Fuller believes that it is. In closing, Fuller does admit that there may be real and supernatural influences on us: "Our experience of life thus hints at the possible—even probable—existence of some metaphysical reality." Indeed.

Body of Faith is not essential reading for most, but scholars and collections specializing in the history of religion in North America should consider it.

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A TROUBLESOME INHERITANCE: Genes, Race and Human History by Nicholas Wade. New York: Penguin Press, 2014. 288 pages. Hardcover; $27.95. ISBN: 1594204462.

Christians who work in science, especially in the biological sciences, are often at pains to explain to

other scientists and many of their Christian brethren how they reconcile their faith with their scientific worldview. When popular science writing conveys a distorted picture of science, it does not help the overarching issue of reconciliation of God's Book of Words with God's Book of Works. We are all familiar with the abuses of scientism in this regard, such as the fallacy of genetic determinism and the misuse of evolutionary science.

The new book by Nicholas Wade, *A Troublesome Inheritance*, is a troubling example of nonscience being used to bolster a bad idea. In particular, the book is a good illustration of the dangers of certain widespread misunderstandings about the science of evolution and genetics. Wade concludes that human evolution proceeded recently and divergently among "the three major races" and that such "genetic evolution" explains many behavioral differences, including, among other things, why Jews are smart and why western cultures are more technologically advanced than others.

In his review of human history, Wade claims that genetic changes were involved in major transitions. We are told, for example, that within the few centuries just prior to the Industrial Revolution, people in England genetically evolved to be less violent, more hardworking, and more trusting of government and strangers, while people in the Middle East remained largely tribal in their behaviors and Islamic civilization declined as a consequence. The proposed reason for this difference is that, in the Middle East, modern-state-compatible behaviors were not selected for because people lived under "largely predatory" regimes that "extract[ed] taxes from their citizens but provide[d] few services." How this circumstance was not true for medieval England is not clear, and of course the actual genes supposedly responsible for these changes are not identified.

In many parts of the book, what Wade claims to be a central concept is nicely refuted by his own writing. When it comes to the question of how many races there are, Wade usually refers to three or five "major races," and admits that it is possible to think of seven races. He even says, "the more DNA markers that are used … the more subdivisions can be established in the human population." It is not clear why Wade does not see this as a fatal error in his overall thesis. He is absolutely correct that the number of races defined by genetics is indeterminate and that fact renders the concept of racial biology meaningless. Furthermore, if one *were* inclined to divide the human population into three groupings according to genetic distances (F_{st}), they would not be Africans, Asians, and Europeans (as Wade says), but Africans, Australians, and everyone else, including everyone from Asia, the Americas, and Europe.

In his discussion of the genetics of populations, Wade follows a minimalist definition of evolution as an inherited change in allele frequencies in populations. Allele frequencies differ to various degrees among all populations, defined in any way one likes. Most people think of evolution as the mechanism by which new species arise from common ancestors (descent with modification), but this is emphatically not what Wade is talking about.

The fact that there is some extent of allelic frequency variation in the human population (though actually very little compared to other primates) does not in any way imply evolutionary changes leading to permanent divergence, which requires fixation of alleles in defined and usually isolated populations. For example, we know that chimpanzees and humans evolved from a common ancestor and that the differences between chimp and human behavior are understood to be genetically fixed and a result of evolution. From this, it follows—Wade tells us—that the differences in social behaviors between different human cultures are the result of genetic evolution too. But even Wade admits that none of the human allelic changes found between populations have become fixed; all of them are reversible, and they do not lead to permanent or significant alterations in the critical phenotype of any human population. The analogy to human/chimp evolution is scientifically absurd.

While it is true that Africans have some unique genetic polymorphisms (one of which was discovered by one of us[1]) and that the mutations allowing for malaria resistance and lactose tolerance in adults began as regional changes under strong selection, these examples of population-specific genetic alterations actually refute rather than support Wade's racially based evolutionary claims. Lactose tolerance began as local variants, but has spread over the globe, and is still spreading.

Among the most telling cases of self-refutation of Wade's hypothesis is the example he gives of African Americans losing the sickle cell trait SNP because malaria is no longer providing a strong selection pressure on this population. His example refutes the idea that Africans have undergone any sort of actual evolution, since within a very brief time span the proposed phenotypic segregation of Africans due to selection for the S allele in hemoglobin is being *reversed*. The same kind of malleability is true of

many so-called racial features such as skin color and body shape.

Human populations have been on the move and intermixing for the past 50,000 years. While some human genetic isolates exist, they are rare and represent a tiny fraction of the total human population. Wade does admit that there exist some populations that he calls "admixed," such as the modern residents of Ethiopia who are genetically more European than African. But what he does not seem to understand is that all human populations are mixed—there are no genetically "pure" populations. The idea of a pure race is pure myth.

Wade speculates that Jews have undergone some kind of selection for genes conferring higher intelligence because some of them (actually the wrong ones) were bankers during the middle ages. Wade bases this absurd idea on a misunderstanding of the scientific literature. What the key paper actually showed was that by principal component analysis of 550,000 genetic markers, European Jews can be identified and differentiated from non-Jewish Europeans.[2] This does not mean that Jews differ in any allelic frequencies from other Europeans, only that familial relationships can be detected. It would be quite surprising if the results presented in the paper were not obtained, and they have nothing whatever to do with "evolution."

Despite being a respected science journalist, the author frequently fails to distinguish between scientific arguments based on data and conjectures that are not. Two examples illustrate this serious deficiency. Wade mentions and does not dispute the work of Richard Lewontin showing that there is less genetic variation between populations than between individuals regardless of what population they belong to. To counter this, Wade cites Sewall Wright, as quoted in a famous textbook.[3] The very same textbook clearly indicates that the total average human F_{st} is less than that of different villages within the Amazon tribe of the Yanomamö, confirming Lewontin's point. Neither the textbook's authors nor Wright disagreed with Lewontin's conclusions on the relative importance of genetic diversity within compared to between populations.

The use of pseudo-scientific arguments to advance philosophical and political agendas is quite familiar to most readers. From eugenics to social Darwinism to some of the antitheistic arguments of the new atheists, the name of science has been misused to cloak questionable ideas in a mantle of unassailable truth. The Christian belief that all human beings are created equal in the image of God is a matter of faith and not a scientific statement; there is no scientific evidence to refute it.

Notes

[1]F. Crofts, G. N. Cosma, D. Currie, E. Taioli, P. Toniolo, S. J. Garte, "A Novel CYP1A1 Gene Polymorphism in African-Americans," *Carcinogenesis* 14, no. 9 (1993): 1729–31.

[2]A. C. Need, D. Kasperaviciute, E. T. Cirulli, D. B. Goldstein, "A Genome-Wide Genetic Signature of Jewish Ancestry Perfectly Separates Individuals with and without Full Jewish Ancestry in a Large Random Sample of European Americans," *Genome Biology* 10, no. 1 (2009): R7, doi:10.1186/gb-2009-10-1-r7.

[3]Daniel L. Hartl and Andrew G. Clark, *Principles of Population Genetics,* 3rd ed. (Sunderland, MA: Sinauer Associates, 1997).

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TECHNOLOGY

THE GLASS CAGE: Automation and Us by Nicholas Carr. New York: W. W. Norton, 2014. 288 pages, notes, index. Hardcover; $26.95. ISBN: 9780393240764.

Nicholas Carr, author of popular technology books including *The Shallows*, *The Big Switch*, and *Is Google Making Us Stupid?* preaches another sermon in *The Glass Cage*, his newest book about technology. He echoes millennia of concerns about the detrimental effects of technology on humans if we continue to lunge full steam ahead toward a future of unintended consequences. Carr's sermon ends with a poem. That reminded me of classical Chinese thinkers who valued harmony with nature as more important than conquest of nature, and therefore elevated poetry over technology and mathematics.[1]

Only recently have Western philosophers criticized technology. Aristotle "argued that slaves and tools are essentially equivalent" (p. 224). But he was in favor of both. Adam Smith in 1776 claimed that because of industrial machines, laborers would lose "the habit of ... exertion, and generally become as stupid and ignorant as it is possible for human creatures to become" (p. 106), but he also claimed that the machines would bring workers "convenience and luxury" (p. 22). Alfred North Whitehead a century ago encouraged the use of "technological aids" (p. 65) to free hands for greater dexterity, to free minds for richer intelligence and decision making, and to free souls for a broader perspective (p. 66). But today the

human is the clerk and the automated system is the decision maker (p. 66). Carr asks, "What if the cost of machines that think is people who don't?" (p. 113).

Carr details his complaint in at least three areas. First, in controlling a plane or car—or in wayfinding in general—automation results in humans losing skills. Pilots "without their digital assistants … feel helpless" (p. 12). New generations of Inuit who find their way across the tundra using GPS lose their ability to find their way without automation. They die when their GPS dies (p. 126). Second, computer-aided architecture gives way to an inhospitable style called "parametricism" that begins with the CAD software instead of beginning with insight and pencil sketching (p. 140). Third, computerized medicine actually hinders evidence-based practice of medicine. When a physician diagnoses a patient based on electronic medical records, she loses the ability to grasp how thick the patient's file is, how many different hands have prepared it, and how intensely each contribution is or is not made—all tacit clues that inform her judgments.

To keep workers thinking, claims Carr, we must design tasks that involve moderate stimuli—neither unusually weak nor unusually strong stimuli. Psychologists Yerkes and Dodson discovered over 100 years ago that mice learned best in such an environment (p. 89). We must promote "human-centered automation," which, thanks to regular feedback, is "adaptive," keeping "the operator at the peak of the Yerkes-Dodson performance curve" (pp. 164–65). We must limit technology (p. 154). We must avoid "an almost religious faith in technology" (p. 160). We must not allow computer programmers to "legislate" what should be automated (p. 161).[2]

But who is this "we"? In the case of Inuit wayfinders, Carr is clear: The "tribal elders" decide. Carr is rightly concerned about Big Brother deciding for us (p. 194). He fails to offer examples to support his concern that technology can be used for evil. I offer a strong example: Adolf Hitler used tabulating machine cards—the height of technology of his time—to track Jewish families marked for destruction.

Carr admits that ethical issues can challenge a pluralistic society. A Roomba automatic vacuum cleaner, for example, is an ethical robot in the sense of Isaac Asimov's Three Laws of Robotics because it harms no humans, but not ethical for a Jainist because it harms insects (p. 185).

Initially Christians were optimistic about technology. Carr gives as an example Sir Francis Bacon's seventeenth-century utopian novel *New Atlantis*. In recent decades, however, Christians have been more pessimistic about technology. Readers of *PSCF* will be familiar with Michael Polyani and Jacques Ellul as two examples, although Carr mentions neither author. As early as 1953, Polyani warned us that although machines can model algorithmic knowledge, they overlook tacit knowledge—a point which Carr makes as well (pp. 9, 105, 144). Ellul worried that with technology "means … have established primacy over ends"[3] and Carr echoes the warning.

Christians know that work is not the curse of Adam. Carr agrees with Christians that work should bring joy and freedom (pp. 20, 232). But we miswant: "We're inclined to desire things we don't like [such as leisure] and to like things we don't desire [such as work]" (p. 15). The term "miswant" is only fourteen years old; the sentiment is as old as Romans 7, for we too easily sell our birthright of long-term gains for the mess of pottage that is immediate gratification.

The strength of Carr's book is that it is a lively, up-to-date, interesting, often first-person account of the problems that society faces in the "quasi-Darwinian process" (p. 173) of increasing technology. The weakness of Carr's book is that it is short on solutions. But that is true of most other accounts of our technological future. The book includes an index and endnotes, but a bibliography would have been helpful. If you do not already know what Carr has said repeatedly in blogs, news articles, and his previous books, then *The Glass Cage* is an excellent introduction to his passion for the right use of technology. He should say more about how we decide what that right use is.

Notes

[1]Frank J. Swetz, "How does a society support and nurture the growth of an intellectual discipline?" Lecture at Messiah College, Mechanicsburg, PA, March 4, 2010.

[2]Several books use the term "technological priesthood" instead of Carr's weaker term "technological legislators." For example, Robert C. Scharff and Val Dusek, eds., *Philosophy of Technology: The Technological Condition – An Anthology*, 2nd ed. (Hoboken, NJ: Wiley-Blackwell, 2014). They all credit Alvin M. Weinberg as coining the term "technological priesthood" in his "Social Institutions and Nuclear Energy," *Science* 177, no. 4043 (July 7, 1972): 34. In fact, that article contains the term "military priesthood," but not "technological priesthood."

[3]Jacques Ellul, *Living Faith: Belief and Doubt in a Perilous World*, trans. Peter Heinegg (San Francisco, CA: Harper and Row, 1983; Eugene, OR: Wipf & Stock, 2012): 86.

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