HEALTH & MEDICINE

SPIRITUALITY AND AGING by Robert C. Atchley. Baltimore, MD: The Johns Hopkins University Press, 2009. xvi + 201 pages, index. Hardcover; $45.00. ISBN: 9780801891199.

Dedicated "To Awakened Being, with gratitude" and on its way to becoming a best seller, this book challenges readers "to engage the possibilities of spirituality and aging" by trying its ideas and framework to "see what happens" (p. 159). It aims to put "the jumble of concepts and empirical evidence in the field together into a meaningful mosaic" as a starting point for research, teaching, and service (pp. 146–7). Although it repeatedly claims to be nonreligious, its subtitle should be *An American Buddhist Interpretation*.

Robert Atchley, Distinguished Professor of Gerontology (emeritus) at Miami University, Oxford, Ohio, has published many articles and books, including the best-selling social gerontology text, *Social Forces and Aging,* now in its tenth edition. Renowned for developing continuity theory (challenging disengagement), he has lectured widely, conducted numerous workshops and seminars on aging, and has a three-decade interest in his subject.

Most of this book is oriented around the spiritual self-perceptions, existential experiences, and spiritual identities of people. An introduction and three chapters about spiritual experience, spiritual development, and related concepts are followed by two chapters about spiritual journeying (transpersonal psychology and sociology), then four chapters of examples "using an expanded view."

Spirituality is interpreted as "a holistic region of human experience" that "is rooted in our purest experience of existence, the 'I Am' without words, just awareness" (p. 6). According to Atchley, it is an inner subjective concept that sensitizes us to qualities and avenues of experience beyond concretely observable referents. Because it pertains to an experiential region of life as a quality that can be both immanent and transcendent, we should augment empirical and analytical analysis with "humanistic capacities such as contemplation, rumination, imagination, and intuition" (p. 6).

"Spiritual development is in essence an increasing connection with the non-personal ground of being that lies within each human being, whether he or she is religious or not" (p. 114). Self-actualization, achieved through the human potential movement's philosophy and methods, is at the core of Atchley's operating definition. Spirituality "gradually infuses more and more of life, until most experiences are at least partly a spiritual experience" (p. 114). That secular humanist perspective is close to the unacknowledged biblical teaching that people are created in the image of God. Because God is Spirit (John 4:24), the central core of each person is the spirit, so everything human is in some sense spiritual.

Most authorities will agree that "many people have spiritual experiences but deny them because of their *belief* that spirituality does not exist" (p. 49), that holistic gerontology education should include spirituality, that students will be more attracted to it if encouraged to work simultaneously on their own "spiritual process," that all who work with aging people should tune into the basic spirituality of those they serve, and that spirituality needs further study.

However, nearly all of the large and rapidly expanding corpus of existing research on spirituality and aging is neglected, so this book provides neither summaries nor direct comparisons. The references mention very few research-based studies, most of which are not cited in the text. The alleged reason is that most of the research commingles religious and spiritual variables, but the author's faith may be more important.

Atchley's goal is to treat spirituality in its own right as a topic distinct from religion. In fact, however, those concepts overlap so significantly that many research variables (behavior, beliefs, affiliations, and attitudes) can be used as admittedly imperfect indicators of either religion, spirituality, or both. Indeed, one of the very few empirical studies he does cite reveals that only 6.7% of a diverse sample thought that spirituality and religiousness do not overlap. He assumes that the current behavioral science tendency to refer to them collectively as Religion/Spirituality (overlapping but not synonymous concepts) has such serious flaws that all empirical studies mentioning religion should be ignored. He believes that looking at spirituality as separate from and not overlapping with religion will "provide a conceptual and theoretical picture of spirituality that is much broader, deeper, higher, more interrelated, symphonic, full-spectrum, and panoramic than the narrow views used in much of the current work on spirituality and aging" (p. 8).

Most of the data Atchley uses are drawn from his own reflections, interviews, and experiences as a spiritual elder or sage (one who manifests "cognitive, emotional, and contemplative wisdom" from doing "the inner work necessary to act in the world with pure being, transcendence of the personal self, and direct connection with the sacred," p. 76). He has studied with Sri Nisargadatta Maharaj in India, spent several years teaching at Buddhist-inspired Naropa University, and since 1996 "has found spiritual community in Quaker Meetings" (p. 201).

The frequently mentioned goal of separating spirituality from religion is belied by Atchley's advocacy of his own religious faith—a nontheistic Buddhism supported with contemplative methods from the Quaker tradition. The book has few, mostly casual, references to Christianity, Judaism, and Islam, but it is permeated with commendatory references to contemplative enlightenment that is only occasionally identified as Buddhist. It also shares the three jewels of Buddhism (p. 43), the Zen Buddhist depiction of the spiritual quest as the search for an elusive wild ox in the forest (pp. 57–62), the Buddhist practice of Tonglen (p. 84), the Buddhist eightfold path and wheel of the dharma (pp. 94–6), the Buddhist concept of nothingness (p. 127), and the Tibetan Buddhist preparation for death (pp. 137–8). Its most cited authorities are Ken Wilber, a Buddhist transpersonal psychologist, Ram

Dass, a Hindu guru, and the late Aldous Huxley, who was associated with the Vedanta Society.

Buddhist perspectives are blended with contemplative Quaker methods of spiritual journeying and growth through inner discovery, spiritual seeking in community, and transpersonal group process. Quakers are described as examplars of the "true self" with its "journey of reuniting soul and role" (p. 56). Their clearness committees, living-learning communities, and joyful "answering that of God in everyone" (pp. 156–7) are praised. The richness of Christian faith and the Bible for spirituality and for transpersonal sociology and psychology is completely ignored, presumably because they are religious, as if Buddhism and Quakerism are not.

This book is very well organized and smoothly written. Its self-oriented categories of qualities in spiritual experience and its linkage with selected psychological interpretations are innovative. Because a central focus is "the value of being on an intentional journey whose purpose is to find within oneself the nonpersonal consciousness needed to approach objectivity" (p. 158), it arouses self-reflection and stimulates contemplation about spiritual realities.

Appendix A is an excellent twenty-two-page "Spiritual Inventory." Its eighty-five questions, several with additional subsidiaries, are a useful tool for either discussion groups or personal assessment of spiritually-related experiences, desires, activities, feelings, and self-concepts. Appendix B similarly provides perceptive "Questions for Reflection and Spiritual Self-Assessment." Because the responses of most Americans will flow from their religious or anti-religious spiritual experiences, the questions can be adapted to fit the diverse viewpoints of other religious groups, not only those of contemplative meditators, secularists, and Buddhists.

By his veiled Buddhist faith and exclusion of the interactions of religion and spirituality, Atchley subtly pushes readers toward spiritual perspectives that fail to consider the faiths and philosophies of most Americans. He also ignores data that demonstrate how biblical teachings and Christian faith guide millions of people to personal fulfillment and spiritual wholeness, sometimes affirming and sometimes correcting or contradicting his goals and techniques for their attainment. Like him, for example, the Bible affirms the "danger of an overly individualistic approach" to spirituality and the need for a spiritual community that provides "support, checks and balances, and feedback along the spiritual journey" (p. 147).

The diversity of methods applicable to the study of spirituality, selected deficiencies of conventional research, and a critique of a prominent multidimensional study are overly concisely sketched on pages 152–4, yet Atchley refuses to acknowledge that empirical research has strengths despite its weaknesses. He scorns scientific studies of spirituality because every investigation touches only on fragments of the complex subject. His methodological preference is for intensive open-ended interviews instead of the "flawed questions" used in "large-scale structured sample surveys, with their relatively rigid protocols and mathematically abstracted analyses" (p. 190). He rightly emphasizes that "one-shot survey questions" about a person's spiritual identity are very deficient, but he apparently assumes that whatever good researchers interpret as, at best, imperfect reflectors of spirituality, invariably attempt to "measure" its entirety.

This innovative essay will stimulate theory development and research in spite of its disparagement of scientific research, its implicit disparagement of non-Buddhist religious faiths, its subtle contempt for theistic and biblical guidelines for spirituality and aging, and its weak index that omits dozens of subjects and nearly all authors cited in the text. It is based upon introspective convictions, New Age and Eastern philosophical speculations, and erudite opinions presented as facts while ignoring more firmly grounded empirical evidence. Therefore his conclusion is also mine, "Revise and improve. Junk this framework and make a better one of your own" (p. 159).

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HISTORY OF SCIENCE

CHARLES DARWIN (Blackwell Great Minds Series) by Michael Ruse. Malden, MA: Blackwell Publishing, 2008. xii + 337 pages. Paperback; $24.95. ISBN: 9781405149136.

The cover blurb claims that this is "the definitive work on the philosophical nature and impact of Darwin's thought." In reality, it is an extensive informal introduction to the topic. This series focuses primarily on philosophers, and the overall point of the book is to look at the impact of Darwin's ideas (and later developments from them) on philosophy, though Ruse readily admits that Darwin was not much of a philosopher. Overall, Ruse does more to justify the idea that evolutionary philosophy is worth pursuing than to survey what sorts of concepts have emerged from evolutionary philosophy.

As many philosophers and much of the general audience do not have much background in evolutionary biology, Ruse starts with an extensive overview of Darwin's life and evolutionary biology, both as conceived by Darwin and in its more modern development. Some points are oversimplified, and what I think of as important caveats are not always present. Overall, it is a fairly good overview of the field of evolutionary biology (despite disparaging paleontology, which is more or less equated with Stephen Gould). Ruse also gives good coverage of the history, including intellectual history, influencing Darwin.

As many of the book's readers will not be scientists, the quality of the figures could be greatly improved for clarifying concepts. Many of the figures are not very helpful, especially for someone unfamiliar with the field. For example, Figure 4.2 showing the geographic link between sickle cell genes and malaria uses darker or lighter shading for malaria prevalence on one map, and percentages of sickle cell genes in different populations as numbers written on the other map, making them difficult to compare. Figure 5.4 shows *Archaeopteryx* and pigeon skeletons, but differences are not spelled out and teeth are not visible in the former. Several other figures would

also benefit from more explanation. A couple of figures are taken directly from Darwin's work, providing a nice historical tie-in (and lack of copyright), but a more artistic modern rendition of the same topic would have been clearer. Figure 5.3, like many biologist-produced diagrams, retains 570 rather than 545 million for the Precambrian-Cambrian boundary, though the geologists made the change well over a decade ago. Also, due to a typo in the figure, it claims that in the upper Precambrian, "cranial sediment chiefly oxidized." Rusty cranial sediment might account for some of the philosophical claims in the book, but "cratonal" was the intent in the figure.

Ruse often presents arguments initially as a dichotomy, only later providing a more nuanced admission that one can hold intermediate or otherwise different positions. This approach tended to annoy me, but it could reflect an attempt to provide a simpler approach followed by complexities, as Ruse uses a colloquial style throughout. Still, there are many passing statements outside the main thrust of a passage that make unsupported philosophical assertions on highly debated topics. The nuanced treatment may come much later. For example, page 111 claims that accepting evolution entailed a change from "a worldview that allowed interventions by the Creator" to "a worldview that refused to allow the Creator any direct role." The next paragraph qualifies this a bit, stating that there is "some truth" to this, and noting that some (like Huxley) endorsed evolution because they already "endorsed the metaphysical shift they thought it embodied," but the following section seems to persist in equating evolution and naturalism. Likewise, chapter 7 begins by asserting that religion "cannot enter into the discussion of the origins and nature of humankind." The intent of the paragraph seems to exclude religious consideration from the scientific discussion (which, of course, is contentious), but it gives the impression of excluding religion from all discussion of origins and of human nature, a much more contentious claim. Later on, the detailed discussion of religion in chapter 10 concludes that Christianity and evolution are reasonably compatible. Thus, it would be easy to pick out quotes supporting a particular viewpoint on evolution and Christianity while misrepresenting Ruse's overall verdict.

Another occasional problem is the use of inaccurate religion-related statements, e.g., "Calvinistic mind cast—a self-deprecating belief that we must have been pathetic degenerates" (pp. 170–1); holding that evolution is not all that important in understanding modern human culture; claiming that character is attributed to lingering effects even in secular thinkers after more than 2,000 years of Judeo-Christian denial that we have any connection to animals (p. 171). On page 208, "Creationism" and "Creationist" are undefined examples of errors. Augustine's willingness to accept nonliteral interpretations of the Old Testament is cited as justification labeling "anti-supernatural explaining away" Augustinian (e.g., the resurrection of Jesus really just means we still feel him in our hearts). Likewise, a passing assertion that the Bible indicates that Jesus expected the end times within his lifetime is unsupported, as well as not seeming tenable to me.

On pages 209–10, Ruse deals very briefly with the suggestion (attributed to Christians generally and Polkinghorne specifically) that human brains have capabilities above and beyond what natural selection would be expected to produce. The response is merely that it is hard to say what evolution could not do and that alternative ideas (i.e., God) are hard to test scientifically. Thus, being hard to test is an advantage for evolution and a disadvantage for alternatives, not to mention the false dichotomy of God or evolution. (Gould's suggestion that human mental capacities could be a byproduct of evolution, rather than directly selected for, gets similar treatment—theistic arguments are not the only ones getting quickly dismissed.) The suggestion by Plantinga (also explicitly labeled as a Christian) that evolutionary explanations for the mind leave us with uncertainty about whether there is any ultimate reality behind them, receives a bit more treatment (pp. 210–4), but the answer is mainly that this places one in an implausible scenario.

On perceived implications of evolution for morality, Ruse surveys a variety of views, including those of Darwin himself. In particular, he highlights the tendency for people to claim evolutionary justification for a number of mutually conflicting moral claims. Ruse notes the problem of identifying evolution with progress, an assumption that underlies much popular invocation of evolution in moral contexts. Rather, Ruse prefers to treat moral norms as an established empirical fact and as a result of evolution, but does not provide a thorough defense of this position. Ruse likewise finds the attempts to provide an evolutionary explanation for religion far from satisfying, mainly because the numerous mutually conflicting models that he notes generally say much more about the author's views on religion than about evolution.

In summary, this book is a good introduction to biological evolution and the ideas that invoke it. Although it is not the definitive work on evolutionary philosophy, the notes will direct the interested reader to the literature. The style will annoy some readers, and Ruse's taste in examples would interest Freud, but it is a useful contribution to the field.

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MATHEMATICS

THE MATHEMATICS OF THE HEAVENS AND THE EARTH by Glen Van Brummelen. Princeton, NJ: Princeton University Press, 2009. 352 pages. Hardcover; $39.50. IBSN: 9780691129730.

In the classic children's story, *A List*,[1] one morning the protagonist, a literal Toad, makes a list of things to do that day. A strong wind blows the list away. Toad is immobilized without it. With it, he could have accomplished many things. In desperation, he enlists the help of his friend Frog, and together they spend the day pursuing the list.

In many ways, Van Brummelen's exhaustive history of trigonometry parallels *A List*. The Frog and Toad protagonists are "obsessed scientists [who] are not very hard to find" (p. 203) and who generate extensive lists of triangle

ratios versus an associated angle so as to answer more easily basic questions about the heavens and the earth. Like the wind, time and chance distribute this idea of the list up through the ages and across cultures from the first inklings of the idea with the Egyptians and their notion of slope, to the Greeks and their geometry axioms who in Hipparchus and Ptolemy render their lists using Babylonian sexagesimal form, to the Indians who use a hodgepodge of practical calculation tricks to improve their lists, to the Arabs and their algorithms and more lists, and then to the Europeans who render their lists in decimal form. After each list is compiled, a new generation or an adjoining culture finds a better way of constructing the tables, sometimes rediscovering old ways, yet all mimicking the reasoning and style of Ptolemy's *Almagest* and its recursive construction by way of versions of the half angle formulas and the addition formulas, whose modern day representatives are

$$\sin^2\left(\frac{\theta}{2}\right) = \frac{1-\cos(\theta)}{2} \text{ and}$$

$$\sin(\alpha \pm \beta) = \sin\alpha\cos\beta \pm \cos\beta \pm \cos\alpha\sin\beta.$$

At the end of the book, we the readers are at tea time: Van Brummelen promises a second book to tell the rest of the story, from the days of Copernicus up through today where the lists no longer clutter our bookshelves but instead are readily accessible in e-space, to any desired degree of accuracy.

Although Van Brummelen invites anyone to read his book, he clearly states that "my first loyalty is scholarly," (p. xiii) and that his book is the first updating of the subject "in a Western language" since the 1903 publishing of Anton von Braunmühl's work.[2] He documents the text with hundreds of footnotes, and his bibliography runs to thirty-five pages. To maximize a casual reading experience of Van Brummelen's encyclopedic book, I recommend first getting a broad overview by reading the first forty pages—*the history of mathematics in a large nutshell*—of Berlinghoff and Gouvêa.[3] Then read snatches of a history of math text such as Eves.[4] If after these two, the reader persists in wanting more on how modern society inherited the sine function and its relatives, read Van Brummelen.

Even though he says at the outset that "definitions are unwise in a historical account" (p. 10), Van Brummelen religiously knows his definition of trigonometry and rarely strays from his subject. Throughout his narrative, he features selections from the works of trigonometers written in a semblance of the original notation, followed by an explanation in modern terms. Here are a few snippets of what to expect. When Archimedes was inventing language to characterize very large numbers in his work *The Sand Reckoner*, he uses Aristarchus' model of a heliocentric universe (*and* trigonometric reasoning) because a geocentric model is too small to contain all of the sand particles being enumerated (pp. 27–30). The Indian astronomer Bhāskara (AD 600) used a rational function, whose modern representation is

$$\frac{4\theta(180-\theta)}{40500-\theta(180-\theta)},$$

to approximate the sine function on the interval $0° \le \theta \le 180°$; and Van Brummelen offers a clever re-creation of how Bhāskara may have discovered this amazingly good approximation (pp. 102–5). Furthermore, the medieval Indians basically had the equivalent of our eighteenth-century Taylor series for sine:

$$\sin(\chi) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \ldots,$$

where x of course is in radians. Such discoveries are wondrous, especially if we remember that up until after the days of Galileo, mathematicians worked in prose rather than symbols. Thus ancient and medieval trigonometric algorithms were often a series of couplets. The Arabs used trigonometry for a number of religious purposes: finding the direction from any place to Mecca so that the faithful could kneel in the proper direction during prayer; finding the time of day with respect to the sun, for a true believer needs to pray five times a day at the proper times; and determining when the fasting month of Ramadan, with the appearance of a new crescent moon, begins. To compute such quantities, zealous astronomers compiled detailed trig tables; indeed, the thirteenth-century trigonometer Najm al-Dīn al-Misrī's table contained more than 400,000 entries. The west, too, had equally dedicated zealots; Rheticus, who was mentored by Copernicus, along with a team of four others, in a labor of twelve years, generated 388,800 entries of tables for the six standard trigonometric functions to fifteen significant digits in the last seven hundred pages of his *Opus Palatinum*. With a few corrections near the singularities of the tangent and secant and their co-functions, these tables were the standard until 1918 when Marie Henri Andoyer compiled tables to twenty significant digits.

Finally, a word about the etymology of *sin*. The Greek's basic trigonometric function was the ratio of a circle's chord subtending twice a given angle to the circle's radius. The Indians found the ratio of a right triangle's opposite side of a given angle to its hypotenuse to be a more useful ratio and called it the *jyā*, Sanskrit for *chord*. Islam transliterated the word to the Arabic *jiba*, an Arabic word which also meant *fold* or *inlet*. Translated into Latin as *sinus*, in English it became *sine*, which in practice is abbreviated as *sin*. As for Frog and Toad, like many of the lost trig lists of the past, they never find their original list, but as the sun is setting on their day, Toad remembers the last thing on the list, "Go to sleep," and that is what they do.

Notes

[1]Arnold Lobel, *Frog and Toad Together* (New York: Harper Collins, 1979).

[2]Anton von Braunmühl, *Vorlesungen über Geschichte der Trigonometrie*, 2 vols. (Leipzig: Teubner, 1900/1903).

[3]William P. Berlinghoff and Fernando Q. Gouvêa, *Math through the Ages* (Farmington, ME: Oxton House and The Mathematical Association of America, 2004).

[4]Howard Eves, *An Introduction to the History of Mathematics* (Saunders, 1953).

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ORIGINS & COSMOLOGY

MORE THAN A THEORY: Revealing a Testable Model for Creation by Hugh Ross. Grand Rapids, MI: Baker Books, 2009. 304 pages. Hardcover; $17.99. ISBN: 9780801013270.

The purpose of the book *More Than a Theory* as stated by its author, Hugh Ross, is to "present a creation explanation for the record of nature in a scientifically acceptable form" (p. 14). Ross, the founder and president of *Reasons to Believe* (RTB), goes on to say, "My hope is that by developing RTB's creation model and testing it against other explanations we may see significant scientific progress on the origins and history of the universe" (p. 21).

Ross, his books, and the work of his colleagues at RTB are well known for their advocacy of old-earth views of creation. With outstanding credentials in the field of astrophysics, Ross has done much to draw people into worship as they consider the majesty of the universe in the context of a deep appreciation for the authority of Scripture and a high degree of respect for the scientific findings of cosmology. Through his talks, his books, and his gentle demeanor, Ross has done much to illustrate how Christians ought to deal with contentious issues if they are to be faithful followers of the Christ we all follow.

This book, in particular, has an especially important purpose. Ross has embarked upon a project to develop a scientifically testable model of a biblically consistent view of creation. The model is all-encompassing. It includes both the origin of the components of the physical universe as well as the origin of life and its various forms. Since I am not a physical scientist, this review will focus on the book as it relates to my discipline, biology.

Ross proposes that God has created life through a series of epochs up to and including the creation of Adam and Eve. In the current epoch, God is no longer creating new life forms. We are currently, as Ross sees it, in the seventh day, the day of God's rest. No new species are being created and because of that, biodiversity is decreasing (p. 189). Ross divides life up into three categories: "first, purely physical; second, both physical and soulish (manifesting mind, will, and emotions); and finally, one species with body, soul, and spirit" (p. 170). His first category includes everything except birds and mammals. The second is birds and mammals which, as he sees it, have a special capacity to form emotional relationships not only with members of their own species but also with humans. In fact, God endowed these "soulish" species with special capacities to serve or please humans (p. 170). We humans are unique in that we have soul and spirit. As Ross sees it, the whole purpose of the first 3.8 billion years of life's history is to prepare a place that is ideally equipped for human civilization. Beginning especially with the Cambrian explosion though, God engaged in a *flurry* of activity:

> … the Creator worked efficiently to rapidly prepare a home for humanity. A huge array of highly diverse, complex plants and animals living in optimized ecological relationship and densely packing Earth for a little more than a half billion years perfectly suits humanity's needs. These life systems loaded Earth's crust with sufficient fossil fuels and other biodeposits to catapult humans toward a technologically advanced civilization" (p. 159).

The history of life on earth has one purpose, Ross believes, and that is to prepare the earth for the arrival of our current technologically adept civilization.[1] Our arrival time was planned in advance. We would be created when there were sufficient fossil fuels to enable civilization to thrive. The RTB model proposes that each species of advanced life (i.e., soulish animals) is a unique creation event. For example, the species on the pathway to whales and horses (documented extensively in the fossil record) are not part of an evolutionary trajectory; rather, each species reflects one new creation event. Large animals, as he sees it, are especially in need of new creation events. Because of their large bodies, long generation times, and small population size, they accumulate deleterious mutations, and they keep going extinct. Because of that they have to be created again. Each time, they are recreated a little differently, always becoming increasingly suited in some fashion for a world that would eventually be inhabited by humans. "Creatures such as cockroaches, with long extinction times, manifest either no transitions or very few. God seldom needed to intervene to preserve them" (p. 163). All of this is an interesting approach on how to harmonize one view of Scripture with scientific data. It relies heavily, as I see it, on the views of "genetic entropy" put forward by the young-earth creationist and former Cornell agricultural geneticist, John C. Sanford.[2] I think it would be helpful, though, if it addressed the views and referenced mainstream thought in evolutionary genetics, which is very different than the views espoused here.[3]

The RTB model of unique creation events of all "soulish" species from scratch is inconsistent with other extensive genetic data. The insertion of hundreds of thousands of repetitive DNA elements each at the exact same location really needs to be addressed. It is clear to biologists that by far the majority of these insertions have no functional significance. Hence they are simply passed from one generation to the next as ancient history, "scars" of old events from days gone by. Often when they are inserted at a particular site, they become truncated. When that happens, it is the exact same truncated version that is found at the exact same site in all ancestral species.

Ross attempts to address this question through a three-page discussion (pp. 196–8) of what he considers to be the demise of the "junk DNA" hypothesis. For example, he states that "After more than thirty years of referring to DNA that does not code for proteins as 'junk,' geneticists have discovered five kinds of nonprotein-coding DNA … that perform critical functions." Actually, throughout that thirty-year period, there were likely very few geneticists who would not cringe at the use of the term "junk" DNA. They knew that in the midst of that DNA of no apparent function, there would be portions that were important in regulating gene activity. Ross attributes the recognition, that there was regulatory DNA in the midst of nonfunctional regions, to observations of physicists in 1994. "This breakthrough and later analyses of genomes drew teams of geneticists worldwide into a veritable frenzy to uncover hidden designs …," he states

on page 198. Actually the frenzy of activity had dominated the field of molecular biology for the preceding twenty years and continues to dominate it today. Geneticists continue to believe that most of the repeated DNA is not functional, although there are certainly "islands of functionality" surrounded by that which likely has little benefit or harm. The inheritance of these regions of nonfunctionality, including deletions and insertions within them in a lineage specific manner, remains inconsistent with the RTB model.

On page 69, Ross lays out the foundations for the RTB model: "God's dual revelation through the record of nature and through the words of the Bible must be trustworthy, free of contradiction and error." He then proceeds to point out that both the discipline of science and that of theology involve human interpretation. "In some instances these interpretations can be faulty and/or incomplete. Similarly Christian theology is not the same as the words of Scripture. Like science, theology involves human interpretation, which may be inaccurate." This is laudable. What he is saying here is that neither can be totally trusted since both involve human interpretation. Where they differ, one or the other must be wrong.

Given that statement, I am sure that Ross would be the first to admit that he brings his own interpretations to the table as he sits down to write the book. For example, interpreting the wonderful 104th creation-Psalm, Ross suggests that the Psalmist may be referring to extinctions, followed by re-creation events, when he says: "When you take away their breath, they die and return to dust. When you send your Spirit, they are created and you renew the face of the earth" (p. 81). Others would look at this as rich 3,000-year-old poetry in which the poet, like each of us today, celebrates God as the Creator and Sustainer of life in the here and now. They will feel that Scripture is not meant to be used as a scientific textbook, and that doing so leads to an inadequate biblical hermeneutic.

As Ross points out, the scientific data is also subject to interpretation. This means that he is aware that the science he presents to his reader has been filtered through his own perceptions. It is important to emphasize that he sees the science of biology much differently than mainstream biologists, not only in how biology is interpreted but also in how he presents the data itself. We all see data through tinted lenses. However, as scientists who color the lenses of the general public, we have a special obligation to be especially careful that we are presenting the science in a balanced and accurate manner. I am not sure that Ross always succeeds at this. For example, Ross states that the Cambrian explosion "occurred in a time window narrower than 2 to 3 million years (possibly much briefer)" (p. 158). Actually, a recent authoritative review states that "while the Cambrian radiation occurred quickly compared with the time between the Cambrian and the present, it still extended over some 20 million years of the earliest Cambrian."[4] Ross gives no references for his time span of about one order of magnitude less. It may still exist in the current scientific literature, but if so, I think it important to provide the citation, especially given that this is a book intended for non-experts. They will be taking him at his word.

Similarly readers, in being told about human uniqueness relative to the characteristics of chimpanzees, are told that

> New research … indicates that the widely advertised 98 to 99 percent similarity between the chimpanzee and the human DNA is greatly exaggerated … while comparisons between the complete human and chimpanzee genomes have *yet to be done*, the most complete analyses performed so far show that the similarity is closer to 85 to 90 percent (pp. 183–4, emphasis mine).

Ross does not mention (and seems to be unaware) that the chimpanzee genome was sequenced in 2005[5] and that the similarity of DNA sequence between the chimpanzee and human is indeed 99 percent in the portions of the genome that code for protein and 96 percent similar in the genome as a whole.[6] This is much different than his 85 to 90 percent figure.

There are other key statements in the book that are not cited. Here is one: "naturalistic models predict that examples of design convergence should prove nonexistent to extremely rare" (p. 166). I am not aware of any predictions of this sort in the scientific literature and believe it would have been good to cite the work to which he is referring. Also, on page 163, he states, "naturalistic models would predict transitional forms among tiny-bodied simple life-forms vastly outnumbering those among large-bodied complex life." There is no citation and I am unaware of any work that would lead to that conclusion. As another example, on page 162, Ross indicates

> biologists should be discovering new bacterial species (definitions of a species are difficult to apply at the bacterial level) at a rate that roughly exceeds one per year. Yet during the past 150 years biologists have failed to observe—in real time—the emergence of even one truly new bacterial species. (Parentheses are in the original.)

He fails to cite any microbiology data that would allow one to trace the basis for his prediction. Finally, as one last example, on page 147, the book states that "Evidence now shows … the simultaneous appearance of multiple distinct complex unicellular life-forms rather than a single ultra-simple organism." The basis of this evidence is not cited and I am personally unaware of such data.

The sincerity of the project, like the sincerity of Ross himself, is highly admirable. However, if this is going to be science, and not simply a model of how things work based on one interpretation of Scripture, a much more thoroughly cited and up-to-date analysis of the data will be of fundamental significance. Clearly, as Ross himself points out, there is much work still to be done.

Notes

[1]On page 70, Ross states that God created as he did so that (among other things) he could "supply physical resource for the rapid development of civilization and technology and the achievement of global human occupation."

[2]John C. Sanford, *Genetic Entropy*, 3d ed. (Waterloo, NY: FMS Publications, 2008).

[3]See, for example, Michael Lynch, *The Origins of Genome Architecture* (Sunderland, MA: Sinauer Associates, 2007).

[4]Charles R. Marshall, "Explaining the Cambrian 'Explosion' of Animals," *Annual Review of Earth and Planetary Sciences* 34 (2006): 356.
[5]Chimpanzee Sequencing and Analysis Consortium, "Initial Sequence of the Chimpanzee Genome and Comparison with the Human Genome," *Nature* 437 (2005): 69–87.
[6]For a compelling review of the comparison between the two species, see Ajit Varki and David L. Nelson, "Genomic Comparisons of Humans and Chimpanzees," *Annual Review of Anthropology* 36 (2007): 191–209.

Reviewed by Darrel R. Falk, Executive Director, BioLogos Foundation; Professor of Biology, Point Loma Nazarene University, San Diego, CA 92106.

MORE THAN A THEORY: Revealing a Testable Model for Creation by Hugh Ross. Grand Rapids, MI: Baker Books, 2009. 256 pages + 5 pages of appendices, 30 pages of footnotes, index. Hardcover; $17.99. ISBN: 9780801013270.

Many readers of *PSCF* are probably familiar with ASA member Hugh Ross and his apologetics ministry Reasons to Believe (RtB, www.reasons.org). Ross earned a PhD in astrophysics and worked for a time as a research astronomer at a major university before founding this ministry. In recent years, the scientific staff of the ministry has grown to include expertise far beyond astronomy. *More Than a Theory* is the latest of several books from Ross and his team presenting solid arguments that not only is the Bible consistent with the data of modern science, but the data push one toward a belief in the God of the Bible. While this might be considered an intelligent design approach, Ross distances himself somewhat from the Intelligent Design movement per se by being very explicit that the designer is the God revealed in the Bible.

In the book *Creation as Science* a few years ago, Ross broke new ground in the interaction between science and Christianity by proposing that creation be tested as a scientific model. His (really his team's) Bible-based RtB creation model was used to make predictions of what would be found through scientific research in the coming years. *More Than a Theory* is an update of the RtB model approach. Anyone who has any interest in this subject, but did not get around to reading the previous book, should read the present book. Those who read the previous book and would like an update, can now read the latest.

The present book seems to be aimed at a broad audience of both Christians and nonbelievers who have at least a little interest in science, but not necessarily much knowledge of science. Beginning with a discussion of what science is and is not, there is an emphasis on the making and testing of predictions. Some may disagree with Ross' criticism of typical modern definitions of science that allow only natural processes, but he presents good arguments for a more open definition. Ross also discusses how scientists routinely use models, since this concept may not be familiar to readers with less background in science than most *PSCF* readers. Following these points, the book summarizes the various positions Christians have taken over the years when interacting with science.

The real meat of the book sets forth the RtB model, beginning with the biblical basis and proceeding to scientific data and tests in various areas of science. Ross emphasizes RtB's commitment to both biblical and scientific integrity, and a commitment to follow wherever the evidence leads. The tests begin with cosmology and other areas of astronomy, and are followed by the origin and history of life in general; then come advanced life forms, and finally humanity. While there is a good deal of scientific detail here, it is presented in ways that should be understandable to many nonscientists. The extensive footnotes can lead interested readers to more detailed presentations in other RtB books, as well as to the professional scientific literature and other sources. As an astronomer, this reviewer concentrated on the astronomical chapters (but also learned a lot from the biological material). In general, the astronomy is good, solid science. One might argue that while the "just-right" tuning is fundamentally correct, some of it is overplayed to a degree. For example, the temperature and luminosity of the Sun must be very close to what they are for the survival of humanity, but I suspect that these solar properties could be somewhat different *if* the Earth's distance from the Sun were adjusted appropriately to compensate. Large changes in any of these quantities would run afoul of other issues, but small variations may be allowed which could be larger than the book implies. Discussing such interactions between properties, however, could easily get into details beyond the intended scope of this book (or of this review, for that matter). The fundamental point that Ross makes is that a great deal of what astronomers observe broadly is fine-tuned for human life here. This is recognized today by many atheistic astronomers as well as by Christians.

Finally, Ross discusses how the model's predictions have fared to date, when compared to predictions based on naturalism, theistic evolution, and young-earth creationism. Since the other models do not all have predictions made by their adherents, the tests necessarily include predictions Ross constructs from the writings of various authors. To this reviewer, the predictions from the other models do not appear to simply be straw men set up to be easily knocked over. Furthermore, Ross encourages supporters of other positions to send him predictions that can be tested by further research. The RtB model fares very well—read the book to learn how well! It is said that the RtB website will include a list of predictions and how they fare, with periodic updates planned. I look forward to following the updates as they appear.

Reviewed by Kyle Cudworth, Professor of Astronomy at the University of Chicago and Director of Yerkes Observatory, Williams Bay, WI 53191.

PHILOSOPHY & THEOLOGY

THE REASON FOR GOD: Belief in an Age of Skepticism by Timothy Keller. New York: Dutton, 2008. 242 pages, endnotes, index. Hardcover; $24.95. ISBN: 9780525950493.

Tim Keller is not your typical apologist. Despite being in a quite conservative denomination, Keller has built a successful church in Manhattan by addressing, in a winsome and intellectually honest way, the concerns of his mostly young, urban audience. Keller brings this authenticity and gentle reasonableness to *The Reason for God*. While the book has some shortcomings, it is a positive contribution.

Unlike many today, Keller does not adopt an "us vs. them" culture-war stance. He aims for respectful, reasonable discussion, and usually succeeds. In the first half of the book, Keller considers common arguments against Christianity (including exclusivity, evil and suffering, injustice from the church, science, and the Bible). He urges skeptics to "doubt your doubts" and to see if their reasons for rejecting faith stand up to scrutiny or are based on some alternate, unjustified faith. In the second half, Keller presents positive reasons, moving from arguments for theism (such as cosmic fine-tuning and our sense of morality and longing for God) to Christian specifics like the claims of Jesus and the Resurrection. A final chapter tells readers what it means to commit to Christ.

Keller generally does well with both defensive apologetics and the positive chapters. His writing is accessible without being simplistic, relying on sources like Jonathan Edwards, N. T. Wright, and especially C. S. Lewis. He does not claim to offer proof by the standards of Enlightenment rationalism, but he builds a strong case for the credibility of Christian faith.

ASA members should appreciate chapter 6, refuting the "Science has disproved Christianity" objection. The circular argument against miracles is easily dealt with, but the best part comes as Keller debunks the "warfare" model of science and faith. He approvingly cites Francis Collins and Alister McGrath; warfare promoters like Henry Morris and Phil Johnson are nowhere in sight. He emphasizes the key distinction between evolution as a scientific theory that might describe how God works, and the philosophical naturalism that some (such as Richard Dawkins and, sadly, many Christians) inappropriately weld onto it. Without using the phrase, he tentatively endorses theistic evolution, while rejecting "evolution as All-encompassing Theory." It is encouraging to see a prominent evangelical like Keller avoid the warfare, the uninformed interpretations, the shoddy treatment of science, and the knee-jerk rejection of biological evolution that are common among his counterparts. If more followed Keller's lead, science would be much less of a stumbling block for the Gospel.

Despite this praise, I have two significant criticisms. First, in the chapters on arguments against Christianity, some important questions are addressed weakly or not at all. For example, Keller does a good job of defending the exclusivity of truth and hell as a logical destination for those who actively reject God, but he ignores the biggest issue for many, which is, "Is Gandhi (or my Buddhist friend, or the tribesman who never heard the Gospel) condemned to hell?" In the chapter on the Bible, the problematic inerrancy doctrine is not mentioned, despite its centrality in the author's own denomination. Theodicy is a difficult topic for any apologist, but much of that chapter amounts to "maybe God had a good reason for causing the Holocaust and the tsunami." He does eventually get to the cross and God's participation in suffering, but there is no mention of other concepts that many find helpful, such as Polkinghorne's "free process" defense and similar ideas in Lewis' *The Problem of Pain*.

An example illustrates my second criticism. In chapter 8, Keller shows that "evolution has wired us to seek a God who isn't there" is a weak argument. But then he says, "This is a huge Achilles' heel in the whole enterprise of evolutionary biology and theory." What a silly statement. It may be a flaw for evolutionary psychology, but that is hardly "the whole enterprise." His argument has no bearing on common descent and the other central features of evolutionary biology.

This is not an isolated incident. It is as though years of conditioning trained Keller to take potshots at "evolution" at every opportunity. On several occasions, he forgets the wisdom of chapter 6, failing to respect the important distinction between evolution as science and as an all-encompassing world view. Perhaps chapter 6 represents recent evolution (pun intended) in Keller's thinking, and while writing other chapters he could not resist slipping into old "warfare" habits. Whatever the reason, these vestiges of warfare undercut his previous helpful messages about science.

I am not a big fan of apologetics books. I think we are in a time when more people are moved by a holistic approach to the Christian story (as in N. T. Wright's *Simply Christian*), and when our primary apologetic should be the church as it loves and faithfully follows Jesus. But many people still want specific arguments and answers. For such people, *The Reason for God*, despite its flaws, is much better than most works in this genre, and is well worth reading.

Reviewed by Allan H. Harvey, 1575 Bradley Dr., Boulder, CO 80305.

THE EVOLUTION OF EVIL by Gaymon Bennett, Martinez J. Hewlett, Ted Peters, and Robert John Russell, eds. Göttingen: Vandenhoeck & Ruprecht, 2008. 368 pages. Hardcover; $95.00. ISBN: 9783525569795.

The Evolution of Evil began with a graduate seminar at the Center for Theology and the Natural Sciences at the Graduate Theological Union in Berkeley, California. The participants agreed that through the process of evolution, countless animals have suffered greatly through predation, illness, and extinction over ages of time. In response, they asked two orienting questions. First, does it fit God's character and justice to create a world of such suffering and waste? This is a version of the classic question of theodicy with a deepened challenge from the numbers of harmed individuals over eons of evolution. Second, does the genetic selection of survival of the fittest account for recurring human evils such as genocide? The book's first five chapters orient the reader to theology, evolution, and sociobiology. The second five chapters follow on the first question, and the last five chapters on the second question. Established leaders in the field set the context, and the developing scholars push forward points of the discussion, much as one would expect in a lively doctoral seminar and research group.

Our own ASA Fellow George Murphy provides the book's concluding chapter entitled "Cross, Evolution, and Theodicy: Telling It Like It Is." There he argues that a theology of the cross includes a kenotic view of divine action in creation. God works through, yet is concealed by, the painful process of evolution. The world "must pay a price for its integrity and relative freedom, and that price becomes higher the further living things have advanced toward sensitivity, consciousness, and moral

agency." As Ted Peters says, we are destined by our genes to be free. God has endowed us with a genetic system that founds a costly freedom that is worth its high price.

As in almost any anthology, the quality of the chapters is uneven from one to the next, but they are more integrated than in many such collections. One frequent assumption is that extinct species have been wasted. But are flowers that bloom resplendently for only a few days therefore a waste? That an individual or a species is temporally finite does not mean that it was not worth its while. A full chapter is devoted to Rene Girard's theory of scapegoats as repeatedly central to human experience, but the book does not specify whether the phenomenon his argument describes is included as an example of replicating human culture, or of culture repeatedly carrying out genetic tendency. In every chapter, there is the welcome presence of extensive footnotes to alert the reader to the wider discussion. In particular, several of the authors have recently published books to expand the themes of their chapters. Christopher Southgate's *The Groaning of Creation: God, Evolution, and the Problem of Evil* (Louisville, KY: Westminster John Knox Press, 2008) is a case in point.

Considering the book's erudite reflection on an increasingly felt challenge (and the book's price of $95.00), the anthology would probably best fit theological or university libraries.

Reviewed by James C. Peterson, R. A. Hope Professor of Theology, Ethics, and Worldview, McMaster University Divinity College and Faculty of Health Sciences, Hamilton, ON L8S 4K1.

KNOWLEDGE OF GOD by Alvin Plantinga and Michael Tooley. Malden, MA: Blackwell Publishing Ltd., 2008. 270 pages. Paperback; $34.95. ISBN: 0631193647.

THEISM AND ULTIMATE EXPLANATION: The Necessary Shape of Contingency by Timothy O'Connor. Malden, MA: Blackwell Publishing Ltd., 2008. 177 pages. Hardcover; $74.95. ISBN: 1405169691.

The first book is a debate between Alvin Plantinga and Michael Tooley on the existence of God. They discuss whether belief in an all-good, omniscient, omnipotent, God is warranted. While I cannot do justice to the nuances of the complex give-and-take of their arguments, I can suggest some salient lines of their positions. In the opening chapter, Plantinga is concerned to oppose the philosophy of materialism or naturalism. He poses the question of whether faith is warranted. He holds that faith "just *is* a certain kind of knowledge, and knowledge of truths of the greatest importance" (p. 9). Plantinga then defines warrant as "the quantity enough of which distinguishes knowledge from true belief" (p. 9). Warrant, says Plantinga, is related to the "proper function" of our cognitive faculties, "working in the way they are supposed to work" and in the "appropriate cognitive environment" (p. 11). Proper function seems to be related to the notion that our cognitive faculties have been designed for a certain purpose and that our using them for this purpose is how we know that our knowledge is warranted. Naturalism, the belief that matter is all there is, he says, cannot ground proper function and thus cannot provide the warrant for making our true beliefs into knowledge. The reason why it cannot ground proper function is that naturalism does not have any notion of things being designed in nature by "conscious, purposeful intelligent agents" (p. 20). In this way, naturalists have no reason to think that the beliefs with which their cognitive faculties supply them are reliable (p. 30). Thus, naturalism leads straight to an absolute skepticism, since none of our beliefs are warranted.

Plantinga asks what a belief would have to be, from the naturalist's perspective, and he responds that it would be nothing but an electro-chemical event in the brain. As such, he asserts that it could not have any sort of content or signification. In the absence of any reason or purpose behind such neuronal events, naturalists have no warrant for believing that any of their beliefs are true. Hence, materialists, who are true to their position, ought to be eliminative materialists, since under their philosophy, there cannot be any such thing as beliefs. At this point, Plantinga proceeds to give what appears to be an argument for substance dualism regarding human beings. Given that neuronal (material) events cannot be said to have propositional content, he goes on to argue that something immaterial must be at the source of how we get from neurons firing to beliefs: "… if a material object can't think, then whatever thinks must be an immaterial object. Hence a human being is really an immaterial object (or at least has an immaterial part or element)" (p. 56). Plantinga raises a very interesting question with regard to how material events can give rise to spiritual realities such as beliefs and consciousness. He does not consider, however, the possible benefits of the concept of emergence in his appeal to an apparent substance dualism.

For his part, Tooley denies that formulating a credible account of neuronal events with meaning (propositional content) entails an appeal to an immaterial mind (substance dualism) as Plantinga suggests. Instead, he proposes a kind of weak, property dualism. In this brand of dualism, one can account for the existence of qualitative states (e.g., "greenness"), or "syntactically structured sequences of experiential states and causal connections," by appeal to the complex circuitry of the brain. In this way, there is no need to appeal to an immaterial mind since the neurophysiology of the brain is sufficient to account for our experience and beliefs. Tooley develops his position along Darwinian lines by arguing that the beliefs produced by the neurophysiology of our brains can be trusted to produce reliable beliefs and states, because the very survival of our species has been and continues to be dependent upon it.

Turning to theodicy, Tooley's argument for atheism is not of the deductive sort that J. L. Mackie made famous. He does not claim that the existence of evil is logically impossible, given that God is an omniscient, omnipotent, and morally perfect being. His approach is, rather, inductive. He seeks to enumerate a number of reasons, taken from empirical facts about the world, and leading to the improbability of there being a God. He thinks that this approach to the issue is more promising because it is less abstract and more forceful than the deductive approach. He makes a list of many different things that have caused

untold suffering, throughout the eons of time, for human and nonhuman animal life.

Having made this enormous catalogue of pain, Tooley focuses upon a single event in human history to make his case: the Lisbon earthquake of 1755, in which about 60,000 men, women, and children were killed. God is defined as a morally perfect, omniscient, and omnipotent person. It is, according to Tooley, terribly wrong that such a being would fail to prevent the Lisbon earthquake from happening. Furthermore, there is no possible good(s) that could have come about, during or in the aftermath of the earthquake, that might compensate for the horror of the catastrophe of this human slaughter. Given this state of affairs, it is, says Tooley, highly improbable that God exists.

Plantinga considers whether the kind of evil that Tooley mentions is a "defeater" for belief in God. He is unimpressed with Tooley's claim that God has no good reason for permitting such atrocities as the Lisbon earthquake. Plantinga asserts that if God exists and is a perfectly good person, then a believer is perfectly within his or her rights in believing that God had good reasons for allowing the Lisbon earthquake to happen. The "rightmaking property" needed to counterbalance this suffering is, according to Plantinga, that a perfectly good person, namely God, allowed it to happen (pp. 170–1). To the counter-argument that he is simply *assuming* that belief is justified in the face of such evil, Plantinga replies that Tooley is equally *assuming* simply that it is unjustified (p. 171).

Plantinga also considers Tooley's argument that the existence of really horrific evil is incompatible with the existence of God. His reply to this is interesting. He states,

> … an *argument* might be counterproductive, enabling the believer in God to turn his attention away from these evils, taking refuge in abstract discussion … It diverts attention from the phenomena that in fact constitute the defeaters for theistic belief (p. 180).

He states that for someone who believes in God "in a sort of weak and perfunctory way," such evils may be a defeater, but for someone whose faith is supported by what Aquinas called our natural knowledge of God or what Calvin called the *sensus divinitatis* or the Holy Spirit, such evils may challenge or trouble one's faith but will not, in the end, overwhelm one's faith (p. 180). Plantinga believes that belief in God is "non-inferentially justified—i.e., that there is powerful non-propositional evidence or grounds for the existence of God" (p. 164). Thus, if a person's "cognitive faculties are functioning properly … [and] she believes in God by way of *sensus divinitatis,*" then "the extent, duration, and distribution of suffering and evil" (p. 180) will not constitute a defeater for her belief because, according to Plantinga,

> She realizes that God has good reasons for permitting these things to happen—after all, being God, he would, wouldn't he? But she may nonetheless deeply resent what she sees God as doing, hate what he's doing, and resent him as well. She realizes that all of this is for some wonderful end, some end God has in mind, an end probably beyond her ken; this need not put her at ease and she may remain angry and resentful. But she needn't even entertain for a moment the belief that there is no such person as God (p. 180).

In *Theism and Ultimate Explanation,* O'Connor's project is to rejuvenate appreciation of the "rich realm of irreducible modal truth" (preface, x). By modal truth he means the way that possibility and necessity are part and parcel of our ability to furnish an explanation of states of affairs in the world. We talk about what *might have been* or what *must be so*. O'Connor is interested in this way of speaking and wants to explore, philosophically, how we know such modal truths:

> … how do I go about "verifying" that my dog *might* have been in the yard instead [of on the couch], or that my wife not only is not but *could not* have been simultaneously in this room and upstairs? These truths are not observable, or obviously inferable from what can be observed (preface, x).

O'Connor criticizes many contemporary denials of his modally realist position. Modal realism is a position that takes seriously the notion that possibility and necessity are part of the deep structure of reality. They are not projections of the human mind, remnants of the conceptual schemes of our language, or merely the contents of empirical generalizations about the world. In his criticism of these various contemporary positions regarding modal truth, O'Connor says, "A great many contemporary metaphysicians have been captivated by the modally denuded Humean picture of the physical world and our interactions with it …" (p. 31).

Having defended his notion of modal realism, O'Connor now attempts to employ it with respect to the nature of the world and the existence of God. His purpose amounts to a revival of Aquinas' "third way" for the existence of God, which is based upon "possibility and necessity." O'Connor takes seriously the perennial question, "Why is there something rather than nothing?" He believes that this question implies the notion that the things of this world are, in their ontological character, "contingent" or non-necessary. A continental philosopher might put it more poetically and say that this world is a "gift." Be that as it may, O'Connor claims that the contingent character of the things and events of the world are causally dependent upon and find their ultimate explanation in a transcendent, necessary being, who is God (p. 85).

Of particular interest to readers of this journal will be O'Connor's final chapter in which he discusses the relation of his philosophic findings on the divine nature to Christian revelation. He chides many contemporary Christian theologians for their "de-Hellenizing" tendencies in rejecting the results of philosophic theology. While he respects some healthy criticisms of the ways that such philosophic frameworks may modify, distort, or ignore the character of the God revealed in Scripture, O'Connor asserts that not all such suspicions are justified:

> … there is also bad news for the uncompromisingly "de-Hellenizing" theologians. Natural theological reflection cannot be neatly separated from unphilosophical religious belief. Specifically, the concept of God implicit in certain claims at the heart of the biblical revelation themselves *require* articulation in the metaphysical terms of necessary being (p. 132).

As O'Connor later argues, those who would deny God's ontological character as a "necessary being" attack God's sovereignty over created being since they are claiming, implicitly, that "… there *could* have been objects other than God who do not owe their existence to anything, who just 'happen' to exist" (p. 143). Such a state of affairs would be embarrassing for Christians to hold since God would no longer be the "Creator of all things, visible and invisible."

Both of these books offer nuanced and sophisticated reflections in philosophical theology. For that reason, it seems to me, they are recommended more for graduate school libraries in philosophy and theology than for undergraduates. Still, the precocious undergraduate may profit from them.

Reviewed by Jay Aultman-Moore, Professor of Philosophy, Waynesburg University, Waynesburg, PA 15370.

RELIGION & SCIENCE

THE HISTORICITY OF NATURE: Essays on Science and Theology by Wolfhart Pannenberg; ed. Niels Henrik Gregersen. West Conshohocken, PA: Templeton Foundation Press, 2008. xxiv + 242 pages. Paperback; $29.95. ISBN: 9781599471259.

Even those who do not or cannot agree with him on any number of points admit that the sheer breadth of Wolfhart Pannenberg's oeuvre places him in the top tier of twentieth-century theologians. Through his numerous published volumes and articles, Pannenberg proved himself to be a formidable theological thinker who was capable on multiple fronts. His keen intellect allowed him to see through to the problem areas in the thinking of theologians and philosophers as diverse as Kant and Barth, Bultmann and Cobb, Descartes and Schleiermacher. As this volume of essays shows, Pannenberg was equally adroit at engaging even the meteoric advances that so characterized science across the twentieth century in the fields of quantum physics, cosmology, evolutionary biology, and psychology. In short, these collected essays prove yet again that Pannenberg is an alarmingly learned individual.

This volume, edited by Pannenberg's former student Niels Henrik Gregersen, brings together sixteen essays, all of which traffic in topics somewhere in the vicinity of the border territory between theology and science. Two of the essays were previously unpublished, and seven others were translated from the original German by Linda Maloney specifically for this volume. A couple of the more recent pieces were published in other venues as recently as the year 2000, whereas most were published in the 1970s and 1980s in a variety of periodicals and edited volumes. This collection, published by the Templeton Foundation, is divided into four sections: Methodology, Creation and Nature's Historicity, Religion and Anthropology, and Meaning and Metaphysics.

Across the scope of my own theological education, my exposure to the thinking of Pannenberg was regrettably little. But even those pastors and theologians who know only a bit about the theological contributions of Pannenberg are probably aware that his work concerning the historical nature of Jesus Christ's resurrection is among his signature pieces of reflection. In fact, I have always found his writing on this subject to be profound and yet accessible enough that I have been able to weave it into more than a few Easter sermons. Although this review cannot capture the subtle nature of his thinking, it may suffice to say that in the face of those who mumbled about (if not outright denied) the historical nature of the resurrection, Pannenberg asserted that Jesus' rising again from the dead was at once a historical occurrence and yet an out-of-history event, in that Christ's emergence from his tomb represented not so much an event of past history as an in-breaking of the future into our collective past. Christians have the hope that they will one day rise again, not just because God says it *will* happen but because in Christ it already *has happened.* The future's promise already came true in the past. This is our hope.

In this volume of essays, Pannenberg's distinctive view of the future's influence on our present moment is on prominent display. For many Christians who try to engage theological and faith matters with reference to the teachings of contemporary science, it is the past, the beginning, the origin of the universe that becomes of paramount importance. What did God do to make the Big Bang possible? How did God order the cosmos in the beginning, and what does that tell us about our present moment and the nature of all that exists? In short, when it comes to faith and science, many Christians look to the past. Pannenberg, however, turns this on its head through his belief that it is *the future*, not the past, that is decisive for what is happening now.

Pannenberg believes that far too many theologians and ordinary Christians look to the distant past in order to see what God did, once and for all, in the creation of the universe. The idea seems to be that God finished his work of creation long ago and, having clapped the dust off his divine hands, walked away from that creative process with a de facto declaration along the lines of, "That's that." But Pannenberg is utterly convinced that the act of creation is ongoing, and that it is the realization of God's future vision for this universe (what believers would call the fullness of the Kingdom of God or of the New Creation) that not only draws the universe onward in a kind of evolutionary progression right now (and throughout our past) but that renders the whole of reality as utterly contingent and ever-new. As Pannenberg writes, "Contingency and novelty in natural processes can be interpreted theologically as evidences of God's continuing creative activity" (p. 47).

A striking insight that emerges in this volume is Pannenberg's conviction that the universe is not governed by fixed laws that determine what happens moment to moment so much as it is filled with contingency and novelty, as God retains divine freedom to make the universe into what he desires it to be in the future. Of course, a great many regular patterns emerge from God's orderly arrangements—patterns that we are able to codify into what we would regard as the rules that govern "the way things go" in this world. But for Pannenberg, those patterns (or what some might call "natural laws") are less about some fixed order estab-

lished long ago and more about the regular ongoing work of a God who compels the universe forward, not from behind, but from up front, as he draws all things toward the future he has planned in Christ.

This fundamental orientation of thought informs a great many of the essays in this volume. Because these sixteen pieces were never planned to be incorporated into a single book, there exists across them a fair bit of repetition. If you read this volume from cover to cover, you will repeatedly run across sections that ponder how "field theory" may explain divine action in our physical universe, as well as other sections that discuss Pannenberg's views on evolution and the Bible, including his clever point that even biblical literalists should note that in Genesis 1, God commands *the earth* to bring forth a variety of plants and species (and so why would anyone be surprised to encounter the Darwin-esque discovery that over time, *the earth* did indeed evolve a wide variety of plants and species!?).

But despite some repetition of thought, these collected essays impress the reader with Pannenberg's breadth of learning. Included here are essays that smartly engage questions surrounding human consciousness and the nature of the soul, process theology (and why its teachings on the "initial aim" of each creature do not anchor our hope the way Pannenberg's own "anticipated" future work of God succeeds in doing), the *Logos* Christology of John Cobb (and Pannenberg's sharp insights into how Cobb deviates far more from his teacher, Alfred North Whitehead, than Cobb himself seems to sense), and several different reflections on the nature of time, space, and eternity, some of which, to be frank, go to places somewhere beyond this reviewer's ability fully to comprehend or grasp!

Although a few of the essays from the 1970s and 1980s seem a little dated in terms of not taking into account more recent scientific developments, this collection of essays from the last third of the twentieth century feels fresh and vibrant and deeply challenging. There were a number of passages that seemed overly ponderous, and there were a few occasions when I wished Pannenberg had been willing simply to grant that faith-based insights, as delivered to the heart of believers by the inner testimony of the Holy Spirit, count as reliable and epistemically defensible pieces of knowledge that need no further proof or elaboration. But those quibbles aside, reading these essays revealed not only the mind of a brilliant theologian, but also the heart of a true believer in the future God has prepared for his creation beyond the inevitable demise of this current cosmos and/or of the exceedingly brief existence of any one of us.

The editor no doubt knew what he was doing when he concluded this collection with a relatively short essay titled "A Modern Cosmology: God and the Resurrection of the Dead." In it, Pannenberg engages the thought of Frank Tipler, whose reflections on the anthropic principle and related matters may not indicate the replacement of theology with physics (as Tipler has suggested) so much as (in Pannenberg's term) the "approximation" of the two. But at the end of this short essay, Pannenberg is at his theological and lyric best as he notes that when pressed, Tipler claimed he was not a Christian, because he could not believe that anything like a resurrection from the dead could ever have happened. Science rules out such miracles, after all. Still, Tipler's own belief that the universe is headed toward some omega point of renewal led him once to admit that he could believe in a resurrection of a dead person in the past "if the appearance of such a person at a particular stage of human history were necessary for the omega point to be attained at the end." To that deeply intriguing musing, Pannenberg replies, "According to Christian teaching that is, in fact, the case" (p. 210).

Or to put it another way, "Risen indeed!"

Reviewed by Scott Hoezee, Director of the Center for Excellence in Preaching, Calvin Theological Seminary, Grand Rapids, MI 49546.

Book Notice

THE EXTRATERRESTRIAL LIFE DEBATE, ANTIQUITY TO 1915: A Source Book by Michael J. Crowe, ed. Notre Dame, IN: University of Notre Dame Press, 2008. xxi + 554 pages, appendix, selected bibliography, index. Paperback; $39.00. ISBN: 9780268023683.

This source book, in fact, a monumental anthology, presents key documents from the pre-1915 history of the extraterrestrial life debate. Michael Crowe, the Rev. John J. Cavanaugh Professor Emeritus in the Graduate Program in History and Philosophy of Science at the University of Notre Dame, provides an introduction and commentary for each of the source documents, some of which are published for the first time or in a new translation. The book is designed to shed light on the question of the existence of extraterrestrials, and on those who sought to tackle the question. The range of documents treated is extremely impressive: excerpts of primary sources from Aristotle and Lucretius, through Newton, Pope Voltaire, Kant, to Herschel, Darwin, Wallace and Lowell, among others.

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