

HISTORY OF SCIENCE

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ON THE EDGE OF ETERNITY: The Antiquity of the Earth in Medieval and Early Modern Europe by Ivano Dal Prete. Oxford, UK: Oxford University Press, 2022. 214 pages of text plus 82 pages of notes, a bibliography, an index, and sixteen pages of black-and-white halftones. Hardcover; \$37.99. ISBN: 9780190678890. Kindle; \$25.99. ISBN: 9780190678890.

Ivano Dal Prete is a senior lecturer in the History of Science and Medicine program at Yale University. After receiving his doctorate at the University of Verona, he served as a visiting professor at Columbia, Harvard, and Minnesota before coming to Yale. He has published two prior books in Italian on early modern science and its culture. He is also an amateur astronomer and is the co-discoverer of several asteroids.

On the Edge of Eternity is a helpful and also a disturbing book. Dal Prete's explicit purpose

is to take the first steps toward a new paradigm for the history of deep time in Western culture. It aims to replace the view of a relatively recent discovery of the "abyss" of geological time with one that accounts for the complexity, diversity, and social and cultural significance of pre-modern Earth history. (p. 7)

In the process of his detailed narrative, he demonstrates how an originally multi-perspectival conversation could sadly devolve into polemics and escalating polarization, mimicking (or predicting?) what we have seen during the past century and a half.

Dal Prete carefully lays out the groundwork for his narrative in the first two chapters. Chapter 1, "Footprints in the Dust," concisely introduces classical sources such as Eusebius, Augustine, Avicenna, and Boethius, and their late medieval successors including Albertus Magnus and Thomas Aquinas. Of particular interest was the question of whether the world (today we might think of the material universe) was eternal or had a beginning in time (or with time). The question became highlighted following the translation of Aristotle's major works from Arabic into Latin during the twelfth century and played into the theses of the Fourth Lateran Council and later the controversies at the University of Paris during the thirteenth century. As Aquinas put it, reason could not assess whether the earth was eternal or not, but scripture settled the matter with an absolute beginning in time. However, many aspects of Earth history could be made to mesh with either viewpoint. This provided for a multiplicity of opinions and openings for merging empirical observations with philosophical perspective.

For example, Noah's Flood could be a global catastrophe or a local catastrophe; further, it could be a singular event or one of many, repeatedly forced by hypothesized interchanges of land and water, hinted at in Aristotle's *Meteorologica*.

Chapter 2, "The Medieval Earth," summarizes multiple running debates, extending through the fourteenth century. A problematic issue was the origin of mountains. Erosion of highlands was easily observable, and without a mechanism to raise new highlands, the only result could be the washing of the entirety of the exposed earth into the sea. Thus, without such a mechanism, Earth's age would be constrained. But perhaps Aristotelian or Ptolemaic understandings of Earth's figure and the sea-land boundary could be used to support many cycles of erosion and sedimentation, resulting in new uplifts. Claims for astral influences were yet considered possible by many as well. Dal Prete examines the give-and-take between intellectuals such as Jean Buridan, Albert of Saxony, Pierre d'Ailly, and Dante Alighieri, among others.

Chapter 3, "Vernacular Earths, 1250-1500" broadens attention to the northern Italian Renaissance community of the mercantile class, including artisans and engineers, outside the university faculties. During this period, translations of the classical authors into vernacular dialects became widely available, as well as newer encyclopedic summaries of useful knowledge—for example, mathematics, astronomy/astrology, medicine. Coincidentally, northern Italy developed as a major mining center, which literally opened up fertile material (rocks) for speculation. The nascent science of stratigraphy was developing, two centuries prior to Steno. Dal Prete convincingly argues that Leonardo da Vinci was not a lone predecessor of modern natural science, as is often depicted, but rather "just the most celebrated representative of an extremely rich and variegated tradition" (p. 77). Further, typifying his cultural milieu,

Leonardo's writings do not provide the slightest hint that the idea of a young Earth ever crossed his mind. The Italian artist failed to bring up the problem not because it was too much an issue, but because it was not an issue at all. While his world was expanding horizontally toward other continents and vertically in the underground, the one dimension that did not need to be enlarged was time. (p. 90)

If this book were a novel, Dal Prete would have now laid the detailed foundation for ensuing confusion, conflict, and misrepresentation. Unfortunately, this is not a novel. Things begin to unwind in chapter 4, "A 'Pious' History of the Earth? 1500-1650." Here, Dal Prete

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explicates the creative attempts to formulate a physico-theology for Earth's historical development during the period of the Reformation. Within Reformation-era Protestantism, the principle of *Sola scriptura* settled the question of Earth's possible eternity. Earth had a definite beginning in (linear) time. But *Sola scriptura* could be employed to argue for a face-value interpretation of the genealogies of Genesis, plus a 24-hour-day view of the Creation week, to yield a very compressed Creation account. Reflexively, Counter-Reformation scholars, in their efforts to outdo their Protestant counterparts, often employed the same tactics and principles to take back the "high ground." Their efforts were also responses to the great voyages of discovery, which revealed whole segments of humanity previously unknown to the Christian world. What was the relationship of the inhabitants of the New World to the biblical genealogies? A strict appeal to the Flood of Noah as a singular Earth agent provided an anchor for a lineal descent of the American aboriginal population from Noah and therefore from Adam; they were thus inheritors of the Divine image.

Chapter 5, "The Rise of Diluvialism, 1650–1720," expeditiously covers a lot of territory that will be familiar to many of our readers. During this period, early Earth scientists, including Kircher, de Maillet, Aldrovandi, Scilla, Hooke, Burnet, Woodward, Vallisneri, and others grappled with observations of marine fossils in layered rocks exposed in mountains. They pondered a possible relationship to the Noachian Flood, but derived disparate histories. Some retained a modified Aristotelian Earth, with a protracted history of alterations of land and sea. Some natural historians attempted to meld the rock record with a Noachian Flood in a Newtonian gravity-driven world. Others argued for the strictly miraculous nature of the Flood of Noah, that could not be expected to yield a record in the rocks. But overall, "the idea of a 'Mosaic' natural philosophy met with considerable success, and its influence was profound" (p. 127).

In chapter 6, "The Invention of the History of Deep Time, 1700–1770," Dal Prete examines a diversity of Enlightenment-era historians and philosophers. These vary from Christians (e.g., Leibniz, Calmet) to deists (Voltaire, Buffon) to atheists (de Maillet, Diderot, Boulanger, d'Holbach). Their proposed schemes for cosmic and human prehistory demonstrate varying familiarity with real Earth phenomena, as well as an expansive willingness to speculate beyond the evidence at hand. However, they realized correctly that Earth must be quite old. Unfortunately, the increasingly strident, even vicious, polemics that some of these thinkers offered against the Christian faith engendered a

wide range of popular respondents. And unfortunately, many of these respondents easily seized on diluvialist versions of Earth histories to rebut anti-Creation philosophies. Thus, a century and a half before European and American rationalists invented the "warfare" thesis, a popular perception began to emerge that materialist philosophies often went hand-in-glove with the study of nature.

At this point, Dal Prete returns to Venice and north-eastern mainland Italy, in chapter 7, "Political Fossils, 1740–1800." Italian translations of works of the French materialists began to appear in northern Italy in 1740. Up until this time, there had existed a strong community involvement in natural history pursuits. These included clergy: the priest Giovanni Giacomo Spada is reported to have put together a collection of fossil fishes (from the nearby site of Monte Bolca, famed among modern paleontologists) that was far superior to that of John Woodward. But after 1740, numerous books appeared arguing the diluvialist cause. Fossils were co-opted as evidences for the Flood and a young age of Earth. Dal Prete carefully chronicles how the political and economic elites of the region "elaborated a diluvialist orthodoxy allegedly supported by 'true philosophy' and 'sane science,' which appeared very different from the Earth history many enlightened Catholics conceived only a few decades earlier" (p. 183).

I found this book useful (but disturbing) for three reasons: (1) Dal Prete demonstrates that prior to AD 1700, many serious Christian scholars realized Earth was an old object and saw no theological problem; (2) the classic fairytale of some age-long conflict between Christianity and natural science began to be manufactured during the eighteenth century, long before Draper, White, and others in the later nineteenth century; and (3) Dal Prete demonstrates that the oversimplistic claims and harsh rhetoric of the diluvialists of the seventeenth and eighteenth centuries, provoked by and responding to erudite but self-important atheists, eerily presage the writings of twentieth-century diluvialists. And thus, the magnificence of God's creative activity in deep time is clouded by verbiage. Ouch.

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READING THE BOOK OF NATURE: How Eight Best Sellers Reconnected Christianity and the Sciences on the Eve of the Victorian Age by Jonathan R. Topham. Chicago, IL: University of Chicago Press, 2022. 544 pages. Hardcover; \$47.50. ISBN: 9780226815763.

Jonathan R. Topham's *Reading the Book of Nature* examines the interplay between science and religion in nineteenth-century Britain, focusing on the *Bridgewater Treatises*—an influential collection of eight scientific works commissioned to explore the “Power, Wisdom, and Goodness of God, as manifested in the Creation.” Armed with a rich array of primary sources, Topham is particularly interested in setting this interplay against the backdrop of the evolving print culture. Topham's is not just a treatise on treatises, nor simply a history of ideas, but an exploration grounded in the lens of book history, which involves investigating the production, distribution, and reception of printed materials, including books, periodicals, and pamphlets. Topham thus wants to understand the entire “network of communication” in which the *Bridgewater*s were enmeshed, including publishers, reviewers, libraries, and readers.

Topham divides the book into three parts. The first examines the authorship of the *Bridgewater*s themselves, revealing the complicated (and often contested) process of “writing God into Nature” (p. 107). Chapter 1 navigates the intricacies of establishing oneself as a scientific author, which posed multifaceted challenges. Topham shows that many practical matters consumed the time of the authors, and sometimes delayed their work a great deal (p. 105). Moreover, the task of writing was rarely solitary. Topham highlights the collaborative nature of writing, emphasizing the contributions of the authors' wives and female relatives (pp. 91–105).

What is most interesting in this part, however, and which Topham emphasizes again and again throughout his book, is that the *Bridgewater*s should not be seen as mere works of “natural theology.” Though the authors relate their work to William Paley's *Natural Theology* (1802), the *Bridgewater*s were not simply new arguments from design. They adopted a more comprehensive approach, examining various scientific disciplines to showcase the harmony between science and theology (p. 80). Topham introduces the concept of an emerging “theistic science,” suggesting the series aimed to reassure readers that science and religion were not adversarial but rather mutually reinforcing (p. 14). It was, in short, an effort to present a tamed science tailored to align with Christian sensibilities.

In chapter 2, Topham examines the intended purpose of the treatises, such as the need to respond to popular science treatises and their alleged association with radical thought, particularly to the utilitarian approach to science advocated by such thinkers as John Stuart Mill or the materialism of French scientists such as Baron D'Holbach and Pierre-Simon Laplace. Indeed,

according to Topham, it was mainly “French speculators” who motivated the *Bridgewater*s (p. 166).

In part two, Topham explores the significance of selecting a reputable publisher for the *Bridgewater*s. Chapter 3 gives insight into the decision to publish with William Pickering rather than John Murray. Murray was known for both its literary and scientific focus, publishing works by Jane Austen, Lord Byron, Charles Lyell, and Charles Darwin. This made the John Murray Publishing House a hub for nineteenth-century intellectual and literary circles. Conversely, Pickering was mostly known for classical literature, including works by John Milton and William Wordsworth. Because the *Bridgewater*s needed to be seen as “dignified” (p. 189), the authors were more philosophically (and socially) aligned with Pickering, with its focus on high-quality printing, crucial for the series' numerous iconic illustrations (p. 205). The authors settled nicely with a “publisher who was used to producing beautiful works for gentlemanly connoisseurs” (p. 224).

Chapter 4 offers a comprehensive overview of how the *Bridgewater*s were “serialized” — that is, how they were critically reviewed in scientific and religious periodicals. In general, the *Bridgewater*s were well received within academic and intellectual circles. Many scholars appreciated the efforts to reconcile scientific discoveries with religious beliefs. The series also had a notable influence on later Victorian thought, contributing to a broader conception of natural theology and the accessible popularization of science. Many religiously conservative periodicals were ambivalent if not “hostile” to natural theology (p. 246), albeit not natural theology in the traditional sense. If used properly, the “*Bridgewater*s could evoke suitable feelings toward God while developing an enlarged but theologically orthodox understanding of the creation” (p. 330). Periodicals less conservative than High Church and evangelical journals still found them “useful vehicles of scientific enlightenment” (p. 263). Medical and scientific journals, including the then radical *Lancet*, also found the *Bridgewater*s “trustworthy” (p. 273).

In the final section of his book, Topham focuses on case studies of “reading.” Chapter 5, for instance, looks at how the *Bridgewater*s were used, remarkably, in the daily devotional reading practices of several individuals. Some readers even promoted *Bridgewater*s as courtship reading material (p. 311)!

Chapter 6 explores how Christian preachers utilized the *Bridgewater*s to reinforce theological and moral lessons and offer “a positive vision of the sciences” (p. 331). This

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affirmation of the “religious tendency of the sciences” was all the more important in an era marked by a growing separation of science from theology.

Chapter 7 provides an interesting examination of how the authors of the *Bridgewaters* constructed an image of the Christian “man of science” in an era when many scientific practitioners wanted to establish a new identity of the man of science, in direct opposition to the clerical gentlemen of science that the authors represented. As Steven Shapin has pointed out, in early modern culture the “man of science” was heterogeneous in that it attached to preexisting roles. A number of key figures spent their whole lives working within religious institutions or sustained by clerical positions, such as Nicholaus Copernicus, Marin Mersenne, and Pierre Gassendi. The argument that God had written two books by which his existence, attributes, and intentions might be known was foundational for “natural theology” to such English clerics such as John Ray, Stephen Hales, Gilbert White, and William Paley. The naturalist-parson, Shapin contended, belonged to the century’s inventory of recognized characters, and the scientific portion of his activities was understood to flow from some version of what it was to be a minister.

But this “priestly” role is seen almost concurrently in other key figures who spent much of their careers as amanuenses, clerks, tutors, or domestic servants to the gentry and aristocracy. With the advent of the eighteenth century, we witness a vast expansion in the numbers of scientifically trained people employed as civic experts in commerce, the military, and government. The man of science as godly naturalist and moral philosopher buckled under the emerging identity of the valued civic expert. While professorial and medical roles included the “pious naturalist” and, more specifically, parson-naturalist, especially among Protestants, there was a growing perception by the beginning of the nineteenth century that men of science were objects of “religious suspicion” (p. 375). Thus the authors of the *Bridgewaters* strategically reemphasized “the vision of the man of science as pious, patient, and humble” (p. 390), “embedded within Christian orthodoxy and as inculcating Christian habits of mind” (p. 429).

Chapter 8 examines how the *Bridgewaters* influenced the scientific practices of notable readers such as Charles Babbage, Charles Darwin, Robert Chambers, Richard Owens, and William Carpenter. Topham illustrates how the *Bridgewaters* functioned as a foil, enabling them to negotiate between arguments advocating for intelligent design and those rooted in empirical scientific observation. The irascible Babbage, for instance, who published his own unauthorized *Ninth Bridgewater*

Treatise, appreciated the design arguments presented in the series, but offered a radically different “vision of God’s agency” (p. 436) which amounted to little more than deism. Darwin, moreover, included an epigraph from Whewell’s *Bridgewater* at the start of his *Origins of Species*, but the two ultimately disagreed on the mechanism of evolution.

In his conclusion, Topham returns to the *Bridgewaters* as promoting a “theistic science” serving “to assure a generation that the rapidly changing disciplinary sciences ... would feed rather than undermine Christian faith” (p. 471). They were a “godsend to the sciences,” he writes, convincing the public that the progress of science was not inimical to Christianity (p. 473). At the same time, the theological meaning of the *Bridgewaters* was “somewhat ill defined,” in part since most authors came from strikingly different theological orientations (p. 474). Topham concludes, as I did in my research on the liberal Christians John W. Draper and Andrew D. White, who are often labeled “co-founders” of the “conflict thesis,” that science and religion are fundamentally at war. While Draper and White believed that their liberal theologies offered a reconciliation of science and faith, secularists, free-thinkers, and atheists used their narratives as weapons against all religious traditions.

Similarly, Topham notes how the *Bridgewaters* led many radical thinkers, such as George Holyoake, to see theistic science as “hopelessly outmoded” (p. 477), hollow, and ultimately constraining science (p. 478). There seems to be a lesson here that, for whatever reason, today’s theologians and Christian men and women of science keep ignoring.

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NEUROSCIENCE

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NEUROETHICS: Agency in the Age of Brain Science by Joshua May. New York: Oxford University Press, 2023. 340 pages. Hardcover; \$110.00. ISBN: 9780197648087. Paperback; \$29.95. ISBN: 9780197648094.

Neuroethics, “the study of moral issues that are either raised or answered by neuroscience” (p. 4), is a relatively young field, whose origins are generally traced to the early 2000s. Despite its rapid growth since then, it remains unfamiliar to many, and over the years, numerous introductions and overviews have been written to make it more familiar. Joshua May’s new book, the latest in this line, is described as an “opinionated introduction” (p. 9). It has grown out of the author’s undergraduate course in neuroethics and is written partly

with students in mind. However, he aims to “[challenge] the distinction between a research monograph and a textbook” (p. xvi), not only introducing a representative range of neuroethical topics, but also contributing to the debates.

May follows Adina Roskies, one of the field’s founders, in distinguishing two main branches of neuroethics: the more practically focused “ethics of neuroscience” and the more theoretical “neuroscience of ethics.” He emphasizes, though, how “intertwined” (p. 6) these branches are. The design of the book reflects this: each of the four main parts consists of a pair of chapters on related topics, one more theoretical and one more practical in focus.

Before we reach these, a single introductory chapter is designated as Part I. This does a good job of defining and introducing the field, as well as summarizing the book and announcing May’s overall approach and conclusions. In addition, the chapter offers appendices with overviews of philosophy and neuroscience for readers unfamiliar with these disciplines. To put it mildly, this is an ambitious thing to attempt in a few pages of an opening chapter, but May succeeds in offering lucid and accessible accounts.

In the first main part, “Autonomy” (Part II), the more theoretically focused chapter (chap. 2) is on free will, while the more practically focused (chap. 3) is entitled “Manipulating Brains.” The former examines three threats that neuroscience might pose to the idea that humans have free will: determinism, physicalism, and epiphenomenalism (the last implying that our experience of conscious will is illusory). May argues that none of these rules out free will, but they do suggest that we are less free than we often think. Chapter 3 then explores ethical concerns about manipulating brain activity for therapeutic purposes, concluding that such interventions are legitimate, but a cautious approach to balancing risks and benefits is needed.

Part III is entitled “Care” (perhaps an odd title for a pair of chapters largely concerned with agency and responsibility). Chapter 4 focuses on mental disorders, asking “whether having a mental illness ... categorically exculpate[s] one for inappropriate behavior” (p. 116). May’s answer is that a “nuanced” view is required, in which we cannot generalize about the effects of mental disorder on agency and responsibility but must judge on a case-by-case basis. To my mind, while I generally agree with the conclusion, this chapter is less satisfying than much of the book. It is built on a contrast between “naïve” and “nuanced” views of the implications of psychopathology for responsibility, but the former seems

something of a straw man, as May himself comes close to acknowledging in the conclusion. One section of the argument, claiming that some psychopathologies enhance agency, I find rather unconvincing. And there are a few instances of careless expression, as when physical injury is categorized as a non-pathological effect on agency (p. 115, table 4.2). Chapter 5 continues in similar vein with a discussion of addiction, critically examining the “brain disease model” and arguing that conceptualizing addiction as a disorder (as distinct from a disease) does not imply complete loss of agency, responsibility, or accountability.

Part IV turns to the neuroscience of morality, with one chapter examining the neuroscience of moral judgment and another assessing the legitimacy of moral enhancement. The first is focused on the relationship and balance between reason and emotion in the making of moral judgments. It includes a well-judged critical account of Joshua Greene’s high-profile but controversial brain-imaging studies of moral cognition. This is followed in chapter 7 by an ethical evaluation of moral bioenhancement: the project to improve ourselves morally by the use of neurotechnologies such as psychoactive drugs or electrical brain stimulation. May develops a “presumptive case” (p. 175) in favor of this project and rejects a series of objections to it.

The final main part is entitled “Justice.” Chapter 8, “Motivated Reasoning,” begins with neuroscientific perspectives on self-deception, cognitive bias, and the like, then moves into a discussion of bias, questionable practice, and misconduct in science. While acknowledging the challenges—including those facing neuroscience, in particular—May takes an optimistic view of the capacity of scientific communities to produce genuine knowledge. This optimism feeds into the next chapter on brain reading, the use of functional neuroimaging to gain information about subjects’ mental activity, in which it takes two almost opposite forms. In criminal justice, May concludes that for all its limitations, brain reading can be useful in the courts. By contrast, he believes that it is unlikely to be effective enough in neuromarketing to seriously threaten consumers’ privacy or autonomy; other technologies such as big data pose greater threats. While May takes concerns about brain reading seriously, I can’t help wondering if his general aversion to alarmism tends in this chapter toward over-optimism. But it would take a longer discussion to settle that question.

May’s overall argument, spelled out in the concluding chapter, is for a “nuanced neuroethics” that avoids alarmism, takes evidence and complexity seriously, recognizes the likeness of neurotypical and neurodiverse

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people, and engages both neuroscience and philosophy carefully. The book is beautifully written, communicating complex content and ideas with admirable clarity. In general, I find it persuasively argued, with a few caveats of the sort indicated earlier. The structure of the book is effective in integrating the “neuroscience of ethics” with the “ethics of neuroscience.” Another valuable design feature is that each chapter begins and ends with a real-life case study, effectively keeping the book’s complex discussions grounded in concrete realities. However, most of the case studies are drawn from the world of criminal justice, which could give a rather skewed impression of the areas of human life on which neuroethics has a bearing.

I would certainly recommend May’s book to readers of this journal. While some of the content is complex and challenging, the clarity of presentation should make it accessible to advanced students. It would be a valuable text for an upper-level undergraduate or graduate class in neuroethics, as well as an excellent introduction for anyone prepared to work through some complex ideas and arguments. If I use it for my own classes, though, I shall need to supplement it, because one thing it does not address at all is religious and theological perspectives. This is not to fault May for not having written a different book: as a philosopher also trained in neuroscience, he brings these two disciplines together very adeptly. In this respect, the book also faithfully reflects neuroethics as a field, often a highly secular one in which religious and theological voices are not much in evidence. To my mind, there is work to be done to challenge that secularity and explore what difference a theological engagement with this field might make. But that is my agenda, not May’s.

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PSYCHOLOGY

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THE PERSON IN PSYCHOLOGY AND CHRISTIANITY: A Faith-Based Critique of Five Theories of Social Development by Marjorie Lindner Gunnoe. Downers Grove, IL: IVP Academic, 2022. 244 pages. Paperback; \$30.00. ISBN: 9780830828722.

As a teacher of counseling psychology in a faith-based (Christian) tertiary institution, Marjorie Lindner Gunnoe responds to the challenge facing her students to engage theologically with contemporary psychological science. Her goal is to facilitate a bridge between the (largely secular) theories that dominate the field of

counseling practice and the Christian faith of psychology practitioners and educators. To this end, Lindner Gunnoe develops what she sees as a trans-confessional (broad, not framed within a particular Christian theological tradition—though still largely Protestant) theological position about human ontology, motivation, and behavior, applying it to five key theories in contemporary psychology.

Linder Gunnoe’s “faith-based working model” (p. 2) presents a Christian stance along four dimensions: the essence of human life; human purpose; moral-ethical tendency; and agency and accountability. Lindner Gunnoe does acknowledge her own location in the Reformed tradition but references widely while eschewing any attempt to anchor her theology in that tradition. Most of the book is devoted to comparing the four dimensions of this faith lens to the theories and work of five twentieth-century shapers of contemporary psychology: Erik Erikson and his lifespan stages; John Bowlby and Mary Ainsworth’s attachment theory; B.F. Skinner’s radical behaviorism; Albert Bandura’s social learning theory; and evolutionary psychology broadly. For each theory, she identifies the way in which the questions posed by the four dimensions are answered (or not), asking how and if they are compatible with the faith-based position articulated at the beginning.

While the book is academic, written by an academic for academic teaching contexts, it is academic ‘light’ in reference density, using more accessible language suitable for practical theology and knowledge mobilization in the field. Lindner Gunnoe’s attempt to thoroughly understand and represent nuances in the writings of the psychology founders is appreciated. With each theory, she tries to present a balanced view, moving past the reductionist (and atheist) emphasis of the theories that is commonly presented in (secular) textbooks, by digging into a variety of primary and secondary sources. The book is thought-provoking, insightful, and interesting both from the standpoint of faith in practice, and from the field of psychology.

Making no claims to be a theologian, Linder Gunnoe offers reflections on the “temporal characteristics of personhood ... physical and psychological features manifest in our relationships with other humans and the rest of creation” (p. 5). Rather than approach her reflection from the traditional theological categories (e.g., ontology, teleology), she identifies the four key aspects of humanity that are addressed by biblical reference, and which pertain most directly to the field of psychological intervention (essence, purpose, morality/ethics, and agency/accountability).

Essence is the central intrinsic quality of humans (vs. other species) ascribed in Genesis 1: the image of God. She argues that this central feature continues to be important after the Fall, since it is later referenced in Genesis 9. It has substantive qualities (e.g., reason, embodiment, inherently gendered “different but equal”), relational qualities (inherent relationality, i.e., between genders, between humans and God), and functional qualities. The functional qualities relate to the task of “dominion” over the creation, which she describes in caring stewardship terms (i.e., careful management for the health of creation vs. “right to abuse” historically blamed on Christianity). It is the relationality and functionality of human essence that shape the purpose of humanity: love and “dominion work.”

Purpose in theological traditions may be emphasized differently, depending on the relative importance placed on relationality versus functionality. Lindner Gunnoe grounds the purpose to love in Genesis 2 (that humans should not be alone), as supported in the New Testament by Jesus’s statement that the greatest command is to love (Matt. 22) and by the many injunctions to love one another (Matt. 5, Rom. 12, 1 Cor. 12). That we are also created (in the context of love) to engage in creative work on the earth is seen first in Genesis 2. Later biblical references such as Ephesians 2 remind us that God has ordained creative work. There is an overarching telos which is the goal to become more conformed to the image of God (due to the Fall we are created in it, but some of our work involves spiritual work to return to a better reflection of it). Although there is an end goal spiritually, Lindner Gunnoe skirts the spiritual-eschatological debates (e.g., free will vs. chosen regarding salvation), to focus on “temporal” aspects (what we are meant to be doing in the here-and-now life).

Moral-ethical tendencies in the faith framework of this book refer to “propensities toward good and evil in our daily dealings” (p. 20), rather than to questions of eternal life. Rather than position the drives or motivations toward good or bad action as part of human essence, Lindner Gunnoe uses the term “tendency” to refer to a latent capacity that could go either way. Once again based on the opening chapters of Genesis, Gunnoe argues that humans are structurally good in an embodied way that allows us to be capable of God-like abilities (i.e., the choice of right, reason). They are additionally (since the Fall) also now inherently inclined (but not structurally, i.e., in nature) toward evil. After a brief review of different theological debates about the acquired versus inherent nature of evil, she describes the tendency to wrong as more of an emergent property. It is something that we are capable of, but only as

a warping of the core power that was initially created good (the image of God).

The issue of moral-ethical tendency gives rise to the issue of humanity’s degree of agency. Agency is framed as the degree and power of choice, whereas accountability is the degree of liability for agency. While finding widespread support in the Bible for God’s expectation of both human agency and accountability, this chapter also addresses concepts which create degrees of these, such as Old Testament laws differentiating between a sinful act conducted under force versus conducted willfully (Num. 14), and New Testament references to different expectations based on the age of the person (child vs. adult) (Luke 12, Romans 2).

These four elements of the faith-framework are then applied in each chapter to exploring the five psychological traditions with which she is engaging. The central question for Gunnoe is not whether the psychologist(s) who created the theory adhered to Christianity (or any other faith), but whether there are compatibilities (or opposition) to the four elements of her faith framework.

The discussion of each of the five theories is prefaced with an engaging and fresh biographical story about the relevant theorist, that provides insight into the life questions they sought to answer through their work. This approach reminds the reader that theory (and theology) are inherently grounded in personal perspective, and that all “argument” with others is first an exercise in understanding and respecting the Other and their story. This is, of course, the central task of any counseling encounter. It is also grounded on the biblical tenet that (all) humans are created in the image of God.

It is difficult to draw definitive conclusions about the secular streams of thought presented, since she does not present them as right/wrong, or for/against Christianity, in a neat way that absolves the reader of doing the thinking for themselves. Some may be uncomfortable and find it difficult to have the edges of binary in-group/out-group thinking challenged. The underpinning theological arguments may be unsatisfactorily light for some. However, she achieves her goal of unmooring the reader from entrenched denominational thinking, and from stereotyped and categorical representations of the psychological ideas and their founders.

The book leaves the reader with a new appreciation for the value of the theories in clinical practice, as well as the challenge to continue to wrestle theologically with the tools of the counseling trade rather than abandon them, or compartmentalize professional practice and faith life. The responsibility remains with the reader to

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think through their own position. Even if holding an uncomfortable relationship with an approach, the point is to be more aware of one's own convictions and their impact on practice integrity. Such spiritual and existential thinking is a critical form of awareness training for anyone in a counseling role in ministry or in mental health, especially in a multi-religious and post-Christian society. Overall, I found this book fresh, enjoyable, and relevant to anyone in pastoral care, counseling, or psychology.

Reviewed by Heather Sansom, PhD, Registered Psychotherapist, Perth, Australia, and Ottawa, Canada.

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THE CONSCIOUSNESS REVOLUTIONS: From Amoeba Awareness to Human Emancipation by Shimon Edelman. New York: Springer, 2023 (1st ed.). 226 pages. Hardcover; \$44.99. ISBN: 9783031240119.

In *The Consciousness Revolutions: From Amoeba Awareness to Human Emancipation*, Shimon Edelman takes on the onerous task of defining consciousness at multiple levels of complexity, from the most basic of life forms such as amoebas and microbes, to some of the most complex interactions between individual humans and their communities and political systems. In the Prelude, Edelman's characterization of essential consciousness in single-celled organisms is at first surprising and appears to stand in direct opposition to the prevailing view that consciousness is what separates humankind from other living organisms. However, in chapter 1, he quickly qualifies this by turning the reader's attention toward "the experience, of being a fully conscious, alert, and focused human" (p. 7), thereby setting the stage for ascent to complexity of consciousness through seven revolutions, concluding with a discussion on the inevitable emergence of capitalism with proponents protected by armed forces and the formation of social class structure which limits accessibility of privileged consciousness to those with the right status (e.g., via skin tone, financial means, and educational opportunities).

The book is organized into Edelman's introduction, two sections, an interlude, and an epilogue. Section I, "The Human Condition," comprises the first five chapters. Chapter 1 defines essential consciousness as the ability to differentiate self from other and move away from potentially threatening objects in order to survive, an operational definition met by even simple organisms. The foundation is then laid for the rest of the text to describe how the mind is necessarily, indirectly, supported by the brain whose processes are calculated by algorithms, like comparing the risk of getting spiked by thorny berry bushes against the need to eat. Chapter 2

details a slightly higher level of consciousness where cause and effect become understood, both in the present and when analyzing the past, leading to learning and blame. In chapter 3, self-monitoring, agency, and free will are tied to one's ability to make accurate predictions and to the emotional response of the system (of self) when errors are made. Chapter 4 characterizes the development of language as a tool for consciousness that works almost like "magic"—extending influence and power over (even distant) others. Chapter 5 covers the self in relation to society, formation of morals, and how privilege allows for consciousness.

Section II, "The Roads to Freedom," moves us into higher levels of consciousness where social constructs are now an integral part of the conscious experience. Chapter 6 describes the balance of self and others and some options on getting help. Finally, chapter 7 is a rather depressing narrative on the inevitable ascent of capitalism, a societal system marred by oppression and injustice, concluding with a message of cautious hope.

Most chapters are densely written and probably best understood by those with expertise from microbiology, neuroscience, and cognitive psychology in the early chapters and philosophy, political science, and economics in the later chapters. Lack of knowledge in one or more areas may leave a reader confused (especially in chap. 3) and disrupt one's climb to the Epilogue. However, aids to the reader include quotes from Buddhist monks, Catholic saints, current philosophers, and storytellers, with additional notes in the columns to define or summarize content. Moreover, each chapter is followed by extensive endnotes with references.

Edelman's writing reminds one of a mix between Vonnegut and a science fiction novel with a strong dash of political perspective/economic theory and a spoonful of cognitive psychology and neuroscience. His writing is entertaining and interesting. He uses numerous cognitive constructs woven together to describe the building blocks of consciousness, from essential consciousness in an amoeba up to the privileged consciousness of capitalist societies. If one reads with this in mind, they might appreciate the novel take on consciousness, the comprehensive tie-in of relevant (and tangential) literature, and witty humor.

Two overarching themes bear mentioning. One involves an organism being a system that makes predictions where the feedback should hold no surprises if it is "inherently good." The organism's dilemma is in trying to plan its actions based upon how the world will respond to it, a logical impasse, dealt with by feeling that the self is in control.

Unfortunately, this also makes the self automatically the bearer of all responsibility for everything that comes out of its host's actions—a side effect of being self-aware that really helps learning, at the cost of condemning a conscious being to anxiety and suffering. (p. 4)

This comment is made in the book's introduction and carried through to the end as the inevitable demise of society—a system run by the richest and most privileged who are seemingly imperious to the plight of those with less privilege.

A second theme is one of consciousness revolutions in an ascent toward the complexity and perils of being human in community. Each revolution has its own chapter. This is evident in the description of book sections and chapters (above), beginning with the amoeba's essential consciousness and ending in the highly complex consciousness of humans in community.

One main point of the book is that true consciousness is defined by being at a level where one does not have to worry about freedom, politics, or the economy. Thus, a person needs to have enough resources (e.g., financial means) to just focus on self, family, and science. "Being, or at least being well-off, does after all determine consciousness" (p. 128). This indicates, then, that one must be of privilege to experience consciousness, in its current iteration. Thus, the inevitable evolution of societies into a capitalist structure, with overlooked and underprivileged classes of individuals, means an unequal ability for multitudes of people to experience "consciousness"—at least, until another consciousness revolution occurs. Edelman declines to elaborate on the next revolution but implies, with careful optimism, a transformation of the freedom that arises from privilege into true freedom for all humans, with a decline in materialism/capitalism.

Edelman's proposal for evidence of consciousness detours away from how it is defined in the cognitive domain by being both too simplistic and broad. In the cognitive literature, processes linked to consciousness must reveal knowledge of a person, place, and time specific to an event. It would certainly be difficult to find evidence of this in the behavior of amoebas, but humans are generally able to show it, regardless of social class (with the latter point contradicting Edelman's later revolutions). Language is another defining feature of conscious cognitive process, a requirement met in chapter 4, but not met in earlier chapters and not enough to meet the requirement for consciousness in later chapters. Since Edelman defines consciousness in many different layers of complexity, it ends up feeling like a moving

target and many definitions. This complicates empirical evaluation and comparison with existing cognitive theories of consciousness.

In relating Edelman's ideas to those of Christian theology, some Christian theologians assume that conscious cognitive processes are what set us apart from animals and are part of being made "in His image." For some theorists this includes not being so reactive to emotions. Arguably, though, the incorporation of those emotions into the decision-making processes may lead to poor decision making. Yet, the current focus on mindfulness encourages us to dig into our emotions and become aware of them. Moving into a state of flow, a state considered to be quite positive and an optimal experience, requires unhooking from the planning and coordinating and relying on our bodies to do what they know how to do; this would seem to be a more animalistic, unconscious state.

Edelman describes the inevitable fall of society into a money-prioritized capitalistic structure where only the elite are able to experience consciousness. This implies a lack of choice in this fate, and certainly a lack of a loving God providing oversight. It contradicts that reliance upon God might be easier for those of less means as their needs prevent them from falling into the fallacy that they do not need a God. In fact, it could be argued that it is harder for the elite to rely on God, just as it is hard for a camel to travel through the eye of a needle, as they may assume a false sense of control and, therefore, fail to recognize that they need God. If the marginalized classes have an easier time relying upon God and, therefore, experiencing him more fully, aren't they the ones more likely to experience heightened consciousness?

The book is reasonably priced and enjoyable. I often found myself smiling while I read, highlighting insightful passages for later reference, including those in the interlude. Thus, I recommend this book. Just make sure you have had your coffee first.

Reviewed by Kristin Mauldin, PhD, Associate Professor and Director of the Master of Science Sport and Performance Psychology Graduate Program at California Baptist University.

SOCIAL STUDIES OF SCIENCE

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EQUITY FOR WOMEN IN SCIENCE: Dismantling Systemic Barriers to Advancement by Cassidy R. Sugimoto and Vincent Larivière. Cambridge, MA: Harvard University Press, 2023. 256 pages. Hardcover; \$35.00. ISBN: 9780674919297.

Book Reviews

In *Equity for Women in Science: Dismantling Systemic Barriers to Advancement*, Cassidy Sugimoto and Vincent Larivière take a social science approach to characterizing and assessing the role of gender in the successful pursuit of science. Using seven metrics—production of scientific results, collaboration, contributorship, funding levels, ability to move and travel, scientific impact, and a scientist’s role within social institutions—the authors find that despite country of origin, male scientists continue to outpace female scientists across these areas.

Each chapter of *Equity for Women in Science* focuses on one of the seven metrics, beginning with stories from the history of science. In this way, the authors highlight the achievements of early women, as well as the barriers they faced and the sacrifices that were required. While these sections will be familiar to those who have studied the history of women in science, the examples are excellent and represent many of the strongest exemplars of early women in the sciences. Even for those who may already know the stories, these sections are a strength of the book and provide needed context for the subsequent analysis and discussion of the modern situation.

The chapters then transition through time, presenting meta-analysis of existing data followed subsequently by new, largely bibliographic, data produced by the authors. In most cases, the authors utilize publication authorship, the gender of the authors, placement within the author list, and subsequent publication citations, as indicators of the relative contributions of men and women. While the authors do acknowledge the limitations of their analysis (e.g., considering gender as a binary, assigning gender based on an author’s name, etc.), these restrictions remain significant caveats to the reported results. In an effort to overcome these limitations, the authors supplement their bibliographic data with that from other sources, including the National Science Foundation (NSF) and Academic Analytics. However, while these datasets provide further evidence that disparities in productivity, funding, and mobility exist between male and female scientists, they too are plagued by limitations (e.g., NSF is a single US funding agency). Regardless, *Equity for Women in Science* provides a useful framework for the assessment and subsequent discussion of the persistent gender gaps in science.

The authors’ engagement with the idea of contributorship was new to this reviewer and is a helpful metric for determining gendered roles in the production of scientific results. Since authors contribute in distinct ways to published work, it is helpful to know the role that each author has played (e.g., conceiving of the work, doing the experiments or the analysis, writing or editing a manuscript, etc.) and whether that distribution

deviates by gender. Within the biomedical sciences, many top journals have begun requiring authors to attribute coauthor contributions within publications; however, many other fields have yet to move in this direction. Regardless, in journals that attribute contribution, the authors find that women are more likely than their male counterparts to conduct experiments, rather than raise funds or conceive of the ideas. This suggests that women are disproportionately serving in technical roles, rather than leading teams. Yet, the authors show that when women do lead teams, as indicated by their presence as last author on publications, more women are included within those teams. Moving forward, the lens of contributorship may provide a useful means for gauging gender parity in science.

The global nature of the data provides a broader context than one usually sees in these types of analyses; unfortunately, the limitations of bibliographic analysis render the findings more approximate than quantitative. For example, the authors measure the mobility of scientists based on joint publications with international coauthors. While these examples indicate the ability of one or both collaborators to travel, they significantly undercount collaborations within a single country that may also require travel, such as those between colleagues at US institutions that are on opposite coasts, and assume that both collaborators, rather than only one, are engaged in such travel. By using only published international collaboration to measure a scientist’s mobility, the reported gender disparity is unlikely to accurately represent the actual mobility of male versus female scientists.

The book finishes with a chapter of recommendations and conclusions, which nicely summarizes many best practices for increasing inclusion of historically underrepresented groups in science. While none of the suggestions are groundbreaking, this section serves as a “quick start guide” for those who are just beginning to think about how to make science more inclusive for women and other underrepresented groups. This chapter would be an excellent resource for those who are introducing these ideas to advanced undergraduate or graduate students.

I believe that the strength of *Equity for Women in Science* rests in its ability to provide a succinct summary of key historical examples of women in science, its characterization of seven individual, but interrelated, measures for gauging gender parity, including the previously underappreciated area of contributorship, and its final summary of best practices for increasing inclusion across disciplines. While the observed trends suggest that more needs to be done to support women

in science, the limitations of the authors' bibliographic methodology hinder the specificity of their findings.

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THEOLOGY

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CIRCLES AND THE CROSS: Cosmos, Consciousness, Christ, and the Human Place in Creation by Loren Wilkinson. Eugene, OR: Cascade Books, 2023. xvii + 354 pages. Paperback; \$36.00. ISBN: 9781666746341.

This book invites the reader to share a great-hearted and generous journey through some profoundly important territory. I take its aim to be to show both how humanity has arrived at the distorted and potentially disastrous relationship we have with the non-human creation, and that Christian thought, framed through an emphasis on creation, incarnation, kenosis, and resurrection can form the basis for a just form of earthkeeping which is also a sharing in the new creation.

In Part I Wilkinson identifies consciousness as the great mystery to be puzzled over, together with the fact of the existence of the cosmos. Part II reviews different aspects of the practice of science—its pleasures, paradoxes, and pains. Part III traces tensions and ambiguities in how science has evolved through the Enlightenment and its interaction with Romanticism, then how that interaction gave rise to the environmental movement, paving the way for various forms of new religion, especially variants of pantheism. Part IV then takes up the theological task, emphasizing incarnation and kenosis. In a concluding Part V, Wilkinson stresses the importance of resurrection and new creation in shaping the Christian story and understanding the human vocation.

The book, then, makes a huge journey. It is the fruit of painstaking research and long reflection. But it is written in such an engaging style that the reader's attention need never flag. The journey is, moreover, leavened with personal reminiscences which show how grounded the author is in his own place (the Pacific Northwest), and how passionately involved he has been in the journey, taking with him many generations of students and conversation partners. It was, for instance, a delight to read that he had held dialogue with E.O. Wilson, whose reductionist views differed so radically from the author's own.

Wilkinson begins from reflections on circles, with their association with cyclic time and rhythms of being, from which there is no escape, and the Cross as a decisive

interruption of time. He writes fascinatingly about the design of the Celtic cross, and notes how recent religious longings have wanted to recapture a sense of the rhythms of the earth. Arguably, the linearity of the Christian narrative, and its eschatological drive, make this recapture harder. I would like to have seen this circle-cross motif developed further, but it seemed to get rather lost as the book evolved.

The author's two great allies make a fascinating pair. The first is Iain McGilchrist, whose book *The Master and His Emissary* provides an increasingly influential model of how the two hemispheres of the brain operate differently, the left toward reductive problem-solving, the right toward wonder, imagination, and empathy. The second is the poet Gerard Manley Hopkins (with Wilkinson's knowledge of Romantic poets adding significantly to his analysis).

The author's conclusion will be congenial to most readers of this journal. Some of his history of science will be very familiar ground. I found the tracing of the voluntarism that catalyzed scientific enquiry back to Scotus and William of Ockham fascinating, though it must be of concern that neither of those premier historians of the rise of science, John Hedley Brooke and Peter Harrison, feature in the bibliography. And I felt that there was significant sleight-of-hand in simply associating the Enlightenment with reductive understandings of human beings and the world.

Theologically, Wilkinson's dominant motif is kenosis, which he maps back from Philippians 2 all the way into the heart of the Trinity (following von Balthasar), and forward into the necessary costs to some creatures that enable other creatures to flourish (following Holmes Rolston). I have criticized Rolston for invoking kenosis in the latter respect, since it seems to me to confuse voluntary self-giving with creatures' instinctive survival at the expense of others. Perhaps one of Wilkinson's examples, the Pacific salmon returning upriver to spawn, will make me start to think again. But neither Rolston nor Wilkinson clarify why it is that creation must be so costly to creatures and to God—it seems this is just the pattern that triune creation has to follow.

Wilkinson is very much influenced by the collection of essays *The Work of Love: Creation as Kenosis* edited by John Polkinghorne; I too love that book, but it is important to take note of the criticisms of kenosis, both from classical systematics and from feminism, offered by Sarah Coakley in the concluding essay. Karen Kilby's recent work is a significant sequel to this critique; however, a more comprehensive treatment is needed to address this.

Letter

The innovative theology of the book is developed in a fascinating section at the end of Part IV. Wilkinson moves us up a gear with his invocation of Heidegger's *Gelassenheit*, "releasement," or "letting be." It was a disappointment that Loren did not interact with Ruth Page's use of that term in *God and the Web of Creation*, but what he goes on to do is very striking. He uses Hopkins's terminology of "selving" from the sonnet "As Kingfishers Catch Fire" to develop the idea of transitive and intransitive selving. Creatures in general "selve" intransitively—to return to the poem, they "fling out" that "What I do is me, for that I came." But God, through what Hopkins called "the great sacrifice," selves transitively in a ceaseless and costly letting be. So far, so good, but then there is a yet bolder step, in suggesting that humans too are called to transitive selving. When our "gifts of reason, creativity, and imagination are directed to other creatures—not in order to use them, but to know, name and enhance *their* true selves ... human selving can echo God's selving" (p. 299). This is (using the sestet of the same poem) the selving activity of "the just man" who "justices," using humans' unique gifts to nourish the selves of other creatures, and becomes "in God's eye ... Christ," as Hopkins has it. (This extraordinary theological claim could be justified by appeal to the idea that the human being perfectly "justicing" is acting as the authentic image of God in the world. The Pauline letters identify Christ as this image [Col. 1:15, 2 Cor. 4:4]. So, the process by which humans can be "conformed to the image of [God's] Son" [Rom. 8:29] and be "transformed into the same image" [2 Cor. 3:18] is seen as complete in the justicing human. But Wilkinson does not offer this groundwork—he is content to work from the poem itself.)

Here I would suggest that Heidegger's term *Gelassenheit* is very helpful, because it addresses the vital question of what it is that humans can do for the non-human creation. We can let it be, in ways that draw on all our gifts, very much including the scientific, and all our virtues—vitality those of wonder, love and hope. This hope is underpinned by resurrection, as Wilkinson goes on to conclude. I found this formulation both original and compelling. It begs many questions, but I hope it will stimulate much thought, as such a rich offering deserves to do.

There were occasional errors—for instance, Laplace should be "Pierre-Simon" not "Simon"—but the book is attractively presented and well indexed. It will introduce the general Christian reader to an intriguing vein of reflection on our place in creation and new creation, and students to important aspects of the science-religion debate. The ecotheologian will

find plenty to chew on in Part IV. Above all, I am left with the sense of a profound gift generously given, by which we are all left in Loren Wilkinson's debt.

Reviewed by Christopher Southgate, University of Exeter, Exeter, UK EX4 4RJ.

Letter

On Makous and Biblical Longevities

In the most recent past issue of *PSCF*, Walter Makous ("Exponential Decay of Biblical Longevities," *PSCF* 76, no. 1 [2024]: 30–34) presented an intriguing theory that attempts to explain the decay in the lengths of patriarchal longevities from Shem to Moses reported in the genealogy of Genesis chapter 11.¹ Makous previously argued that the lifetimes of these patriarchs were not fabricated or "manufactured" numbers, based on an analysis of the first digit in each longevity figure.² In a dialogue with Walter Huebner that followed publication of the earlier paper, Makous argued that his analysis did not say that the numbers were accurately transmitted, but "simply provides evidence against fabrication as one particular source of inaccuracy."³ However, in his new analysis, Makous has gone considerably further, by attempting to validate the patriarchal lifetimes as real numbers, with the conclusion that this "somewhat strengthens one's confidence in the truth of the biblical longevities."⁴

However, other evidence suggests that the ages in the patriarchal genealogies are not *meant* to be taken literally. If that is the case, a belief in the "truth of the biblical longevities" reported in the genealogies of Genesis may lead to the erroneous dating of historical events described in the Bible, and therefore may actually undermine the historicity of the biblical record.

Some of these issues were raised in an earlier paper by Carol Hill, which Makous did not properly take account of in either of his own papers. For example, Hill analyzed both of the major genealogies in Genesis (Adam to Noah and Shem to Abram), which list the age of each patriarch at the birth of their first son, their remaining years and their total lifespan, comprising a total of sixty age values.⁵ Within these sixty values, the final digit in each age never ends in 1 or 6. If these final digits were randomly distributed, as would be expected for true age information, Hill calculated a one in half-a-million chance that these values would result.

In contrast, Makous analyzed the first digit in each of these ages, with the suggestion that the first, second,