# Book Reviews

## ETHICS

**GOD'S COVENANT WITH ANIMALS: A Biblical Basis for the Humane Treatment of All Creatures** by J. R. Hyland. New York: Lantern Books, 2000. 126 pages. Paperback; $14.00. ISBN: 1930051158.

Hyland is an ordained minister who has worked in prison ministry and currently works with migrant farm workers. She edited *Humane Religion*, a bimonthly journal, for several years, and has contributed numerous articles to religious periodicals. She is actively engaged in supporting issues of female equality and animal rights. Her previously published book, *Sexism Is a Sin: The Biblical Basis of Female Equality*, addresses the first of these two issues while this book addresses the second issue, that of animal rights.

As the title of the book suggests, the Hyland's goal is to provide biblical support for the thesis that all living creatures should be treated humanely. Much of this support is taken from the writings of the Old Testament prophetical books. Hyland suggests that the teachings of the latter prophets emphasized several themes including the importance of social justice, a rejection of ceremonial and sacrificial religion, and the inclusion of the animal kingdom in God's Kingdom of the future. Several passages are cited as evidence for her thesis that the manmade sacrificial system of the Old Testament, which flourished under the supervision of the priesthood, was an abomination in the sight of God and needed to be abolished. According to Hyland, the prophets not only condemned the practice of animal sacrifice, but also tried to reestablish the teaching contained in the book of Genesis regarding God's care for and covenant with the entire animal kingdom.

In addition to passages from the prophetical books of the Old Testament and the book of Genesis, other evidence is cited from the life and ministry of Jesus Christ. Jesus reminded the Jewish people that the prophets had called for an end to sacrificial worship and he also predicted that this system of worship would end with the destruction of the temple in Jerusalem. According to Hyland, Jesus continually revealed a God of compassion whose concern extended to all creatures. This is supported by the comparison of his role to that of a good shepherd who is continually concerned about the welfare of the flock. The author also uses the incident of Jesus cleansing the temple as evidence for the need to abolish the Old Testament sacrificial system, a system based upon the use and abuse of helpless animals. One additional line of evidence from the New Testament is derived from the book of Revelation, which records the fact that all kinds of God's creatures will be represented in heaven.

After supporting her main premise from selected passages of Scripture, the author describes several ways in which the humane treatment of animals can be directly applied to our contemporary lives as Christians and to our society as a whole. Hyland condemns the wearing of furs, the practice of recreational hunting, and the use of animals in medical experiments. She also strongly suggests that a vegetarian diet is preferable from a biblical perspective as well as from a human health perspective and that many of the books listed in her recommended reading section deal with this theme. For Hyland, the Kingdom of God come to earth is a kingdom in which justice, compassion, and love for all creatures should be a reality. In this kingdom, humans and nonhumans are to live in peace with their own kind and with all other species as well.

The author is to be commended for writing about a subject that is rarely discussed among Christians or addressed from the pulpit. Her explanations of various biblical passages are both interesting and thought provoking. One criticism, however, concerns the selectivity of the biblical material used to support the book's main thesis. The author makes that assumption that the entire sacrificial system of the Old Testament was an invalid form of worship. While it is certainly true that this system was abused during the time of the prophets and needed to be reformed, the book of Leviticus claims that the system was instituted by God, and a number of laws were included to ensure that this system of worship was properly maintained. The only place where a passage from Leviticus is mentioned is in the appendix, where it is argued that sacrificial religion was initiated by humans to legitimize their desire to consume animal flesh. There is no discussion of the dietary laws listed in the book of Leviticus, the observance of the Passover in the book of Exodus, or the Old Testament justification for the doctrine of the atonement.

Another criticism centers upon the author's treatment of the doctrine of the atonement in the New Testament. According to Hyland: "The God whom Jesus came to earth to reveal was nothing like the God of Paul's understanding" (p. 71). Hyland argues that Paul constructed his own theory of Christ as the sacrificial victim for the forgiveness of sin and that the Christian church has erroneously propagated this theory. By suggesting that Paul's understanding of Christ's death was flawed, the author calls into question the authority and teaching of the Pauline epistles as a whole. In choosing to regard any biblical passage which poses a challenge to the book's premise as false teaching, the author undermines her own "biblical basis" for the humane treatment of all creatures.

*Reviewed by J. David Holland, Biology Instructor, Springfield College in Illinois, 1500 North Fifth Street, Springfield, IL 62702.*

## FAITH & SCIENCE

**CAN A DARWINIAN BE A CHRISTIAN? The Relationship Between Science and Religion** by Michael Ruse. New York: Cambridge University Press, 2001. 242 pages. Hardcover; $24.95. ISBN: 0521631440.

Ruse's parents were Christian believers for whom he had the greatest respect. Nevertheless, Ruse is an agnostic. But that is not the point of this stimulating book. Ruse wishes to establish what it is to be a Darwinian and to be a Christian, where the positions agree and where they are in

tension, whether it is possible to hold both views simultaneously, and on what terms.

Many people will not be happy with Ruse's argument that some form of Darwinism is true, and if Christianity cannot be harmonized with it, Christianity must be discarded. However, Ruse bends over backwards to be fair to Christianity, using the work of Christian thinkers— particularly Ronald Fisher and Theodosius Dobzhansky— whenever possible. And he delights in using the work of E. O. Wilson and Richard Dawkins to support a Christian position within Darwinism.

I did not find Ruse's discussion of miracles satisfying. Ruse enunciates the liberal Christian's theological objection, that anything extra-natural makes God a conjurer. But Ruse only scratches the surface of the conservative Christian position, noting that, in this view, extra-natural miracles fit into the *super*natural regularities of God's plan for us and for the universe. To be fair, none of this is Ruse's concern; he simply wants to point out that acceptance of supernatural miracles is intellectually defensible. "There is nothing in Darwinism, or in the notion of science that it supports, which says that your commitment is wrong or stupid. Yours is not a scientific commitment, but you knew that already."

Ruse has much to say on the problem of natural and human evil. "Darwinism stresses the natural evil in the world … [opening] the way to the Christian response … if you are a Darwinian looking for religious meaning, then Christianity is a religion which speaks to you. Right at its centre there is a suffering god, Jesus on the Cross. This is not some contingent part of the faith, but the very core of everything."

Furthermore, Ruse points out that God cannot do the impossible: it may be that the existence of free, intelligent creatures requires the universe to be as it is. "The Darwinian supports this argument; … you cannot get adaptive complexity without natural selection." And you cannot get natural selection—or perhaps even a knowable universe— without pain.

Ruse is not sure that the exchange—autonomy, intelligent sentience and hope, for pain and suffering—is worth it. But Darwinism supports the legitimate Christian position that we cannot know as God knows; "as a Darwinian you ought to be dubious about thinking that your selection-based attributes and powers … give you total insight into ultimate metaphysical reality."

Nevertheless, there are tensions here. Sociobiology, which allows us to explain both original sin and our moral conscience, leads to relativism: what is moral in one time and place might be immoral in another. Furthermore, Ruse does not address how Darwinist explanations could be used to make sense of the Christian's realization that the universe is fallen, imperfect: if the universe must be what it is, how can it be fallen? Here John Haught's *God After Darwin*—to which Ruse does not refer—is helpful: creation is a work in progress, unfinished until God's purposes are fulfilled.

Ruse concludes that the answer to his question is affirmative, and yet … "Is the Darwinian obligated to be a Christian? No, but try to be understanding of those who are. Is the Christian obligated to be a Darwinian? No, but realize how much you are going to foreswear if you do not make the effort, and ask yourself seriously (if you reject all forms of evolutionism) whether you are using your God-given talents to the full."

This book has received high praise from both Christians and non-Christians working in the science-and-religion field. It has its limitations and disappointments; a few of them are pointed out above. A non-Christian himself, Ruse does not present a fully coherent Christian position within Darwinism. But he points to many ways in which such a position may be defined. This book is highly recommended for all serious Christians, especially those who also wish to take science seriously.

*Reviewed by Daniel J. Berger, Professor of Chemistry, Bluffton College, Bluffton, OH 45817.*

**WHEN SCIENCE MEETS RELIGION: Enemies, Strangers or Partners?** by Ian G. Barbour. New York: HarperCollins Publishers, 2000. 204 pages, index, notes. Paperback; $16.00. ISBN: 006060381X.

In 1991, Barbour published *Religion in an Age of Science: The Gifford Lectures, 1989–1991*, Volume 1. So well received was this book for persons concerned with science/religion boundary issues that he issued a revised, retitled *(Religion and Science: Historical and Contemporary Issues)*, and expanded edition of it in 1997. The second of these holds a place of prominence on my own library shelf.

*Religion and Science* is a difficult read, however, and its 366 pages (of very small text) have turned away many readers. *When Science Meets Religion* is Barbour's attempt to summarize and make clearer his arguments on a somewhat less scholarly level. He has succeeded admirably.

Barbour is retired from Carleton College where he was both a professor of physics and a professor of religion. Among his other well-known publications are *Ethics in an Age of Technology* and *Myths, Models and Paradigms*. He was the recipient of the Templeton Prize for Progress in Religion in 1999.

Those who have read my book reviews in *PSCF* before know that I often refer to significant publications as "keepers." This one is beyond that designation. For all ASA members, who are presumably interested in science/faith issues, this book is a requirement. I cannot recommend it too highly.

Barbour's masterpiece can be described best structurally. He posits four wholly separate ways of thinking about science and religion: Conflict, Independence, Dialogue, and Integration. In chapter 1, he discusses each of these. In chapters 2, 3, 4, and 5, he considers four areas of study which each view must necessarily consider: astronomy/creation, quantum physics, evolution, and genetics. In each chapter, he discusses each model, so one can visualize this book as setting forth, in clear and persuasive prose, each of the four ways of viewing science/religion for each of the four issues, a very neat 4 x 4 matrix. It may be of interest to those familiar with his earlier works that his previous subcategory, "nature-centered spirituality," is omitted entirely in this volume. It is not clear if he has abandoned it or has left it out for reasons of space.

Barbour treats fairly the claims of the Conflict model, but argues against it. He accepts some of the insights of the Independence model, but, in the end, casts his lot with the proponents of Dialogue and Integration.

In a concluding chapter, "God and Nature," having argued that both the Conflict and the Independence models are unsatisfactory, Barbour discusses how God's actions in this world can be seen as consistent with a universe of apparent causality. Here he treats the models of Murphy, Polkinghorne, Whitehead, and others; having done so, he leaves the evaluation of these models to the reader. He concludes:

> All models are limited and partial, and none gives a complete or adequate picture of reality. The world is diverse, and differing aspects of it may be better represented by one model than another … the use of diverse models can keep us from the idolatry that occurs when we take any one model of God too literally. Only in worship can we acknowledge the mystery of God and the pretensions of any system of thought claiming to have mapped out God's ways (p. 180).

The $16.00 cost for this book may well be the best book money you have ever spent.

*Reviewed by John W. Burgeson, Stephen Minister, First Presbyterian Church, Durango, CO 81301.*

**GODFARING: On Reason, Faith, and Sacred Being** by Francis Clark. Washington, DC: Catholic University Press, 2000. 229 pages. Paperback; $24.95. ISBN: 0813209595.

*Godfaring* is the author's lifetime ruminations on faith and reason, particularly as relating to natural theology. Francis Clark uses his prowess as a former theology professor from the Pontifical Gregorian University, to show how Catholicism harmonizes with natural theology, views the role of non-Christian religions, and addresses one of the grand questions of Christianity, i.e., the problem of evil.

Clark has written a dense text requiring some determination to uncover the nuggets buried within complicated sentence structures and obscure terms such as otiose, regnocentrism, and ecclesiocentric. Clark's discussion of universal salvation provides an example of both the prose and theological persuasion that pervades the writing.

One may distinguish two different senses in which the non-Christian religions are said to be communities of salvation. In the second sense, which is more questionable theologically, the proposition is interpreted to mean that the non-Christian religions serve, each in its own pattern of creed and cult, as divinely sanctioned pathways of revelation and salvation in their own right, parallel to—yet independent of—that of Christianity, leading their adherents to the ultimate union of all believers in the eschatological Kingdom of God, towards which all religions converge (pp. 82–3).

Clark draws heavily from the Catholic catechism and papal writings to develop an overly optimistic natural theology and role for human reason. "Thus the age-old and sternly exclusivist interpretation of the Christian doctrine of salvation has been finally discredited as a historic misinterpretation" (p. 70). Several of the early chapters examining the possibility of salvation through a natural theology or non-Christian religions are at odds with arguments presented in later chapters, particularly in "The Dark Mystery of Evil" (chap. 11). However Clark provides valuable insight into the human condition and asks several penetrating questions. He writes: "We are all children of the same Father, all bearing his lineament. In all faces is glimpsed the face of God. Why is it, then, that the company of those kinsfolk in God's family does not lead us more easily to him? Why, rather, do contemplative souls often find deeper awareness of God's presence in solitude, away from human beings rather than in the midst of them?" (p. 178).

*Godfaring* is a synthesis relating Catholic thought to reason, faith, and natural theology. The book has a distinct niche for Catholic scientists and provides a valuable summation of natural theology from a Catholic perspective.

*Reviewed by Fraser F. Fleming, Associate Professor of Chemistry, Duquesne University, Pittsburgh, PA 15282.*

**THE HEALING CONNECTION: A World-Renowned Medical Scientist Discovers the Powerful Link Between Christian Faith and Health** by Harold G. Koenig with Gregg Lewis. Nashville: Word Publishing, 2000. xii + 211 pages. Hardcover; $21.99. ISBN: 0849916224.

Geriatric psychiatrist. Koenig, founder of the Center for the Study of Religion/Spirituality and Health at Duke University Medical Center, has spent one-quarter of a century doing research related to religion and health and analyzing the findings of his own and others' studies. This autobiographical study for the first time narrates events and experiences of his own life, interweaves accounts of his research with clinical experiences, and points to applications for Christians in medical practice, research, and ministries.

Details of the story of his early life include tribulations and hardships associated with his education, the use of drugs, experiences at Jane Goodall's Chimpanzee Project in Tanzania, climbing Mt. Kilimanjaro, searching for truth and meaning through Eastern and New Age religions, physical injury, divorce, expulsion from medical school and later readmission, and stages in his career that are better read than summarized. Along the way, a Christian spiritual awakening brought inner peace and strength, especially through The Living Bible. Isaiah 61:1–3, a growing knowledge of "the plight of the elderly" in America, and Matt. 25:34–40 gave him a deep sense of God's calling to serve the elderly and people suffering from depression. Medical practice "was no longer just my profession; it became a ministry to others. And it would become my way to serve Jesus" (p. 73).

His commitment was deepened through participation in an influential congregation and a personal pilgrimage to Rome and Israel during a break from his third year of residency. "Just a week spent walking in Jesus' footsteps had such a profound impact on me that I determined to spend the rest of my life trying to follow him" (p. 80). Marriage to a committed Christian, growth in spiritual maturity, learn-

ing the significant role of personal spiritual experiences in the lives of elderly patients, a fellowship in geriatric medicine, a residency in geriatric psychiatry, appointment to Duke's faculty, and finding that nearly one-third of patients surveyed had spiritual experiences similar to his own were elements of preparation for the conviction that he should publish God's glorious acts (Psalm 96:34, Living Bible). The result has been fourteen books prior to this one, forty book chapters, over twenty-five research projects, and some 150 professional articles examining the effects of religious faith on physical and mental health (p. 93).

Chapters 9–11 summarize twenty-three generalizations from the findings of some 1,200 studies. "The pile of evidence is growing and showing that spiritual faith has a very real, scientifically measurable, and positive association with mental and physical well-being" (p. 125). The only negative discovery is that those who frequently attend religious services are more likely to be overweight. On average, people with negative religious beliefs and behaviors have worse health than others (p. 148).

Chapter 12 summarizes and critiques the "red flags" thrown up when faith does not heal, an experience Koenig himself is now familiar with, for he suffers from a slowly progressive disabling arthritis. Then Chapter 13 summarizes what the research means—religious faith and practice are connected to mental and physical health, and God can and will use illness to heal us more completely and at a deeper level than could be possible in any other way. How Christians ought to respond to the research findings (with encouragement, hope, concern, and compassion) is the focus of Chapter 14. Among other things, we need to help those who are ill and disabled to identify their particular gifts or talents and give them opportunity to use their gifts to serve God by serving others.

The book concludes with "The Call to Care" (chap. 15), which emphasizes the importance of ministering to three categories of twenty-four psychological and spiritual needs—those related to self, to God, and to others. "What amazes me … is how the Christian faith addresses each of these needs so directly. … the Great Physician's example and his admonitions about caring for those who are sick have never been more relevant than they will be in the years ahead" (pp. 210–1).

This is Koenig's first account of the ways in which his personal life experiences and especially his faith in Christ interact with his medical research. It is not a bibliographical resource and is not even indexed, but it is a powerfully moving testimonial to the power of God and the fact that careful scientific research affirms the truth of Scripture.

*Reviewed by David O. Moberg, Sociology Professor Emeritus, Marquette University, 7120 W. Dove Ct., Milwaukee, WI 53223.*

**WHO IS GOD? Integrating Faith and Learning to Address This Question** by Robert B. Fischer. Bloomington, IN: 1stBooks Library, 2000. 168 pages. Paperback; $9.95. ISBN: 1588202429.

Fischer, with a Ph.D. from the University of Illinois, is a longtime member of the ASA and many readers may be familiar with his book *God Did It, But How?* He has spent much of his life in academics at both secular and Christian universities.

This book addresses the challenge of the integration of faith and learning through a discussion of the nature of God. The discussion is framed by the answer given in the Westminster catechism. Scientific findings and theories are used to illustrate explanations of the catechism's answer. Though the book contains numerous discussions of physical systems and phenomena, there are no illustrations (except the one on the cover), notes, or supplementary materials other than a single page summary that appears at the end of the text.

The book begins with a brief discussion of the meaning of God from various religious perspectives and then focuses on the Christian definition as provided by the Westminster catechism. The author discusses how special and general revelation can both provide insight into this definition. The nature of special revelation is discussed with respect to inspiration and interpretation. The nature of general revelation is discussed with respect to the scientific method and scientism. A methodological discussion of the catechism's answer is then given using references to both special and general revelations. The references to general revelation range from cosmology to subatomic particles. The wonder and breadth of the general revelation are used to illustrate such concepts as infinite as a descriptor for God.

The theme of this book is that both general and special revelations contribute to learning and to faith and that faith and learning contribute to our understanding of both special and general revelation. This idea is nicely illustrated on the cover of the book where learning and faith appear in a column on the left and general and special revelation appear in a column on the right. Lines are drawn from each of the items on the left to both items on the right. The author explains these concepts in his usual clear and readable manner. Fischer does not present anything new in the way of theology or scientific theory. What he does that is unique is to offer an example of how the study of science can be integrated into a discussion of the Christian faith.

This book would be a supporting text for those who hold to the reformed tradition of the integration of faith and learning. The book is also valuable instruction for those in academics who are endeavoring to integrate faith into the content of their discipline. Unlike many books that may address apparent conflicts between faith and science, this book exemplifies the integration of faith and learning. What is notably lacking in the book, and what could significantly improve and expand upon the desired impact of the scientific discussion, are illustrations. Illustrations, such as the one on the cover, to explain the concept of the integration of faith and learning and to accompany the scientific discussions of such topics as cosmology and subatomic physics would have been very helpful in communicating the message. The lack of effort to provide illustrations, references, notes, or a bibliography is disappointing.

Though the book has its shortcomings, it is still a book that can be read both for its intellectual discussions and for its meditative value. The book is edifying for those who know God and may be a revelation for those who do not.

It clearly presents the Gospel of Christ in a unique manner that makes use of both special and general revelation.

*Reviewed by Gary De Boer, Assistant Professor of Chemistry, LeTourneau University, Longview, TX 75607-7001.*

**CAN SCIENCE BE FAITH-PROMOTING?** by Sterling B. Talmage. Salt Lake City, UT: Blue Ribbon Books, 2001. 253 pages. Paperback; $18.95. ISBN: 0963473239.

Sterling B. Talmage (1889–1956), son of James E. Talmage, was a teacher, geologist, and writer. Both Talmages taught geology with Sterling teaching at the University of Utah. The Talmages were both spokesmen for old-earth geology and evolution as faith promoting. They were members of the Church of Jesus Christ of Latter Day Saints (LDS) and their writings are specifically addressed to science-related theological issues within the LDS. Much of the work of Sterling B. Talmage is archived at the University of Utah Marriott Library.

This book is a reprinting of the original written in the 1930s. It is introduced with several essays describing the historical setting of the original publication. In addition, it contains a section of correspondences. These are correspondences from LDS clergy and both Talmages. Taken together, these three parts—the introduction, the book itself, and the correspondences—make for a far more dramatic reading than one would expect for a book of this genre.

The body of Talmage's book is arranged into four parts. The first part discusses the question of whether science can be faith affirming. In this section, Talmage first defines several terms such as science, faith, creation, natural, supernatural, dogmatism, open mindedness, scriptural, fundamentalism, modernism, and evolution. With these definitions, he introduces the idea of science versus faith as a pseudo issue and prepares the reader to engage in a productive discussion of the science and theology to come. He then continues with a discussion of the findings of science in the areas of astronomy, physics, chemistry, paleontology, and biology. The summation of this presentation is to state that the evidence for an old earth and an older universe is overwhelming and that the idea of an old earth is not unscriptural.

The second section of the book discusses creation based on the scientific evidence presented in the first section and a theological discussion that includes references from the Bible and other works that are part of the LDS. Much of this discussion relates to methods of interpretation: literal, figurative, and how to make the judgment of which method should be applied. Talmage strongly states that a literal interpretation of some scriptural passages does a disservice to the reader. He relates these discussions back to the definitions he offered earlier in section one.

The third section of the book is devoted to the discussion of evolution and whether it can be faith promoting. Talmage discusses the principles of evolution, the geological record, and the evolution of humans. He protests the idea that the evolution of humans is unscriptural. He says it may be nonscriptural, but it is not unscriptural. Talmage states the study of natural law is faith promoting. He says we must think of God not as a magician wielding miracles but as "the great engineer, the designer, and operator of the universe." Talmage defends the methods of science in determining the natural processes involved in the creation of the universe and states that such efforts do not undermine faith, but affirm faith. He continues his discussion of human evolution in the fourth section of the book with respect to the evolution of Adam, and the existence of "Pre-Adamites." Much of his theological discussion of human evolution comes from the LDS book *Doctrines and Covenants*.

Talmage makes a strong argument that science can be faith affirming. Although the book was written in the 1930s, the discussion is not dated and the issues presented are still timely. Talmage writes as a geologist and as a person who is striving to better understand his faith and gain a closer walk with his God. The introductory essays and the collection of correspondences give a glimpse of the people and ideas of the time. The correspondences of Talmage with his father and with the leading clergy of the LDS are especially interesting. One will not easily put the book down because of wanting to know what might happen next. Though this makes for exciting reading, it also illustrates the challenges of scientists who choose to confront anti-science ideas within their church and community. The book then becomes more than a scientific and theological discussion of science and faith. It becomes the personal story of scientists dealing with anti-science elements within a beloved church.

This is a book that can be read for its discussion of science and faith and for the story of Sterling B. Talmage. For these reasons, it is suitable for those who want to learn more about the issues surrounding the debate of evolution and "creation science" and for those who find themselves in a similar teaching role as Sterling B. Talmage.

*Reviewed by Gary De Boer, assistant professor of chemistry, LeTourneau University, Longview, TX 75607-7001.*

**CREATION AND THE ENVIRONMENT: An Anabaptist Perspective on a Sustainable World** by Calvin Redekop, ed. Baltimore: Johns Hopkins University Press, 2000. 283 pages. Paperback; $19.95. ISBN: 0801864232.

A visit to the publisher's web site for this book states: "What the Amish can teach us about creating a sustainable world." Amish may be the most distinctive of Anabaptist groups but they are not the largest; Mennonites are the largest group of Anabaptists.

Identifying oneself as a Mennonite gives no clear indication of theology except for the requisite pacifism. This is one of the problems as well as one of the strengths of *Creation and the Environment*, an edited volume with fourteen contributors with a range of liberal and conservative views.

The first of the four parts of the book deals with human activities and their alteration of the creation. The chapter on population density mentions Garrett Hardin more than God and gives us little biblical reason to consider population control.

I was disappointed to find hints of syncretism in an article on the Amish view of the environment with such practices as honoring the god Donar and planting according to astrological signs. Remaining chapters in Part II deal with other aspects of Mennonite life in relation to the environment. Mennonites are one of the more active Protestant groups for environmental concerns in the political arena.

Section three of the book is "Anabaptists' Theological and Historical Orientation." Here, again, there is a diversity of theological views. Readers of *PSCF* would probably be most comfortable with the views of Thomas Finger. He states that the focal point of Anabaptist/Mennonite theological understanding is best expressed "… as the process that brings everything under the radical, living lordship of Jesus Christ." Amen! His chapter would make for good reading for *any* Bible-believing Christian interested in the environment.

This section of the book was also instructive for me to realize that the followers of Menno did not choose to be agriculturalists. Because of persecution, it was often the only option for them to survive.

*Creation and the Environment* concludes, appropriately, with challenges to care for the environment. Appendix A is a letter to the U.S. Congress from the Mennonite Central Committee (MCC) with the unabashed request to "… recommit government to preserving the beauty and diversity of creation …" This is followed by the MCC statement on the environment, notes for each chapter, and a useful index.

Other denominations and groups of Christians have much to learn from the present work. For example, where is a Baptist view of the environment?

*Creation and the Environment* is a helpful, valuable contribution to the growing corpus of writing on Christianity and the environment.

*Reviewed by Lytton John Musselman, Mary Payne Hogan Professor of Botany, Old Dominion University, Norfolk, VA 23529-0266.*

## HISTORY OF SCIENCE

**GOD'S FUNERAL: A Biography of Faith and Doubt in Western Civilization** by A. N. Wilson. New York: Ballantine Books, 1999. 354 pages + notes, bibliography and index. Paperback, $16.00. ISBN: 0345439597.

This title is bound to draw gasps from the Christian community, thinking that it advocates atheism. Nothing could be further from the truth. It is a comprehensive history of the rejection of God by nineteenth century intellectuals. The title comes from Thomas Hardy's poem by the same name—a sad ode to Hardy's own rejection of God's existence.

Wilson begins with the epistemological rejection of God by looking back at the effects Hume and Kant had on the Western World. Hume had removed the philosophical necessity for believing in God by questioning the idea that there is a mind behind the universe. Hume claimed that humankind anthropomorphized this Mind by making a human's mind the model or standard for the entire universe. Then came Kant's differentiation between noumena (things in themselves) and phenomena (that which we observe). Once it was admitted that the noumena could never be known in and of itself and that all we could actually observe were the phenomena, the entire nature of truth was changed. No longer was God the basis of truth, but phenomenalism became *the* sole determiner of truth. If it could not be observed, then it could not be discussed with any certainty.

Wilson then follows the effect of these issues on several notable nineteenth century intellectuals, many of whom are little known today. These include Jeremy Bentham, Hegel, Comte, Thomas Hardy, George Elliot, Swinburne, Marx and many others. Each came to the conclusion that God did not exist. Some of them came to that conclusion very reluctantly; others easily and enthusiastically.

Two extremely sad stories stood out, at least to me. The first was the contrast between the Newman brothers, John Henry, a well-known Catholic mystic, and his brother Francis, a man who rejected Christianity in the 1820s because of its bigotry toward other religions. Francis, the apostate, decried the bigotry, yet John, the better-known of the two, wrote that the Christian should be more bigoted! John, the Christian spent his life breaking off relationships with those who disagreed theologically.

The other sad story is that of the atheism of Edmund Gosse, son of Phillip Gosse who wrote *Omphalos*. Edmund's story of his father's rejection of Christmas celebration as a pagan, popish affair extended to even the banning of plum pudding from the Gosse household. When a servant fed the young Gosse a slice of this forbidden fruit one Christmas, the elder Gosse violently disposed of the offending material, leaving a lasting impression on the young child which ultimately bloomed into full-blown atheism.

The one failing of the book is that it is too often without emotional impact. The subject screams for more description of these people's personal struggles in giving up Christianity and belief in God. Yet with few exceptions, the emotional impact is lacking. This may be in part because there is too little material preserved describing these struggles, or it may be that the author remained a bit too academic.

The book documents incredibly well the intellectual tenor of the nineteenth century. Modern Christian characterizations which focus on Darwin and Lyell as the chief culprits in the rejection of the Bible miss entirely the fact that on all levels of society and in all disciplines people were questioning the authority of God. Christians should read this if for no other reason than to clearly understand what happened.

But the reader should understand that Christians are not portrayed very kindly on the pages of this book. We should pay attention to how we appear to others. Examples from early and late include St. Simeon Stylites, whose main claim to Christian fame is not a charitable life, but the feat of living atop a column for thirty years, the young Christian woman who was convinced that the Crystal Palace was of the devil giving her license to smash sculpture there, and Carylyle's claim that Christians, who

ignore observational data, try to steal into heaven by sticking their heads, ostrich-like, into fallacies on Earth. There is a certain truth in all that. This sad book is one that should be read!

*Reviewed by Glenn R. Morton, Ramsden House, 105 Malcolm Road, Peterculter AB1 4 OXB, Scotland.*

**THE SCIENCE OF MAN IN ANCIENT GREECE** by Marta Michela Sassi. Translated by Paul Tucker. Chicago: University of Chicago Press, 2001. 224 pages, xxix, bibliography, index. Hardcover; $34.00. ISBN: 0226735303.

Anthropology is a broadly framed discipline that examines all aspects of human life and culture. In the US, the main subfields are archeology, cultural anthropology, linguistic anthropology, and physical anthropology. Europeans often use different terms to describe these subdisciplines (ethnology over cultural anthropology) or do not include them (archaeology and linguists) as disciplines of anthropology.

Sassi teaches at the Scuola Normale Superiore in Pisa. *The Science of Man in Ancient Greece* reminds us that the field has ancient roots. The Greek desire to make sense of the world included the studying of aspects of human nature that make us different, that is, men from women, slaves from freemen, etc.

This ground-breaking study of Greek texts (Homer, Aristotle, Plato, pre-Socratic, Hippocrates, Galen, etc.) is an English translation of the revision of her groundbreaking 1988 work. Sassi says:

> I show that something very broadly (but precisely) definable as an anthropological discourse did exist through an examination of a wide range of texts. I also identified some especially significant areas, such as physiognomics, ethnographic observations, and medicine, where it is possible to reconstruct a set of rules (no less influential for being unwritten) that guided the selection and assessment of the *signs* of difference offered by the human body and ordered them in a discourse on the passions and their psychophysical foundation and on a destiny of illness and death predicted on the basis of the individual's life history (pp. xi-xii).

The five chapters, "The Colors of Humanity," "The Physiognomical Gaze," "Reality and Its Classification: Woman and Barbarians," "Prediction and Norm," and "Framed by the Stars," offer a tightly woven and extensively referenced account of Greek attitudes. One is not shocked to find the Greek male at the top of the ancient pecking order.

Chapter Five, "Framed by the Stars" contains one of the few references to the place of religion in this study. Astrology fused science and religion in many ancient cultures. The gods that inhabited the sky "manifested themselves in a variety of signs … that gave stellar divination enormous vitality and prominence over all other forms" (p. 162). Ptolemy had a large influence with his four-volume astrological treatise *Tetrabiblos.* Ptolemy said: "… the Sun [male] affects the right-hand side of the body (as well as the faculty of sight, the brain, the heart, and the nerves), while the Moon (female) affects the left (as well as the digestive organs and the uterus)" (p. 167). What had originally been a symbolic classification had been translated into physical properties.

The value of this fascinating work is enhanced by twenty-two illustrations drawn from the art of the period. It is a reminder that bias based on gender, race, and class is not a recent phenomenon. This work belongs in institutional libraries and in the hands of those who work in the field.

*Reviewed by John W. Haas, Jr., Emeritus Professor of Chemistry, Gordon College, Wenham, MA 01984.*

**EVOLUTION'S WORKSHOP: God and Science on the Galapagos Islands** by Edward J. Larson. New York: Basic Books, 2001. 243 pages, illustrations, appendix, endnotes and index. Hardcover; $27.50. ISBN: 0465038107.

ASAers who heard Edward Larson's Templeton Lecture at the 2001 annual meeting or read it on a listserv were introduced to major themes of this, his latest publication on science, religion, and evolution. To those whose curiosity was piqued to venture further, I recommend his book. *Evolution's Workshop* weaves exploration and specimen collecting, national and scientific rivalries, ecology and tourism, and conflict over interpretation and meaning into an engaging story about the history of an archipelago, the Galapagos, and their effects upon science and religious belief.

Larson divides this story into three sections. "Part One: Creationist Conceptions" traces the story of European and American visitations through the mid-nineteenth century. We see that Darwin saw the Galapagos through Lyell's eyes, but learn how, in the years following his 1835 visit, the creationism of his intellectual mentors Paley and Lyell gave way to his new conception of transmutation. He credited the species on the Galapagos as "the primary source 'of all my views'" (p. 77). However, those famous finches were not the birds that spurred his thinking, rather, the island's mockingbirds provided an early clue to evolution.

In "Part Two: Evolutionary Debates," Larson parades a cast of champions who entered the lists for or against Darwinism. Louis Agassiz used his journeys to the Galapagos to reinforce his special creationist and anti-Darwinist views. Disciples like David Starr Jordan accepted evolution but favored neo-Lamarkian mechanisms. Jordan sent out a number of American collectors, whose specimens for California museums sought to rival the immense and varied gatherings of Galapagos animals and plants funded by Englishman Walter Rothschild. Jordan favored geographical isolation as a primary factor in speciation and downplayed natural selection, and with his colleague Joseph LeConte "shared a sense of the divine in nature" (p. 125). The California Academy of Sciences' expeditions, like others around the turn of the century, made collecting finches from the islands a secondary objective to other species, especially tortoises which were driven nearly to extinction by those who hunted them for zoos or food. And while their publications of these expeditions raised no doubts about evolution, the authors "offered little theoretical analysis about the specimens they collected" (p. 140).

These great scientific expeditions were succeeded by others sent out before World War II by wealthy amateurs such as Harrison Williams, who enlisted popular journalist William Beebe; his numerous pieces on the Galapagos and their famous inhabitants did much to stimulate public interest in the islands. One of the most important visitors for science was Julian Huxley's *protegé* David Lack. In groundbreaking studies of the Galapagos finches both on the islands and in collections, Lack reconstructed the speciation of the birds he named "Darwin's finches" and argued that the islands' ecology played an important role in their descent through adaptive radiation. In Lack's work theoretical analysis about life's history on the islands resumed its central place.

"Ecology Matters" is the title of Part Three. Larson traces how during the post-war years collecting yielded to studies of Galapagos flora and fauna in situ. Surveying Huxley's successful efforts to create an Ecuadorian national park and scientific research station there, the rise of "ecological tourism," the activities of several research scientists on the isles, and visits by influential nature writers such as Annie Dillard, Larson brings his natural and human history of the Galapagos to the present. "The archipelago," he notes, "remains 'a perpetual source of new things' for scientists more than one and one-half centuries after Darwin first proclaimed it so" (p. 239).

This is an interesting tale, and Larson knows how to lay out a complex historical narrative with clarity. The research he devoted to his subject is admirable, and the story contains many surprising facts that may delight the reader. However, this banquet of expeditions proceeds as one course upon another, and the reader is advised to take them in portions to avoid becoming surfeited. I do raise a question about the subtitle, "God and Science on the Galapagos Islands," for Larson has much more to say about science than about God. The religious views of his subjects are more touched upon than developed. A greater degree of detail and reflection on their views of God and nature would have enhanced the narrative and made the subtitle fulfill its promise.

*Reviewed by Robert J. Schneider, Episcopal Church Committee on Science, Technology and Faith, 187 Sierra Vista Dr., Boone, NC, 28607.*

**THE PURSUIT OF DESTINY: A History of Prediction** by Paul Halpern. Cambridge, MA: Perseus Publishing, 2000. 250 pages, photographs, illustrations, notes, bibliography, index. Hardcover; $25.00. ISBN: 073820096.

The Oracle of Delphi, Newton's Obsessions, Freudian Slips, and the Eyes of Nostradamus all show how *prediction* emerged during the birth of modern science in the seventeenth and eighteenth centuries. Halpern, a professor of physics at the University of the Sciences in Philadelphia, Pennsylvania, is the author of many trade science books including *The Cyclical Serpent, The Quest for Alien Planets,* and *Countdown to Apocalypse.* In this present volume, he ponders the age-old question, "Can we predict the future?"

As Halpern points out in the Introduction, "Man's desire to foretell, understand, and ultimately explore the future is an integral part of what makes us human." History is replete with stories of humankind's attempt to calculate the future. Halpern shows how breakthroughs in science, humankind's perceived understanding of the cosmos, and an instinctual awareness of human behavior have all contributed to humankind's quest to employ forecasting methodologies.

In ancient times, envisioning the future was far from being a precise scientific task. Humankind went from scanning the skies and examining the entrails of sacrificial animals to expounding upon Einstein's concept of relative time and space in attempts to foretell "what's next." Drawing on modern theories of complexity, chaos theory, quantum theory, and relativity, Halpern explores the latest methods of scientific, social, and technological prediction.

This incisive and revealing survey of *prediction,* both as it has been determined in the past and how we perceive it scientifically today, is a smartly compartmentalized analysis of an intriguing part of humankind. Halpern's book is an expressive and articulate testament to people's insatiable appetite to understand their existence, accept their limitations, and foresee their future.

*Reviewed by Dominic J. Caraccilo, Lieutenant Colonel, US Army, 301 Lumpkin Rd., Fort Benning, GA 31905-6549.*

## NATURAL SCIENCE

**TRAVELS TO THE NANOWORLD: Miniature Machinery in Nature and Technology** by Michael Gross. Cambridge, MA: Perseus Publishing, 2001. 254 pages. Paperback; $16.00. ISBN: 0738204447.

Gross has a Ph.D. in physical biochemistry from the University of Regensburg, Germany. He is also the author of *Life on the Edge* and *Non-Standard Computation.* Gross writes as a science journalist and has published many science related news articles in the U.K. and Germany. For more information on the author, his books, and other articles, you may visit his web site at: www.michaelgross.co.uk.

The book surveys a very broad spectrum of nanoscale technology. It is organized into four parts: an introductory overview, a survey of some biological models, descriptions of some current man-made macromolecular biological systems, and a discussion of the future of nanotechnology. The reader will also find biographies of scientists and descriptions of experimental techniques. The book contains black and white illustrations that clarify the text, a glossary of terms, a list of further readings and Internet links, and an index.

The author hopes to provide a realistic vision of nanotechnology through examples of nanotechnology in the biological world and a survey of current manmade nanoscale materials and machines. The book's uniqueness lies in its unbiased, yet engaging, journalistic style. Gross communicates the promise and the challenges of nanotechnology without any overarching thesis or theme. It is a fair and informative analysis. The book is well written and is readable by a general audience while still being informative to those with more formal training in the sciences.

In evaluation we may wish to compare this book to other books in its genre. For example, if you enjoyed the science in Behe's *Darwin's Black Box*, you will also enjoy the science in this book. But unlike Behe, Gross has no problem with attributing the systems of life at the nanoscale to evolutionary processes. Though Gross differs in perspective from Behe, he also differs from the new age themes that nanotechnology will lead to future godlike humans as described by such nanotechnology zealots as Drexler. Gross provides a fair analysis of nanotechnology making use of guidelines that have been used to evaluate other emerging technologies.

Though the book is strong in its clear, balanced approach, one might make a case that the title is somewhat misleading. Of the ten chapters that span the four parts, only two provide any technical information on current nanotechnology, the rest is biology, philosophy, and predictions. Given the heavy emphasis on descriptive biology, a better title might be "*Understandings in Molecular Biology and its Implications for Medicine and Technology.*"

*Travels to the Nanoworld* is a book of descriptive molecular biology with a discussion of the possible implications of biological models for design of nanoscale machines. An overview of current technology and predictions for the future are discussed. Though the book is not written from a Christian perspective, the content is still valuable for Christians who are examining the ideas of intelligent design and evolution. Also, anyone with an interest in nanoscale science and nanotechnology will find this book a beneficial read.

*Reviewed by Gary De Boer, Assistant Professor of Chemistry, LeTourneau University, Longview, TX 75607-7001.*

**THE QUEST FOR IMMORTALITY: Science at the Frontiers of Aging** by S. Jay Olshansky and Bruce A. Carnes. New York: W. W. Norton & Co., 2001. 254 pages. Hardcover; $25.95. ISBN: 0393048365.

Aiming to give readers a better understanding of how and why people age and an expanded awareness of the realities of the aging process, length of life, and death, two biodemographic scientists survey the broad sweep of scientific knowledge related to mortality, longevity, and promises of earthly immortality. An underlying theme is the fallacy of the "life extension industry," which profits from hopes built up by exaggerated claims about products and services that have little or no basis in science.

Ten well-written and interesting chapters cover early views of philosophers and alchemists, modern developments related to length of life, selective breeding, antioxidants, alternative medicine, the genetic frontier, current antediluvian legends, and many other topics. Since 1993 the authors have attempted to test Gompertz's 1825 "law of mortality," concluding that there is on average a doubling of the risk of death about every seven years after puberty and that similar age-related changes occur in other animals as well. They coined the phrase "manufactured survival time" to designate the days people live beyond their normally expected longevity potential, concluding that "medical science may have already pushed human survival beyond the limits implied by a law of mortality" (p. 124).

The first longevity revolution has nearly doubled life expectancy at birth by human interventions in public sanitation, controlled environments, and the development of vaccines and antibiotics to help control various diseases. They predict that, during the second longevity revolution now in its early stages, "science will be used to manipulate the genetic instructions that determine the structure and function of the internal processes which give biological meaning to life and place limits on its duration" (p. 118). But they warn against errors of the pro-longevity "fountain of youth legends," poorly grounded claims for anti-aging products, assumptions that gains in longevity from conquering specific threats to life are additive, beliefs that eventually everyone will live to age 120, and the like.

Their main deficiency is a lack of attention to recent research on religious variables in relationship to longevity, health, and quality of life. (The most comprehensive survey is the *Handbook of Religion and Health* by Harold G. Koenig, Michael E. McCullough, and David B. Larson [New York: Oxford University Press, 2001], which critiques 1,700 studies in terms of their rigor of methodology and strength of findings.) Their references to religion are in a sketch of "the religious legacy" on longevity in the Bible and early Christian history (pp. 32–4), the "spiritual approach" of spiritualists (pp. 208–10), and scattered sentences mentioning the Old Testament, Jewish Midrash, Taoism, and the like.

Otherwise this is an excellent, solidly based, well-indexed overview, even though no documentation for specific studies they mention is provided. Since life is lived one day at a time, they conclude that it "should be a never-ending search for new ways to appreciate each day that is lived" (p. 217). The penalty for a relaxed lifestyle diminishes with advancing age, so those who survive to old age can, with moderation, afford to indulge themselves without fear of damaging their health or length of life, provided they continue exercising and have a diet that avoids known aging accelerators like excessive quantities of animal fat and processed sugars.

*Reviewed by David O. Moberg, Sociology Professor Emeritus, Marquette University, 7120 W. Dove Ct., Milwaukee, WI 53223.*

**PAIN: The Science of Suffering** by Patrick Wall. New York: Columbia University Press, 2001. 184 pages, index. Hardcover; $24.95. ISBN: 0231120060.

This book offers an insightful, educational, and delicate look at our current understanding of pain. Written for both the novice and expert, it blends history, sociology, psychology, neurology, and physiology in its analysis. Wall is one of the world's foremost experts on pain and the co-editor of several related books, including *Textbook of Pain*. As a medically trained physician, Wall speaks knowingly and with authority.

Wall gives detailed descriptions of clinical observations from patients he has treated over the years. These encounters convey the complexity of pain, illustrated by the many patients with similar disorders, but with vastly different

perceptions of pain. As a scientist, Wall describes the proposed theoretical mechanisms of pain, and he gives the research supporting or disputing these various theories.

In the chapter on the "Philosophy of Pain," he explores the concept of dualism (the idea that the mind and body are separate entities). Some scientists believe an understanding of the principles which control the mind are beyond scientific reach. At best, science may be able to describe some of the process, but little of the mechanisms behind the process. Here is Wall's intriguing comment on this conundrum:

> A more cautious group of dualists see mental processes as operating on principles that are entirely different from those of the body but that will eventually be understandable in materialist terms, including obeying the laws of physics. However, we will take the approach that the abrupt frontier between body mechanisms and mental processes does not exist. Instead, I will propose that mind, body and sensory systems exist as an integrated unity serving the biological needs of the individual with no abrupt shift of fundamental mechanism.

In eleven chapters, Wall deals with most of the relevant issues connected with pain, especially the philosophical, physiological, and treatment considerations. He discusses both acute and chronic pain from a mechanistic perspective, with the psychological and social focus on the latter. The discussion on treatment deals with the mechanisms for how it works, but also delves into the realm of the placebo effect, and how one person's pain subjectively differs from another. Two engaging chapters compare the two types of pain: (1) pain with an obvious cause; (2) and pain without an obvious cause.

Illustrations are used in the early chapters in support of the mechanisms of pain, but they are not a major part of the book. A disappointing feature of the book is its lack of suggested readings and a bibliography. However, further information is available by tracing the citations cited.

Overall, Wall does an admirable job blending a variety of centrally and peripherally related topics into a well-written, concise, informative, and entertaining book on pain. It will provide valuable insights to anyone who teaches the neurology, physiology, or psychology of pain. Furthermore, it will be of interest for those who suffer from acute or chronic pain, which eventually includes everyone.

*Reviewed by Stephen Bennett Ruble, Associate Professor of Exercise Science and Sports Medicine, Samford University, Birmingham, AL 35229.*

## Origins & Cosmology

**THE CASE AGAINST EVOLUTION** by Randal L. Nyborg. Mannford, OK: University Publishing House, 2000. 152 pages + references. Paperback; $7.95. ISBN: 157002118X.

The back of the book says that Nyborg, a certified public accountant, is the author of several books but does not list them. That is a shame because the reader may be curious about the topics this well-published author has covered. The book is published by University Publishing House which I found to be a curious, if overreaching, name. Mannford, a town of 2,500 near where I grew up, has no university in it but seems to have a University Publishing House.

The book has nine chapters covering micro- and macro-evolution, the origin of life, mutations, the fossil record, the evolution of humans, the evolution of earth, media analysis, evidence for a Supreme Planner and a conclusion. Each chapter follows the well-worn path of the young-earth anti-evolutionist repeating the same arguments cited by almost all other books of this kind. It is a shame that not a single original thought is to be found in this book, and I looked for one. But I was always able to find his arguments in earlier books originated by earlier authors.

The number of factual errors in the books are legion. Biochemists will be amazed to learn of the claim from this CPA that DNA is a protein. Botanists are informed that plants cannot grow without organic matter in the soil. Microbiologists will be astounded at the claim that organic compounds are not food for microbial life! (What on earth do they eat?) Microbiologists will also be surprised to hear that microbes have "millions of genes" rather than the 600–6,000 that we observe. Naturalists (as well as the club-footed pigeon I saw in Amsterdam last week) will be surprised to learn that only perfect animals can survive in the wild. Nyborg claims that those which are less than perfect automatically die. Someone should tell the toad found in a Canadian garden with eyes on the roof of his mouth that he had no right to survive (*Nature* [Feb. 2, 1995]: 398).

English teachers will learn that the spelling "thru" has now entered the language as a replacement for "through." Anthropologists will find the claim that the common ancestor between humans and chimps is now at three million years ago rather than the five million they (and genetic data) held. And finally logicians will learn that logical contradictions are no problem with one part of the book clearly contradicting an earlier part.

With only twenty-nine references in this book, most of the anti-evolutionary arguments are repeated without any attribution to the earlier sources from which Nyborg must have taken them. But more disturbing is the average age of his references. It is a useful tool when evaluating young-earth material to look at the publishing dates of the books and articles the work cites. In this case, the average reference date is 1970, positively Paleozoic by modern scientific standards.

The reader must be warned of a manufacturing problem with the book. It has cheap color printing on the cover. After accidentally and unknowingly getting it wet, the ink smeared across the cover. Not knowing that this was what had happened, I tried to clean that smudge off the cover with a damp cloth only to find that I was about to wash the cover clean. The reader should be warned so as not to get ink on his clothing or hands as I did.

The book will only be useful to those who are aficionados of young-earth creationist literature but certainly not to those seeking modern scientific knowledge or an interesting philosophical discussion of the creation/evolution area.

*Reviewed by Glenn R. Morton, Ramsden Lodge, 103 Malcolm Road, Peterculter, AB14 0XB, Scotland.*

**THE DRAGON SEEKERS** by Christopher McGowan. Cambridge, MA: Perseus Publishing Co., 2001. 218 pages, notes, index. Hardcover; $26.00. ISBN: 0738202827.

This is the tenth book by McGowan, professor of zoology at the University of Toronto. It is a history of the discovery and early years of paleontology when the world was becoming aware that an extinct form of life currently known as dinosaurs had lived in the past. The book covers the period from the early 1810s to the 1860s and discusses the roles played by both greater and lesser lights during this critical time in paleontology. McGowan does a good job of uncovering the strengths, weaknesses, foibles, and frauds of those involved. This is an interesting book to read.

McGowan begins with a brief account of the intellectual landscape as it was in the early 1800s. He discusses the great debate that had taken place about whether God could have created creatures that would ultimately become extinct. Cuvier was the one who finally settled that question in the affirmative.

After this brief introduction, he turns to the person who found the first dinosaur, an unsung and often ignored woman who made her living finding, preparing, and selling fossils. This was Mary Anning. Due to the popularity of Lyme Regis as a holiday spot for the wealthy of Britain of the 1810s, Mary was able to earn a living as a fossil collector and seller. By age of eleven, she had already sold her first fossil, an ammonite. Being from the uneducated poverty-stricken lower class and a woman, she was unable to gain a formal education. However, she educated herself by borrowing everything she could get on paleontology and making copies, not only of the text, but also drawing the pictures in exquisite detail.

In 1811, Anning found the first Ichthyosaur that was recognized for what it was, an extinct form of life even though its reptilianess was not recognized for another decade. In 1821, Anning discovered the first Plesiosaur. She sold the specimen to a Colonel Birch who let William Conybeare describe it. In his paper, Conybeare gave no credit to this poor, lower class woman who actually discovered the fossil. This was the treatment that Anning was to receive throughout her career. She found the fossils and the men took the glory. This was an excellent arrangement for the men of the aristocratic Royal Society.

Others who feature prominently in this book are William Buckland, Thomas Hawkins, Gideon Mantell, Charles Lyell, Richard Owens, and Charles Darwin. McGowan describes how the theological views of Buckland and Owens prevented them from coming to scientific truth about the transmutation of species. Mantell was a medical doctor who earned a place in the Royal Society because of his interest in dinosaurs but lost his medical income and family in the process. McGowan describes how Darwin had to withhold his transmutational views in order to get Owen, the world's greatest anatomist of the time and a creationist, to examine the fossils he had brought back from his trip on the Beagle.

But Hawkins is the most interesting character. He was an excellent fossil preparator who illicitly manufactured the missing pieces of his fossils with such skill that when he sold his collection to the British Museum, Buckland and Mantell did not catch the fact that large parts of the fossil specimens were faked. This fraud, to the tune of 1250 pounds (a fortune at the time), went undetected by Buckland and Mantell who had been charged with evaluating the worth of the collection. This fraud was to shake the English government and is the reason today that fossils have missing parts reconstructed with materials differing in color from the bone. This episode is reminiscent of some recent frauds coming from Liaoning, China, where poor farmers can make a fortune (to them) selling perfect or manufactured fossils. Hawkins, while richer, went crazy in his later life, suing anyone who suggested that he had defrauded the government or whom he did not like. These activities actually led to the incitement of a riot.

The book is a fascinating account which spares no one, not even the reader who has religious sympathies. One is faced with the fact of Conybeare, Murchison, Buckland and Owen's rejection of observational data based solely upon their theological conviction. This book acts like a mirror to make one wonder what beliefs modern Christians have blinded ourselves to for the purpose of saving our theology.

*Reviewed by Glenn R. Morton, Ramsden Lodge, 103 Malcolm Road, Peterculter AB14 0XB, Scotland.*

**THE SPARK OF LIFE** by Christopher Wills and Jeffrey Bada. Cambridge, MA: Perseus Publishing, 2000. 260 pages, notes, glossary, index. $17.00. ISBN: 0738204935.

This is the fifth book by Wills and apparently the first by Bada. Wills is professor of biology at UC San Diego and Bada is professor of marine chemistry at Scripps Institution of Oceanography. This book is a well-written review of the history and the current state of the origin of life research. Divided into eleven chapters, the book covers, among other things, spontaneous generation, Miller's primordial soup, the origin of the earth, and the subterranean life that has recently been discovered.

Numerous issues are raised by this book. Wills and Bada acknowledge that life appeared extremely early in the history of earth, citing the work of Bill Schopf who found photosynthetic bacteria in rocks dating to 3.5 billion years. This is immediately after the period of heavy meteorite bombardment which should have sterilized the earth of all life. But these bacteria were too advanced to be the first living creatures. So where did they come from? The creationist would say this is evidence of creation but Wills and Bada cover several different possibilities.

Observations have shown that life can be found deep in the subterranean earth, as deep as 3.5 km! Life could have hidden there during the bolide impacts and recolonized the surface when conditions were more favorable. Secondly, analysis of the Murchison meteorite which fell in Australia in 1969 has shown that it contains not only amino acids, but predominantly left-handed amino acids which are of the type used by living systems. Another suggestion is that life actually formed in space and then landed on earth. Many Christians will discount this idea, but then we discounted the idea that nonracemic amino acids could be created by nonbiological processes, something disproved by the Murchison meteorite.

One of the most fascinating aspects of the book is the data showing where life can actually exist. The subterranean unicellular life forms divide maybe once per century, live at temperatures up to nearly 150° C, live on methane, and may actually constitute the largest reservoir of biological materials on earth. If placed on the earth's surface, it is estimated they would form a layer of goo 1.5 meters thick. The desert varnish, a manganese rich coating on rocks thought to be due to abiogenic processes, is now known to be caused by bacteria living on the surfaces of the desert rocks—living almost without moisture. Such slow growing bacterial coatings which are found in the fossil record makes for an excellent argument against young-earth creationism.

One design argument that is weakened by the data in this book is the concept that the earth was created in a specially narrow habitable zone. Given all the places where life has survived and grown, one can no longer claim that the earth is in a very narrow habitable zone determined by the sun's energy. Life, it is now known, lives entirely separate from the sun's energy. It also lives on methane which comes from the earth's interior. Thus one cannot rule out life in certain other places in the solar system which have lots of methane—like the moons of Jupiter.

Wills and Bada, when discussing the origin of mitochondria, which are the energy producing organelles of the cell, cite the belief that they are the result of a free-living organism coming to live within the ancient cells, increasing the latter's ability to survive by giving the cells an energy source. Such a symbiosis, they report, was observed in Prof. Jeon's lab at the University of Tennessee, when bacteria invaded amoebas and eventually became necessary for the amoeba's survival. Facts like this give credence to the conventional views of how life originated.

There is much more in this book that is of great interest. Anyone who desires to get a good overview of the origin of life issues, the early history of the earth, or the wide range of habitations occupied by life should get this book. Christians cannot afford to ignore this area of research.

*Reviewed by Glenn R. Morton, Ramsden Lodge, 103 Malcolm Road, Peterculter, AB14 0XB, Scotland.*

**THE EVOLUTIONISTS: The Struggle for Darwin's Soul**
By Richard Morris. New York: W. H. Freeman and Company, 2001. 251 pages, index. Hardcover; $22.95. ISBN: 071674094X.

Veteran science writer Richard Morris has produced a highly readable introduction to contemporary evolutionary theory, with particular emphasis on the so-called "Darwin Wars." These are the internal debates that have become so animated and occasionally downright ferocious in recent years. This is an excellent analysis of why the mainstream scientific community continues to struggle with aspects of evolutionary theory. But lest critics of evolution take heart from these intramural controversies, Morris repeatedly asserts that there is no question that evolution happened. The theory of evolution with its mechanism of natural selection is "universally accepted among biologists." It is "the only possible interpretation of the numerous different kinds of evidence that scientists have been uncovering for well over a century."

Evolution is not just a single theory. Following Ernst Mayr's typology, Morris provides brief sketches of the five main evolutionary subtheories: evolution as such (that change occurs over time), common descent, multiplication of species, gradualism, and natural selection. Much of the recent debates have surrounded the question of whether natural selection, recognized by virtually all evolutionary theorists to be the major cause of evolution, is its sole cause. Stephen Jay Gould and Niles Eldredge represent the evolutionary pluralist position, which holds that other phenomena beyond natural selection are operating at higher levels of complexity. They want to call attention to what happens at the levels of species and ecosystems. The so-called Darwinian fundamentalists—most notably Richard Dawkins, Maynard Smith, and Daniel Dennett—aggressively reject the pluralist view and reduce (in a non-pejorative sense; Morris reminds the reader that reductionism is a valid scientific method) evolution to natural selection at the genetic level. Morris is fair in his analysis of this debate, and the reader is treated to a very lively account of the whole Gould-Dawkins/Dennett war of words, one that develops the notions of radical contingency, punctuated equilibrium, species sorting, spandrels, selfish genes, and so forth.

After detailing the basic positions of the pluralists and fundamentalists in the first half of *The Evolutionists*, Morris devotes most of the remainder of the book to an assessment of whether newer approaches favor one side or the other. He has a wonderful chapter on the sciences of complexity in which he outlines the work of Stuart Kauffman and Thomas Ray. He follows this with a very serviceable chapter devoted to evolutionary psychology. Both complexity theory applied to evolution and evolutionary psychology are promising but highly controversial areas in their own right. For Morris' purposes, however, they are enlisted at least in part to show that neither resolves the pluralist-fundamentalist debate. Complexity theory does share with Gould and Eldredge a suspicion that reductionistic approaches do not fully capture the richness of the multiple layers of activity that may be occurring with evolution. And evolutionary psychology as it has emerged out of sociobiology certainly builds upon the gene-centered view of the so-called fundamentalists.

With the score seemingly tied, Morris assesses recent literature for other evidences supporting either side. While there is much exciting research going on, it is inconclusive. There is some corroboration that Gould and Eldredge were correct that evolution can occur at a more rapid rate than anyone had suspected. Recent fruit fly studies suggest that evolution may not always occur through the slow accumulation of small mutations. But these and other recent studies seem to confirm that natural selection alone is the most important evolutionary factor.

"Evolutionary biology is a science in ferment," Morris concludes. He wisely makes no attempt to crown a winner, but uses the intramural Darwin Wars to make a modest but nevertheless important point about the role of controversy in science. "Scientific controversy," he concludes, "is a healthy thing." Rather than viewing it as something to endure until a measure of tranquility and civility is restored, Morris sees the existence of controversy as a sign

of vitality that a scientific field is "very much alive." Science is a quest for knowledge, he notes somewhat triumphantly—or perhaps naively. And when new discoveries are made, "it is only natural that scientists should argue with one another about what they have found." What Morris does not consider adequately is the "vexed and troubled" question of whether scientific orthodoxies and those who represent them are in fact simply interested in the quest for knowledge.

*Reviewed by Donald A. Yerxa, Professor of History, Eastern Nazarene College, 23 East Elm Avenue, Quincy, MA 02170/ Assistant Director, The Historical Society, 656 Beacon Street, Mezzanine, Boston, MA 02215-2010.*

**MODERN COSMOLOGY AND PHILOSOPHY** by John Leslie, ed. Amherst: Prometheus Books, 1998. 352 pages, bibliography, glossary. Paperback; $21.00 ISBN: 1573922501.

Leslie, professor emeritus of philosophy at the University of Guelph, has edited this book of twenty-six readings on cosmology and philosophy. The book contains articles by many of the leading philosophical and scientific luminaries, including Ernan McMullin, George Gamow, Hermann Bondi, Martin Rees, G. F. R. Ellis, and William Lane Craig. The articles were written between 1954 and the present.

Leslie begins the book with a brief introduction, outlining the arguments contained in each article. I found it confusing. It is a rare book whose introduction is less understandable than the actual articles. That being said, that is truly the only weakness in the book.

The articles are engaging and fascinating, discussing all aspects surrounding the origin and cause of the universe, its purpose, its fitness for life, and its future. Concerning the ultimate origin of the universe, opinions in this book vary greatly. McMullen notes that an eternally existing universe is a better candidate for self-existence than one with a beginning, like the Big Bang. W. B. Bonnor sees no reason for putting down the tools of science and "handing things over to God."

Edward Tryon, in his classic paper, argues that the entire universe is uncaused as our universe is merely a long-lived quantum fluctuation. He argues that this does not violate the Heisenberg uncertainty principles because the universe's net energy is so small (gravitational energy is negative thus balancing the mass-energy) allowing a large survival time for the fluctuation.

Paul Davies takes a different tack and sees quantum mechanics as breaking the rigid link between cause and effect allowing the universe to come into existence uncaused via a quantum fluctuation. All of these points of view are profoundly thought provoking and a modern Christian apologetic needs to deal with them.

Part of the debate in this book revolves around the evidence for design because that issue is crucial to understanding the purpose of the universe. Stephen Jay Gould writes that the argument for design is "moth-eaten" and he cites an interesting historical example. Alfred Wallace, the co-discoverer of natural selection, published an argument for design in 1903, which by today's standard seems wacky. Wallace's universe was 3600 light-years big and perfectly designed for humans. It consisted of concentric rings of stars centered on a central cluster of stars, which cluster contained the sun. Wallace argued that human existence depended upon this arrangement as plants depended upon starlight to carry out their nighttime activities. And because he knew nothing about radioactivity, he held that the star for a life-giving planet must be at the center of the universe because the sun was supposedly powered by the gravitational energy released when matter from the outer parts of this universe fall into it.

Two articles are of particular note in relation to life in the universe. Michael Hart analyses the Drake equation (an equation that evaluates the likelihood of life in the universe) in respect to atmospheric evolution. He concludes that the likelihood of a planet evolving a technological civilization to be very, very small ($< 10^{-30}$). He thus believes that we may very well be alone in the universe but this loneliness would not be due to God creating us specially.

In trying to define what he means by life, Hart cites another paper published in this interesting volume, that of Shapiro and Feinberg. This second article examines the possibility of life forms vastly different than those carbon-based ones with which we are so familiar. They speculate about other life forms in solid hydrogen, plasma, radiant life forms and in liquid sulfur. Assuming that such life forms as these exist, the anthropic coincidences discussed often by apologists would be meaningless. Of course, they would need to demonstrate their existence for their argument to have weight.

The book is a fascinating mix of opinion and scientific/philosophic discussion. After the introduction, the volume is quite readable and enjoyable. It is a book that should be in one's library.

*Reviewed by Glenn R. Morton, Ramsden Lodge, 103 Malcolm Road, Peterculter AB14 0XB, Scotland, UK.*

## PHILOSOPHY & THEOLOGY

**SIGNS OF INTELLIGENCE: Understanding Intelligent Design** by William Dembski and James Kushiner, eds. Grand Rapids, MI: Brazos Press, 2001. 224 pages. Paperback; $10.99. ISBN: 1587430045.

The thirteen essays presented here were first published in the journal *Touchstone* (July/August 1999). Dembski has added an introductory essay on what intelligent design is not. From the information given on the authors' backgrounds and affiliations it appears that five are scientists, four are philosophers, as well as a mathematician/theoretician, a publicist, a lawyer, a political scientist, a pastor, and a theologian. Half the authors are connected with the Discovery Institute's Center for the Renewal of Science and Culture. Many of the authors have published books generally related to the subject. Dembski, Michael Behe, and Philip Johnson have published books in this same area.

Perhaps the simplest way to give the flavor of the book is to indicate some of the topics discussed: the intelligent design movement, challenging the modernist monopoly, the view of ordinary people, the apologetic value of intelli-

gent design, scientific materialism vs. intelligent design, irreducible complexity, DNA, fatal flaws of natural selection, the Cambrian explosion, fine tuning in the cosmos, signs of intelligence, and the future of design-theoretic explanations.

The main contentions of the essays are: (1) It is possible to recognize objectively in biology signs of intelligent design by quantitative measures and by recognition of irreducible complexity; and (2) By introducing these concepts into scientific explanation, the materialistic bias of science will be removed. Thus Darwinism, which is so much part of modern cultural thought, will be countered or rendered obsolete. The book is part of America's culture wars. It has the advantage of presenting how persons from a wide range of disciplines see the advantage of the concept of intelligent design.

The book lives up to its title in that it reveals what intelligent design means to many thoughtful persons who support what Philip Johnson calls a movement. It is not convincing to those who have difficulty with either the goals of the movement, or simply, with the implications of introducing intelligent design as an explanatory term for scientific use.

Other authors such as Donald M. MacKay (*The Clockwork Image*, IVP, 1977) have shown carefully why it is illegitimate for materialists to claim that their world view follows from scientific theories. The essayists take no account of such writers; rather, they appear to believe that if a scientist claims that the theory of biological evolution shows there is no God, then he derived his conclusion from the science. Thus it is the science that is at fault. The introduction of the explanatory concept of intelligent design will correct the science, by taking away its materialistic bias. MacKay and others have pointed out that the metaphysical claims of the materialist do not at all follow from the science. The science fits in with other types of world views including Christian ones.

This is an important question not discussed: If two different instances of intelligent design are demonstrated who may the designers be? Simply to answer, God, assumes too much. If one stands above one's science, at the level of metaphysics, then talk of intelligent design is appropriate, and mandatory for the Christian. I believe employing this concept inside science will prove destructive. The essays, complete with notes, appear to be written for a well-read, American audience.

*Reviewed by C. P. S. Taylor, Professor Emeritus of Medical Biophysics, U. of Western Ontario, London, ON N6A 5C1 Canada.*

**HOW BLIND IS THE WATCHMAKER? Nature's Design and the Limits of Naturalistic Science** by Neil Broom. Downers Grove: InterVarsity Press, 2001. 220 pages, index. Paperback; $11.99. ISBN: 0830822968.

New Zealander Neil Broom, whose area of expertise is joint-tissue biomechanics and arthritis research, joins Phillip Johnson and others in challenging the assumption that scientific materialism represents the "sole pathway to objective knowledge" and that the materialist model of the universe is "alone consistent with the facts revealed to us by modern science" (p. 15). In clear prose with numerous helpful and entertaining illustrations and photos, Broom argues that a commitment to materialism impoverishes science and shuts it off from the "splendor of a living world that functions poised, as it were, in the presence of a transcendent, nonmaterial dimension—a dimension that both nourishes and imparts meaning to the processes of life" (p. 16).

Does he succeed? Broom covers familiar territory when he advances his case that scientific inquiry, despite the hyperbole of many prominent science writers, is fundamentally limited and is not capable of providing answers to "the really big questions concerning meaning and purpose" (p. 187). He is right to chastise the science popularizers who make extravagant claims about God and humanity based upon their own commitment to a materialistic world view and methodology. What would critics of reductive naturalism do, by the way, without Richard Dawkins? His gene-centered approach to Darwinism, saturated as it is with aggressive challenges to theism, has spawned a virtual cottage industry of response from Christian authors, let alone from anti-reductionists of various stripes within the Darwinian camp.

Broom is also correct to point out that science points to "a dimension that transcends the processes and systems in nature that this same science so successfully describes" (p. 188). The scientist's belief in a universe that should make sense is a fundamental assumption of successful science that cannot be accounted for by science itself.

But Broom goes much further. He contends that the entire living world "operates within a rich gradient of meaning. It is a world that expresses vast amounts of creativity, orchestration, goal-centeredness and ultra-sophisticated levels of communication. It is a world driven by an overwhelming 'urge' to live and to keep on living. It seeks to 'attain,' to 'achieve,' to 'improve.'" These "prolife" attributes are "completely outside and beyond the power of science to explain" (pp. 188–9). This conclusion draws Broom "beyond naturalism" into a call for a holistic science enriched by a recognition of the "purposeful dimension that transcends the material processes in nature" (p. 191).

This final point, which gets to the heart of Broom's project, is incredibly important, and I fear that all the attention paid to design as design has deflected attention from the issue of teleology in science. It seems that the human psyche resists the stark notion that there is no direction or point to the flow of natural, let alone human, history. Historian of science John C. Greene has noted that even prominent Darwinians cannot resist the temptation to smuggle into their discourse terms (e.g., more complex, development, progress) that are pregnant with telic implications. But must science itself, not merely its rhetoric, remain aggressively anti-teleological? Robert Wright is attempting to introduce a naturalized teleology based upon game theory into the Darwinian framework, and William Dembski admits that his objective is to enrich the discussion with the possibility of real, substantial teleology in science.

The rub comes when some scientists and theologians suggest that this teleological dimension belongs in contemporary science. Perhaps. But the jury is still out. To be

convincing, this case must be made from the standpoint of science not theology. Broom believes he has done so. I, for one, will need more evidence and, for now, will argue that it is safer to suggest that science does indeed have severe limitations. We should not ask too much of science. The quest for the meaning of life and the cosmos can certainly be informed by science, but these matters beg for the insights and methods of the historian, poet, artist, philosopher, and theologian.

While I have focused on the philosophical dimensions of Broom's argument, the bulk of the book consists of fascinating vignettes into biology. Broom and InterVarsity Press are to be saluted for reminding the reader that science need not point to atheism and starkly nihilistic world views, or even a generalized sense of awe (in that sense, as Ernst Mayr has noted, almost all scientists are indeed religious). As was the case for the devoutly Christian nineteenth-century scientist Michael Faraday, seen through the eyes of faith, science also can evoke "a profound sense of wonder for God as Creator" (p. 216).

*Reviewed by Donald A. Yerxa, Professor of History, Eastern Nazarene College, 23 East Elm Avenue, Quincy, MA 02170/ Assistant Director, The Historical Society, 656 Beacon Street, Mezzanine, Boston, MA 02215-2010.*

**GOD AND TIME: Four Views** by Gregory E. Ganssle, ed. Downers Grove: InterVarsity Press, 2001. 252 pages. Paperback. ISBN: 0830815511.

This is a collection of four different views of time as experienced by us and by God. The contributions are by William Lane Craig, research professor of philosophy at Talbot School of Theology; Paul Helm, until recently professor of history and philosophy of religion at King's College, London; Alan G. Padgett, professor of theology and philosophy of science at Azusa Pacific University; and Nicholas Wolterstorff, Noah Porter Professor of philosophy at Yale Divinity School. After each presentation, the other three contributors give their comments and then the author gives his final response. This is one of a series of such books published by InterVarsity Press, and it provides a very attractive format.

You need to be interested in the philosophy of time and its theological implications in order to enjoy this book, and probably most readers will be theologians and pastors. There is much for a physicist, like myself, to get his teeth into as well. For instance, "What was God doing before the Big Bang?" I agree with Padgett that he was not, as Brian Leftow has suggested, eagerly anticipating the Creation. "What is God's relation to time?" Helm argues that he is absolutely timeless, with or without the existence of the Universe; and to think of God as temporal is to diminish him. Padgett considers several alternatives in the framework of either a dynamic or process theory of time (McTaggart's A-theory) or a static or block theory of time in which all times are equally real (the so-called B-theory). Padgett also gives due consideration to the implications of Einstein's Theory of Relativity and the difficulties associated with the concept of simultaneity. Craig's view is that God has been temporal since the creation, but before then, he was timeless. He discusses the notion of the Oxford group of philosophers, including Richard Swinburne, of an "amorphous" or nonmetrical time before creation. Finally, Wolterstorff argues, on the basis of biblical references, for the A-theory of time and a temporal God. For instance, the Scriptures affirm that God responds to the pleas of his people, and this can only be so if he exists in time.

I found the book thought-provoking, making me question things more deeply than I would otherwise have done. My own conclusion, after reading the book, is that God created time and space in the Big Bang and that subsequently he experiences time within the universe in the dynamic or "process" manner, a term introduced by the mathematician and scientist A. N. Whitehead. Though relativity hampers our ability to establish simultaneity, this is no problem for God who has a unique frame of reference. But in the spiritual realm, I do not believe that either time or space exist, but only information, and therefore the concept of "amorphous" time does not appeal to me. I agree with the four essayists that the "eternal-temporal" or ET-simultaneity idea introduced by Stump and Kretzmann is complicated and unhelpful. A spiritual God can be said only to exist, and we should not question where or when. Thus we can better appreciate Jesus' statement, *"Before Abraham was, I am."*

If, therefore, time was created together with space, I agree with Alan Padgett that "God must await the future of any and all objects in the universe in order to act directly upon future (nonexistent) episodes of that object." This is, of course, a process or A-theory of time. I agree with Padgett that it is not true that God exists only if time exists, but I depart from him when he writes about "God's own time, eternity." By analogy we would have to speak of God's own space independent of the universe, and this is meaningless. This book shows us again how very difficult it is to escape from spatio-temporal language and thinking.

I think you will see from my comments that the varied but clearly expressed views contained in this book, covering as they do ideas ranging from Augustine and Anselm to Hawking and Wheeler have proved to be very stimulating. You cannot help but take sides in the discussion, and it is one that is very important for us at the present time. It relates directly to the debate on openness theology currently taking place in evangelical circles. The concept of time and its origin, furthermore, is common to theology and science, like that of creation, and thus such debates bridge the two approaches. Give yourself time to enjoy this book!

*Reviewed by Geoffrey Dearnaley, FRS, Vice President (retired) of Southwest Research Institute, San Antonio, TX 78200.*

**REALISM REGAINED: An Exact Theory of Causation, Teleology, and the Mind** by Robert C. Koons. New York: Oxford University Press, 2000. 349 pages. Hardcover. ISBN: 0195135679.

In the Introduction, Koons writes that he aims to bring an end to dualism. Dualism came, he says, when Aristotle's metaphysics fell. Since then, the roots of dualism are reportedly in the dualisms of mind and body, of fact and value, of objectivity and subjectivity, and in the early separation of scientific fact and normativity. This is caused

by unnecessarily and disastrously rejecting Aristotle, says Koons. In my opinion, he is correctly rejecting dualist philosophies. This book is not easy reading because it requires an understanding of philosophy.

Words like "Causation," "Teleology," and "Mind" may have a slightly different meaning for Christians than they have for non-Christians, even when the terminology used is "scientific" rather than Christian. While "Causation" and "Teleology" are carefully defined, other technical words are used as if everyone knows their meanings. One example is the word "modality," a word used in the philosophy of the cosmonic idea as developed by Vollenhoven. Koons' use is sometimes close to that, other times its meaning is unclear. In general, though, Koons does his best to define words and expressions carefully.

The author recognizes that cause and result are not always in order of time. Sometimes the result comes before the cause. He points to recent interpretations of quantum mechanics that show the possibility of temporally reversed causation. For Christians, miracles are another area to consider. The book is worth reading and discussing.

*Reviewed by Jan de Koning, 20 Crispin Crescent, Willowdale, ON M2R 2V7, Canada.*

**MY COSMIC PESSIMISM: A Philosophical Critique to the Existence of a Cosmic Almighty Mind** by Luis A. Santander. Raleigh, NC: Pentland Press, 2000. 100 pages. Paperback; $12.95. ISBN: 1571972110.

This book will appeal to folks with a philosophical and apologetical bent. It examines religions, and finds them wanting. Santander's arguments against faith are as old as recorded history. They are based on "worldly wisdom," by which, according to Paul, the world knows not God. According to Santander, "those who possess blind 'faith' in God … prefer the blind, brute, and subjective thinking instead of rational thought" (p. 34). With this pejorative statement, Santander maligns some of the most intelligent minds of all time!

While Santander rejects evidence for God's existence, he readily accepts the classical atheists' arguments against religions' validity. In the last chapter, the author summarizes his salient beliefs this way: "Life was the most unfortunate accident in the history of the universe" (p. 93). This statement supports the appropriateness of the word "pessimism" in the book's title.

Atheism and agnosticism are not outlooks noted for their positive view of life. The curmudgeon and Roman Catholic believer Malcolm Muggeridge observed that he would rather be wrong with Peter, James, and Paul than right with Ingersoll, Paine, and Nietzsche. In other words, Pascal's wager prevails!

So if you want to read a succinct presentation of atheism with its concomitant pessimism, this book will serve as a concise introduction. The author is a native of Argentina, so his English is stilted, but his ideas are generally discernible.

*Reviewed by Richard Ruble, John Brown University, Siloam Springs, AR 72761.*

## RELIGION & CHRISTIAN FAITH

**CAN GOD BE TRUSTED? Faith and the Challenge of Evil** by John Stackhouse. New York: Oxford University Press, 1998. 196 pages, notes, index. Paperback; $25.00. ISBN: 0195117271.

Stackhouse, a professor of theology at Regent College, has read widely in the area on the question of suffering. He quotes freely from many well-known authors including C. S. Lewis, Dorothy Sayers, G. K. Chesterton, and Philip Yancey. Stackhouse does not see the problem of suffering as a particularly Christian problem. Evil exists and human beings need some sort of faith to make sense of lives that suffer as a result of this evil. They can choose to align their hopes with the faith of the New Testament, or with some other faith, or with no faith at all. In light of these options, Stackhouse sees his role not as a giver of answers but as a challenger of logical responses.

First of all, since evil is part and parcel of the universe in which we find ourselves, the focus of the discussion should be, not on the question, "Why is there evil?" but on the question, "What will I do about the fact of evil?" In his introduction, he states his purpose in these words: "What I offer, then, is this: a description of what we are up against in our struggle against evil, and good reasons to believe in God even in the throes of that struggle."

He sets forth his argument for the Christian faith response under four themes: (1) there is an abundance of evil in our world and God does not stop it so perhaps evil has a necessary role in the way things should be; (2) there is also an abundance of good, and how could good exist at all if a good God is not behind it all; (3) Christianity teaches that God created human beings with free will which presupposes that there are choices; (4) for all people complain about the badness of the world they live in, very few of them show any desire to leave it. In developing his argument, Stackhouse draws heavily on arguments put forth by Alvin Plantinga, concluding with Robert Frost.

Finally Stackhouse reviews what the Bible tells us about evil, from Job and the Psalmist to Christ and the cross. No one knows everything perfectly and no one knows anything for sure. All faith choices are that—leaps into the unknown. "Amy has to decide whether to marry Matt. A seeker has to decide whether to commit himself or herself to God." For Stackhouse the best answer is found in the person of Jesus Christ. I recommend this book. Every ASA member should have it on his or her shelf to pass on to a young person dealing with doubts.

*Reviewed by Elizabeth Hairfield, Staunton, VA 24401.*

**THE LIFE OF PRAYER IN A WORLD OF SCIENCE: Protestants, Prayer, and American Culture 1870–1930** by Rick Ostrander. New York: Oxford University Press, 2000. 232 pages. Hardcover; $39.95. ISBN: 0195136101.

In November 1857, George Mueller prayed to God to shift the direction of the wind blowing over the orphanage he operated in Bristol, England. He had scheduled repairs on

the orphanage's boiler at a time when very cold weather threatened the health of his wards. Mueller recorded in his journal that on the day of the boiler's shutdown, a "south wind blew: exactly as I had prayed." Millions of American evangelicals in the decades surrounding the turn of the century certainly believed, along with Mueller, that God answered petitionary prayers. Prayer could indeed convince God to change the weather.

But prayer, particularly petitionary prayer, was not so simple a matter for many other American Protestants who believed that modern science made asking God for things seem unreasonable and even problematic. As historian Ostrander puts it in his contribution to Oxford University Press's Religion in America Series: "Petitionary prayer, with its vision of a God rushing to the rescue of his children, did not seem very reasonable in a culture in which science had seemingly ruled out supernatural intervention" (p. 12).

Other historians have explored the attempts of Anglo-American Protestantism to come to grips with modernity. But while those studies have focused on the challenges of biblical criticism and Darwinian evolution, Ostrander explores the efforts of American Protestants to articulate both an intellectually and culturally satisfying ethic of prayer in the modern world.

Ostrander begins his study with a brief summary of evangelical Protestant efforts to justify prayer. The modern scientific world view did not significantly challenge nineteenth-century American evangelicalism's traditional notions of prayer. In fact, evangelicals were fascinated with "answered prayer narratives" like those of Mueller and Hudson Taylor. Evangelicals frequently used answered prayer as a practical apologetic, something Ostrander suggests reflected "a scientific, empiricist impulse that coexisted … with … [evangelicalism's] supernaturalist impulse" (p. 49).

The evangelical experience provides the backdrop for the bulk of Ostrander's book, which focuses on liberal, mainline Protestantism and its struggles to adapt traditional teachings on prayer to the modern scientific world view. It is an interesting story. Liberal Protestants, especially prior to World War 1, were keenly interested in prayer as they sought to undergird social betterment with spiritual sensitivity. But several factors worked together to push liberal Protestants away from traditional notions of prayer. Perhaps the most important of these was the emphasis on divine immanence, the presence of God in nature, which rendered traditional notions of God crudely anthropomorphic, with very significant implications for prayer. Asking God to intervene in the world made God into a capricious magician, who altered the created order for the benefit of some but not others. Moreover, liberal Protestantism showed an increasing unwillingness to be restrained by the authority of the Bible at the same time it gave great deference to science "as a determiner of what was and was not possible in the religious realm" (p. 87).

Ostrander argues that liberal Protestantism did not abandon traditional petitionary prayer overnight; "the liberal expurgation of the supernatural element in prayer occurred quite gradually" (p. 97). He uses the example of popular liberal writer Harry Emerson Fosdick to illustrate this. As late as 1915 in *The Meaning of Prayer*, Fosdick affirmed the viability of intercessory prayer, despite the fact that several of his fellow liberal Protestant theologians were restricting prayer to the personal subjective world, where it was efficacious only in that it benefitted praying individuals and energized them to change the world by personal effort. But by 1926, when Fosdick returned to the subject of petitionary prayer in his *Adventurous Religion*, things had changed. "Prayer will not alter the weather," Fosdick noted; furthermore, it was blasphemous to tell God "what we think he should do."

No longer could prayer be understood as ceaseless clamoring to "a mysterious individual off somewhere." What, then, was the liberal Protestant conception of prayer? According to fellow liberal, Protestant writer William Adams Brown, prayer was the means by which we produce "psychological wholeness by focusing on God as the unitive ideal" (p. 158).

Clearly, by the end of the 1920s, American Protestantism was deeply divided on the subject of prayer: liberals had expunged virtually all traces of the supernatural from prayer, while evangelicals still believed in a personal God who answered petitionary prayers. Ostrander makes this point effectively by referring to a symposium entitled "Does Prayer Change the Weather?" that ran in the *Christian Century* in the summer of 1930. For liberal Protestants participating in the symposium, harmonizing notions of prayer with the modern scientific world view was a matter of intellectual integrity. Many American Protestants, nevertheless, prayed for rain—not just for patience—during that hot summer when parts of the nation suffered through a severe drought.

Ostrander has produced a valuable history of Protestant thinking about petitionary prayer and devotional disciplines in America from 1870 to 1930. Apart from the light he sheds on an important aspect of the struggle of American Christianity to accommodate theology and to practice science, Ostrander has also provided important historical context for current research and discussion on the efficacy of prayer. In fact, readers are likely to be struck by how many of the issues that confront contemporary empirical and theological explorations of prayer were raised at the turn of the last century.

*Reviewed by Donald A. Yerxa, Professor of History, Eastern Nazarene College, Quincy, MA 02170.*

**THE FACE OF TRUTH** by William Edgar. Phillipsburg, NJ: P & R Publishing Company, 2001. 136 pages. Paperback; $10.99. ISBN: 0875521789.

This book's ten chapters have short, pithy titles like "Lifting the Veil," "Collision Course," and "A Cloak of Decency." Each chapter, averaging just over ten pages in length, is a short and easy read. The index and endnotes (not as convenient as footnotes) assist the reader in locating information.

There are no ground-breaking insights or revelations in this book. But the author's ideas are expressed in succinct, yet nascent, language able to stimulate some dormant nerve-cell activity! The book illustrates Samuel Johnson's observation that there is a greater need to be reminded

than informed. Edgar's reminders include the following: we are God's image-bearers; God is knowable; Jesus never disappoints; believing is no leap of faith; the Scriptures provide basis for faith; faith and science are friends; Genesis points to the world's purpose; the Bible gives no acceptable, logical explanation for evil; Christianity is unique and those who accept its truths "have nothing to lose that is worth keeping, and everything to gain you'd never want to lose."

Edgar's touching dedication is to Edith Schaeffer "whose home led us to heaven." This present volume has elicited this comment from George Gallup, Jr.: "Speaks powerfully to the present times. An invaluable guide to those who seek a deeper faith, one that withstands intellectual challenge. Edgar writes to both the heart and head in a clear and winsome way." The book has both an apologetic and evangelistic tone; consequently, it would make an excellent gift to a seeker or young Christian.

Edgar is professor of apologetics at Westminster Theological Seminary and author of *Reasons of the Heart* and *Taking Note of Music*. He is also a professional jazz musician who has published articles on cultural apologetics, the music of Brahms, and African-American life.

*Reviewed by Richard Ruble, John Brown University, Siloam Springs, AR 72761.*

**WORDS OF GRATITUDE FOR MIND, BODY, AND SOUL** by Robert A. Emmons and Joanna Hill. Radnor, PA: Templeton Foundation Press, 2001. 105 pages. Hardcover. ISBN: 1890151556.

The words of gratitude found in this book comprise eight inspiring chapters, many trenchant quotes, and a suggested reading list. One of the suggested readings is entitled *Gratefulness: The Heart of Prayer* by David Steindl-Rast, who provides this book's introduction. In it ("Proverbs As Words of Gratitude"), he quotes this proverb: "When you drink from a stream, remember the stream." He also points out that some noble words of gratitude have originated with the unwashed, nameless, and homeless. "Better a bush than an open field," said someone seeking shelter. "The sun is the poor man's blanket," said another cold from the night.

Pages fully devoted to quotes fill more than half the book's length. They include quotes from the ancient ("Gratitude is not only the greatest of virtues, but the parent of all the others," Cicero) to the recent ("To be grateful is to recognize the love of God," Thomas Merton); from the famous ("A proud man is seldom a grateful man, for he never thinks he gets as much as he deserves," Henry Ward Beecher) and the not so famous ("There is a calmness to a life lived in gratitude, a quiet joy," Ralph Blum).

Gratitude is a Christian virtue, and this book helps believers express it. It helps put into words those feelings which periodically swell up in thankful hearts for the gift of life, of salvation, of provisions, of fellowship, of opportunity, of hope. Gratitude is also found appropriately in the vocabulary of scientists, as it was in this one: "A hundred times a day I remind myself that my inner and outer life depends on the labors of other men, living and dead, and that I must exert myself in order to give in the measure as I have received and am still receiving," words spoken by Albert Einstein.

I am pleased to recommend this book which sees the thankful life as a natural part of the scholarly life: "Thinking and thanking spring from the same root—in the realm of language as well as in the soul realm." It will provide a devotional uplift to all Christians who deal not only with things seen, but things unseen, for both of which they are grateful to God and to others.

Robert A. Emmons, the author of many research articles, book chapters, and a recent book, empirically explores how core aspects of identity reflected by spirituality relate to personality. Joanna Hill, a graduate student at the Theological School of the Academy of the New Church, is director of Templeton Foundation Press.

*Reviewed by Richard Ruble, John Brown University, Siloam Springs, AR 72761.*

**CAN ARCHAEOLOGY PROVE THE OLD TESTAMENT?** by Ralph O. Muncaster. Eugene, OR: Harvest House Publishers, 2000. 48 pages. Paperback. ISBN: 0736903569.

Muncaster's conclusion in this short book parallels the one in his companion volume *Can Archaeology Prove the New Testament?* The author thinks "Archaeology provides one means of confirming the historical accuracy of the Bible" (p. 5). He believes there is more historical evidence for the Bible than for any other historical document. Archaeology cannot prove Old Testament events happened, but it can provide significant credibility. And, of course, archaeology does not prove the metaphysical truth imbedded in the event.

The method Muncaster uses is to provide historical and archaeological findings which support the information found in the Old Testament. This involves explaining how archaeology works, how it has uncovered biblical sites (a list includes fourteen key places), and how archaeology's findings confirm many biblical accounts. He divides archaeological discoveries into four chronological categories, from the time of creation to the first century.

Muncaster concludes on an evangelistic note, answering common questions and explaining the way of salvation. Other books the author has written include *Creation vs. Evolution*, *Science-Was the Bible Ahead of Its Time?* and *What is the Proof for the Resurrection?* Muncaster is the founder of Strong Basis to Believe, a frequent lecturer on biblical topics, and professor at Vanguard University of Southern California.

*Reviewed by Richard Ruble, John Brown University, Siloam Springs, AR 72761.*

## Social Science

**WHY GOD WON'T GO AWAY: Brain Science and the Biology of Belief** by Andrew Newberg, Eugene d'Aquili, and Vince Rause. New York: Ballantine Publishers, 2001. 320 pages. Hardcover; $24.95. ISBN: 03454483.

Is there really a God-shaped hole in each person? This popular sentiment has been used to explain the worldwide, cross-cultural prevalence of religious expression. This book posits a physical basis and an evolutionary benefit for this human activity. Newberg, Director of Clinical Nuclear Medicine and NeuroPET Research at the Hospital of the University of Pennsylvania, is a physician specializing in neuro-imaging as was the late d'Aquili. Ballantine Publishers calls them pioneers in the emerging field of neuro-theology, a discipline dedicated to understanding the relationship between spirituality and the brain. This book continues their writing collaboration, a relationship which most recently produced *The Mystical Mind: Probing the Biology of Belief*. Rause, the third author, is a journalist.

The book's premise is that the mystical experiences and altered states of mind associated with religious practices are observable neurological events that can be studied using scientific approaches. The authors use examples from their studies of meditating individuals to postulate that decreased activity in a particular region of the brain, the Orientation Association Area, is largely responsible for the sensations associated with these altered religious states of mind. The authors' original data is described in the first chapter. The remainder of the book is largely a hypothesis of how various brain activities may have promoted religious experiences and been evolutionarily beneficial.

After a brief introductory chapter, the authors devote two chapters to describing "Brain Machinery," or neuroanatomy, and "Brain Architecture," or functional neurobiology. These chapters are admirably written, without the flood of technical language that could have led to many readers giving up. However, they observe that it is always difficult to pare down the information needed. The authors could have condensed these two chapters into one without confusion.

In the next four chapters, the authors discuss myth-making, ritual, mysticism, and concepts of reality as they may relate to brain activity in the association areas and human evolution. A consistent premise is that this brain activity confers a human advantage. For example, in the chapter on myth-making, the authors describe myth-making as an outgrowth of the ability to anticipate danger. The authors include a nice description of the brain processes involved in the fear response and how humans differ from animals in danger anticipation. The ultimate danger, of course, is death. The chapter is fleshed out with some speculative treatments of how myths got their start and the process by which an individual's idea is transformed into a cultural myth. A similar structure is used in the chapters on ritual, mysticism, and reality.

The book falters in communicating the boundaries between science and speculation. The authors are respected neurologists who are experts in brain imaging, so the science they describe is accurate and current, as one would expect. However, the book is so well written that the differences between the neural activity that the authors observed during religious activity and the acquisition of these abilities during evolutionary development are often subtle. I would highly recommend this book for college students enrolled in a course that examines these types of science/nonscientific boundaries. First-year college science students should be able to read this book without much difficulty and benefit from the discipline of identifying each type of writing in the text. The book is also a good exercise for all Christians in science who need to recognize these differences. Since the science is written at a very accessible level, this book could be enjoyed by anyone interested in the topic.

*Reviewed by Robin Pals-Rylaarsdam, Assistant Professor of Biology, Trinity Christian College, Palos Heights, IL 60463.*

**AGING AND SPIRITUALITY: Spiritual Dimensions of Aging Theory, Research, Practice, and Policy** by David O. Moberg, ed. Binghamton, NY: The Haworth Pastoral Press, 2001. 250 pages. Paperback. ISBN: 0789009382.

Venerable ASA member, David Moberg is considered by some people to be "America's premiere gerontologist." His edited book comes with such high recommendations as "an important tool," "the best there is in theory and practice," "a rewarding source," and "rich in practical applications."

The book's sixteen chapters are grouped under four main headings: conceptual and theoretical foundations; research and spirituality; professional and practical implications; and policy implications and priorities for the future. The book includes a brief biography for each of the eleven writers (Moberg wrote six chapters), person and subject indices, and a recommended reading list. The writers come from a variety of backgrounds including a coordinator of food drives, a director of pastoral care, a health care administrator, a case manager, a family therapist, a dental hygiene instructor, and a geriatric nurse.

Some of the more intriguing topics include the spiritual role of the elder, attitudes toward death and dying, the relationship between age and spirituality, hospice care, and the role of the chaplain. As to the spiritual role of the elder, the world would be a better place if elders were "encouraged to exercise an active role in the community." As to death and dying, "most of the elderly … are not afraid of death itself but of all that could precede death." The 2,500 hospices serving people in every state hold the belief that every person matters to the last moment of life, and therefore they should be cared for in mind, body, and spirit. The role of the chaplain will become increasingly important with the aging of the American population. This may require reallocation of theological and denominational resources.

This helpful collection of articles is relevant to a large segment of the population. Laypersons and professionals will discover here valuable insights and considerations. The writing is not technical, and it can be accessed easily. I particularly appreciate the editor's comments and writing style which are appropriate and thoughtful.

Three weeks before death from cancer, Cardinal Joseph Bernadin wrote: "I am at peace and I can only account for that by looking upon it as a gift from God … (but) you have to let go. That letting go is not the easiest thing in the world." The compassion contained in the writings of these articles may aid those struggling with letting go, which eventually may include everyone.

*Reviewed by Richard Ruble, John Brown University, Siloam Springs, AR 72761.*

# Letters

## Is Theism a Theory? A Response to Snoke

David Snoke has recently written a bold and stimulating article ("In Favor of God-of-the-Gaps Reasoning," *Perspectives on Science and Christian Faith* 53, no. 3 [Sept. 2001]: 152–8) in favor of GOG (God-of-the-gaps) reasoning, or perhaps more accurately, criticizing the prevalent assumption that GOG reasoning has no merit. While I agree with much of his epistemology, I think there are serious problems with his treatment of theism as if it were a theory; I doubt that Christianity can accept that kind of self-understanding. In what follows, I will attempt to explicate the main problems with Snoke's position, which are fourfold: (1) there is reason to question the religious adequacy, so to speak, of treating theism as if it were a theory; (2) there are some serious internal problems with theism and Christianity *qua* theories; (3) most people do not approach theism or Christianity with the attitude proper toward a theory; and, (4) it is not as clear as Snoke seems to think that theism and Christianity entail any falsifiable predictions.

Before I begin in earnest, I should note a few minor points. I am sympathetic to Snoke's general epistemological position. As he argues, evidential considerations should play an important role in a person's decision between theism and atheism, and generally in the evaluation of world views or theories. I am also in agreement that if a theory cannot explain something, it ought to be able to explain what counts against it, although, as a careful reading of his article makes clear, that does not automatically cripple a theory or favor one of its competitors over others. Snoke notes several explanatory failings or "gaps" in the atheistic position that weaken it, and he suggests that theism gains credence by being able to explain what atheism cannot. Although I do not think these gaps are as serious or as unlikely to be overcome as Snoke claims, space limits me to noting my disagreement and referring the reader to some of the literature that Snoke does not cite.[1]

The most serious problem concerns Snoke's contention that theism is a *theory*. This is not argued for in his essay but is simply assumed. It is a controversial position, to say the least, and does not seem to sit well with the main themes of the Bible or the bulk of Christian tradition. Since when is God to be considered as part of a theory? The God of Abraham, Isaac, and Jacob, as well as of the Old Testament prophets, Jesus, and the apostles, confronts us as a Thou, a person, a most intimate challenge, not as something hypothetical or theoretical. *Prima facie*, theism in general, and Christianity in particular, are not theories and it may be contrary to their very spirit to see them that way. As John Baillie has said:

> Thus for the New Testament, as for the Old, God is One who is directly known in His approach to the human soul. He is not an inference but a Presence … The knowledge of God of which the New Testament speaks is a knowledge for which the best argument were but a sorry substitute and to which it were but a superfluous addition.[2]

Having made this point, I will go along with Snoke's contention for the sake of argument, and offer some criticisms of theism and Christianity *qua* theories. In the first place, if theism is a theory, then it has at least the following internal problems (excepting for the moment, the problem of evil, which Snoke appears to recognize as a problem). First, its most crucial concept, God, may be incoherent. I refer to the longstanding and ongoing philosophical and theological debates over the meaning of divine attributes such as "omnipotence" and "omniscience" and over whether a God having these and other essential attributes is possible, for some of them appear to conflict.[3] At the very least, there are serious difficulties in providing a satisfactory account of the concept of God. Second, a similar and related debate is over whether there are any satisfactory explanations of central Christian doctrines such as the Incarnation and the Atonement.[4] I submit that a theory that had as many hotly contested central concepts and claims as theism and Christianity have, and for as long as they have had them, would never last long in the world of science.

Certain other problems follow from treating theism as if it were a theory. Belief in God is not generally held as if it were part of a theory. People tend to believe in God more firmly than they would be entitled to if it were a theory, and tend not to be as willing to consider criticisms and new evidence as commitment to a theory requires. So, Snoke's contention is incorrect as a description of how people in fact embrace theism and Christianity. Should we say that Christians ought to try to accept Christianity as if it were a theory? What then becomes of faith?

The question of whether theism or Christianity entail any falsifiable predictions is more complex than Snoke indicates. A basic distinction made by the philosopher of biology Elliot Sober between *strongly falsifiable* and *weakly falsifiable* theories is instructive.[5] A theory is strongly falsifiable if it entails at least one observation statement O (i.e., a prediction) whose truth or falsehood can be determined by direct observation. Most scientific theories do not by themselves entail observation statements; only in conjunction with auxiliary hypotheses do they do so, which is to say, they are weakly falsifiable. This is acceptable so long as the auxiliary hypotheses are confirmed (and falsifiable) *independently* of the theory in question.

Now, theism by itself does not seem to entail any observation statements, so it is at best weakly falsifiable. As Sober explains, the difficulty for theism concerns auxiliary hypotheses about God, that is, claims concerning what God is like and how he acts. To take one of Snoke's examples, he claims that if theism is true, we would expect there to be "many, daily, direct, miraculous communications from God" (p. 156), a prediction he takes to be falsified and that requires a modification of theism. However, this prediction only follows on the assumption of knowledge about how God would reveal himself to human beings, if he existed. But why suppose that Snoke or anyone else could *know* this? The problem with auxiliary hypotheses about God is that they are not independently confirmed or falsified. Is there any way of confirming or falsifying auxiliary hypotheses about God without presupposing theism? I raise these issues not to take a firm stance on them, but merely to suggest their complexity and cast doubt upon the idea that we can easily find falsifiable predictions for theism and Christianity.

Ever since Hume and Kant, natural theology has been on the defensive, only making a serious comeback in the last twenty-five years or so. Snoke welcomes natural theology as part of his evidentialist epistemology, and wants theism to subscribe to the "normal rules of evidential discourse" (p. 154). In our pluralistic world, this is an understandable and reasonable reaction. However, it is not clear that this is a move theism and Christianity can make, as the problems I have outlined show. Some serious issues concerning faith and reason still need to be addressed.

### Notes

[1]On the Intelligent Design—Evolution controversy, see Massimo Pigliucci, "Design, Yes, Intelligent, No," *Skeptical Inquirer* 25, no. 5 (Sept.–Oct. 2001): 34–9; Niall Shanks and Karl Joplin, "Behe, Biochemistry, and the Invisible Hand," *Philo* 4, no. 1 (Spring–Summer 2001) available at the website <www.philoonline.org>; and *Skeptic* 8, no. 4 (2001), which has an excellent section on Intelligent Design. On fine-tuning arguments for the existence of God, see Theodore M. Drange, "The Fine-Tuning Argument Revisited," *Philo* 3, no. 2 (Fall–Winter 2000).

[2]"The Irrelevance of Proofs from the Biblical Point of View" in John Hick, ed., *The Existence of God* (New York: MacMillan, 1964), 209–10.

[3]For an introduction, see Theodore M. Drange, "Incompatible-Properties Arguments: A Survey," *Philo* 1, no. 2 (Fall–Winter 1998). Available at the website <www.philoonline.org>.

[4]For the critical side, see Michael Martin, *The Case Against Christianity* (Philadelphia: Temple University Press, 1991), and Walter Kaufmann, *The Faith of a Heretic* (Garden City, NY: Doubleday, 1961), an older work still worthy of careful study. For a defense of the Incarnation, see Thomas V. Morris, *The Logic of God Incarnate* (Ithaca, NY: Cornell University Press, 1986), and of the Atonement, see Richard Swinburne, *Responsibility and Atonement* (New York: Oxford University Press, 1989).

[5]See Elliot Sober, *Core Questions in Philosophy: A Text With Readings*, 3rd ed., lecture 9, "Is the Existence of God Testable?" (Old Tappan, NJ: Prentice Hall, 2001). For a much fuller and more sophisticated treatment, see Elliott Sober, "Testability." *Proceedings and Addresses of the American Philosophical Association* 73 (1999): 47–76. Available at the website <philosophy.wisc.edu/sober>.

Shawn Dawson
11 Princess Place
Regina, SK S4S 2K3 Canada
email: sl.dawson@sk.sympatico.ca

## Choice of Research Topic

Although I am now retired, I was for many years head of a research group and chairman of a university department of electrical engineering. I was therefore particularly interested in the recent issue of *Perspectives on Science and Christian Faith* (53, no. 4 [December 2001]) reporting on a conference dealing with the choice of research projects by young graduates and post-docs. I have to say that I found the advice offered rather disturbing.

My chief cause for concern was the overriding importance attached to individual choice. My experience suggests that a fulfilling career in research generally requires team work. It may be that a few outstanding scientists work best in isolation, although I doubt it. But the creativity of most ordinary research workers is enormously enhanced by regular discussion with colleagues. The conference did not mention that giving is the other side of receiving. In this connection, I found the advice on choosing a supervisor to further one's career somewhat distasteful.

Nor do I like the idea of encouraging research workers to live from grant to grant. In my experience, the financing of research is best left to the head of a research group. Younger members need to be protected from commercial pressures so that they can give themselves unreservedly to the quality of their work and the enjoyment of it.

I fear that much of the advice given at the conference may increase the perception of science as a self-regarding pursuit and may strengthen the postmodern backlash against it.

I have been an appreciative reader of *PSCF* for many years and hope you will forgive the criticism.

Professor Percy Hammond
The Dingle
Whinfield Road
Dibden Purlieu
Southampton SO5 4AA
UK

## A Reply to the Dialogues

The March 2002 issue of *PSCF* contains a dialogue concerning science, naturalism, biology, and design.[1] Walter Thorson argues for a new definition of naturalism in science, with the unstated assumption that evolutionary biology would be included in such a science.[2] Although biology is usually classified as a science and biologists use the scientific method for investigation, the biochemical evolution of the first cell and macroevolution are supernatural. Uniting evolutionary biology with naturalistic science joins two mutually exclusive categories.

If science is defined as the study of natural things and natural processes in which supernatural causation is absent, evolutionary biology is not scientific. If science is defined as the study of the physical universe in which causation could be supernatural, evolutionary biology would be scientific. The two sets of definitions are functionally equivalent if God does not exist. Since the large majority of scientists accept a definition of science that excludes supernatural causation, such a definition of science should be accepted as the best working definition.

# Letters

Thorson wrote: "Theological reflection on creation is entirely legitimate, but must be clearly distinguished from the mundane study of creation with which science is concerned." To be precise, science is the study of the product of creation. The act of creation is supernatural. The product of creation is natural. In parallel fashion, the act of macroevolution is supernatural. The product of macroevolution is natural. Biology is the study of the product of macroevolution.

The biochemical evolution of the first cell and macroevolution are supernatural. The probability of naturalistically or randomly assembling a small protein composed of 100 amino acid residues is about I chance in $10^{65}$ per try.[3] Less than $10^{50}$ tries have existed over the last 3.5 billion years, because less than $10^{50}$ proteins have existed on Earth during that entire period. The probability of naturalistically assembling just one necessary, functional small protein by using every try available is about one chance in $10^{15}$ or one chance in a million billion [$10^{-65} \times 10^{50} = 10^{-15}$].

Thorson wrote: "[W]e need a new 'naturalistic' biological science which is more than the application of physical science to biosystems." A naturalistic science is proper for the study of microevolution, since the DNA in microevolution already exists and already functions. A naturalistic science is not proper for the study of the biochemical evolution of the first cell and macroevolution since they involve the supernatural creation or supernatural assembly of functionally new DNA.

Thorson desires science to be naturalistic because he sees God as transcendent. God is not transcendent just because his methods are obscure. In evolutionary biology, God is also immanent. An example might suffice.

> A defined high-energy photon is generated and streaks through space for 100 years. At the right moment in time, a man, of his own volition, runs for a fly ball, stumbles, and wipes out on the grass. As he lies sprawled on the ground, the high-energy photon penetrates one of his sperm cells and energizes and alters DNA at a precise location while in a specific spatial orientation. The sperm cell, which contains the DNA altered in a manner preordained by God, fertilizes an egg. The two form the DNA component of a child woven together by God in the womb of the mother.[4]

God is immanent in the details of evolutionary biology, for he said, "Who gave man his mouth? Who makes him deaf or dumb? Who gives him sight or makes him blind? Is it not I, the Lord?"[5] Our inherited make-up is a personal gift from God.

Thorson seeks a biologic "a logic controlling achievement of certain tasks or *functions*." For both natural and metaphysical reasons, the bio-logic is not discoverable through scientific investigation.

The bio-logic is not discoverable for the following natural reasons:

1. A bio-logic is unique for each protein and each enzyme. Physicists can experimentally approximate the physical-logic of simple entities because they are uniform and contain mundane information. A billion oxygen molecules exhibit similar behavior and interact uniformly. A billion proteins and enzymes exhibit diverse behavior and each interacts uniquely.
2. The comparative study of fossils, homologous structures, proteins, and DNA provide no information for determining the origin of the bio-logics.
3. Since science cannot sufficiently explain the bio-logic of even one small enzyme, it is totally incapable of determining the entire bio-logics.[6]

The bio-logic is not discoverable for the following metaphysical reasons:

1. The bio-logic of the protein or enzyme resides in the purpose and design of God that precedes the initial appearance of the protein or enzyme.
2. Since the bio-logic arises from a supernatural purpose, the total bio-logic must be appropriated by supernatural revelation.
3. The bio-logic arises from a supernatural concept of function, which culminates in glorifying God.

Therefore, Thorson's bio-logic is not achievable. On the other hand, the intelligent design proposed by William Dembski is also problematic. Intelligent design cannot differentiate between macroevolution by intelligent design and progressive creation by intelligent design. Comparative studies of fossils, homologous structures, proteins, and DNA do not differentiate between them. Scientific experimentation cannot differentiate between them because they both involve supernatural causation.

Proponents of intelligent design make a fundamental error in strategy when they attempt to include intelligent design in a science curriculum. No study of biological origins, including intelligent design, is scientific. A more fruitful approach for the intelligent design movement would be to show that the naturalistic biochemical evolution of the first cell and naturalistic macroevolution are highly irrational scientific hypotheses, which also need to be excluded from a science curriculum. Intelligent design, the naturalistic biochemical evolution of the first cell, and naturalistic macroevolution should be transferred to some other curriculum such as philosophy, religion, or to an entirely new course.

## Notes

[1] *Perspectives on Science and Christian Faith* 54, no. 1 (March 2002).
[2] Walter Thorson, "Legitimacy and Scope of 'Naturalism' in Science," *Perspectives on Science and Christian Faith* 54, no. 1 (March 2002): 2–11.
[3] H. P. Yockey, "A Calculation of the Probability of Spontaneous Biogenesis by Information Theory," *Journal of Theoretical Biology* 67 (1977): 377–98; and J. F. Reidhaar-Olson and R. T. Sauer, "Functionally Acceptable Substitutions in Two a-Helical Regions of Repressor," *Proteins: Structure, Function, and Genetics* 7, no. 4 (1990): 315.
[4] See: Psalm 139:13
[5] Exodus 4:11
[6] Yockey; and Reidhaar-Olson, 315.

Fredric P. Nelson, M.D.
Eastwick Pediatrics
Suite Two
2801 Island Avenue
Philadelphia, PA 19153