

Book Reviews



ANTHROPOLOGY & ARCHEOLOGY

MAMMOTH: The Resurrection of an Ice Age Giant by Richard Stone. Cambridge, MA: Perseus Publishing. Hardcover; \$26.00. ISBN: 0738202819.

The woolly mammoth, the fabled creature of the Pleistocene Era, exerts a powerful hold on the imagination of explorers. Once an improbable notion, today the plausibility of resurrecting a prehistoric creature is theoretically feasible thanks to advances in genetic science. This book offers such a scenario. With the intention of establishing a "Pleistocene Park," in which long-extinct creatures like the mammoth, saber-toothed tiger, and woolly rhino could be resurrected and given sanctuary, Richard Stone, European news editor for *Science* magazine, ventures out to Siberia in an effort to find a potential carcass to excavate.

This book is about the daring individuals who are penetrating the farthest reaches of Siberia in search of the mammoth. Stone appreciates that to discover the frozen remains of a woolly mammoth holds out the tantalizing prospect of finding tissue with DNA that could be used for cloning. The very idea of establishing a Pleistocene Park may seem radical to some, but Stone's premise is that it may not be radical enough for it to thrive. A woolly mammoth is needed to meet the requirements of developing a "mammoth steppe."

In late October 2000, Stone follows Arctic explorer Bernard Buigues and his multinational team to a remote village in an attempt to excavate and airlift the mammoth carcass known as "the Jarkov"; appropriately named after its discoverers. Studying the potentiality of restoring a stretch of northern Siberia to its prehistoric condition, creating what they call a "mammoth steppe," Stone envisions the area populated by bison, Yakutian horses, and elephants—and one day, creatures such as the woolly mammoth, genetically "summoned from the world of the dead." The excavation of the woolly mammoth is the first step in making this "park" a reality.

This lively adventurous chronicle is divided into three well-balanced chapters that explore the primary, and often conflicting, theories on mammoth extinction: shifting weather patterns caused by climate change, overhunting by humans, and a "hyper disease" passed from humans to mammoths. In the end, *Mammoth* is an extremely intriguing, entertaining, and detailed account of our quest to resurrect the past. It is a provocative look at an intellectual voyage "through uncharted moral terrain, as we confront the promise and peril of resurrecting creatures from the deep past."

Reviewed by Dominic J. Caraccilo, Lieutenant Colonel, U.S. Army, Vicenza, Italy, CMR 427, Box 1628, APO AE 09630.



ENVIRONMENT

THE REENCHANTMENT OF NATURE: The Denial of Religion and the Ecological Crisis by Alister McGrath. New York: Doubleday, 2002. xvii + 204 pages. Hardcover; \$23.95. ISBN: 03855005909.

The review copy was a bound galley, and this means that I cannot be sure what the final version of this book will be like. There were some English errors that I am hoping will be corrected. The index had eight pages designated, but they were all blank, so I have no way of knowing how useful the index may be. However, based on the galley, I judge the final version will be worth the price.

McGrath is a professor of theology at Oxford, and a consulting editor of *Christianity Today*. He has written or edited a number of books, some of which have been about science and Christianity.

This volume attempts to do a number of things. Let me summarize three major thrusts: (1) It attacks the thesis of Lynn White, author of "The Historical Roots of our Ecologic Crisis," (*Science* 155 [1967]: 1203-7), which mostly blamed Christianity for that crisis, and has been widely followed; (2) It attacks the Enlightenment view of Nature, quoting Steven Vogel, who, according to McGrath, says that "Enlightenment is marked by the 'disenchantment' of nature, its transformation from something sacred into mere matter available for human manipulation" (in A. McGrath, *Against Nature: The Concept of Nature in Critical Theory*, p. 54); and (3) It attacks Richard Dawkins, devoting an entire chapter, "Disenchanting Nature: The Case of Richard Dawkins," and other parts of the book to him.

McGrath argues that the view of Dawkins and others, which leaves out the enchantment of nature, is a fairly recent matter, and that, historically, the West has mostly seen nature as enchanted (more than quarks and chromosomes), and should return to such a view, which he believes is compatible with the practice of modern science.

There is more here, for example, McGrath's take on postmodernism, and quite a few references to C. S. Lewis, and even some to *Star Trek*. McGrath is widely read, and writes well. Reasonably intelligent readers should have no trouble understanding and profiting from reading this book.

Its main shortcoming is the absence of notes indicating sources. Perhaps they will be added. A list of works consulted is given, albeit without specific page numbers. If an author has written more than one work on a relevant subject, McGrath usually does not point out which of these sources he is discussing. If an author is of historical significance, like Aquinas, Lenin, or Pascal, there is usually no mention of the work to which McGrath is referring. He just says that Lenin said something, and it is up to the reader to find out when and where.

McGrath believes that the Enlightenment of the eighteenth century still affects the way many of us view the created world and ourselves. He claims that Christians ought to see nature as enchanted, having more meaning

than reductionism would give it. He is on to something, and deserves to be read.

Reviewed by Martin LaBar, Professor of Science, Southern Wesleyan University, Central, SC 29630.



ETHICS

YOUR GENETIC DESTINY: Know Your Genes, Secure Your Health, Save Your Life by Aubrey Milunsky. Cambridge, MA: Perseus Publishing, 2001. 410 pages. Hardcover; \$27.50. ISBN: 0738203777.

GENETIC TURNING POINTS: The Ethics of Human Genetic Intervention by James C. Peterson. Grand Rapids: Eerdmans Publishing Company, 2001. 364 pages. Paperback; \$22.00. ISBN: 0802849202.

Genetic testing and gene therapy have taken a back seat to stem cell research in the recent popular press. In reality, these techniques are inextricably linked to stem cell research and as the technology expands will only become more prevalent in clinical settings to provide information about more disease-related genes. These books offer important, complementary treatments of this pressing issue.

In *Your Genetic Destiny*, physician and geneticist Milunsky writes one of the best scientific introductions to genetic technology that I have read. Persons with little background but some interest in the topic will benefit from and enjoy reading the first three sections of the book. Milunsky begins the book with "Knowledge is Lifesaving," a section devoted to helping the reader understand why knowing genetic information is beneficial, and how to go about obtaining it. He writes: "If you choose not to know [about your genetic information] you might not be altering your chances, but you most certainly will be limiting your choices." It is particularly noteworthy that Milunsky discusses collecting family history information at length. This part of genetic information is often overlooked, and forms a critical basis for continuing on to more specific DNA-based tests. The second and third sections are excellently written treatments of chromosomal and single-gene inheritance and associated diseases.

The most informative section of the book is the fourth, where genetic contributions to such disorders as heart disease, diabetes, and cancer are discussed. The science in these sections is accurate and the writing is clear and interesting. This section alone could serve as an important reference guide for anyone interested in genetic diseases. The book closes with sections describing prenatal testing, ethics and legal issues, and treatment of genetic disorders. Milunsky is clearly a proponent of using genetic information extensively in medical decision-making, but to his credit he presents drawbacks and risks associated with testing as well as the positive aspects of obtaining genetic knowledge.

The ethical aspects of genetic testing and intervention are the focus of Peterson's book, *Genetic Turning Points: The Ethics of Human Genetic Intervention*. This book is the extension of Peterson's doctoral work in ethics at the University of Virginia. A unique facet of the author's background is the time Peterson spent as a research fellow in

molecular and clinical genetics at the University of Iowa. Although the book is written by an accomplished ethicist, he is a Christian ethicist who thoroughly understands the science and technology of which he speaks.

Genetic Turning Points is organized in the best possible way. First, a section on the context of science and technology and a Christian perspective on both are provided. Then the book moves gradually from impersonal genetic research, on to genetic testing, followed by genetic drugs, or gene therapy as we know it today, and finally the potential genetic surgery of the future. In each section, the author discusses the ethical implications to the individual, families, and communities. The chapters on community ethics are particularly well thought out, and raise important questions that are often overlooked in discussions of genetic testing and therapy.

My one major criticism of the book is that it deviates from the task at hand into an extended treatment of developmental biology and abortion in chapter five, and it returns to the abortion theme too often. The abortion sections distract from the excellent ethical discussion of genetic technology that are present in the same chapters. While abortion is clearly a related issue, genetic technology in and of itself presents Christians and the greater society with specific, important issues that Peterson ably addresses.

I highly recommend both of these books to readers interested in the nuts, bolts, and more of genetic technology, and to those interested in expanding their knowledge of ethical issues associated with modern genetics. As the use of genetic medicine spreads, books like these will become necessary reading for educated patients.

Reviewed by Robin Pals-Rylaarsdam, Trinity Christian College, Palos Heights, IL 60463.



FAITH & SCIENCE

GLIMPSING THE FACE OF GOD: The Search for Meaning in the Universe by Alister McGrath. Grand Rapids, MI: Eerdmans Publishing Co., 2002. 124 pages. Hardcover; \$18.00. ISBN: 0802839800.

McGrath, professor of historical theology and principal of Wycliffe Hall, Oxford University, is the author of over forty books. This book's print is rather small. However, its thoughts are not dense, and they are well illuminated by trenchant quotes and insightful illustrations. Modern publishing is complex: McGrath wrote this book at Oxford, it was printed and bound in Singapore, first published in the UK, and now released by Eerdmans in Grand Rapids. The twelve chapters of this book are produced on quality, slick paper, interspersed with beautiful color photographs and paintings.

Especially appealing is its nondogmatic tone. McGrath approaches the topic—the meaning of life—in a gentle, compassionate, kind way. He disarms the critic by admitting the evidence for both theism and atheism is ambiguous. To McGrath, it is a matter of choosing the view which is the best fit. The scientific minded will appreciate illus-

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trations from the history of science, mystery aficionados will enjoy references to the great detectives of fiction, and those who appreciate the world of aesthetics will have a peak experience admiring the selection of color pictures.

This book might be considered an apologetic for the Christian faith. And yet, it is not argumentative nor combative. It might also be considered a devotional book, intended to inspire, motivate, and confirm believers. Appropriately, too, it has an evangelistic tone to it and might point the undecided to faith. I think it serves all three of these functions well and therefore will appeal to doubters, believers, and seekers. I highly recommend it.

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

IN SIX DAYS: Why Fifty Scientists Choose to Believe in Creation by John Ashton, ed. Green Forest, AR: Master Books, Inc. 2000. 384 pages, notes. Paperback; \$13.99. ISBN: 0890513414.

The fifty scientists contributed short essays varying in length from two to twenty pages. They had responded favorably to a question from the editor Ashton: "Why do you believe in a literal six-day biblical creation as the origin of life on earth?" No other stipulations were placed on the essayists other than that statement. Ashton arranged the "final" papers into two divisions. In the first, the heading was "Science and Origins," and the second, "Religion and Origins." The first division deals with a scientific critique of evolution and presents a scientific case for creation. The second division presents "a more philosophical approach" to the debate on evolution and creation.

The scientific credentials of the fifty authors are listed at the beginning of each paper. All have earned Ph.D. degrees in their field of science. As far as this reviewer can estimate, all Ph.Ds. were granted by reputable institutions of higher education.

After reading and analyzing the papers, I made the following observations. Twenty-two essayists affirm their belief in a literal six-day creation. Eight essayists affirm their belief in six-day creation but do not use the adjective "literal." Twelve essayists affirm creation rather than evolution, but the words "young earth" or "six-days" do not appear in the text. Eight essayists do not mention "six-days" in their texts. Ben Clausen (essayist number 30) makes the interesting statement (pp. 272-3): "I do not find the evidence for a recent creation compelling."

Most of the papers do a very respectable job of pointing out the scientific weaknesses of the evolutionary hypothesis. Jerry Bergman (essay number 2) made a good impression on this reviewer with his analysis of naturalism. He quotes Michael Behe's illustration of "irreducible complexity" as found in the simplest of living cells. "Naturalism," he says, "must account for both the parts necessary for life and their proper assembly." The Darwinian hypothesis fails here. "Living cells must be created at once with all parts functioning."

Some of the essayists were "hard core" atheists and evolutionists before they abandoned that belief system for a creationist viewpoint (Allen, Cimbala, White). To me,

one of the more interesting articles was by Andrew McIntosh as a result of his study of the principles of flight. He points out how beautifully flying insects and birds show evidence of design which enables them to fly. There is "no fossil evidence for 'pro-avis' creatures." He says birds are classic cases of "irreducible complexity, and design by a 'designer.'"

I strongly recommend this book of essays to ASA members and any open-minded scientist. The case for "literal Six-day" creation is not proven, and the authors admit that neither creation nor evolution can be "proven."

Reviewed by O. C. Karkalits, Dean College of Engineering and Technology, McNeese State University, Lake Charles, LA 70609-0695.

THE FRONTIERS OF SCIENCE & FAITH by John Jefferson Davis. Downers Grove, IL: InterVarsity Press, 2002. 177 pages, index, bibliography. Paperback; \$14.99. ISBN: 0830826645.

Davis is professor of systematic theology and Christian ethics at Gordon-Conwell Theological Seminary. This is his ninth book but the first in this area, although he has won awards for excellence in the teaching of science and religion. The book has ten chapters discussing the implications to theology of the Big Bang, quantum indeterminacy, delayed choice experiments, mathematical chaos, Goedel's Theorem, artificial intelligence, progressive creation, the anthropic principle, the search for extraterrestrial life, and the ultimate fate of the universe. The book is a wide-ranging discussion of important issues the Christian faces in the world of science. And Davis faces them fairly and squarely without distortion of the information he has available.

Davis deals with the Big Bang, following the history of the idea that the universe had a beginning from ancient to modern times. He displays a quite up-to-date knowledge of the cosmological thinking. However, he seems to be behind in the very recent indications of a cosmological constant and the implications of charge conjugation-parity symmetry violations to the creation of the excess of matter over antimatter. He is correct when he points out that the Big Bang is no threat to Christian doctrine.

One of the most amazing features of the book is his acceptance of chance in the universe. So many apologists writing today flee from chance as if it would be the death of God. Davis accepts true indeterminacy but adopts a position which allows God and the creature to have control of contingent events. If one has to put his position in one phrase, it is that God ratifies what the creature proposes. But God also has knowledge of how a radioactive atom will behave when placed in a particular circumstance, which is a variation of the hidden variables approach to quantum mechanics.

This surprising book also bursts several canards which are widespread in the apologetical literature. In discussing chaos theory (nonlinear dynamics), Davis acknowledges that effects may be larger than the cause. This is the butterfly effect in which tiny differences in initial conditions of nonlinear systems lead to huge differences in results. Davis clearly accepts the data for transitional forms and the gradual development of the human body.

Davis acknowledges the force of Hume's objections to the design argument while not rejecting their use entirely. Davis notes that the anthropic principle has re-introduced teleology and design into modern philosophy. Refreshingly, he does not simply cite evidence in his favor, ignoring contradictory data. He openly and intelligently discusses the implications of Guth's inflationary universe and Everett's Many Worlds Hypothesis as counters to the anthropic principle. Davis makes one rather weak criticism of those two views by appealing to Occam's razor that they are complex options or untestable. This criticism rests on the *assumption* that nature is simple which simply may not be true. What if God decided to create complexity? Does Occam overrule God? And as to untestability, Goedel's theorem, which is discussed in the book, shows that certain mathematical statements are true but quite indemonstrable, i.e. without evidence. Is it totally out of the realm of possibility that the same can be said for the universe as a whole? What legislative body has told God that he must make every object in the universe display evidence for its existence? God himself is often accused of hiding from the scientist's gaze.

The main weakness of the book lies in the area of paleontology broadly defined. The references were rather old. Davis cites the Cambrian explosion as evidence of creation, but because the references are old, he apparently is unaware of data showing connection of Cambrian with Precambrian animals. He also erroneously claims that no new phyla have appeared since the Cambrian. Treatment of anthropology is cursory and generally cites old texts.

I would heartily recommend this book. It is truly a rarity when a conservative theologian actually deals with the world as it is rather than as he wishes it to be. Davis does not deny evidence or try to twist facts into a mold of his making. His approach is refreshing and raises the question of why it is such a rarity.

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

NEW MAPS FOR OLD: Explorations in Science and Religion by Mary Gerhart and Allan Melvin Russell. New York: Continuum, 2001. 232 pages; notes, bibliography, indexes. Paperback; \$24.95. ISBN: 0826413382.

Gerhart, professor of religious studies at Hobart and William Smith College, and her colleague Russell, professor of physics emeritus, explore in these previously delivered or published papers and articles the implications of the epistemological model described in their 1984 book, *Metaphoric Process*. MP is their term for the process that leads to new insight and knowledge, often revolutionary, in both religion and science. It differs from analogy, in that in analogy, an unknown is compared to a known in a way that leads to a greater understanding of the unknown, as when the motion of a gas in an enclosed space related to the motion of balls on a billiard table leads to new insights about the characteristics of the gas in this circumstance. In MP, however, similar things are related, but in a way that leads through "cognitive disruption" to a "higher viewpoint." For example, the Copernican and Ptolemaic models of the cosmos (the metaphors) are alike, but the change in the positions of the sun and the earth (the dis-

ruption) led to new discoveries (the process) by Galileo and Kepler about motion on earth and in the heavens, and the later recognition by Newton that the same laws of motion govern both (the higher viewpoint).

This concept of MP lies behind most of the eleven chapters in the collection. The topics are too varied and complex to summarize here, so let me highlight a few points. In the chapter "MP as the Tectonic Reformation of Worlds of Meaning in Theology and Natural Science," the authors cite examples of the cognitive disruptions brought on by MP in theology. God viewed from the standpoint of "relationality" rather than "being" (the "omni-" God), the notion of God as both human and divine, and the understanding of Christ as both *sophia* and *logos* are but a few examples of changes that have led to higher understandings of God.

In "The Genre Bidisciplinary Dialogue," the authors argue that collaborative dialogical work between persons from two separate disciplines (here physics and theology) can lead to greater understanding for both. They recommend this genre for its fruitfulness in bridging disciplinary boundaries and leading ideally to a higher viewpoint achieved not by compromise but by a synthesis of the two views. While their views remain unchanged, the participants may find a new level of understanding in the "amalgam," which in turn invites further dialogue. The authors illustrate this technique in the chapter following through one of their own dialogues.

In "A Generalized Conception of Text Applied to Both Scientific and Religious Objects," the authors argue that scientific research, discovery, and formulation of theory can be understood much as a scriptural text in religion. Four characteristics of "textness"—readability, formality, material transcendence, and retrievability—can be applied to scientific work in a way that illustrates commonalities in the processes of interpretation and shared understanding found in both the sciences and theology. Scientific data must be "read" (i.e., interpreted) within the framework of formal processes and techniques. The resulting interpretations and fields of meaning transcend their media; and they are retrievable, in that experiments carried on in any time or place may duplicate the results. The notion that those in the sciences interpret nature within their own hermeneutical sets in a way analogous to those in the humanities, including theology, has been gaining attention recently.

In another paper, "Mathematics, Empirical Science and Theology," the authors assert that "the natural sciences influence theology not so much by causing necessary changes in doctrine but by reforming the world of meanings within which human beings explore the limits of human understanding. This process is analogous to the enlarging of the realm of the analytical that occurs in the interaction between pure mathematics and the natural sciences." Developing this analogy with examples from physics and theology, they conclude:

Just as the physicist prospects among the accomplishments of pure mathematics for the means to the achievements of the ends of science, so only the theologian is able to determine what changes in our world of meanings brought about by the many investigations and discoveries of the natural sciences, can be of use in furthering the ends of theology.

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These are not easy pieces. The concepts are often rather abstract and difficult to grasp, even with concrete examples, and are sometimes vaguely expressed in cumbersome sentences. And the book shares the characteristics of any collection—some disconnection, even with editing, but much to ponder. Graduate students, faculty, and scholars interested in exploring the interface between science and theology might find the book useful.

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

THE GOD MAN WORLD TRIANGLE: A Dialogue Between Science and Religion by Robert Crawford. New York: St. Martin's Press, 2001. 234 pages, notes, index. Paperback; \$22.95. ISBN: 0312232381.

Beginning with the rise of science and the materialistic world view that accompanied it, Crawford asks where is God? He first looks for him in the world and in humankind, and then in the world religions, setting quotations from members of the scientific community against quotations from the theologians or from the scriptures of the major world religions to find answers.

Crawford concludes that God is present in the world and in humankind and that his presence is demonstrated by such evidence as the facts of values and purpose—human characteristics that are not compatible with an atheistic evolutionary model based on the selfish gene—and recent discoveries in physics. Hence Crawford concludes that science has not been able to exclude God from the world. However, the world described by modern science is not the same as the world of the Bible. Thus the second question: if modern people are to believe in God, what kind of God are they to believe in?

To answer this question Crawford looks at religious ideas throughout all cultures and ages, i.e., the world religions. He notes that world religions all proclaim a God who is both transcendent and immanent, impersonal and personal. With the exception of Buddhism, all believe that God creates and sustains the universe. Semitic religions differ from the Oriental religions, however, in their belief that history is linear, not cyclic, and God is directing history toward the consummation of all things. The religions also differ in their views of the nature of the imperfection of humanity, but all agree that each human being is responsible for his or her own actions. Judaism and Christianity specifically recognize the image of God in mankind. In Christianity this image reaches its perfection in Jesus Christ.

Crawford writes for the seeker, the person who is looking for evidence for faith. His argument in summary is that the only model of God that will stand up in a scientific age is one of a God who is in loving interaction with the world, who is omnipotent but has modified his attributes to grant true freedom to his creatures, who has made this world a testing ground for faith. The challenge for seeker and believer alike is to respond to God's love, to try to understand God's world, and to cooperate with God in changing it.

Reviewed by Elizabeth M. Hairfield, Professor of Chemistry, Mary Baldwin College, Staunton, VA 24401.

CREATION AND LAST THINGS: At the Intersection of Theology and Science by Gregory S. Cootsona. Louisville, KY: Geneva Press, 2002. 102 pages, notes. Paperback; \$11.95. ISBN: 0664501605.

This erudite but accessible book is one of twelve planned titles in the series "Foundations of Christian Faith," sponsored by the Presbyterian Church, USA (PCUSA). The author, an associate pastor at Fifth Avenue Presbyterian Church in New York, seems solidly Christ-centered but not as doctrinally conservative as some in the PCUSA (my own denomination). He emphasizes theology more than science, which I applaud since I believe most of our problems in this area spring from poor theology. Despite some small errors, like an endnote attributing *Finding Darwin's God* to "Keith" Miller, Cootsona does well (for a non-scientist) at presenting the relevant science.

After a brief introduction, the book discusses what it means for God (as Trinity) to be the Creator, giving meaning to a universe that is wholly dependent on him. The nature and limitations of general revelation are stated; it can be a witness to God, but is "fleeting and vain" (quoting Calvin) without special revelation. After rejecting the warfare model of science and theology, Cootsona advocates Ian Barbour's "integration" approach.

The next chapter concerns what it means to be created in God's image. I especially liked the material connecting image-bearing to our relationships with others and to our stewardship responsibility for God's creation. When Darwin comes up, the author wisely makes the vital distinction between evolution as a scientific explanation and the philosophical baggage some attach to it. While rejecting the God-excluding metaphysics often associated with Darwinism, he sees no reason to reject the science itself and to deny God the option of creating by evolutionary means.

The next chapter discusses how all is not right with creation. The problem of evil cannot be covered in a few pages, but helpful things are said about the incarnate God suffering with us, and about God providing himself as our answer when we want explanations. Evolution comes up again in the context of the Fall, and Cootsona suggests a "typological" Adam.

In the final chapter on "last things," the connection to science is weaker. Science has much less to say about how God will make all things new than about how he made things in the past. The author closes with the important reminder that our future hope in Christ should affect the way we live today.

I liked the book, but at times I felt like a teacher reading a B+ paper from a student who had the talent to earn an A. It sometimes seemed to lack focus, but I was most disappointed by some missed opportunities to clarify key issues.

Readers will bring questions like "Is evolution compatible with Christianity?" "How should I read Genesis 1?" and "Is 'Intelligent Design' (ID) good apologetics?" Cootsona does answer the first question (in the affirmative). Concerning Genesis, the idea of God accommodating revelation to human limitations is introduced, and it is implied that we should not treat the Bible as a science text. The stage is set to advise readers that concordism is an unwise approach to these passages, but that statement is

never made. As for the ID movement, several of its flaws are mentioned in other contexts, such as the need to distinguish between science and materialist philosophy, the mistake of looking for God primarily in the gaps of our knowledge, and the danger of "natural theology" divorced from special revelation. I was hoping for a clear statement that the ID movement is theologically deficient when it does not allow God to create *via* his sovereignty over nature and when it elevates a gap-based, Jesus-free apologetic. The author may have been unwilling to rebuke a movement that he felt had some worthwhile things to say, but he missed a prime opportunity to caution readers about its less healthy aspects.

As an introduction to science/faith issues, my first recommendation would still be Charles Hummel's *The Galileo Connection* or George Murphy's *Toward a Christian View of a Scientific World*. But *Creation and Last Things* is well worth reading. Perhaps it will find its way into the hands of a certain prominent anti-evolution crusader who attends a PCUSA church in Berkeley; it might help him see why many of us think his movement needs to think about its theology.

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



GENERAL SCIENCE

THE TRUTH NEVER STANDS IN THE WAY OF A GOOD STORY! by Jan Harold Brunvand. Urbana and Chicago: University of Illinois Press, 2000. 217 pages, index. Hardcover; \$22.95. ISBN: 0252024249.

Brunvand is professor emeritus of English at the University of Utah, specializing in folklore. His previous books include *Too Good to Be True* and *The Baby Train and Other Lusty Urban Legends*.

Among the thirteen stories in this book, the one most likely to interest ASA members is chapter 10, "The Missing Day in Time." Since at least 1970, this urban legend has surfaced sporadically in sermons, church bulletins, and even at least one usually reputable Christian journal (which later retracted it when informed of its bogus nature).

The claim is that a NASA computer had verified a discrepancy in planetary movement, thus verifying two Old Testament accounts. Harold Hill, an electrical engineer who claimed to have been a consultant for NASA, circulated a story that NASA computers in Greenbelt, MD, had computed the positions of the various celestial objects over several millennia, and had discovered that there was a day missing. Hill interpreted this "missing day" to be a composite of 23 hours and 20 minutes when Joshua commanded the sun to "stand still" for "about a day" (Joshua 10:12-14), and 40 minutes when "the shadow return[ed] backward ten degrees" during a confrontation between Isaiah and Hezekiah (2 Kings 20:9-11). He concluded one article by saying that this NASA evidence confounded skeptics by "Our God ... rubbing their noses in His Truth!"

The obvious difficulty with such a story is the lack of computer data from the Old Testament era, which allegedly conflicted with the smooth flow of the celestial bodies

through time and raised the computer's "red flag." Brunvand notes that the story bears a striking resemblance to pre-computer versions, including a 1927 book by Harry Rimmer and an 1890 book by a military science professor.

Hill died in 1987 without either retracting the story or finding the original notes on which he allegedly based his claim. But the story still circulates, with variations and permutations, "continually re-created in oral and printed tradition just as any urban legend is modified."

Aside from "The Missing Day in Time" chapter, this book may have some entertainment value when we need to unwind from weightier matters, but not much practical instructional value.

Reviewed by Dave Fisher, editor of "Truth in the Test Tube" broadcast, Aurora, IL 60504.



HISTORY OF SCIENCE

BODIES POLITIC: Disease, Death and Doctors in Britain 1650-1900 by Roy Porter. New York: Cornell University Press, 2001. 328 pages, index, bibliography. Hardcover; \$35.00. ISBN: 0801439531.

Porter, professor of the social history of medicine at the Wellcome Institute for the History of Medicine, Oxford University, has the credentials to write this gripping account of emerging medicine. His expertise in this field is unchallenged. He writes with erudition, shown in the frequent comparisons of classical and Christian traditions. This requires the reader to keep an unabridged dictionary handy. Pithy axioms permeate the text. The author's aim is to show that historically the body was presented as an expressive medium because the control of the flesh had a high priority in Western philosophy and religion, art and ethics, and law and order.

The text concerns healers and those who sought healing, the art of dying and the deathbed, and the doctor as Death's deputy. Although the patient is sometimes the hero, the doctor was often viewed negatively by contemporary society because of his deceit, love of money, and in these earlier times, his undeserved social standing. Prevention of diseases came to be seen as better than available cures.

The author describes how the flesh was constantly pummeled, punished, exploited, and subjected to the prying gaze of science, medicine, and the people. That reality is often hilarious. From Tudor times, the medical profession showed dexterity in its promoting of a high-minded image of itself although the doctors continued to fight each other. The health of the body eclipsed the previous concern for the salvation of the soul. It was rumored that the doctors fleeced the patients first, then killed them with their untried potions.

The author explains how sexuality gained the stamp of approval in the eighteenth century. Among the pre-1800 doctors, the elite physicians occupied the highest social position, but surgeons, because they practiced manual crafts, and apothecaries were on lower strata. This seemingly demonstrated the superiority of head over hand,

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mind over matter, even a model of sagacious self-control. Porter shows that eventually a union of hand and head was achieved by these medical people. All of these doctors were regulated by their own governing bodies. A Georgian doctor who lacked civility risked censure. Genuine skills developed at this time such as bone setting. Clinical relationships were often power plays, patients negotiating with their doctors for the high ground.

With the arrival of the twentieth century, science and technology moved the balance in the doctors' favor. The symbol of the physician who achieved worldly success was a gold-headed cane. He was now emerging as a person manifesting a liberal education and a cultivated mind. The physician's wig, the surgeon's saw, and the apothecary's mortar and pestle became a part of this changing society. Books on domestic medicine that began to appear in the seventeenth century now became widely available. Elizabeth Garrett Anderson, in the mid-Victorian era, stormed this male citadel. By now specialization had emerged and the highly influential Scottish universities were instrumental in and encouraged the rise of the family doctor.

Porter thinks that the culture of the day contributed to an understanding of the body and he demonstrates this in 137 quality illustrations. These are mainly archival cartoons in color, visual images that complement the text. By skillful melding of the visual with the written word, the author has produced an excellent book. He achieves his aim of presenting a visual medical history of those times. The typeface and paper are of the highest quality. No footnotes distract the reader. The book is extensively and helpfully referenced. This book, with its refreshing insights and details, will be of interest to many readers. It would be a welcome gift for a doctor, physician or surgeon, or any reader of this journal. It is highly recommended.

Reviewed by Kenneth NP Mickleson, Mt Eden, Auckland 3, New Zealand.

DRIVING MR. ALBERT: A Trip Across America with Einstein's Brain by Michael Paterniti. New York: The Dial Press, 2000. 211 pages. Hardcover; \$18.95. ISBN: 0385333005.

A tale of a man who kept Einstein's brain stored in a Tupperware container for decades sounds like an urban legend, but it turns out to be true. In *Subtle is the Lord . . .*, Abraham Pais mentions in a footnote that Einstein's autopsy was performed "by Dr. Thomas F. Harvey, who removed the brain, part of which now rests in a bottle somewhere in Weston, Missouri." This book picks up where most Einstein biographies leave off.

The story begins with how the author learns about Dr. Harvey from his landlord and becomes obsessed with contacting him. After tracking down the doctor, Paterniti offers to drive him and Einstein's brain from New Jersey to California to visit Einstein's granddaughter. The author portrays the decision to go on a road trip across the country with Dr. Harvey as spontaneous. However, one gets the impression that he went into it with the intention of writing about the experience. He did a good deal of background research before leaving on the trip. For example, he even visited a collector of Einstein memorabilia in Japan to learn more about Dr. Harvey.

The dust cover accurately describes the book as "part travelogue, part memoir, part history, part biography, and part meditation." The doctor was not very communicative during the trip so the dialogue between him and the author is not very exciting. Paterniti fills in the gaps with biographical information about Einstein and the doctor. The duo sees some interesting pieces of Americana along the way, such as a place in Kansas called the Garden of Eden. They also meet some interesting people along the way including William Burrows, the Beat poet, and Roger Richman, president of a celebrity-licensing agency or "Upholder of Dead Celebrities."

The science in this book should be taken with a grain of salt. For example, the predictions of general relativity about the gravitational deflection of light by the sun and the precession of the orbit of Mercury are conflated. The description of the "Z machine" at Sandia Labs is also inaccurate.

The book only touches briefly on Einstein's religious beliefs. Paterniti describes his "attempt to devise a kind of personal religion." He claims that "Einstein's brain is one of those rare objects in which science and religion actually meet." There is also a brief discussion of how Einstein tried to reconcile his pacifism and his actions related to World War II.

The book has enough suspense to keep the reader interested: Why does Dr. Harvey want to visit Evelyn Einstein? What will happen to the brain? It will appeal to those who like hearing about the lives of quirky people. If you enjoy the NPR program "This American Life," you will probably like this book, too.

Reviewed by Alan J. DeWeerd, Assistant Professor of Physics, University of Redlands, Redlands, CA 92373.

THE AZTEC TREASURE HOUSE: Selected Essays by Evan S. Connell. Washington, DC: Counterpoint, 2001. 470 pages. Hardcover; \$28.00. ISBN: 1582431620.

The essays in this book for the most part appeared in two collections of essays published by Connell in 1979 and 1980, both now out of print. The essays show their age in that many of the entries in the bibliography date from the 1960s and 1970s, with a good few in the 1950s and only a relative handful in the 1980s and 1990s. Presumably not much modernizing has been done. For many of the essays, this is not a problem but there are certainly new perspectives available on some matters (such as deciphering the inscriptions of the Maya).

Connell is a historian, but not a cataloguer of facts and dates. He tells stories well, making the events he describes seem like the activities of real people in real situations. He interweaves some of his own experiences with the historical material (and describes some places in a way that makes one think he must have visited them himself); he turns aside to draw in other facts that cast light on his main topics; he reads widely (the bibliography is ten pages long) and synthesizes these various aspects of his interests very well.

The essays here cover a wide range of topics. Some deal with scientific history (the development of the heliocentric

model of our neighborhood in space), others with visits to the new world by European explorers from the northern Europeans to the Spanish, others with exploration of polar regions and searches for the South Pole and the Northwest Passage. Some investigate bizarre topics such as the Children's Crusade or the search by alchemists for a way of producing gold.

This is an entertaining collection of essays. In several places, the author pokes fun at the role played by the church and individual believers, but it is generally justified.

Reviewed by David T. Barnard, University of Regina, Regina, SK S4S 3X4 Canada.



ORIGINS & COSMOLOGY

MEASURING ETERNITY: The Search for the Beginning of Time by Martin Gorst. New York: Broadway Books, 2001. 338 pages, index. Hardcover; \$23.95. ISBN: 0767908279.

Gorst is a writer and director of science documentaries which have aired in Britain and on the Discovery channel. This book is organized into fifteen chapters. The topics include an introduction to the philosophical implications of a finite or infinite universe, the histories and science of the people who have been involved in the dating of the earth and the universe, and a discussion of how knowledge of the age of the universe may alter our thinking about ourselves.

Gorst discusses the efforts of Bishop Ussher to arrive at the often cited creation date of 4004 B.C. Ussher arrived at his date by comparing various Bible translations, verifying the biblical dates with other historical records, and studying the "gap" problem which addressed the length of time between the end of the Old and the beginning of the New Testaments. Not only are Ussher's research efforts documented, but Ussher's life experiences are also noted.

In subsequent chapters, Gorst describes how European expansion and the resulting interactions of Europeans with other cultures, such as the Chinese who also had well-documented histories, gave rise to questions about the accuracy of Ussher's date. Isaac La Peyriere proposed that there may have been other human histories that predated Adam. Views of Father Martino Martini and Father Perrenin, Roman Catholic missionaries to the Chinese, are also discussed.

Gorst describes the shift from a historical chronology for dating the earth to a natural science-based methodology. This discussion begins with Descartes and Copernicus and their philosophy of using naturalistic means to describe the behavior and formation of the earth and the universe. The interaction between these thinkers and the Roman Catholic church is also recorded.

Other chapters discuss the historical accounts of some of the other persons involved in the dating of the earth. These stories range from Thomas Burnett's explanation of a global flood to Hubble and the standard model to a discussion of evidence for an expanding universe. All of the

scientific discussions are qualitative and placed within the context of the contemporary thinking of the time.

Gorst concludes the book with a brief discussion of how knowledge of the age of the earth and humankind may impact our thinking. He implies that the vast amounts of time involved in the making of the universe and the relatively small amount of time that human beings have lived on the earth suggest that the universe was not made for humans, but rather that humans are a small inconsequential part of this process. In this respect, I disagree with Gorst. The vastness of space and time may change our perspective on the influence we exert on the universe, but it can only magnify our awe for the concern that God extends to us.

Gorst's atheistic conclusion with respect to the dating of the earth does not diminish the value of this excellent resource. The book provides a useful overview of the history and science related to the dating of the earth and includes an extensive section of notes and sources for those inclined to pursue the subject further.

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

THE BATTLE FOR THE BEGINNING: Creation, Evolution and the Bible by John MacArthur. Nashville, TN: Thomas Nelson, 2001. 237 pages, index. Hardcover; \$21.99. ISBN: 0849916259.

MacArthur is pastor of Grace Community Church in Sun Valley, CA, and president of The Master's College and Seminary. He has written numerous books and has a popular radio program, *Grace to You*. His MacArthur Study Bible has sold more than 300,000 copies and won the Gold Medallion Award.

This book has ten chapters between a twenty-page Introduction and a nine-page Epilogue. In my opinion, MacArthur says everything important that he has to say in his introduction. He states his "chief aim is to examine what the Bible teaches about the origin of the universe and then to look at the moral, spiritual, and eternal ramifications of biblical creationism ..." I agree with MacArthur that Scripture is the ultimate test of truth, but we obviously do not agree on how truth is obtained. He claims that more and more educational institutions, apologists, and theologians are abandoning the truth by abandoning faith in the literal truth of Genesis 1-3. I think it is unfortunate that MacArthur has based his understanding of science on the works of Ken Ham and Henry Morris and their organizations.

MacArthur criticizes old-earth creationists for blending "some of the principles of biblical creationism with naturalism and evolutionary theories, seeking to reconcile two opposing world-views," while "lacking any skill whatsoever in biblical interpretation," leading to "all sorts of theological mischief" by rejecting or compromising the literal truth of the biblical account of creation. He is emphatic that "all the geological, astronomical, and scientific data" can be easily reconciled with creation in six literal, 24-hour days. One might suggest that the author has given commentary on science while lacking any skill whatsoever in understanding modern science. I can agree with

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MacArthur when he states: “the only reliable source of truth about our origin is what has been revealed by the creator.” I would add, however, that our interpretation of God’s revelation, whether in his Word or in his creation (see Rom. 1:19–20) is fallible.

MacArthur is convinced that “the universe is relatively young, albeit with an appearance of age and maturity.” He finds “absolutely no reason for an intelligent mind to balk at accepting” Genesis 1–3 as a literal account of the origin of our universe. He says: “As we see consistently throughout the Genesis account, from the moment God creates something, it appears as if it has been there for some time.”

I searched for strengths in this book which could be recommended. Unfortunately, I have not been very successful. I found little in this book which contributes to a resolution of *The Battle for the Beginning*. However, MacArthur does clearly demonstrate our continuing failure to educate evangelicals about beginnings.

Reviewed by Bernard J. Piersma, Professor of Chemistry, Houghton College, Houghton, NY 14744.

NATURE, DESIGN, AND SCIENCE: The Status of Design in Natural Science by Del Ratzsch. Albany, NY: SUNY Press, 2001. x + 220 pages. Paperback; \$18.95. ISBN: 0791448940.

Ratzsch is professor of philosophy at Calvin College and author of other books related to theism and science. His excellent book gives both a detailed philosophical explanation and defense of intelligent design and a careful qualification as to its parameters. Ratzsch notes that despite a spate of material written on intelligent design, “almost none of the foundational philosophical work essential for such debate [regarding intelligent design] to make real progress had been or was being done” (vii).

The book is divided into four parts. In Section I “Design Basics,” Ratzsch explores what *design* is and looks at the concept of design as it pertains to the activities and productions of *nonsupernatural* beings. He describes features related to design such as counterflow and mind-correlativity. Giving an interesting design parallel, Ratzsch explores finite design by aliens and paves the way for comparing and contrasting natural (e.g., human, extra-terrestrial) and supernatural design.

In Section II, “Supernatural Design” is explored. While similarities exist between finite design and supernatural design, there are important differences. In this section, Ratzsch refers to categories of *nomic* and *contranomic* activity. He notes how a supernatural being may use natural means to produce something—or may use special means but produce something that finite beings could produce. He points out, for example, that nature’s producing something does not conclusively establish that nature could have produced it on its own. Moreover, it could be that God could have acted proto-historically in creating certain conditions and the structure of laws, eliminating alleged gaps in nature.

Section III “Boundaries of Scientific Legitimacy” claims that to place the concept of design properly, one must look at what the boundaries of scientific legitimacy are. In this

section, Ratzsch claims that empirical data and logic alone cannot establish science in any rigid sense. While science is committed to limiting and neutralizing subjective factors and its social embeddedness is not fatal to objectivity, the scientific method is not a human-free zone and there are no airtight distinctions between science and non-science.

Section IV looks at “The Permissibility Question—Conceptual and Pragmatic Issues.” Ratzsch examines a host of “legitimacy” criteria alleged to offer lines of demarcation between science and non-science (empiricality, falsifiability, controllability, etc.), but these all fail to carry the day. Perhaps the relevant question boils down to the scientific fruitfulness or the payoff supernatural design affords. Ratzsch suggests that some kinds of supernatural design can meet the relevant criteria (under certain conditions). Of course, design can readily fit into a nonrealistic approach to science—we can approach nature *as if* it is designed and work from there (instrumentalism) or according to the fruitfulness of a design hypothesis (e.g., Maxwell’s field equations shaped by his thinking about inter-trinitarian relations).

Historically, modern science emerged from and was shaped by a theistic world view. Ironically, many “scientists” will discount God’s existence on the basis of simplicity/economy (Ockham’s razor), but they will posit an infinite number of universes to account for the universe’s fine-tuning. Physicist Edward Harrison has remarked: “Take your choice: blind chance that requires multitudes of universes, or design that requires only one.” Openness to theistic explanation may actually open up doors of discovery whereas naturalism may actually close certain doors of scientific exploration. Prohibitions to design have their risks as well. Also, any alleged “gaps” that exist need not destroy science, but may simply help *focus* scientific endeavor.

In an appendix, Ratzsch examines William Dembski’s explication of design (which uses the “Explanatory Filter” of *regularity*, *chance*, and *design* as disjuncts), noting that it is primarily a negative concept with “almost no positive content” (p. 154). Dembski tells us what design is not rather than what it is. He also gives examples revealing Dembski’s criteria which are unable to deal with the full range of possibilities.

Despite distracting typographical errors in the text, Ratzsch has made a significant contribution to the field of intelligent design theory, laying an important foundation for furthering the discussion. The book is a superb piece of groundbreaking work in the field of design theory.

Reviewed by Paul Copan, Trinity International University, 2065 Half Day Rd., Deerfield, IL 60015.

DARWINISM AND THE “CREATION SCIENCE” MOVEMENT by Joe T. Ator. Fort Worth, TX: Star Bible Publications, 2000. ix + 88 pages. Paperback. ISBN: 1567942210.

To get right to the point, Ator does not believe that everything that science says about origins is true, but he does believe that the earth is at least millions of years old. A physical scientist by training, and a teacher, Ator has apparently created this book without a lot of help, as a

labor of love. He could have used some help. The English usage is fine, but the organization is strained in places. The scholarship could have used some assistance, as well. For one thing, there is not enough from primary sources. For example, on page 20, he says: "Ross reported on the summary announcements presented at the 1996 conference when this myth was exploded ..." and goes on to quote someone, presumably Ross, for 22 lines. Although he also cites Shapiro among these 22 lines, it is not clear whether Ator personally has ever looked at Shapiro.

Another problem with the scholarship is that some of it is out of date, which is hardly surprising, since he uses material from biology, biochemistry, astronomy, and other areas, and it is impossible for anyone to keep up with all these fields. As probably the worst example, on pages 30 and 31, Ator quotes a reference which says, in part, that "Man is able to use symbols; no other creature possesses this ability." Unfortunately, his source is, he says, a Leslie A. White, in the 1968 book *Readings in Anthropology*, 2d edition (New York: Thomas Y. Crowell Co.) There has been a lot of work, most of it since 1968 (although not all) that establishes that at least some non-human creatures do possess some ability to use symbols. There is some mention of Intelligent Design and the Creation Research Society. I found no mention of this journal, nor of the affiliation that publishes it.

Ator is to be commended for his belief that young- and old-earth creationists should both be called creationists, and that they should stand together, without either doubting the orthodoxy of the other. He is also to be commended for his sincerity, and his effort in getting this book published. However, neither Amazon, Barnes & Noble, nor the publisher list it as being in print at this time.

Reviewed by Martin LaBar, Professor of Science, Southern Wesleyan University, Central, SC 29630.

MANY WORLDS: The New Universe, Extraterrestrial Life and the Theological Implications by Steven Dick, ed. Philadelphia, PA: Templeton Foundation Press, 2000. 217 pages, index. Hardcover; \$22.95. Paperback; \$14.95. ISBN: 1890151424.

Editor Dick is historian of science at the U.S. Naval Observatory and president of the International Astronomical Union's Commission on History of Astronomy. The book is a compilation of papers presented by authorities in diverse disciplines at a conference convened by the John Templeton Foundation on "Cosmotheology."

Recent discoveries of new planets make this book timely for a wide audience. Newcomers to cosmology and SETI will find Parts I and II an excellent introduction. Those knowledgeable in the technical aspects may skip ahead to Part III, dealing with philosophical and theological interpretations.

Part I is "Origin and Evolution of Life." Nobel laureate biochemist Christian de Duve opens with "Lessons of Life." Axiomatic to most of the book are his summary statements:

"[L]ife is explainable in terms of the laws of physics and chemistry."

"[O]ur species ... now appears as a transient link ... in a long evolutionary process very likely to give rise ... to beings much more advanced than we are."

"Even though we may not be the final product of evolution, ... the human species is not the meaningless outcome of chance events in a pointless universe."

Paul C. W. Davies writes "Biological Determinism, Information Theory, and the Origin of Life," Bernd-Olaf Kuppers adds "The World of Biological Complexity: The Origin and Evolution of Life" and Christopher P. McKay covers "Astrobiology: The Search for Life Beyond the Earth."

Part II, "Humanity's Place in Cosmic Evolution," begins with England's Astronomer Royal, Martin J. Rees, on "Life in Our Universe and Others: A Cosmological Perspective." Theoretical physicist Lee Smolin contributes "Our Relation to the Universe." Physical chemist/theologian Arthur Peacocke's paper, "The Challenge and Stimulus of the Epic of Evolution to Theology" and philosopher John Leslie's "Intelligent Life in Our Universe" conclude the section.

Part III, "Extraterrestrial Life and Our World View," is the most novel part of the book. SETI astronomer Jill Cornell Tarter depicts believers as rigid and doctrinaire. In "SETI and the Religions of the Universe," she says people who think "there is a special relationship between humans and their God, have been uncomfortable since Copernicus first moved the Earth from center stage." Those who think the presence of intelligent aliens could mean sinful souls, who "require ... Sons of God" to die on each fallen planet "and a like number of resurrections," would "be quite discomforted by the information revealed by the fact of extraterrestrial technologies."

In his chapter, "The Many Worlds of Neurology," physicist Freeman J. Dyson says discovering intelligent extraterrestrials would not be a setback for theology; Bruno and Newton accommodated multiple worlds and possible inhabitants in their speculations. In "Life and Intelligence Far from Earth: Formulating Theological Issues," Notre Dame emeritus philosopher Ernan McMullin adds:

... the notion that we should expect to find such intelligence came, in significant part, from Christian theology in the first place ... Were traces of life to be discovered elsewhere ..., it would favor the Augustinian idea that the "seeds" of life were implanted in matter from its first appearance. Such seeds could presumably come to fruition anywhere ... "water and earth" provided the right environment.

Vatican Observatory director George V. Coyne writes "The Evolution of Intelligent Life on the Earth and Possibly Elsewhere: Reflections from a Religious Tradition." Of approximately 10^{22} stars in the universe, Coyne estimates that perhaps 10^{17} may be Earthlike. He states: "Unless our scientific thinking is drastically wrong, this conclusion ... implies: at a minimum the macroscopic physical conditions for life (an Earthlike planet in a 'habitable zone' about a solarlike star) exist elsewhere in the universe."

As in any compilation, the authors of this book publish conflicting opinions. Some of their viewpoints elevate human reason above scriptural revelation. Among several examples, Steven J. Dick states in his concluding chapter, "... the true meaning of God is not grounded in any single human culture, but in the best elements of otherworldly

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thinking of all of them." Later he adds, "... the natural God of cosmic evolution and the biological universe, not the supernatural God of the ancient Near East, may be the God of the next millennium." With this one caveat, this book can be a very good source of information and a "springboard for discussion."

Reviewed by Dave Fisher, editor of the "Truth in the Test Tube" broadcast of Trans World Radio, Aurora, IL 60504.

THE THEORY OF CREATION: A Scientific and Translational Analysis of the Biblical Creation Story by Jim Schicatanano. San Jose, CA: Writers Club Press, 2001. 278 pages. Paperback; \$20.95. ISBN: 0595199283.

This book is based on the premise that the Bible is objectively true, the findings of modern science are reliable, and the creation account found in the early chapters of Genesis can therefore be harmonized with modern science. The book examines each verse in the creation story in Genesis and relates the biblical creation account to current scientific theories of the origin of the universe, earth, life, and humans.

The book is easy to read. It is broken up into 32 chapters that average less than ten pages each. Although the author is not a Hebrew scholar, he does look back at the Hebrew manuscripts to clarify the meaning of the Genesis creation account. He recognizes that many Hebrew manuscripts exist, and so he does not take an overly simplistic view of the reliability of the early manuscripts.

The author accepts most of the findings of modern science (such as the age of the earth, the age of the universe, and the fossil record). However, his strict alignment of the Genesis creation account with modern science will be bothersome to many *PSCF* readers. He does not interpret Genesis as an allegory or a theological statement, but rather as a historical document that should be interpreted literally. He believes that the chronology of Genesis 1 is exact. However, he does not interpret Genesis 1 literally, and he has no patience for young earth creationists. His approach to this topic is reminiscent of Hugh Ross, whom he cites often in his book.

The book recognizes the existence of early hominids and discusses in some detail the fossil record on this subject. But the book states that there is not enough scientific evidence to genetically link ancient hominids with modern man. This is consistent with a literal interpretation of the Bible, which states that modern man was created just a few thousand years ago independently of any other living creatures. Surprisingly, the book states that if it is proven conclusively that ancient hominids are the ancestors of modern man, it would prove that the biblical account of man's origin is incorrect (p. 106). Statements like these are admirable for their intellectual honesty, but this is one of the aspects of intelligent design that Christian opponents worry about. Linking the Bible and science so closely together sets the Bible up for a possible fall when science makes new theories and discoveries.

As a general believer in intelligent design, I appreciate many of the discussions in this book. Methodological naturalists, along with young earth creationists, will not have much patience for this book. But the majority of Christians,

who read the Bible literally and take the findings of science seriously, will find much intellectually and spiritually appetizing food for thought in this book.

The author has a bachelor's degree in science and is employed as a computer systems analyst. He has had several articles and short stories published.

Reviewed by Dan Simon, Assistant Professor of Electrical Engineering, Cleveland State University, Cleveland, OH 44115.

DESIGNER UNIVERSE: Intelligent Design and the Existence of God by Jimmy H. Davis and Harry L. Poe. Nashville, TN: Broadman & Holman Publishers, 2002. 252 pages. Paperback; \$12.95. ISBN: 0805424474.

Davis is associate provost and professor of chemistry at Union University in Jackson, Tennessee. Poe is also from Union University and serves in the position of Charles Colson professor of faith and culture. This book is an extension to their previous book, *Science and Faith*.

The book has a preface, seven chapters, an epilogue, endnotes, and an index. The topics include a history of general design philosophies from Plato to Behe, descriptive chemistry and biology, and a discussion of more recent ideas on the specifics of intelligent design. The book contains black and white drawings, graphs, and tables to illustrate both the philosophical and the scientific discussions. The preface and the epilogue are important parts of the discussion and should not be skipped by the reader. The endnotes are a valuable resource for further reading.

The first section begins with a discussion of the meaning of design under various religious perspectives before focusing on western monotheistic religions. The views of such western philosophers and theologians such as Plato, Aristotle, Augustine, Aquinas, Calvin, Descartes, and Pascal are compared and contrasted. The question of whether design can act as a proof of, or a path toward, God is examined with particular emphasis on the theologies of Aquinas and Calvin. A review of the thoughts of scientists such as Newton, Leibniz, Hobbes, Locke, Butler, Boyle, and Tindal follows. The atheist David Hume offers a critique of the above-mentioned design proponents. This section ends with the ideas of William Paley and his well-known watch in the forest. Paley's view is contrasted with the ideas of Hume, Darwin, and Dembski who state that evolution has only produced the appearance of design.

The second section presents a brief overview of some of the major topics in physics, chemistry, and biology in an attempt to speak to the question of whether design is indicative of a creator, or if its appearance is a logical consequence of natural processes. This section begins with cosmogony and the anthropic principle. A discussion follows that describes how the general revelation seen in the created world may be indicative of the nature of God and his possible multidimensionality. The book then continues with examples of design, or the appearance of design, in the areas of chemistry and biology. The opposing ideas of intelligent design proponent Behe and evolutionist Crick are explored.

The third section further explores the question of whether the presence of design can be determined. This

section is focused on the recent discussion of intelligent design with a continuation of the biological discussions in the second section. The question of irreducibility is specifically explored. The discussion includes a number of quotes from Behe's book, *Darwin's Black Box*, with quotes from evolutionists Dembski and Gould to counter. The epilogue also offers a good deal to this discussion.

This book is strong in three ways. It continues the dialogue style, begun in *Science and Faith*. It presents the issue of design in its historical perspective from Plato to Behe with contributions on both sides of the issue. It discusses findings in mainstream science in a thorough manner that is understandable to the general reader. The book falls short in its third section where it addresses the ability to distinguish between the appearance of design and intelligent design. But this weakness may provide an answer to the question presented in the first section: can design in creation be a proof of God's existence?

This is an excellent book for those interested in the philosophical and theological issue of design. It traces the history of design and allows both sides to speak, thus nurturing dialogue. It would be suitable for anyone teaching science or for anyone who is just beginning to explore the consequences of design on his view of science.

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



PHILOSOPHY & THEOLOGY

RACE AND THE COSMOS: An Invitation to View the World Differently by Barbara A. Holmes. Harrisburg, PA: Trinity Press International, 2002. 208 pages. Paperback; \$20.00. ISBN: 1563383772.

Holmes, associate professor of ethics and African American religious studies at Memphis Theological Seminary, posits an important potential solution to today's discussion of race by proposing that metaphors from quantum physics can provide new outlooks on race issues. In her introduction, she writes:

The fact that race does not exist as a category of "human biological diversity" does not discount its effects. The resilience of the idea is rooted in deeply sedimented cultural beliefs ... While race may not have scientific origins, it cannot be relegated to the refuse pile until its very real offspring "racism" is no longer a hindrance to intercultural moral flourishing (p. xvi).

Holmes recognizes that today's theological, political, and social descriptions of liberation from racism are limited. She has written this book in an attempt to incorporate languages of science into the discussion of liberation, not as descriptions for why racism is not real, but as windows into alternate ways of viewing other humans in our world.

After introducing this topic in the first few chapters, the meat of the book is found in chapters five through eight. In these chapters, Holmes discusses race and cosmology, dominance and quantum theory, a community of hope and moral fulfillment shaped by both science and theology, and how scientific narratives of holism may lead

to reconnecting marginalized people. As an example of her lines of reasoning, in chapter five she uses the cosmological ideas of dark matter's importance in our universe to encourage readers to rethink the cultural/theological valuation of "white" as good and "dark" as bad. She rightly suggests that justice is not a matter of transforming people of color into white people with dark skin but rather by recognizing the beauty and value of all people. We can celebrate the universe's content of and requirement for dark matter and light, just as we celebrate all shades of humans. "Diversity reflects the complexity of the life space and in quantum and cosmological terms is normative" (p. 102). Chapters six through eight contain similar types of analogies from the universe that may teach us to think about race in different ways.

The most challenging chapter was chapter four. Here Holmes discusses indigenous wisdom and science. She proposes assimilating other cultural and religious realities with western "objective" science. In some ways, this chapter reminded me of the challenges posed by philosopher Al Plantinga in some of his writings on the relationship between science and theology, although Holmes extends the theology beyond western Protestant Christianity to include "wisdom" and religion from indigenous peoples and the two-thirds world. This chapter challenged me as a scientist who "preaches" to her students that science is not the entirety of Truth, to once again evaluate whether I fully believe that claim. It is difficult for western scientists to think about incorporating other cultural norms into our quest for knowledge. Is this difficulty related to our inherent western cultural predisposition to dominate other cultures? Holmes does an admirable job of raising the question and suggesting that in part the answer is, yes.

After reading a well-written book such as this, I ask myself whether these great ideas are likely to make a difference. I hope so, but the one drawback I see to this approach is that it is necessarily limited to the well-educated in our society, as we live in a science-illiterate nation. Even if this book is only effective in opening the eyes of a portion of the cultural elite, it will be an important step toward improving justice for all in our world.

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

ANSWERS TO SATISFY THE SOUL by Jim Denney. Clovis, CA: Quill Driver Books/Word Dancer Press, Inc., 2002. 273 pages. Paperback; \$12.95. ISBN: 1884956203.

Jim Denney is a freelance writer. Some of his other works include biographies of football player Reggie White, *In The Trenches*, supermodel Kim Alexis, *A model for a Better Future*, and Star Trek Yeomen, *The Longest Trek*. These celebrity biographies also make an important contribution to this book.

The book is arranged into four sections, each containing five chapters. The sections discuss questions regarding ourselves, relationships, life, and the infinite (the existence and nature of God). The first three sections could be placed in the self-help genre, while the last section is a philosophical discussion of modern popular science and theology.

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All four sections draw stories from the celebrity biographies and are written in an easy to read popular style. The book also includes an index.

The first section discusses character, success, luck, time and worry. Denney gives practical and sound advice about these issues. For example, he says: "Wealth is not the same as income. If you make a good income each year and spend it all, you are not getting wealthier ... Wealth is what you accumulate, not what you spend" (p. 22). He gives similar advice in regards to luck, which he says we make for ourselves. In his discussion of worry he describes the chronic worrier and gives practical steps to deal with worry.

The second section follows a similar style in that it also gives straightforward common sense advice in regards to relationships. Denney deals with topics such as types of love, how to deal with anger, and forgiveness. The book reads like a late night AM radio show with vivid real life examples taken from the celebrity biographies.

The third section begins to move to a more intellectual style as Denney begins to discuss the bigger questions of happiness, the meaning of life, the existence of evil and why it should exist. Denney again makes use of popular culture by referring to events such as the murders that took place at Columbine High School and the race motivated murder of James Byrd in Jasper, Texas. In addition to these powerful contemporary images Denney draws on the works of Christian apologist C. S. Lewis, atheist Martin L. Bard, and Christian psychologist Scott Peck. The discussion begins to move away from popular psychology to a more systematic study of the existence and why of evil and free will.

The latter part of the third section helps lead into the fourth section. This last section discusses evolution, cosmogony, and intelligent design. Denney makes clear distinctions among science, philosophy, and theology. It is evident that he is a supporter of intelligent design as a proof of a supreme being, and he develops this theme through a discussion of biology, quantum mechanics, cosmology, and cosmogony. Denney distinguishes between an irrational "supernatural" being and the rational "supreme being" that he says is indicated by intelligent design. To his credit, Denney also explains why an atheist would not accept the argument of intelligent design. Later chapters in the fourth section discuss ideas of a soul based on near-death experiences, on scientific studies of the therapeutic effects of prayer in hospitalized patients, on miracles, and on religion.

The book could easily be two shorter books; one of popular Christian psychology and the second a discussion of the existence of God based on theories in modern science. The writing style and the use of celebrity biographies may make this book very suitable to a younger audience. Though the book is not written with the rigor of a theological treatise, it does make a strong argument in a very conversant style and the index will allow readers to pursue the subjects further.

This is a book of hope for the seeker and information for those interested in what modern science may or may not indicate about the existence of God. The early sections are especially suitable for a younger audience while the latter sections would be beneficial to a much broader audi-

ence especially those who are interested in the interface of science and theology.

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



RELIGION & CHRISTIAN FAITH

THE MOST RELUCTANT CONVERT: C. S. Lewis's Journey to Faith by David C. Downing. Downer's Grove, IL: InterVarsity Press, 2002. 191 pages, index, bibliography, notes. Hardcover; \$16.00. ISBN: 0830823115.

"I believe in no religion" — Clive Staples Lewis, 1916, age 17.

"Christianity is God expressing himself ..." — Clive Staples Lewis, 1931, age 32.

Born in 1931, I could have said both statements at similar ages. I suspect I have read every published word Lewis ever wrote; I have read many of them several times. In his 1955 book, *Surprised by Joy*, Lewis speaks of his conversion. It was that book that played an important part in my own understanding and embracing of the Christian message. So it was with great expectations and anticipation that I began this volume.

The author, a professor of English at Elizabethtown College, has written many articles on Lewis, as well as a book, *Planets in Peril*, which studies Lewis's famous Ransom trilogy. Downing dwells closely on Lewis's inner life, on the factors that influenced his spiritual journey, and on the issues that commanded the attention of his keen intellect along the way. Lewis did not have a "Damascus Road" experience; those who have had one are fortunate. The rest of us come to Christ gradually, in an unfolding (dare I say "evolutionary?") process. For (Jack) Lewis it was to take a fifteen-year quest, one that led him through strange pathways. Atheism in his youth turned to materialism, mind-matter dualism and the occult, then idealism and pantheism in the 1920s.

In the summer of 1929, at age 30, Lewis had a "mystical experience" while riding on a bus (surely as prosaic a setting as one can conceive). In *Surprised by Joy*, he describes his subsequent decision in these words: "In the Trinity term of 1929 I gave in, and admitted that God was God, and knelt and prayed: perhaps, that night, the most dejected and reluctant convert in all England."

Lewis's 1929 conversion experience was, of course, to theism, not to Christianity. He began attending church worship services, but only because he thought he ought to make some overt gesture toward his new philosophical position. In 1929, his mind was taking him where his heart was reluctant to follow. Two years of his quest were to follow. Downing describes these two years in chapter eight, and does so powerfully. Even knowing the result, I found myself caught up in the narrative, urging Lewis on, almost like watching a baseball game television replay.

Two steps forward, one step back, and then, on September 28, 1931, while riding in his brother's motorcycle sidecar to Whipsnade zoo, it happened. In Lewis's own words, "I know very well when, but hardly how, the final step

was taken. I was driven to Whipsnade one sunny morning. When we set out I did not believe that Jesus Christ is the Son of God, and when we reached the zoo I did." David Downing describes his vision of this day in three pages of inspired prose, and there, except for an epilogue, the book ends. But the epilogue, it turns out, has perhaps the strongest message of all.

In the epilogue, one more event in Lewis's life, as recorded by Downing, must be mentioned, for it places a capstone on this remarkable giant of a human being. Lewis was famous for his imagination. His writings abound with ideas, figures of speech, and stories seldom dreamed of by others. In July 1963, sick with what would be his last illness, he was in a coma. Awakening, he asked for water. As his friend, Hooper, began to draw it, Lewis suddenly sat up in bed, staring intently at something across the room. He kept on looking, and then exclaimed, several times, "Oh, I never imagined. I never imagined." He then fell asleep with a rapturous expression on his face. I hope that, at the last breath, we will all have this to say. This book is a "keeper." I recommend it highly to my ASA colleagues.

Reviewed by John W. Burgeson, 2295 East Iliff #101, Denver, CO 80210.

HOW CHRISTIAN FAITH CAN SUSTAIN THE LIFE OF THE MIND by Richard Hughes. Grand Rapids, MI: Eerdmans Publishing Co., 2001. 172 pages. Hardcover; \$18.00. ISBN: 0802849350.

This book joins a growing list of publications whose collective aim is in developing Christian intellectuals. Hughes' intention is to provide a book "for Christian scholars who want to connect Christian faith with scholarship and teaching in meaningful and effective ways" (p. xvii). Hughes previously surveyed Christian institutions in a book entitled *Models for Christian Higher Education* that serves as a prelude to what is intended as an individualistic focus on intellectual engagement.

Hughes begins with a historical analysis in which tensions between deism and early American politics are compared with apparent tensions between Christian presuppositions and diversity, openness, and academic freedom. Hughes extensively uses Sidney Mead's idea of the theology of the Republic to highlight "the finitude of humankind and the primacy of God over all human institutions" (p. 21). Human finitude, Hughes believes, creates a Christian imperative to search for truth through scholarship, scholarship that is influenced and informed by theological nuances arising from different denominations. Consequently, Hughes spends considerable time focusing on the question: "What might it mean for Christians to 'break through the particularities' of their own religious traditions?" (p. 31).

Chapter 4 presents the most interesting ideas in "The Power of Christian Traditions." Four case studies contrast the influence of Roman Catholic, Reformed, Mennonite, and Lutheran theologies on the life of the mind resulting in a complementary series of intellectual endeavors. As the key chapter, the ideas are unfortunately poorly interwoven with other chapters, creating the impression of a book derived by loosely connecting related papers together. The

result is, in the words of one of Hughes' Jewish colleagues, rather choppy prose: "You envision teaching and scholarship precisely as I envisage teaching and scholarship. You value openness, diversity, and an unrelenting search for truth, just as I do. But why must you go through such theological gymnastics to get where you're going when you and I arrive at the very same place in the end?" (p. 135).

The main difference between Hughes' book and other books on the life of the mind lies in the specific characteristics emphasized by different denominations. Readers wanting to develop a Christian mind will find more ideas in books by David Gill, James Moreland, and James Sire, although Hughes does sow a few insightful embryonic thoughts. Ironically, the book, therefore, is of more use for understanding institutions than in achieving the stated aim of fostering the life of the mind for individual faculty.

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

RESCUING JESUS FROM THE CHRISTIANS by Clayton Sullivan. Harrisburg, PA: Trinity Press International, 2002. 182 pages. Paperback; \$16.00. ISBN: 1563383802.

Sullivan is out-of-step theologically with his own denomination (Southern Baptist) and the historic Christian Church. He would like to bring some congruence between the two, but he says he is not the one out-of-step. In the first six chapters of his twelve chapter book, he questions (denies) Jesus' love for Gentiles, virgin birth, ethical teachings, vicarious death, deity, and soteriological message. He does this dogmatically without engaging divergent views. For instance, in discussing Mark 10:17-18, Sullivan thinks Jesus denied his deity when he said, "Why do you call me good? No one is good but God alone." The traditional view interprets this passage as confirming Jesus' deity. Another example: "In Matthew's version Mary and Joseph lived in Bethlehem; in Luke's version they lived in Nazareth." Sullivan sees this as contradictory. In sum, Sullivan does not adhere to biblical inerrancy.

Sullivan thinks a difference exists between the historical Jesus of post-Enlightenment scholarship and the embellished Jesus found in church creeds. He writes: "A majority of Christians rejoice in the orthodox 'old time religion,' which they view as their ticket to heaven." Sullivan quotes with approbation a comment made to him: "Take orthodoxy away from common folk and you transform them into atheists." Therefore, he proposes four strategies inquisitive believers can use to rescue Jesus from the prison of orthodoxy: (1) distinguish between the pre-resurrection and the post-resurrection Jesus; (2) do not accept all beliefs held by the early church; (3) do not sentimentalize or aggrandize Jesus; and (4) rejoice in religious pluralism.

Sullivan is disarming when he confesses that an inquisitive Christianity that strives for intellectual honesty is not superior to orthodox Christianity. However, he believes it is an alternative, valid version of Christianity. When he writes that thinking Christians can help churches become what they should be, it appears that inquisitive Christians may be more needed than orthodox ones. In that sense, it would seem they are at least more valuable if not superior.

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Although Sullivan thinks that some of the beliefs of the orthodox church "have experienced a depletion of plausibility and have become obsolete," he does not write in a combative way. He writes with conviction, but not in a condemnatory fashion. In some cases, he is commendatory; he praises the historic church for its good deeds and aligns himself with it. He thinks it unfortunate that some thinking Christians abandon the church. Sullivan also identifies with the human predicament of having no answers to a "whirlwind of unanswerable questions" such as why life, why evil, why suffering, why God, why anything?

Sullivan defends an important aspect of the Christian faith. He writes that "Jesus was raised from the dead and continues to live in the spirit world ... His resurrection from the dead can be the basis for our hope in a blessed future life." If a label had to be attached to Sullivan, it would be liberal, albeit one who can be identified as a compassionate, inquisitive, thinking and questioning one. It might appear to some readers of his book that Sullivan experiences cognitive dissonance denying many Christian doctrines while accepting others.

Who will profit from this book? Anyone interested in a succinct, up-to-date presentation of post-Enlightenment research on who Jesus was (is) and its implication for the church. While Sullivan questions many orthodox doctrines, he does so as one within, rather than outside, the church. He writes: "I was raised within the Southern Baptist denomination. My fate has been to see this largest of Protestant denominations torn asunder by the fundamentalist controversy ... I have witnessed this controversy with great sorrow and dismay."

Sullivan teaches at the University of Southern Mississippi in Hattiesburg. He has written other books including *Toward a Mature Faith* and *Rethinking Realized Eschatology*. He has also authored a biography, *Called to Preach, Condemned to Survive*, and a novel, *Jesus and the Sweet Pilgrim Baptist Church: A Fable*.

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

THE LIFE OF THE MIND: A Christian Perspective by Clifford Williams. Grand Rapids, MI: Baker Academic, 2002. 95 pages. Paperback; \$10.99. ISBN: 080102336X.

This book is the first contribution "to guide readers in reflecting critically on contemporary issues of faith and learning (inside cover)" in a partnership between Baker Academic and the Council for Christian Colleges and Universities. The author, a professor of philosophy at Trinity College, writes to convince Christians that the life of the mind is an integral, and important, component of being Christian. Williams' aim is particularly apt given Charles Malik's admonition that he who wins the world but loses the battle for the mind will find that he has lost the world.

The Life of the Mind is aimed primarily at college students and people wanting "to reflect on a special feature of the Christian life" (p. 13). The greater part of the book establishes a foundation admonishing Christians to intellectual pursuits to experience life fully. Williams gently repackages some of Sire's worldview questions, having

the reader reflect on the meaning of life and death, as a prelude to developing a Christian world view encompassing all areas of thought. With the vision established, several characteristics for acquiring a Christian mind are offered along with some words of wisdom for those who intend to "make all thoughts captive to Christ." The closing chapters appropriately warn of the likely cultural milieu facing Christian thinkers and the benefits of seeking a Christian community of like-minded individuals. Collectively, these sections should guide freshmen into nurturing environments where minds can be honed while avoiding potential insular thinking.

The author has made a valuable contribution in a book that would better be titled "Is Christian Thinking Possible?" The style is often rhetorical and, although the straw-man style wanes after several pages, the technique is appropriately pitched to the target audience. The book would make an ideal gift for a high school graduate.

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SCIENCE EDUCATION

TIME FOR SCIENCE EDUCATION: How Teaching the History and Philosophy of Pendulum Motion Can Contribute to Science Literacy by Michael R. Matthews. New York: Kluwer Academic/Plenum Publishers, 2000. 439 pages. Paperback; \$39.50. ISBN: 0306458802.

Until the latter part of the eighteenth century, the inability of sailors to accurately determine their longitude often led to a shipwreck or starvation at sea. Dava Sobel's *Longitude*, which tells the story of how John Harrison constructed a clock capable of solving the "longitude problem," was a bestseller. As she explains, "to learn one's longitude at sea, one needs to know what time it is aboard ship and also the time at the home port or another place of known longitude—at that very same moment." The fascinating story of how this feat was accomplished is also the basis for Matthews' book, but his emphasis is on teaching about the pendulum and timekeeping.

In the first chapter, Matthews states: "It is apparent to everyone that something has gone wrong with science education." His statement is backed up by statistics about scientific literacy that are both troubling and unsurprising. These are followed by a discussion of possible responses to this crisis. Matthews rejects the option of simply teaching science awareness and advocates "the dual goals of learning *of* science (scientific facts, theories, and methods) and learning *about* science (scientific methodology, history, philosophy, and cultural implications)."

The book describes in detail the technological advances, such as a pendulum immune to temperature fluctuations, that led to an accurate chronometer. In addition, it explains how the scientific description of pendulum motion was developed by such luminaries as Galileo, Huygens, and Hooke. There is an interesting discussion of how strongly the pendulum influenced Newton's physics. Richard Westfall is quoted as saying that "without the pendulum there would have been no *Principia*."

Two chapters are devoted to discussing the broader influences that the pendulum and clocks had on culture. The clock metaphor was used in both philosophy and theology. For example, in theology the concept of a "clockwork universe" with God as clockmaker was used in design arguments. Some other philosophical issues related to the pendulum are idealization (Galileo discounted air resistance and friction), falsification (Huygens suggested a length standard using the pendulum which was based on the false assumption of uniform gravitational attraction), and reductionism (the debate about the relationship between time and its measures stretches back to ancient Greece).

Matthews' opposition to constructivism in education is clear from the outset, but it most strongly stated in the final chapters on pedagogy and science education. Supporters of constructivism will be challenged by his critique. He claims that constructivist curricula ignore history because of the emphasis on discovery by the student. Matthews is also critical of the assumption that students can construct their own knowledge through observation. He writes: "Students are not going to learn the fundamentals of Newtonianism by looking at or merely playing around with things." His harshest condemnation is that "constructivism has in many areas functioned more as an ideology than a learning theory, and although fitting comfortably with Western individualism and relativism, it has had unhappy educational and cultural ramifications."

This book does contain some incorrect statements about physics. The worst example is the statement that, "If modeling clay is put on the two pendulums, thus converting the collisions into perfectly inelastic collisions, *momentum is not conserved* and neither the first nor the second pendulum move upon collision" (emphasis added). However, Matthews gets most of the science right and the mistakes do not detract greatly from the book's value. The book is not intended as a textbook, so hopefully those who decide to teach about the pendulum will also make use of the hundreds of references it contains.

Matthews makes a compelling case that the pendulum is an ideal topic for science classes from grade school through college because of the connections that can be made with other areas. The popularity of *Longitude* helps make Matthews' point that the science of the pendulum is very interesting when presented in its historical and philosophical context. Sobel's book is an excellent complement because it has more information about the competing methods of determining longitude and the personalities involved. Matthews gives many specific suggestions about how pendulum motion can be taught in an engaging way, but he also challenges the reader to imagine how the teaching of other topics could be improved in similar ways.

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Letters

Comment on Book Review:

Trust Us, We're Experts: How Industry Manipulates Science and Gambles with Your Future

Recently (early September 2002), it was reported that tons of U.S. food aid that could prevent starvation of millions in Zimbabwe was rejected because that government does not want genetically modified corn although the starving masses wanted the food with the support of the U.S. aid specialists. Soon thereafter I was shocked and dismayed to hear a distinguished minister in a sermon refer to this incident as an example of scientists telling people "Trust us; we're experts" which the minister felt was demeaning to the "people" and a display of arrogance by scientists. I believe the minister has a distorted view that could have been derived from reading the review of this book by John W. Burgeson in a recent issue of *PSCF* (vol. 54, no. 3 [September 2002]: 195-6).

The book under review, *Trust Us, We're Experts*, is authored by two journalists associated with a nonprofit organization on one side of a continuing battle in the U.S., and the book attacks individuals and other non-profit organizations associated with the other side of this battle. The truth is being sought by the reviewer but he is reading only one side. The battle is litigation unique to the U.S. in which the driving force is the plaintiff's bar (the American Trial Lawyers Association, ALTA) and money—enough to

provide contingency fee income in the many millions and even billions of dollars into some law firms and bankrupt large firms with damage to their employees and stockholders.

During my career I have helped defend industry against allegations that low-level electromagnetic energy is hazardous and has caused all kinds of ailments in people from headaches to cancer. The origin of these beliefs is poor-quality science, which is then amplified in the media and then exploited by the plaintiffs' bar and the ALTA. Eventually in the courts there would be scientists on both sides with two different stories. The system then allows a jury, whose composition is the result of lawyer games and debate, of ordinary citizens to listen to these scientists and decide whose science is more believable. (Truth is really not the object in courts). If you want to know historically what kind of science has been allowed into the courts read the book, *Junk Science in the Courtroom*, by Peter Huber, a book cited and attacked in *Trust Us, We're Experts*. I worked with Peter Huber on a few occasions and greatly appreciate his contribution to modern society. His book helped in the drive to reform how science is injected into the courtroom through the milestone decision of the U.S. Supreme Court in the *Daubert v. Merrell Dow Pharmaceuticals* case (1993), which mandates all judges to keep junk science out of the courtroom using all means, including engaging scientific consultants. Unfortunately it was not soon enough to prevent the bankruptcy of Dow Corning after a \$4.25 billion settlement of breast-implant cases with a judge-stipulated contingency fee of \$1 billion, considerably lower than the usual percentage. This happened despite the fact that the good science was on the side of

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Dow Corning, as convincingly detailed in the book, *Science on Trial*, by Marcia Angell (1996). It is interesting that the breast-implant controversy is not covered at all in *Trust Us, We're Experts*.

Twenty-five years ago, I was engaged in a national debate on whether or not a new technology, the microwave oven, was "safe" and whether its sale should be allowed. On one side were people, like some cited approvingly in *Trust Us, We're Experts*, who called for "zero leakage" – a precursor to the currently faddish Precautionary Principle, which is lauded in *Trust Us, We're Experts*. They argued that the microwave oven was not proven safe, which is, of course, an impossible goal. (See the writings of A. Weinberg, R. Wilson and the Harvard School of Public Health, also criticized in the BUR). My allies and I pointed out that based on science (i.e. that which is known) there are no hazards at the leakage levels permitted by the FDA. We, including academics, were attacked in the media with innuendo and all the tricks of the media and I note that attacks on people like Dr. John Graham, formerly of the Harvard School of Public Health, are included in *Trust Us, We're Experts*. Finally in 1977 on *60 Minutes*, the TV program, Mike Wallace interviewed key players (including me) in the debate. At the end he posed the question of whether after many years we would be sorry we had not listened to those alleging danger, which would show up in the form of cataracts, cancer and other latent illnesses. It is now twenty-five years later and scientists who held such views have in some cases been barred from testimony in courts. On the other hand, the microwave oven is one of the most appreciated appliances in the home as shown by national polls.

In my career, I have interacted with two Christian CEOs of notable companies. I ask the reader the following question. In case of a conflict between the authors of the BUR and these two CEOs, whom would you believe? At the minimum I hope you do not swallow all that is in the BUR, hook, line and sinker.

The larger issue is the existence of poor-quality science today.¹ This makes it difficult to ascertain the truth, especially in environmental matters. I would hope that the ASA would address this problem examining all sides of controversial issues. It is my hope that the newly created affiliation in ASA, CEST (for Christian Engineers and Scientists in Technology) will play a key role in insuring that ASA hears the views of Christians who develop and operate technology for the benefit of humankind.

Note

¹This subject is too vast and complicated to elaborate here so I here mention only two references that touch on different aspects of the problem.

Robert Bell, *Impure Science: Fraud, Compromise and Political Influence in Scientific Research* (New York: John Wiley & Sons, 1992)

Robert L. Park, *Voodoo Science: The Road from Foolishness to Fraud* (New York: Oxford University Press, 2000)

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Theological and Scientific Problems: A Response to John A. McIntyre

I trust it is inadvertent, but McIntyre, "The Historical Adam" (*PSCF* 54 [2002]: 150–7) presents as telling an argument for universalism as can be found. If God chose a non-ensouled first Adam to be transformed, and his fall imposed guilt on all members of the race without their doing anything, then God's choice of a Second Adam who was righteous must transfer redemption to all members of the First Adam's race without their doing anything. This must include believing.

There is a further problem. If Adam was the first creature to whom God gave a conscience and thereby made him religious (p. 153), then either that conscience was distributed to the entire race, or else all but some of Adam's descendants perished in Noah's Flood. But there were many human groups continuously occupying sites in the Americas, Asia, Europe, Africa, and Australia for tens of thousands of years, excluding the second option. Yet the former option requires that their God-consciousness cannot antedate 4000 BC. However, Glenn Morton has collected solid evidence of religion long before this date. See www.glenn.morton.co.uk/shaman.htm; [www.glenn.morton.co.uk/mankind.htm](http://www.glenn.morton.btinternet.co.uk/mankind.htm); www.glenn.morton.btinternet.co.uk/rossrev.htm; [/rtbanthro.htm](http://rtbanthro.htm). I have to conclude that McIntyre's ingenious interpretation is not compatible with his PCA membership, and contradicts the anthropological evidence.

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Response to David Siemens

I thank David Siemens for his evaluation of my article "The Historical Adam." He raises two points.

His first point is that the article says that [Adam's] "fall imposed guilt on all members of the race without their doing anything." Since Siemens mentions my membership in the PCA, I will respond with the statement of the Westminster Confession (Chapter VI.3) concerning the effects of Adam's sin:

They [Adam and Eve] being the root of all mankind, the guilt of this sin was imputed, and the same death in sin and corrupted nature conveyed to all their posterity, descending from them by ordinary generation.

The Confession states that the guilt of Adam's sin was "conveyed to all their posterity"; there is no indication that the posterity did anything to acquire their sin. The Confession (Chapter XVI.1) then proceeds to restrict the saving of souls to the work of the Spirit of Christ in the hearts of the elect:

The grace of faith, whereby the elect are enabled to believe to the saving of their souls, is the work of the Spirit of Christ in their hearts.

All men are lost without doing anything; only some are saved through their belief.

Secondly, Siemens notes that Adam's acquisition of a conscience in 4000 BC appears to rule out God-consciousness before 4000 BC. However, this problem of the transfer of Adam's sin to humans living before Adam is addressed in "The Historical Adam" on page 154:

Adam's disobedience of a direct command of God, not to eat of the tree, led God to declare all humans to be sinners. Just as, across space and time, Christ's act of obedience made Abraham righteous (Gen. 15:6), so did Adam's act of disobedience make the prehistoric American Indians and Australian aborigines sinners. And just as there was no biological connection between Christ and those he "made righteous," there was also no biological connection between Adam and those he "made sinners."

Since the eating of the tree of the knowledge of good and evil was an integral part of Adam's sin, the effect of eating of the tree (obtaining a conscience) was also transferred to those living before Adam along with the guilt of Adam's sin.

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Physical and Nonphysical Aspects of Nature

Walter Thorson's philosophy of science attempts to give naturalism in science a crucial theological basis (*PSCF* 54 [2002]: 2-21). His intention is to combat the philosophical or metaphysical naturalism assumed in the scientific world view, which Thorson describes as atheistic/materialism. However, is a philosophy of science necessary for the practicing scientist to carry on his or her scientific work successfully? Surely, one can take a minimalist approach to science whereby irrelevant philosophical suppositions are eliminated from what constitutes the true scientific enterprise and so give rise to what one may properly call unadulterated science.

Thorson indicates that "science is an enterprise whose aim is to offer understanding and explanation of created things in the (limited) context of cultivating and keeping them" (p. 9). This definition may be too encompassing since it includes all of creation and it would be best to limit the subject matter of science to the physical aspect of reality. The physical data that is constitutive to science is collected, in principle, solely by physical devices. The latter may include, at times, humans as merely physical "detectors." If physical devices cannot detect or measure something, then that something is not the subject matter of science. Thorson recognizes that "the central problem of biology and cognition *logically transcend* a merely mechanistic, physical account of the phenomena involved" (p. 3). However, one wonders how one would perform unambiguous measurements in this "logically distinct aspect or level of creation" proposed by Thorson.

The finite nature of the human mind is evident by the need to understand reality by a process of analysis. This

process of taking things apart has resulted in a multitude of disciplines as manifested in the existence of many departments in our institutions of higher learning. It is clear that each kind of knowledge deals primarily with a certain aspect of reality and, as such, it is based on a specific type of evidence used to establish the truth or falsehood of given propositions in that field. It is foolish for a scientist to require the same kind of evidence appropriate to establish truthful statements in science from a theologian, who has its own source of evidentiary data. The academic disciplines of science and theology are certainly distinct.

Humans are detectors of both the physical (science) and the nonphysical (self, the spiritual, information, etc.) aspects of reality. Accordingly, knowledge and experience of the physical and spiritual worlds overlap in humans and thus need be integrated into one. It is hard to see how to implement Thorson's introduction of a theological basis to his "naturalism" that integrates the biological and spiritual aspects of humans.

There are different levels of inferences that can be made from the data collected by physical devices. It is acceptable to do science by insisting that one limits oneself to purely materialistic explanations. However, higher forms of inferences provide a venue for integrating physical and non-physical kinds of knowledge. Materialism presupposes that the whole of creation can be explained solely on the basis of matter/energy. This represents a higher level of inference than that prescribed by unadulterated science and represents a particular metaphysics. Intelligent Design, as presently understood, represents a similar higher level of inference, which Thorson characterizes as a legitimate theological reflection. Of course, one ought never to forget that human rationality characterizes the whole of reality by mental models, abstractions, and constructs that have their counterparts in the real but are not identical to them.

William Olive Martin noted: "Mathematical, metaphysical, and even theological propositions may be instrumental to the search for true generalizations [laws of nature], but in no case can they possibly be constitutive as evidence."¹ The theological basis of Thorson's naturalism may be ultimately what is needed as science attempts to encompass more of the whole of reality and tries to deal with the fundamental question of what life is, the human self, and human rationality. However, if theological propositions are only instrumental and not constitutive as evidence, in what sense can such propositions be useful in science? It may be that these questions are truly beyond the reaches of science no matter how science is defined. One would then have the curious paradox of humans as living, rational beings that successfully describe the physical aspect of reality yet may never be able to develop a scientific theory of what life, or reasoning is.

Human consciousness and reasoning summarize all physical data into laws and create the mathematical theories that lead to predictions. However, the human element that creates the theories is totally absent from the laws and theories themselves. Accordingly, human consciousness and rationality are outside the bounds of science since they cannot be detected by purely physical devices and can only be "detected" by the self in humans. One wonders if the notions of information, function, and purpose, urged

by Thorson for life scientists to consider, can provide explanations of such nonphysical aspects of creation.

Thorson argues in Part II that “a mechanistic reductionism which sees nature in terms of physics alone need not be the exclusive basis for scientific understanding, and that scientific problems are presented by living things for which it is not an adequate basis” (p. 3). I have emphasized the nature of the subject matter of science as data collected by physical devices in order to preserve the objectivity so crucial to science. Thorson’s observation indicates, therefore, that life is not detectable by purely physical devices and thus life cannot be reduced to the purely physical. Of course, the functional logic of Thorson must be defined operationally; otherwise, it is incapable of providing clues to the scientific description of nature.

Thorson indicates that “God and his mysterious agency in creation are not subject to mundane scrutiny; knowledge of God depends entirely on God’s sovereign and gracious choice to be known personally—as the Scriptures consistently teach” (p. 12). The epistemology suggested by the above definition of science implies that purely physical devices cannot detect God and so God is not the subject matter of science; however, God is “detected” or known by humans who are endowed with consciousness and rationality.

Clearly, the true nature of life, human consciousness, and rationality points in a direction other than the physical. It is not clear, however, that Thorson’s functional logic, even if it accounts for most of biological science, would suffice to explain the nonphysical aspects of humans. In a recent letter I noted:

Unraveling the mysteries of nature requires conscious, intelligent beings. But no humanly conceived theory of nature, however complete, can ever encompass all that exists or the creation process that brought everything into being. This ontological problem is best answered by supposing the existence of a Creator, which must be conscious and intelligent to an infinitely higher degree. I believe this idea is the underlying rationale for advocates of intelligent design to infer an Intelligent Designer.²

It seems like a truism that if conscious beings with intelligence are required to “decipher” nature, then the Creator of all that exists must possess these properties to an infinitely higher degree.

Clarifying the true nature of science will not diminish the power of the scientific enterprise to successfully explain the physical universe. However, it will certainly prevent us from equating all of human knowledge with that derived from science. Max Planck said: “God is the beginning of every religion and at the end of the natural sciences.” Consequently, the honest pursuit of scientific knowledge will reveal the truth in Scripture: “In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things came into being through Him, and apart from Him nothing came into being that has come into being” John 1:1-3. These verses suggest that the whole of reality is so interlocked that a complete knowledge of even the simplest element of creation, say, a mere electron, would correspond to a unified understanding of the whole. In

“Flower in the Crannied Wall,” Alfred Lord Tennyson wrote:

Flower in the crannied wall,
I pluck you out of the crannies,
I hold you here, root and all, in my hand,
Little flower—but if I could understand
What you are, root and all, and all in all,
I should know what God and man is.

Notes

¹William Oliver Martin, *The Order and Integration of Knowledge* (Ann Arbor, MI: The University of Michigan Press, 1957), 214.

²Moorad Alexanian, “Seven More Views on Intelligent Design,” *Physics Today* 55 (2002): 10-11.

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Our Response to Pain and Suffering

The question of why does God allow pain and suffering often comes up in *Perspectives on Science and Christian Faith* and I find that the answers generally are shallow and pass over the topic. In other words, we do not really have an answer. It leaves the feeling that this life is all we have, eternal life is a dream, and we want justice here. That is not the Christian faith. Jesus never received justice in this world, and we as his disciples are asked to follow Him. I take a very different approach to the question.

Who are we? How did we get to be the persons we are now? We begin our life as a baby and possibly inherit some character features from parents and grandparents. Our brains are preprogrammed for language learning and to accept moral teaching. We also have the ability to think, to choose, and to make decisions. We are “a blank page,” as we begin our life. As the baby grows up it is subject to many influences in life. Its character is formed by the decisions the person makes and by the pain, suffering, and trials with which it has to cope. When life is easy and decisions are poor, the character declines; when life becomes difficult but the right decisions are made, the person’s character is enhanced and the he becomes strong like a rugged oak tree standing alone. It is when we suffer unjustly that we truly become strong great persons.

God wants us to become great, strong persons, and he uses pain, suffering and difficult assignments to develop our character, the persons that we really are. When life is too easy, humans become like jelly fish. This is what is happening to our civilization today. Also, God did not make us to be robots but he wants us to serve him of our own free accord.

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