## Environment

**FROM NATURE TO CREATION: A Christian Vision for Understanding and Loving Our World** by Norman Wirzba. Grand Rapids, MI: Baker Academic, 2015. 176 pages. Paperback; $19.99. ISBN: 9780801095931.

*From Nature to Creation*, by Norman Wirzba, is a call to become a radical Christian. Beginning with a vision of the world as "created, sustained, and daily loved by God" (p. 3), we are asked to live out the implications of this vision. In the first chapter, Wirzba builds the case for each of us to recognize ourselves as creatures. The author attacks modernity for its attempts to eclipse the existence of both creator and creature. Part of modernity is industrial agriculture wherein "land, plants, animals, and agricultural workers come to be seen as objects of control" (p. 17). One outcome of the creaturely approach to food is to stop the use of industrial chickens. Instead, we should allow them to be free ranging (p. 125).

The second chapter focuses on what constitutes a Christian understanding of nature. In this chapter (as in the entire book), the author does an excellent job of showing how what we name and narrate matters. For example, nature has been seen as sacred, as a place of temptation, as a place where one became an American, a place of individualism, a destination to visit, a storehouse, or a carefully managed park (p. 38). Each of these views entails a different approach to our stewardship of nature. For further exploration, I would recommend reading Christiana Peppard's excellent essay "Denaturing Nature" in volume 63 of *Union Seminary Quarterly Review*.

In the third chapter, Wirzba sensitizes the reader to the complexity of perceiving nature. Along the way he highlights the noncompetitive relationship between God and creatures. Both perceptions lead to some interesting implications for practical Christianity. One of these implications can be seen in the next chapter where the fundamental importance of land and its care is emphasized. Wirzba shows how our connection with land is exemplified in Genesis and its account of Adam, Eve, and the garden: "… just as the land belongs to us, we also belong to it" (p. 117). This connection involves the production and consumption of food. A Christian perspective opposes today's industrial food systems, which "presuppose the degradation of fields, plants, animals, and agricultural workers" (p. 121). Wirzba effectively uses today's raising of corn as a quick case study and finds it failing in its ecological impact. The entire system (including consumers) is flawed.

The final chapter is entitled "Giving Thanks" and focuses on gratitude. I found it interesting and valuable to see the giving and receiving of gifts/thanks as a practice that nurtures and strengthens communities. Gratitude is further seen as a means to freedom.

*From Nature to Creation* is one volume in a series created "for a broad, non-specialist audience interested in the impact of postmodern theory on the faith and practice of the church (p. ii)." Wirzba's book succeeds in its examination of today's thought in relation to faith and practice, although this volume seems to question modernism more than postmodernism. While I think that every Christian could benefit from reading this book, it would be ideal for a congregational study group in which one chapter per week could be discussed. The leader of the discussion group could prepare for these meetings by reading *Introducing Evangelical Ecotheology* (see its review by Jeffrey Ploegstra in *PSCF* 67, no. 2 [2015]: 143–44).

I was uncomfortable with the use of the vocabulary of idolatry in chapter two and the use of iconic terminology in chapter three. Both uses seem to me to obfuscate the issues. On the other hand, they may serve to make the issues understandable and acceptable to Christians accustomed to such terminology. More substantially, I felt that Wirzba undervalued the insights into nature that ecologists are making. While it is true that "more knowledge or information about the earth is not, by itself, going to be of sufficient help" and that "what we most need are capacities that will help us love the world" (p. 6), I would argue that increasing knowledge should increase our awe of our environment, both for its dynamism and for the conflicts between individual and community. Perhaps troubling to some, but not to me, is what seems to be Wirzba's stance that the created world is good and not in need of redemption. This allows, for example,

> a tree, when seen by God, is never simply a vertical log with varying kinds of foliage or some amount of lumber. A tree is also, and more fundamentally, an incarnation of God's love—made visible, tactile, and fragrant as a giant redwood or cedar of Lebanon. (p. 75)

Wirzba spends several pages guiding the reader toward a "disciplined perception" of seeing a creature as a "material manifestation of God's wisdom and lover" (p. 87). Hopefully, as more and more Christians come to value creation they can make common cause with the modernists and postmodernists who also value the integrity of our planet and its ecosystems.

Overall, I found the book to be a worthwhile read (I even ordered another copy to give as a present). With over 200 footnotes, Wirzba provides abundant opportunity for further study and reflection. I would recommend it to a Christian study group as a springboard for discussion.

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**BEING-IN-CREATION: Human Responsibility in an Endangered World** by Brian Treanor, Bruce Ellis Benson, and Norman Wirzba, eds. New York: Fordham University Press, 2015. 242 pages, notes, index. Paperback; $33.00. ISBN: 9780823265008.

Where do humans belong in the natural world? How are humans to interact with the rest of creation? With the advent of an impending environmental crisis on the horizon, if not already present, these questions become more significant for Christians and the rest of humankind to protect our environment and promote eco-awareness. In *Being-in-Creation: Human Responsibility in an Endangered World*, Brian Treanor, Bruce Ellis Benson, and Norman Wirzba present a collection of ten essays, the majority written by professors of philosophy or theology, that focuses on the Christian environmental perspective, stressing our "creatureliness" and intimate relationship with the rest of creation rather than exerting our dominion over the natural world.

In the introduction, Brian Treanor uses Lynn White's essay, "The Historical Roots of our Ecologic Crisis," to help Christians rethink Genesis 1:28:

> [White's essay] places the blame for our present ecological crises squarely on the Genesis account of creation and its subsequent interpretations, taking issue with the apparent claims of superiority implicit in doctrines of *imago dei* and with exhortations to domination and exploitation based on it … (p. 3)

In essence, Treanor is arguing that Christian interpretation of this passage and the abuse of the environment "has led us squarely into the environmental crisis by suggesting that we have absolute dominion over the earth, including the right to use it in a gluttonous or profligate way" (p. 3). The essays comprising the remainder of this anthology aim to help the reader

> rethink (or reconnect with) what it means to be human in the wider context of creation … we will never live sustainably over the long haul unless and until we come to accept that we are just one type of creature among many fellow creatures, rather than omnipotent gods exercising capricious (and intemperate) dominion over the rest of the cosmos. (p. 13)

In his essay "Rowan Williams and Ecological Rationality," Jarrod Longbons uses Rowan Williams's view that the ecological crisis is "an opportunity that causes society to rethink life with a necessary ecological rationality that can help us rediscover some of the implications of the Christian doctrine of creation" (p. 37). Longbons also cites Williams to support his argument that humans and nonhumans have a reciprocal relationship, as both live in interconnectivity with one another:

> To understand that we and our environment are alike in the hands of God, so that neither can be possessed absolutely, is to see that the mysteriousness of the interior life of another person and the uncontrollable difference and resistance of the material world are connected. (p. 41)

This rationale "reveals human relationship to and responsibility for nature, despite the two obvious differences between these two classes of creatures" (p. 41). At the heart of Longbons's argument is the idea that society, as it becomes more materialistic, is apathetic to nonhuman life; however, rethinking the doctrine of creation calls Christians to bring nature closer to the Creator, as "Christianity compels humans to bridge God's life and the world's life" (p. 49).

Similarly, Norman Wirzba's essay, entitled "The Art of Creaturely Life: A Question of Human Propriety," focuses on the intimate relationship between humans and nonhumans. Wirzba begins by focusing on the beginning of human life in the Garden of Eden. Adam was created from the soil, and animals and plants are likewise largely dependent on the soil. Wirzba cites Wendell Berry, stating that "the soil is the great connector of lives, the source and destination of all … Without proper care for it we can have no community, because without proper care for it we can have no life" (pp. 53–54). Wirzba is arguing that there is a circle of life that ultimately ends in the soil, and by failing to care for it, we are taking "a stance against creation" (p. 54). He finishes the essay using a garden and a gardener as an example for creation in its entirety: "A gardener cannot simply impose her will upon the garden … A gardener, in other words, gives herself to the garden so that the garden can flourish" (p. 72). As Christians, we are called to this type of self-offering to form a new relationship with God's creation, not simply imposing our will on the world around us and exploiting God's gift to humankind.

The idea of the divine call to care for creation is evident in Christina M. Gschwandtner's "Creativity as Call to Care for Creation? John Zizioulas and Jean-Louis Chrétien." She argues that Chrétien suggests

that "offering the creation to God in praise in hymnody is both a special task for human beings and a response to the divine call. Humans hence carry a responsibility for the world: they shelter, protect, and shape it" (p. 100). Zizioulas believes that this call "is not heard in the same fashion by other creatures," making humans unique and set apart from the rest of creation (p. 103). If this is the case, then why do humans, especially Christians with a specific divine calling, exploit nature and destroy God's creation?

Two of the final essays in the collection give Christians a few pieces of advice for re-entering this relationship with creation, whether or not that was their intention. Edward F. Mooney uses the comparison of a mall and a swamp to show the effect of our culture and society today in his essay entitled, "Reflections from Thoreau's Concord." He states that "to sense a swamp's wonder is being intelligently alert there, finding sympathy for it and its creatures in a way that repays attention as the place brings you alive. The mall, in contrast, deadens the 'you' of the wild" (p. 135). Thus, humankind needs to find joy in nature, not in the ever-present materialistic nature of society and culture. This joy will lead to a deeper appreciation and understanding of the intimate relationship humans have with God's creation.

In a similar fashion, T. Wilson Dickinson's "Care of the Soil, Care of the Self: Creation and Creativity in the American Suburbs" attempts to revisit the doctrine of creation by going back to biblical passages (as in Isaiah and the Psalms) that contain deep, vibrant phrases about creation. As Christians made in God's image, it is our duty to preserve this brilliant imagery rather than to destroy the earth. We need to be in an attentive relationship with the world around us rather than thinking "it can be fixed later" or "technology can solve that problem." Dickinson also uses the example of mowing a lawn in an urban area, which depicts the idea of conformity to a "T." Everyone's lawn must be perfectly manicured and ever green; however, "the uniformity of the suburbs also makes those within it blind to the needs that exist outside its borders, as the 'world of manicured yards conceals the blights of poverty, land degradation, and economic injustice'" (p. 166). As called beings by our Creator, Christians need to start noticing the invisible and stop using Genesis 1:28 as a biblical basis to abuse the gift of God's creation.

This book is directed toward readers with an interest in philosophy and theology, as well as those concerned about the state of our environment. It requires careful reading with attention to detail and an advanced knowledge of philosophy and theology, or meticulous research to understand the intricate theories presented. Many of the authors make key points that help summarize their beliefs; Treanor also summarizes each essay in the introduction, helping to give a broad overview if the reader could not understand the depth of theological or philosophical issues at hand. The overall goal is for humans, especially the target audience of Christians, to become more aware of the philosophical and theological basis for creation care. Multiple viewpoints on a single topic are often presented in a single essay, giving a broad Christian perspective that allows the reader to formulate their own opinions or dig deeper into a specific topic. Readers will likely find themselves intrigued by the arguments and will rethink their own opinions on the doctrine of creation as it relates to their lives.

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## Ethics

**LOVING LATER LIFE: An Ethics of Aging** by Frits de Lange. Grand Rapids, MI: Eerdmans, 2015. 159 pages. Paperback; $19.00. ISBN: 9780802872166.

*Loving Later Life* is a book that could potentially be of interest to anyone, because everyone is faced, in theory, with the prospect of living later life. However, if the author's contentions surrounding our great anxiety toward aging are correct, there is little chance that the book will become a bestseller. That being said, *Loving Later Life* is a significant contribution to the burgeoning conversation surrounding the ethics of aging. De Lange provides an honest and unflinching look at the realities of old age that our culture often ignores or attempts to paper over. He seeks to meet the ethical challenges surrounding aging through the nuanced development of a theologically informed ethics of care emerging from Jesus's double command to love God and neighbor as oneself (Matt. 22:38-40). Along the way he engages with an intriguing mix of sources, including some that may not be familiar to English-speaking audiences, encompassing the fields of theology, philosophy, history, sociology, psychology, and gerontology. The book also includes a significant bibliography and detailed index.

After a brief introduction, de Lange begins the first chapter by asking why theological ethics should take an active interest in the subject of aging. The unprecedented aging of contemporary societies, the ethical blind spots of gerontology, theology's unique ability to speak in a pastoral and existential voice, and the inadequacy of the prevailing ethical paradigms for

addressing the problem of aging all contribute to the need for a robust theological ethics of aging. In his discussion of gerontology, de Lange introduces one of the recurring concerns of the book, namely, that while advances in gerontology have made an important contribution to slowing down the declines of old age, the corresponding emphasis upon "successful aging" often results in the marginalization and silencing of the frail elderly who have succumbed to the burdens of deep old age. De Lange concludes the first chapter by introducing the "ethics of care," which has been in development since the 1980s by feminist philosophers and demonstrates striking affinities with theological ethics. In its acknowledgment of the dependence of human beings, its valuing of emotions, its questioning of the public-private divide, and its relational anthropology, the "ethics of care" offers a much more promising set of resources for grappling with the experience of the frail elderly than the agent-oriented, individualistic outlooks of the predominant ethical schools of thought.

The second chapter, entitled "The Ethics of Love," is the conceptual center of the book. At the foreground stands Jesus's great dual commandment, which demonstrates the inseparability and interrelatedness of the love of God, the love of self, and the love of neighbor. Particularly important for de Lange's argument is the recovery of a proper understanding of self-love. The love of self emerges from the reception of the gift of life and serves as a stepping stone toward the love of the other. "Christian love," de Lange insists, "is a communal event" (p. 42). As a result, a care relationship must be understood in dynamic terms, which involve the continuing challenge of seeking the genuine good for both the recipient of care and the caregiver (this may involve a degree of paternalism) while simultaneously respecting the personal autonomy of those receiving care.

The central contention of the third chapter is that because we do not love our own aging selves, we are unable to love the elderly. De Lange explores the cross-cultural phenomenon of "ageism" and the corresponding emotions of fear, hate, and disgust evoked by and directed toward old people. Drawing upon the "terror management theory" (TMT) introduced by social psychologists, de Lange suggests that

> ageism may function as an anxiety buffer, keeping the awareness of aging and its inevitable decline and ending at a distance, by constructing a cultural worldview of growing older, in which everything that reminds of deep old age at the threshold of death is kept far away. (p. 77)

While the hypothesis that one's attitude toward one's own aging influences how one treats the elderly has attractive explanatory power, de Lange acknowledges that the correlation has not yet been empirically demonstrated.

The fourth chapter is animated by the question of what it means to love our aging selves. As recipients of the gift of life we are called to love the whole of life, even its latter stages. This love takes the form of a hearty affirmation of life which manifests itself in an ongoing posture of openness to joy. In no way does this deny the difficulties which characterize our relationship to our failing bodies; however, it does require acknowledging that health is not a goal in and of itself, but rather is instrumental for the realization of our humanity. Therefore, our bodies must be understood not only as a medical or physical puzzle, but also as a moral problem. Our relationship to our bodies may need to be renegotiated and reimagined if we are to faithfully traverse the territory of old age in a manner that heeds the commandment to love ourselves. Aging also presents challenges for the self-esteem of the elderly. De Lange insists that "helping old people care about themselves is the most fundamental and elementary form of care of the elderly" (p. 96), and he briefly presents several strategies for advancing this end. Old age is the terrain over which the continuing journey of self-realization traverses, which resonates with the reflections which close out the chapter on the motif of life as a pilgrimage in the Christian tradition.

Fittingly, de Lange concludes the book with a chapter entitled "Love for Aging Neighbors." He explores three dimensions of love for the elderly: love as attraction, love as attachment, and love as compassion. In the first instance, de Lange seeks to advance an argument for the beauty of old age. In the second, he explores the parent-child relationship and posits friendship as perhaps the best model for a relationship that is ultimately *sui generis*. With respect to the third, de Lange draws upon the parable of the Good Samaritan to elucidate the necessity of suffering with the elderly in a way that both respects the dignity and restores the humanity of the recipient of care.

I offer the concluding thoughts and questions out of respect for the author's contribution and a desire to continue the important conversation he has begun. De Lange has offered an honest and compelling affirmation of life in the midst of old age. However, those looking for extensive discussion surrounding what are commonly framed as end-of-life ethical issues will be disappointed. Furthermore, while the question of what it means to age well is subject to intense scrutiny, the related, but distinct, question of what

it means to die a good death is scarcely addressed. There is an apparent tension which runs throughout the book between understanding love (including compassion, the perception of beauty, and the experience of joy) as a duty on the one hand and as an ecstatic event on the other, into which one gets swept up. To be fair to the author, this tension is apparent throughout both the philosophical and Christian theological traditions. How this tension is to be negotiated from de Lange's perspective is not entirely clear, although the concept of disposition reflected in such phrases as openness and posture implies that it might have some type of mediating role.

While the current work addresses the question of why we must love our aging neighbor as our aging selves and offers suggestions for how to do so, there is perhaps a lacuna with respect to the question of how we can become the type of people who love our aging neighbors as our aging selves. While the absence of thick description of the work of the Holy Spirit within the life of the church may be a necessary consequence of the author's explicit decision to write a book intended to be persuasive to believers and unbelievers alike, a fuller discussion of this theme could perhaps help to address the concern highlighted a moment ago. While these reflections could elicit a diversity of responses, what does seem apparent is that in *Loving Later Life*, Frits de Lange has made a timely and necessary theologically informed contribution to our understanding of the ethics of aging.

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**THE CIRCLE** by Dave Eggers. New York: Vintage Books, 2014. 497 pages. Paperback; $15.95. ISBN: 9780345807298.

How much privacy are we willing to give up in order to reach other desirable goals? *The Circle* is a novel that explores this question, presenting a dystopian near-future that is disturbing due to its plausibility.

The Circle is a high-tech company that is aggregating internet accounts and searches into a single account. The company is expanding into almost every sphere, often with social justice or enhancement of society as goals. It is working to eliminate all crime, preserve the environment, and make daily life more convenient. The novel follows Mae, a new hire at the company. She was recommended by her college roommate, Annie, who is fairly high up in the company's hierarchy.

The Circle seems to be a dream company to work for. The campus has everything you need, including free dorm rooms. There are nightly social events and extensive use of social media to link the circlers together into a community. But the social media is not just a bonus available for employees; it is an expectation. If your activity rating is too low, you will get a visit from your supervisor asking why you are not satisfied with the company.

As time progresses, Mae's work area starts sprouting multiple video screens, close to ten by the end of the book, each demanding that she monitor and respond immediately. All this while she is working as a customer experience representative. And there are expectations for that work as well. After each customer case, there is a survey. If she does not get a score of 100, she has been taught to do a follow-up with the customer to try to raise her score. If her daily average is below the high nineties, she will need to redouble her efforts. This reminds me of the email surveys I receive that list the options "excellent/exceeded expectations" and "not excellent"—there is no option for "met my expectations." If it does not exceed expectations, it is a failure, even if I just ask a question that gets answered, as I knew it would.

Mae's early days in the company made me think about how cults acclimate their new members. My other early comparisons were with two of C.S. Lewis's writings. The first is a transcription of a lecture entitled "The Inner Ring" (http://www.lewissociety.org/innerring.php). It discusses our desire to be part of the elite inner ring in a group, to be part of the power circle. The other work is his novel *That Hideous Strength*, which addresses the ideas in "The Inner Ring" and in *The Abolition of Man* in story form. It details how a person can be lured into an organization that appears to have beneficial goals, but may actually cause great harm.

Mae is excited to work for this progressive company and is willing to change in order to fit in and become important.

The comments that follow divulge plot points that are best left unseen if you plan to read the book. There is one other comment I should make before I discuss these plot spoilers. Throughout the book, Mae has a number of casual sexual encounters, some described in detail. I am not sure whether they are there to assist the exposition of her character or just to sell more books. Perhaps it is a mixture of the two.

I will let the interested reader explore for themselves the motivations of the three founders of the Circle. Instead, I will discuss two related values that are core tenets of the Circle.

The first is that nothing should ever be deleted. *All* of human history should be available to everyone.

The second is that we should be completely transparent. After the Circle convinces most politicians and public servants to start wearing body cameras for their entire waking day, three-minute bathroom breaks excepted, Mae becomes a Circle early adopter, broadcasting all her interactions with the world and her millions of rabid followers. Mae's parents are collateral damage to her desire to make the entire world transparent. In a related project, the Circle uses embedded chips to enable parents to monitor their children all the time, including a constant stream of medical data—all the better to catch problems early.

Mae's commitment to transparency is tested when one of her sexual encounters appears on an uploaded video made without her permission by her partner. And the Circle will never delete anything.

The logical conclusion to all this occurs when the Circle volunteers to help raise the voting percentages by having the government hire them to make voter registration mandatory and, at the same time, tie the voters to the Circle account. Now voting becomes mandatory—all one's electronic feeds stop until one votes. This saves billions of dollars a year in costs for the government, and as a likely consequence will reduce important decisions to popularity polls among the uninformed. This mandate also helps to "close the circle," making the corporation essentially the sole source of all information and power. Those who try to escape are easily found using the worldwide system of surveillance cameras and real-time crowd sourcing as people all over the world are told to help track down a dissenter.

At one point Mae has a short encounter with one of her followers, a former divinity student. He says,

> You and yours at the Circle—you're gonna save all the souls. You're gonna get everyone in one place, you're gonna teach them all the same things. There can be one morality, one set of rules. Imagine! Now all humans will have the eye of God. You know the passage? "All things are naked and open to the eyes of God." Something like that. You know your Bible? Now we're all God. Every one of us will soon be able to see, and cast judgment upon, every other. We'll see what He sees. We'll articulate His judgment. We'll channel His wrath and deliver His forgiveness. On a constant and global level. All religion has been waiting for this, when every human is a direct and immediate messenger of God's will. (p. 398)

This set of values is a perversion of ideas found in scripture. First John 1:7 tells us that if we "walk in the light as he himself is in the light, we have fellowship with one another, and the blood of Jesus his Son cleanses us from all sin." This seems to encourage us to live lives for which we would not be ashamed if others see what we do or think. It does not say that forced transparency is the means by which we achieve inner goodness, as the Circle asserts.

The Circle's view of community seems to be heading toward uniformity in the sense that everyone's individual interests and connections are mediated by the Circle's technology. This seems a poor replacement for the promise in 1 Corinthians 12:12–13:

> For just as the body is one and has many members, and all the members of the body, though many, are one body, so it is with Christ. For in the one Spirit we were all baptized into one body—Jews or Greeks, slaves or free—and we were all made to drink of one Spirit.

If the author's intention was to make the reader question how easily we give up privacy (read the permissions you are giving the Apps you install on your smart phone if you are skeptical) in order to gain some other desirable result, he succeeds admirably. There are some nice literary touches involving side stories that work well. The book as a whole presents a future that is both believable and scary. However, despite the engaging story and the important issues of privacy that are raised, I found the underlying worldview portrayed in the story to be quite sinister.

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## History of Science

**IN THE LIGHT OF SCIENCE: Our Ancient Quest for Knowledge and the Measure of Modern Physics** by Demetris Nicolaides. Amherst, NY: Prometheus, 2014. 266 pages. Paperback; $19.00. ISBN: 9781615922253.

At first look *In the Light of Science* is a book with a somewhat intriguing title. Its scope ranges from a discussion of early *Homo sapiens* hunter-gathers to the standard model for particle physics, and then on to string theory—all in the context of seeking linkages to an array of ancient Greek philosophers. Nicolaides maps out three landmarks for humanity: (1) the culturally explosive event of urbanization (about 10,000 years ago), (2) the Greek intellectual revolution and the birth of science (some 2,600 years ago), and (3) the scientifically extraordinary modern era of quantum physics, relativity, and the standard model for particle physics.

The book comprises two parts, including a prologue and epilogue: Part I (78 pages) seeks to provide a brief history of the development of humankind,

passing through urbanization and the mythological era in which the author pays some attention to the relationship between religion and science, and the birth of science. Part II (130 pages) seeks to link pre-Socratic thought to concepts in modern physics. The linkage between the two parts is provided by a dialogue between Greek philosophers in the form of a brief "dream sequence."

The author's thesis seems to be that Greek thinkers provided, at least in essence, many of the fundamental concepts that form the foundation of certain aspects of modern physics, invented science, and scientific thinking. These events all occurred through the utilization of language and the seminal principles of Greek civilization, and under the impact of urbanization. There is the well-known phrase, "If I have seen a little further it is by standing on the shoulders of giants." Nicolaides seems to be saying that modern physics stands on Greek shoulders.

Nicolaides seeks to provide a book which is readable, but in places he oversimplifies the language and makes assertions that are not adequately justified by his citation of supporting source materials. For example, the simplification of vocabulary can be seen in his use of the term "light," rather than electromagnetic radiation, in the context of the discussion of 3 K background radiation, the residual of the big bang. In his discussion of the migration of early peoples, there are, in most cases, estimated dates provided, but no date is given for the entry of people into the Americas. In his discussion of early pre-humans, specifically "Lucy," Nicolaides states that it can be seen that "two legs were starting to evolve into hands" and that there was an iterative relationship between toolmaking, thinking, technology and intellectual development (p. 215). It has recently been reported that the oldest stone tools on record date to 3.3 million years ago (*Nature* [2015]). This pushes back the known date of such implements by 700k years, and such items were produced by "proto humans" long before the advent of modern humans and pre-dating Lucy.

The author's treatment of early humans and precursor species is thin, and there are a good number of books which could have been cited to provide more depth for the evolution of *Homo sapiens* and the history of humankind. Examples include Richard Leakey's *The Origin of Humankind* (Basic Books, 1994) and the early chapters in Richard Dawkins's *The Ancestor's Tale* (Houghton Mifflin, 2004). A recent summary of many of the topics touched on in the story of the transition "from chaos to order" (Part 1) is covered in a recent *Scientific American* special issue, "The Evolution of Your Body" (2015). The vast majority of the cited references in this issue are to literature published well before the Nicolaides book was published.

Clearly the author has great familiarity with the key Greek philosophical concepts which he compares and contrasts with ideas encountered in modern physics. Examples of these are seen in the discussion of Pythagoras and numbers, Parmenides and oneness, and Democritus and atoms. Nicolaides discusses how the thoughts expressed by the Greeks seem to relate to concepts in physics. However, in several cases, the analogies and parallels between Greek thought and modern physics are, at least for someone with my background, a stretch. The Enlightenment received very brief treatment with only passing reference to key figures such as Newton, Copernicus, and Galileo. There is also no real discussion of the motivation of Enlightenment theists who sought to understand God's creation. The Enlightenment clearly revisited some Greek ideas, but Nicolaides jumps from Greece to the modern era and does not connect the dots in his train of thought or in the development of concepts. A much more complete treatment of the development of concepts in physical science, which fills some of the gap found in the current book, is provided in the classic text *The Origins and Growth of Physical Science*, vols. 1 & 2, edited by Hurd and Kipling (Pelican, 1958/1964). The analysis by Nicolaides is very "western" and, more specifically, Greek-centric. If one takes a wider view, there are clearly astronomical insights to be found in a number of other civilizations (see E. C. Krupp, *Echoes of the Ancient Skies*, Harper & Row, 1983).

There is a tantalizingly brief discussion of the theory of everything and several references to the Higgs boson, as well as to concepts of dark and ordinary matter (which is acknowledged to make up only about 5% of the "stuff" in the universe). Toward the end, there is speculation with regard to the topic of time travel, which has recently received better popular treatment in the TV series *Cosmos* in its reworking of the content of Carl Sagan's book of the same title. The series also ranges much farther and wider, considering the total number of stars and planets, and also speculates about the possibility of habitable planets in other parts of the universe.

I was left wondering if the roots of modern physics, quarks, leptons, string theory, and the like, which have all been developed in the past one hundred years, can truly be traced back to thoughts by Greek philosophers. For me it was an interesting read, with my eclectic background: degrees in physics and an enduring interest in the history of science and its interplay with faith, the origins of humankind, and

the advances in astrophysics and atomic and nuclear physics. That said, this book may encourage the student or more general reader with an enquiring mind to look more deeply into fundamental physics—to move our understanding beyond the standard model toward a theory of everything, or perhaps causing a shift in thought as great as that which occurred with the formulation of general relativity.

However, I am left asking, "Who really is the audience for this book?" The general or high school-level reader really needs a prerequisite or a primer on modern physics, the standard model with its quarks, leptons, and the like. Such treatments can now be found on the web: for example, Dan Bloomberg, *An Elementary Primer on Elementary Particles and Their Interactions*, Leptonica (2014), http://www.leptonica.com/particle-primer.html. There is an opportunity for the book to be used as an introduction to aspects of the philosophy of physics or in a "spirit of physics" seminar/discussion class at freshman or higher level. Although this is a text with some unique thoughts, I fear that the more general readership will be somewhat limited.

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**CREATIONISM IN EUROPE** by Stefaan Blancke, Hans Henrik Hjermitslev, and Peter C. Kjærgaard, eds. Baltimore, MD: Johns Hopkins University Press, 2014. 276 pages, including notes and index. Hardcover; $39.95. ISBN: 9781421415628.

Creationism is often thought of as an American affectation. From influential nineteenth-century theologians such as Princeton Seminary professor Charles Hodge, to grand public spectacles such as the 1925 Scopes "Monkey" trial, to present-day organizations and institutions such as Answers in Genesis's Creation Museum, there has been an almost continuous tradition in America of religious opposition to Darwin. The history of American creationism has been most ably told by Ronald L. Numbers, who in the Foreword to this present volume writes, "Until fairly recently the notion of a history of creationism in Europe would have struck many readers as preposterous" (p. vii). *Creationism in Europe*, edited by Stefaan Blancke, Hans Henrik Hjermitslev, and Peter Kjærgaard, shows the history to be both longer and more diverse than has been previously understood.

Most of the book's chapters are devoted either to individual countries or to a few related ones. Each chapter then tells a national story about a state and its specific engagement with questions of evolution and religion. Taken individually, each of these chapters offers a detailed account of the people and organizations that promoted antievolutionary thinking, the religious geography in which creationism spread, and the ways that creationist thought influenced the public life of a nation. Many of these chapters would, on their own, serve as excellent introductions to the science-religion landscape of a particular place. More importantly, in reading across several of these chapters, some common themes begin to emerge. In many cases, the narrative follows a common pattern: Homegrown varieties of creationism flourished in the late nineteenth and early twentieth centuries, often defined along strict religious denominational lines; but, in most places, these were minority views or had largely faded away by WWII.

In the postwar era, American organizations such as the Institute for Creation Research, Answers in Genesis, and the Discovery Institute helped fuel a creationist resurgence that continues with varying degrees of success today. In addition to this general pattern, the history of creationism in many of these countries also evolved in synchrony with larger national political changes—such as the ending of communism in the Soviet Union, East Germany, and Poland in the 1990s; or the democratization of Spain, Portugal, and Greece in the 1970s. In these cases, the flourishing of creationism was also shaped by the liberalization of religious practice and expression.

Many of these central chapters, by focusing on specific national contexts, do not really address the question of creationism as a European phenomenon. At a time when the idea of Europe as a political, cultural, and economic entity is being openly debated in many of the countries featured in this book, the question is ever present: how much is the creationism described in these countries part of a common European story? As the title of the Introduction asks, is this a story about creationism in Europe, or about a European creationism? Blancke, Hjermitslev, and Kjærgaard opt for the former. Taking note of what they term the "North American Roots of Creationism," and observing the general lack of a common creationist experience shared across these nations, the editors conclude, "one cannot talk about European creationism. Creationism in Europe is so many different things to different populations for different reasons" (p. 9).

The rejection of a coherent European narrative makes the selection of the countries represented in the volume all the more important. Of course, it is unreasonable to expect treatment of every European country, but the selection is at times uneven. Neither Italy nor Ireland is represented, and Northern Ireland is scarcely mentioned in the chapter on the UK.

A chapter on "Catholicism" focuses primarily on the doctrines of the Roman Church rather than on any majority Catholic countries, but this still overlaps in part with both the chapter on Spain and Portugal and on Poland. Numbers notes in the Foreword that "the most surprising pattern … is the generally rising rate of creationist sentiment as one moves east, into the former communist (and officially atheistic) countries of the Eastern bloc" (p. xiv). Nonetheless, Western and Northern Europe are far more represented in the book than are other regions. Romania's recent history of creationism is not given its own chapter, but it is mentioned in Kjærgaard's chapter on "The Rise of Anti-Creationism" (p. 237).

Perhaps the focus on individual nations is especially telling at a time when the very idea of Europe is being questioned by factions from both ends of the political spectrum. If creationism is seen not just as a marker of religious identity, but also as something that has roots in nationalism or in resistance to a transnational and transreligious state control, then European creationism is perhaps more like its American cousin, which has flourished in an environment dominated by rhetoric about local control of education and states' rights. The editors do not explain the rationale for their selection of countries, yet they begin with an event that is unequivocally European.

Resolution 1580, titled "The Dangers of Creationism in Education," was passed by the Council of Europe Parliamentary Assembly in 2007. In warning against such dangers, the resolution most notably expressed concern about "the possible ill-effects of the spread of creationist ideas within our education systems and about the consequences for our democracies. If we are not careful, creationism could become a threat to human rights."[1] Perhaps one of the most striking things about that resolution is its representation of "present-day creationists, most of whom are of the Christian or Muslim faith." This implies that Islamic creationism is coequally present in Europe as are Christian versions, despite lacking the long and complex history that is described in this book. Indeed, the proximate cause of the adoption of Resolution 1580 was the publication and mass dissemination of Turkish creationist Adnan Okta'rs (Harun Yahya) *Atlas of Creation*. This in itself suggests that if there is something coherently European about creationism in Europe, it is in the way that creationism's condemnation, in the language of a threat to human rights, no less, follows swiftly upon the heels of the first organized version of Islamic creationism in Europe. The book's chapter on Turkey focuses extensively on Oktar, making him not only the face of Turkish creationism, but also, by proxy, of all Islamic creationism in Europe.

As Islamophobic policies in European nations exacerbate the plight of refugees from majority Muslim countries, and as Muslim populations already resident in many European nations are vilified in resurgent politics of nationalism, nativism, and racism, the elevation of Islamic creationism to a perceived threat to human rights in Europe, and the depiction of it as equally threatening in Europe as all Christian creationism put together, is an aspect of creationist experience that is not just unique to the countries of Western and Northern Europe, but is also distinctly European.

The "Europe" in this book is undertheorized, and in declaring that there is no essential "European creationism," the editors abdicate the need to define a cultural vision of Europe that informs their undertaking. More explicit consideration of the idea of Europe may be of special concern to North American audiences who claim Europe or a historically imagined Christendom as part of their intellectual and cultural pedigree. Despite this, the multinational picture of creationism in Europe, taken altogether, yields something more than its constituent chapters do on their own.

### Reference

[1]http://assembly.coe.int/nw/xml/XRef/X2H-XrefViewPDF.asp?FileID=17592&lang=en.

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**NEWTON'S APPLE AND OTHER MYTHS ABOUT SCIENCE** by Ronald L. Numbers and Kostas Kampourakis, eds. Cambridge, MA: Harvard University Press, 2015. 287 pages. Hardcover; $27.95. ISBN: 9780674967984.

In *Newton's Apple and Other Myths about Science*, Ronald Numbers and Kostas Kampourakis have assembled a series of essays that attempt to debunk common misconceptions that are taught in science classrooms. This collection serves as a companion piece to *Galileo Goes to Jail and Other Myths about Science and Religion* (Harvard University Press, 2010), which was also edited by Numbers. While the earlier work focused specifically on faulty interpretations that directly impact the modern debate between science and religion, this volume seeks to improve science literacy and generate an understanding of the "nature of science" by answering questions such as: How is science done? What questions do scientists ask? and, What type of knowledge do they produce? While not its focus, *Newton's Apple* does engage with

religion and the role of the church where those interactions are critical to the historical narrative; however, unlike the previous volume, these interactions are not the main focus. Numbers is a renowned historian of science and medicine, having written or edited more than thirty books. Kampourakis's interests in science education meld with Numbers's expertise to make *Newton's Apple* noteworthy.

As with all compiled volumes, this one is built upon the expertise of its twenty-seven individual contributors: these include Peter Harrison, Michael Ruse, Bruno Strasser, Mansoor Niaz, and Patricia Fara. The slate of authors is impressive, each author bringing their own personal expertise to bear on one specific commonly taught idea that lacks historical accuracy. The questions in this compilation range from the general (e.g., that religion has typically impeded the progress of science) to the specific (e.g., that the Millikan oil-drop experiment was simple and straightforward) and are organized into four sections: Medieval and Early Modern Science, Nineteenth Century, Twentieth Century, and Generalizations.

The importance of *Newton's Apple* lies in its honest ability to define and provide historical depth and context to the events surrounding commonly taught myths. Strasser defines a myth in his essay as "a way of collectively expressing something about values, beliefs, and aspirations, even though, taken literally, the content of the myth is not true." He continues to say that "myths not only (imperfectly) reflect the past but also shape the future. For this reason, explaining how and why a myth crystallized in a particular community at a specific time in history is often more illuminating than simply debunking the myth by showing its inaccuracies" (pp. 179-180). Both this volume and *Galileo Goes to Jail* serve this role well by providing succinct, historically informed essays aimed at explaining a variety of myths that have been shaped over time to serve the purpose of their advocates, rather than conveying precise historical events.

Overall, the essays included in this volume address important myths that continue to hinder the public understanding of science and its history. *Newton's Apple* questions myths such as the oft-taught idea that Columbus believed in a flat earth and that a falling apple led Newton to postulate the Law of Gravity. A number of essays are devoted to various aspects of evolution, as postulated by Charles Darwin and interpreted by others. Historical context is also provided for more modern myths, including the role of *Sputnik* in spurring changes to scientific education in the United States and the story that medical practice was revolutionized when Linus Pauling discovered that there was an underlying molecular basis for sickle-cell anemia. Perhaps the most compelling essays, however, are the four included in the final Generalizations section, which provide a useful overview of the field and the major reasons for trying to debunk these myths in the first place. In a classroom setting, engaging these final essays first might provide a useful foundation for the discussion of the other more temporally placed myths, which occur earlier in the volume. With almost thirty percent of the essays in this compilation addressing some form of Darwinian evolution, there are sections of the collection that feel a bit repetitive; however, as evolution and Darwin in general remain major points of debate on the modern stage, the inclusion of so many different myths in relation to this topic may be justified.

I believe that this book has brought together the right group of scholars to address, in intelligent yet accessible ways, the stories that many of us were taught and that we continue to teach our students today about science's most famous characters and the way scientific advancement occurs. Engagement with this volume stands to improve scientific accuracy and the general understanding of how scientists actually do science. While both *Newton's Apple* and *Galileo Goes to Jail* address some of the same myths, it does seem that the change in focus from "science and religion" to "the nature of science" renders this latest volume of value, especially to those working in science education at all levels who wish to ensure that their students are capable of interacting with the modern world in an enlightened and accurate way. Context matters, and this volume does an excellent job of placing each of the presented myths within its historical context and identifying important historical details, which in many cases have been skewed for rhetorical, pedagogical, or, occasionally, for more malicious reasons. Regardless of the motivation, it is time to reclaim scientific history, and Newton's Apple serves as an important step in that process.

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**HUXLEY'S CHURCH AND MAXWELL'S DEMON: From Theistic Science to Naturalistic Science** by Matthew Stanley. Chicago, IL: University of Chicago Press, 2015. 364 pages, including notes, bibliography, and index. Hardcover; $45.00. ISBN: 9780226164878.

That naturalism functions as a guiding point of view or philosophy for the practice of modern science has become a truism. Naturalism is critical of any appeal to the supernatural or of any being or idea that smacks of the transcendent. But how, you may ask, did so many scientists become accustomed

to or convinced that any appeal to God talk is out of bounds in an explanation of natural events? This well-researched book by Matthew Stanley, associate professor at New York University's Gallatin School of Individualized Study, provides an answer as to how British scientists came to believe that "the defining characteristic of science is its *naturalism*" (p. 1).

Stanley provides a clear-eyed look at scientific practice in Victorian Britain by tracing the expulsion of God language, religious ideas and values from scientific discourse. Stanley is interested in showing that the rise of naturalism and the displacement of theistic science has a history; naturalism did not arrive surreptitiously, nor was its rise inevitable, but scientists were passionately involved in arguing for the benefits of naturalism, as well as raising potential objections to its ultimate success. Stanley fixates on two intellectual giants of nineteenth century British society: Thomas Huxley (Darwin's acknowledged agnostic bulldog), and James Clerk Maxwell (the great "evangelical" unifier of electricity and magnetism). Stanley also gives a close reading of some of their contemporaries. Two, of many, quotations typify the underlying tension between Maxwell and Huxley's interpretations: Maxwell, "I have looked into most philosophical systems and I have seen that none will work without a God," and Huxley, "Extinguished theologians lie about the cradle of every science."

At first blush, the title of the book seems rather forced: any association of Huxley with "church" seems outlandish, and to suggest that Maxwell's demon (or Maxwell's use of the metaphor of a railway "pointsman") might be appropriate in a discussion of theistic science and naturalistic science, seems equally out of place. Stanley wishes to mollify the "warfare thesis" between science and religion by suggesting that "valence values" (values common to theists and naturalists) undergird the Victorian transition to naturalism. "Practices were the basic methodological assumptions and goals of science itself" (p. 5). These values help bond scientists despite deep-seated differences as to the meaning of, say, the uniformity of nature.

In addition to the Introduction and Conclusion, seven chapters form the heart of this book. The second chapter, in particular, "The Uniformity of Natural Laws," is crucial to Stanley's argument. Stanley asks, "How can it be that uniformity was seen as rooted in theism in the early Victorian period, when it was presented as an enemy of theism by the end?" (p. 34). He concludes, "The shared value of uniformity allowed for a transition between the two groups, but was surely not sufficient" (p. 79). In chapter 7, "How the Naturalists 'Won,'" Stanley details the events which pushed the transition in a definitive direction. Huxley's efforts to publicize the advantages of embracing scientific and secular ideas, to advantage the cultural preeminence of men of science, to argue that there is but one kind of knowledge and but one method of acquiring it, and to present naturalism as an alternative to Christianity rather than an attack upon it, won the day. As natural theology moved ever closer to the near identification of God with the uniformity of Nature, there was little to choose between the devout and the agnostic. The rise of Huxley's church, a secular (agnostic) religion which challenged the Anglican institutions of the day as well as its intellectual theology, became ever more difficult to counter.

Although there may have been differences concerning the extent, interpretation, and applicability of the uniformity of nature, common practices seemed to trump. However, in the application of scientific concepts to human beings a fault line developed. As Stanley expresses it in the introduction to chapter 6, "Free Will and Natural Laws": "Theistic and naturalistic scientists had been able to find common ground in a lawful nature (chap. 2), the role of hypotheses (chap. 3), educational systems (chap. 4), and intellectual freedom (chap. 5). But free will was the fault line from which they began to diverge profoundly" (p. 179). Huxley, and other closely allied scientific naturalists, extended the scope of the uniformity of nature to the mind, considering both animals and humans to be *automata*. For Maxwell, this was a bridge too far. He thought humans had a soul and clearly displayed free will. Stanley describes Maxwell's ingenious efforts to safeguard free will in a world described and prescribed in terms of mechanical laws governing the motion of material particles. For Maxwell, the soul was like a railway "pointsman" (or demon). This argument was ultimately to fail due to considerations of the Second Law of Thermodynamics. Even the demon (or "soul") expends some minimal energy in its actions.

For Maxwell and his theistic colleagues, ontology superseded methodology. They adhered to an ontological richness which saw God's faithful governance of creation in law-like terms. Methodology was secondary. The prospect of a nascent "methodological naturalism," they thought, would eventually eradicate all sense of the mysterious and the divine. A few decades later, the suggestion from quantum physics of the uniqueness and individuality (indeterminateness) of physical entities would comport much better with the theists' belief in the radical character of all creatures and their dependence on the Creator.

For anyone who wants to read an insightful and novel way of understanding the rise of naturalism in the English-speaking world, this book is invaluable. I highly recommend the book and encourage the reader to take its historical lessons to heart.

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

## Religion & Science

**RE-VISION: A New Look at the Relationship between Science and Religion** by Clifford Chalmers Cain, ed. Lanham, MD: University Press of America, 2015. 164 pages. Paperback; $29.99. ISBN: 0761865462.

As someone who has long been interested in the relationships between faith and science, I was intrigued when I saw that this book claimed to provide a "new look." Sadly, not only is this "look" not new, but its depiction of God is not one with which I or many *PSCF* readers would be comfortable.

Written by various faculty members at Westminster College of Missouri, the format of the book is promising enough. Clifford Chalmers Cain is Professor of Religious Studies and the primary author of the book. Other chapters, written by colleagues in the sciences and philosophy at Westminster, deal with "hot button" issues in religion and science: the Big Bang, evolution, nature-nurture, and intelligent design (ID). Cain responds to each of these chapters, showing how in his view religion interacts with these issues.

Those familiar with the literature on religion-science interactions will know Ian Barbour's four models: conflict, independence, interaction, and integration. Cain acknowledges Barbour but instead chooses the models of conflict, contrast, and conversation (p. 7). Cain rightly rejects the conflict model, which distorts the evidence and has plagued the study of religion-science interactions. Likewise, he points out the impossibility of the contrast model, which holds that religion and science are independent. He sees the most promise in conversation between religion and science, in which each can inform the other to advance potential mutual knowledge (p. 9). In omitting the integration model, Cain evidently sees science as free from worldview presuppositions. However, in his response chapters, Cain absorbs the naturalistic worldview espoused by these authors and accommodates it into his theology. Cain holds to process theology, which denies God's omnipotence and omniscience but argues that God acts by persuasion, not decree. Thus the conversation between religion and science seems more of a capitulation on the part of religion than a conversation, which Cain acknowledges but sees as more of a correction than an acquiescence (p. 15).

The Big Bang implies a beginning and thus someone who began the process. In his discussion of this topic, Cain confuses God's omnipotence with the speed of his action and sees the drawn-out process of creation as evidence for process theology (p. 38). Likewise, the anthropic principle is thought to be guided, not directed, by the God of process theology, even though the form of this guidance is not given.

One theological question raised by evolution is how the randomness of evolution relates to God's providential hand. When the biologist McNett states, "It requires no supernatural guidance or great cosmic direction for its operation. It cares not a whit for our destiny, hopes, or salvation …" (p. 57), he is making a theological statement, not a scientific one. Cain, in his response, affirms the doctrine of providence but cannot reconcile an omnipotent God with the naturalistic processes of evolution or with human freedom (78 ff.). Instead, he again invokes the impotent God of process theology. By contrast, I would argue that God's omnipotence is maintained in the doctrine of concurrence, which holds that God is acting directly (God's omnipotence) and we are acting (our freedom).

In his response to the chapter on the nature-nurture question, Cain rightly criticizes genetic determinism and acknowledges the role of environmental influences that shape who we are. Cain asserts that the failure of genetic determinism gives room for the human freedom that is necessary for religion's standard of morality (p. 116). Maybe so, but what then does account for human freedom? When we are converted and transformed by the renewing of our minds (Romans 12:2), do these changes come about by our actions or God's?

In the chapter on ID, the philosopher Geenen's claim (equating ID with creationism) that ID attempts "to make room for God's causal role in the physical and biological world" (p. 140) is a questionble statement. One could claim that God created the world solely through natural processes, but Geenen rejects any causality by God. Does this also exclude the persuasive God of process theology? Moreover, if the God of the Bible performed miracles in redemptive history, what about miracles in creative history? Cain rejects that the intelligent designer could be God because such a god would be a dictator, not the winsome God of his process theology.

All of this leads me to question the validity of process theology. Cain argues (p. 147) that an omnipotent

God cannot also be the empathetic God as portrayed in the Bible: "God wants/intends certain things but God does not guarantee—cannot guarantee—that those things will come to be." But empathy does not mean impotence. Christ willingly subjected himself to death; this does not mean that he was not in control. Moreover, if the God of process theology is merely persuasive and not directive, how is God so without being superfluous? If God is truly benevolent, wouldn't that benevolence be undermined by his ineffectiveness in carrying out his will?

Although the scientific arguments are clearly presented, the book is not without factual errors. In his chapter on intelligent design, Geenen argues against Behe's irreducible complexity theory by providing evidence that the auditory ossicles and the panda's thumb are not irreducibly complex (p. 134). But Behe never argues that they are; he limited his examples to molecular systems.

In summary, while Cain has raised some interesting arguments about the relationship between religion and science, I find them unconvincing. Science is not done in a theological vacuum and process theology's accommodation to the materialist worldview espoused in the chapters on science is unsatisfying.

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**FOR THE LOVE OF ALL CREATURES: The Story of Grace in Genesis** by William Greenway. Grand Rapids, MI: Eerdmans, 2015. 178 pages. Paperback; $18.00. ISBN: 9780802872913.

This creative study is timely in light of contemporary environmental challenges, and one of its principal findings—that God created humanity to be good stewards of the earth, "caretakers of God's garden" (p. 84)—is most welcome owing to the general neglect of this issue in theological discourses. What William Greenway offers is a reading of Genesis that is overtly creature and creation loving in its approach (pp. xiii, 93–94, 100–105, 110, 143–44). He insists throughout that Genesis is a spiritual classic and that readers ought to approach it as such. Materialist interpretations that assume its authors attempt a primitive "scientific" account of origins are uniformly guilty of "genre confusion" (p. 8).

The problem with materialist readings, whether those of neo-atheism or biblical literalism, is the tendency to leap from science to metaphysics. Scientists who insist that evolutionary theory disproves the Bible and vindicates atheism are as guilty of this as are fundamentalists who find "proofs" for the existence of God in the same writings. Greenway's elegantly argued alternative insists one can accept both evolution and other scientific insights while maintaining that Genesis is true. The problem is not science but materialism (pp. 32, 107, etc.) and in response, he sets about rescuing the religious poetry and spiritual meditations that are the creation and flood narratives from misguided reading strategies. The biblical primeval history may not correspond to contemporary scientific understandings but it does present us with glimpses of a profound grace and beauty in the midst of a world suffused with injustice, cruelty, and suffering (p. 140).

Greenway contrasts Genesis 1–11 with two very different texts. The first is the ancient Enuma Elish, the Babylonian origin narrative that was the primary alternative to the one put forward by the authors of Genesis. The second is the comparatively modern creation narrative in Thomas Hobbes's *Leviathan* (published 1651), which, in combination with Darwinian-style materialism, "constitutes the predominant modern Western understanding of the ultimate character of reality" (p. 17). Hobbes and twenty-first-century materialists alike view existence as "wholly physical, a blind interplay of forces" (p. 34). Whereas the Enuma Elish was the most important competing origin story in the ancient world, *Leviathan* outlines "the basic parameters of the modern Western Hobbesian/Darwinian creation narrative" (p. 29), and is the creation narrative of materialism (p. 30). What Hobbes seeks is a rationale for commonwealths consistent with modernity's discovery of the materialist character of reality, a worldview that insists that human self-interest rules out the existence of true altruism. There is no god, no love, no good and evil. It is a vision of reality Greenway finds "dark and depressing" (p. 45; cf. p. 41) but one that dominates Western thought in its updated neo-Darwinian form.

The alternative is the message of grace found in the Genesis creation and flood myths. Here Greenway finds a basis to question and dismantle the deeply rooted anthropocentrism of the Western world that "has plagued readings of these texts for two millennia" (p. 16; see, too, pp. 101–103), and resources for a spiritual orientation that affirms the goodness of all life. In the process, he confronts ethical questions rarely asked in theological circles. To give but one example, his provocative discussion of animal sacrifice confronts the tendency to devalue nonhuman life so typical in the anthropocentric West. Greenway recognizes competing attitudes toward blood sacrifice in ancient Israelite society (pp. 59–63, 78, etc.) but adds that despite rival views on the matter, biblical authors uniformly present a high regard for all living things. The modern Western option that assumes an

"ontological divide" and "absolute moral distinction between humans and other animals" is untenable in light of Genesis, Isaiah, Micah, and others. Such thinking results in horrific behaviors as humans treat animals as mere machines existing solely for human convenience. The specific examples he cites are trophy hunting and factory farming which, he argues, "would have mortified all of the ancient Israelites, excepting those awful persons who 'break a dog's neck'" (p. 64; citing Isa. 66:3). There is urgent need of reorientation that involves not only an affirmation of the goodness of all creation but also recognition of moral obligations to contribute to its wellbeing.

This is a wonderful contribution to theological and biblically grounded discourses about the environment and animals. Though he does not interact with Norman Habel, in some respects *For the Love of All Creatures* reminds me of the writings of Habel, not least *The Birth, the Curse and the Greening of Earth: An Ecological Reading of Genesis 1–11* (2011) and other volumes in the Earth Bible Commentary series that he edits. There are many differences in approach, but both projects share a concern to reread biblical texts in light of the unprecedented environmental challenges facing our world.

*Reviewed by Michael Gilmour, Providence University College, Otterburne, MB R0A 1G0.*

**SCIENCE AND RELIGION: Beyond Warfare and Toward Understanding** by Joshua Moritz. Winona, MN: Anselm Academic, 2016. 318 pages, includes index and glossary of terms. Paperback; $30.95. ISBN: 9781599827155.

This book is an authoritative, judicious, and considerate review of why there is no real war between scientific pursuit and Christian faith. It successfully fills a large void in the literature of science/faith relationships by supplying an analysis and irenic disassembly of the conflict metaphor, as played out through several scientific disciplines.

Joshua Moritz has for many years been associated with the Center for Theology and the Natural Sciences (CTNS) at the Graduate Theological Union in Berkeley. He combines appointments at the CTNS and the philosophy department at the University of San Francisco. He brings to his writing an extensive background in the natural sciences, biblical languages, theology, and philosophy. He also brings a background informed by lots of discussion with students and others who have been indoctrinated with the conflict thesis.

The introductory chapter begins with a short review of the history of the modern "warfare metaphor" and its rhetoric, with reference to such figures as Andrew Dickson White and John W. Draper. He then briefly deflates three exemplary myths from the warfare corpus: Columbus did not prove (or need to prove) that the world was round; Galileo did not go to jail; and the John Scopes "Monkey Trial" was not really about the relationship between biological evolution and faith. At this point, many readers should realize that they have uncritically absorbed a set of common cultural myths about Christian repression of science.

Chapters two to four build a more nuanced and realistic model for the historical and theoretical relationships of faith and science. Chapter two demonstrates the positive role that theistic conceptions of nature played in the historical development of the natural sciences. Once again, prominent case histories are deployed from the history of geology, evolutionary biology, and cosmology. For example, the role of Christians like Nicolas Steno and William Buckland in the development of a concept of Earth's antiquity are emphasized. Chapter three provides an introduction to the philosophy of science, with attention to the role of faith in the life of the scientist. Moritz lays out a case that beliefs central to scientific investigation, such as a belief that the world is orderly and rational, or that it is good and worthy of investigation, are properly faith statements that are actually supported by theism. He also provides strong support for the complementary thesis that religious faith needs science. Chapter four discusses where real points of conflict lie and diagnoses the problem as one of imperialism by either scientists or Christians.

Chapters five through nine take up classic subject areas that are often portrayed as theaters of conflict. To list, in order: creation and cosmology; evolutionary biology; human nature, uniqueness, and the *imago Dei*; miracles and the laws of nature; and the problem of suffering. Each of these chapters runs about 25 to 35 pages and each competently summarizes a large body of technical literature. Any of these could be used in a classroom setting, for example, as a nice overview of the interactions of science and faith in a positive light.

The final chapter examines the scientific evidence for the nature of the end of the universe and provides a Christian hope in the world to come.

Each chapter concludes with a small set of discussion questions. These are typically followed by a section, "beyond the classroom," which suggests a group activity for further investigation. Then a set of relevant references for further study, including internet-based references, is supplied. These sections

make the book especially applicable for classroom use. I intend to use it in classroom teaching at my institution.

As the topics above indicate, the book is wide ranging in its scope, and well organized, with a definitive trajectory. It takes the warfare metaphor to pieces and offers a more wholesome perspective in its place, one in which faith and science interact, not just to support one another, but to broaden each other's vision. This book presents a win-win option for science-faith interactions. It is a win for the reader, too.

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

## TECHNOLOGY

**HOW TO FLY A HORSE: The Secret History of Creation, Invention, and Discovery** by Kevin Ashton. New York: Doubleday, 2015. 336 pages. Hardcover; $27.95. ISBN: 9780385538596.

During the process of developing the "Internet of Things," Kevin Ashton discovered that much of what he had been led to believe about the creative process was wrong. In *How to Fly a Horse*, Ashton uses several detailed stories from history to help remove the mystery surrounding creativity and to inspire the reader to follow their own passion to make things better by making something new.

In the first few chapters, Ashton challenges commonly held myths surrounding creativity and invention. He makes the case that the ability to create is not a special characteristic possessed by a few, but is rather the essence of what makes each of us human. Inventing is not about having a stroke of genius, but requires hard work driven by a desire to make things better. Ashton asserts, "work is the soul of creation" (p. 24). Using the story of the Wright brothers along with others, he undermines the myth that creating rests on leaps of innovation. According to Ashton, invention is not characterized by leaps, but by methodical stepping, with failure greeting many of those strides. Discovery, we learn, also requires persistence.

Later in the book the author turns his attention to inspiring and instructing the reader in the pursuit of an actively creative lifestyle. Ashton explains that each of us by virtue of our unique heritage of genetics and past experience is positioned to make our own special contribution to the world. While acknowledging the importance of the past, he cautions us to guard against allowing our preconceived notions of the world or the cultural assumptions of those around us to impede our search for the new. He describes fascinating research into the brain's filtering ability, which often allows us to see only what we are expecting to see. Ashton is suspicious of analysis and planning, preferring trial-and-error methods. He tells us that creating is fundamentally about doing. He writes, "There is no creating in meetings. Creation is action, not conversation" (p. 225). Citing research that children are often more openly creative than adults, he maintains that "adults think before acting; children think by acting" (p. 221). As a professor of engineering, I acknowledge that analysis and planning are, at times, used to delay doing and that they can also stifle creativity. However, I believe Ashton is overlooking the fact that while naïve creativity is unencumbered by the past, it is not informed by it either. To abandon analysis and planning is to ignore, to a large degree, communal wisdom, both now and down through the ages.

With urgency in his voice, Ashton reveals his motive for writing the book in the concluding chapter. Looking up from his work, he sees problems looming on the horizon that may eventually threaten modern civilization. He understands that a growing population with an ever-increasing consumptive appetite is not sustainable on a finite planet, and this is leading to a number of significant, multifaceted environmental problems. While I believe Ashton correctly assesses the seriousness of our situation, his solution is troubling. He sees our creative spark as a product of evolution: the only thing that separates us from other species. As a result, he believes that our only hope for a future is found in ourselves: in our ability to create. He hints at this hope earlier in the book when describing the process of invention:

> Creation demands belief beyond reason. Our foothold is faith—in ourselves, in our dream, in our odds of success, and in the cumulative, compound, creative power of work. (p. 66)

Ashton believes that the only way out of our dilemma is that we all should sacrifice ourselves to the all-consuming hard work of creating. "And this is why we need new: Consumption is a crisis because of math; it is not yet a catastrophe because of creation. We beat change with change" (p. 240). By reducing our humanity to our creativity, Ashton is left clinging awkwardly to a blind faith in human ingenuity, free from restraint, which is precisely what has caused our problems in the first place. Ashton attempts to resolve this absurdity by suggesting that we must not be creating enough, fast enough.

The suggestion that we can do it ourselves is familiar snake oil. It is of the same vintage that Adam and Eve tasted in the garden. However, when we put

our trust in ourselves we are left with nothing but a hand-wringing hope: a restless wishing. Thankfully, our salvation and the fate of humanity does not rest on us and our abilities, but rather, in the sovereign God of the universe and in the redemptive work of Christ, his Son. Humanity's creativity is certainly unique, but ultimately it is God's relationship with us that makes us special. Our human capacities, including our creativity, are gifts from God to be used in response to his call to lovingly serve others and the rest of his creation. Humankind and the selfishness of our sinful hearts have given rise to our problems. It is only by God's grace, through the work of the Holy Spirit, that we can bring healing to this world by redirecting our creative efforts toward the Kingdom of God.

Ashton asks us to rest on our wits, but what we find there is not rest at all, but rather a frantic scramble to save ourselves. Creativity is a gift from God that only brings blessing when used in accordance with His will.

You should read *How to Fly a Horse* for its many insights and interesting stories but do not look to it for ultimate meaning. That meaning can come only from acknowledging that true hope is not found in ourselves but in the God who saves us. As a final note, Andy Crouch's *Culture Making: Recovering Our Creative Calling* (InterVarsity Press, 2013) flows from a biblical worldview and makes a wonderful companion read to Ashton.

*Reviewed by Kevin Timmer, Professor of Engineering, Dordt College, Sioux Center, IA 51250.*

**HOW WE GOT TO NOW: Six Innovations That Made the Modern World** by Steven Johnson. New York: River Head Books, 2014. 293 pages, index. Hardcover; $30.00. ISBN: 9781594632969.

This best-selling book was created simultaneously with a PBS/BBC television series that had the same name. Steven Johnson is a prominent writer who has written extensively on the intersection of culture, science, and technology. Among his other books are *The Ghost Map, The Invention of Air, Where Good Ideas Come From,* and *Everything Bad Is Good for You*.

He looks at technology's effect on modern society through six broad categories: glass, cold, sound, clean, time, and light. For reasons unknown to me, these categories are in a different order in the television series. This does not really matter as the six main chapters can be read in any order.

This is neither a Christian book nor an anti-Christian book. Johnson does not look at worldview as one of his main topics. He delights in showing how the development of technology has had unusual sources and unanticipated consequences. He writes,

> Innovations usually begin life with an attempt to solve a particular problem, but once they get into circulation, they end up triggering other changes that would have been extremely difficult to predict. (p. 3)

This has implications for Christians in engineering and science research. Frequently we may get bogged down in the details of our research and do not think through the implications and potential applications of it. As Johnson points out many times, technological developments often have a life of their own and lead to results that their creators may never have imagined.

One of the few times he gets into worldview related issues is when he discusses sound. He discusses the problem of sex selection abortions that have been indirectly promoted by technological development.

> This may be one of the most astonishing, and tragic effects in all of twentieth century technology: someone builds a machine to listen to sound waves bouncing off icebergs, and a few generations later, millions of female fetuses are aborted thanks to that very same technology. (p. 123)

He does show a misunderstanding of Christian faith when he writes about radiometric dating of the earth. He writes that this technology is "establishing the most convincing evidence that the biblical story of the earth being six thousand years old is just that: a story, not a fact" (p. 191). He appears to assume that all Christians believe in a young earth. I do not think that many people reading this review will see radiometric dating as contradicting the Bible.

One example of his approach is to show how the sacking of Constantinople in 1204 and development of the movable type printing press in the 1440s ultimately led to the development of the telescope. The fall of Constantinople led to many of its glass makers fleeing to the small Venetian island of Murano. Their work led to Murano becoming what we would today call an innovation hub for glassmakers. The eyeglasses they developed were expensive, but since few people could read there was little demand for them. With Gutenberg's printing press, many things could now be reproduced. This led to a greater interest in reading by the public. Many people then discovered for the first time that they had bad eyesight. This created a surge in demand for spectacles. Johnson writes,

> Thanks to the printing press, the Continent was suddenly populated by people who were experts at manipulating light through slightly convex pieces

> of glass. These were the hackers of the first optical revolution. (p. 22)

As more and more people tinkered with curved pieces of glass, this eventually led to the development of the microscope and telescope.

Johnson refers to many of the developers of technology as time travelers, for they could see beyond the present day of their era. Sometimes they also had to be stubborn to keep working on something when no one else saw a purpose in it. An example of this is the story of Frederic Tudor. In the early 1800s, he saw many cargo ships coming into Boston harbor filled with goods from the West Indies. However, they were going back there empty. He had the idea to take ice from New England and ship it to the West Indies in what would have been the empty ships. He eventually became a very wealthy man from this business. However, it had a difficult start as most people in the West Indies had never experienced anything cold and saw no use for this strange material called ice. He had to work hard to create a demand for his product. Many people develop technologies that are eventually popular, but which people initially have no desire to purchase. The creators of the technology may have to work to help create a demand for its use.

This is an excellent book written for an intelligent lay audience. Since many of us in ASA are really lay people when it comes to anything outside our individual areas of expertise, I think most members would enjoy the book. In addition to having creative content, Steven Johnson is an excellent writer. Reading this book has motivated me to obtain and read some of his other books dealing with technology and culture.

*Reviewed by William Jordan, Professor and Department Chair, Mechanical Engineering, Baylor University, Waco, TX 76798.*

**AND WEST IS WEST** by Ron Childress. Chapel Hill, NC: Algonquin Books, 2015. 320 pages. Hardcover; $26.95. ISBN: 9781616205232.

For some time, I held a popular view that tools and technologies are neutral: they have no moral value in and of themselves, apart from how we use them. This was an empowering way for me to think about my own use of computing technologies, and perhaps helpful to the extent that it caused me to evaluate the directions of my research.

One of my close friends, however, holds a degree in philosophy and has the troubling habit of asking challenging questions and inviting me to think carefully about my assumptions and their implications. He likes to point out that tools and technology actually change a person. Yes, a hammer can be used for good purposes, or for bad ones, and it is up to the person holding that hammer to determine what use she will put it to. In that sense, we may call it neutral. But a person who picks up a hammer becomes a different person.

Or, to use a more poignant example, a person becomes a different person by picking up a gun. Not only in many circumstances might I act very differently with the gun in my hand, but equally importantly I would think of myself differently. The tools and technologies we use change us.

Childress's new novel *And West Is West* provides a fascinating exploration of how the technologies we use change us. The tale follows two protagonists on opposite sides of the country: Jessica, a drone pilot who carries out missile strikes on suspected terrorists, and Ethan, a quant or programmer who designs algorithms that enable his bank to profit off high-speed currency exchanges based on the market fluctuations caused by terrorist activities. Both protagonists wrestle with moral qualms about their work and the suffering it causes or exploits.

I had some doubts when I picked up the book and saw it had won a prize for "socially engaged fiction." Socially engaged is good. But I feared the writing would be didactic: a sermon thinly veiled as a story. While the author does not leave the reader with many doubts about his view of drone strikes, or of algorithmic trading that profits off human suffering, the much more interesting and subtle exploration describing the seemingly "neutral" technologies the protagonists make use of, and the isolating impact and depersonalizing nature of those technologies. It is not only what the technologies are used for that change the user, but also the nature of the technologies themselves.

Jessica sits thousands of miles away from her targets, flying her drone from a military base in the Nevada desert. She launches missiles (euphemistically called "angels") at blurry images on a computer screen. Sometimes the missiles take innocent lives. She and her colleagues escape the monotony, and perhaps also the feelings of guilt, through overeating, gambling machines, and nicotine. "On the base they call it Operation Expanding Waistline, partly because covert snacking is the main pastime during shifts at a drone monitor."

Ethan is a quant; he works seven-day weeks in the Wall Street trading world, sitting alone behind a computer monitor writing code, keeping himself going

with drugs and energy drinks. "Basically he works all the time." When not at the office he is still at the call of the bank, constantly chained to mobile computing technologies. He seems unable to maintain healthy human relationships. There is no mention of his family until the end of the book. He loses two girlfriends. He has only one friend.

Not far into the novel both Jessica and Ethan lose their jobs. Jessica makes the mistake of confessing feelings of guilt to her biological father, who happens to be in prison. That she had to confess via letter to a biological father she does not even know is symptomatic of her isolation. Since her guilt involves a drone strike with civilian casualties, the confession is a security breach resulting in her discharge. Ethan, in a moment of physical and emotional fatigue also brought about from guilt and failed relationships, makes a decimal point error that causes his bank to lose a few hundred thousand dollars. This is presumably a fraction of the money his algorithms have actually earned the bank, but since Ethan also made the mistake of being unshackled from his technologies for twenty-four hours, it provides an excuse for his boss to fire him.

Then the real drama begins. Having been conditioned to isolation, both struggle to adjust to life away from that work, and in particular to build real human relationships not mediated, restricted, or distracted by technology. The struggles are not easy, and are compounded by the secretive—and immoral—nature of their former jobs. Jessica, with her knowledge of sensitive military secrets, becomes a wanted fugitive. Ethan winds up in a legal battle with his former employer.

Interestingly, the paths of the two protagonists never cross. The only connection is the fact that Ethan's algorithms enabled his bank to profit off the drone strikes carried out by Jessica. Not until the very end of the novel does Childress reveal the thin thread that unites their personal lives, and leaves the reader with the possibility that they might meet in person. But Childress provides a fascinating cast of other characters ranging from an FBI agent who once interrogated (or tortured) Al Qaeda suspects in Afghanistan (thus weaving in another aspect of social concern), to a weed-smoking tattoo artist, to a bisexual painter who goes from a struggling to a wildly successful artist, to a Russian billionaire, to a suicidal father of an ex-girlfriend.

The book raised a number of interesting questions about my own views of technologies and how I use them, and I found myself pondering some of these after closing the pages. The pacing of the novel is excellent, switching back and forth between numerous scenes in the two separate storylines, and now and then jumping to the point of view of one of the minor characters. My primary critique is that many of the characters are one dimensional: caricatures or types rather than fleshed-out persons. Even the protagonists do not really grow or change until the very end, and the change is seen then in only one short scene. Nonetheless, Childress succeeded at the most important level in that I found myself caring what happened to both Ethan and Jessica, even if at points I did not like the former very much. That, and the well-crafted suspense, kept me reading and made it a book I would recommend.

*Reviewed by Matthew Dickerson, Professor of Computer Science, Middlebury College, Middlebury, VT 05753.*

**THE MASTER ALGORITHM: How the Quest for the Ultimate Learning Machine Will Remake Our World** by Pedro Domingos. New York: Basic Books, 2015. 311 pages, index. Hardcover; $29.99. ISBN: 9780465065707.

Pedro Domingos is a professor of computer science at the University of Washington and a leading researcher in the area of machine learning. The central thesis of this book is, as he states it, that "all knowledge—past, present, and future—can be derived from data by a single, universal learning algorithm" (p. 26). He calls that algorithm, yet to be discovered, the "Master Algorithm"—hence the title of the book.

The book begins by discussing the ubiquity of machine learning in the present day. Email spam filters, recommendation systems used by companies such as Amazon and Netflix, selection of stocks by mutual funds, the layout of goods in a supermarket, credit card fraud detection, and loan application approval—among many others—make heavy use of machine learning. According to Domingos, even the result of the 2012 presidential election was heavily influenced by machine learning: "the candidate with the best voter model wins, like Obama versus Romney" (p. xiv).

The author classifies workers in the field into five rival schools, which he often refers to as tribes. The Master Algorithm would unify these five approaches into a single algorithm that draws on the strengths of all five. Domingos claims that

> if such an algorithm is possible, inventing it would be one of the greatest scientific achievements of all time. In fact, the Master Algorithm is the last thing we'll ever have to invent because, once we let it loose, it will go on to invent everything else that can be invented. (p. 25)

Domingos devotes one chapter to each of the five tribes of machine-learning workers. The Symbolist approach (chap. 3) uses induction to derive symbolic rules such as decision trees. Connectionist models (chap. 4) emulate the learning that takes place in the human brain through neural networks. The Evolutionist approach (chap. 5) uses learning strategies modeled after the way species have learned (i.e., become more fit for their environment) through the evolutionary process; hence the names "genetic algorithms" and "genetic programming" for variants of this approach. The Bayesian approach (chap. 6) involves algorithms that learn to assess the probability of statements of the form effect → cause by learning the probability of statements of the form cause → effect by means of data mining, followed by an application of Bayes's theorem and/or developing a Markov chain. The Analogizer approach (chap. 7) learns from a study of cases that are analogous to the question under consideration.

In the next two chapters, the author explores what the Master Algorithm, an algorithm that draws on all five approaches, might look like. He describes a system known as Alchemy that he has been working on since 2003, which he regards as a step along the road toward the Master Algorithm and which is available for download. Domingos points out that Alchemy still has significant shortcomings, for instance, "it does not yet scale to truly big data" and "someone without a PhD in machine learning will find it hard to use" (p. 255). He notes that Alchemy has been successfully applied to many applications, and describes one example in detail:

> One of Alchemy's largest applications to date was to learn a semantic network … from the web. A semantic network is a set of concepts (like planets and stars) and relationships among these concepts (planets orbit stars). Alchemy learned over a million such patterns from facts extracted from the web (e.g., Earth orbits the sun). It discovered concepts like planet all by itself. (p. 255)

In the final chapter, the author moves into a broader view of the future of artificial intelligence (AI), with the Master Algorithm playing a key role. He envisions the day when a digital model of each person, based on the totality of their data and under the individual person's control, might facilitate more-accurate matching in everything from advertising, to personalized medicine, to finding a job, to computer dating. From there he moves on to speculate about the further impact of such technological growth on society. One thing this reviewer found fascinating was his discussion of the singularity theory espoused by Ray Kurzweil and others. While agreeing with Kurzweil that the point at which machine intelligence surpasses human intelligence is coming, he argues that it will come about as a result of invention of the Master Algorithm, rather than as a result of reverse-engineering the brain as Kurzweil postulates. He criticizes (rightly in this reviewer's opinion) Kurzweil's tendency to see various phenomena as exhibiting exponential growth into the distant future rather than as S-curves trending toward an asymptote.

It is at this point, in this reviewer's opinion, that the author falls into the same trap that seems to especially bedevil people working in AI: claiming that future developments in AI will lead humanity to utopia, and even ascribing God-like powers to it. As he puts it, "any sufficiently advanced AI is indistinguishable from God" (p. 285). If the basic problem of humanity is lack of knowledge, then arguably AI may be the solution; but if it is estrangement from our Creator as a result of sin, then it is not the tree of knowledge that humanity needs, but rather the tree of the Cross.

That having been said, the book is still a fascinating glimpse into the increasingly important field of machine learning, written by an expert in the field who is also a good communicator.

*Reviewed by Russell C. Bjork, Professor of Computer Science, Gordon College, Wenham, MA 01984.*

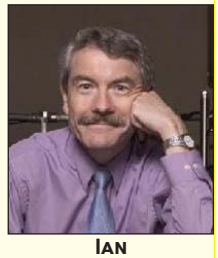

## Plenary Speakers

**Katharine Hayhoe**
Associate Professor, Texas Tech University; Director of the Climate Science Center

**James Peterson**
Schumann Professor of Ethics; Director, Benne Center for Religion and Society, Roanoke College, VA

**Philip Yancey**
Author of more than 21 books, many articles, editor-at-large of *Christianity Today*

**Annabelle Pratt**
Principal Engineer (Electrical), National Renewable Energy Laboratory



**Ian Hutchinson**
Professor of Nuclear Science and Engineering at MIT Plasma Science and Fusion Center

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