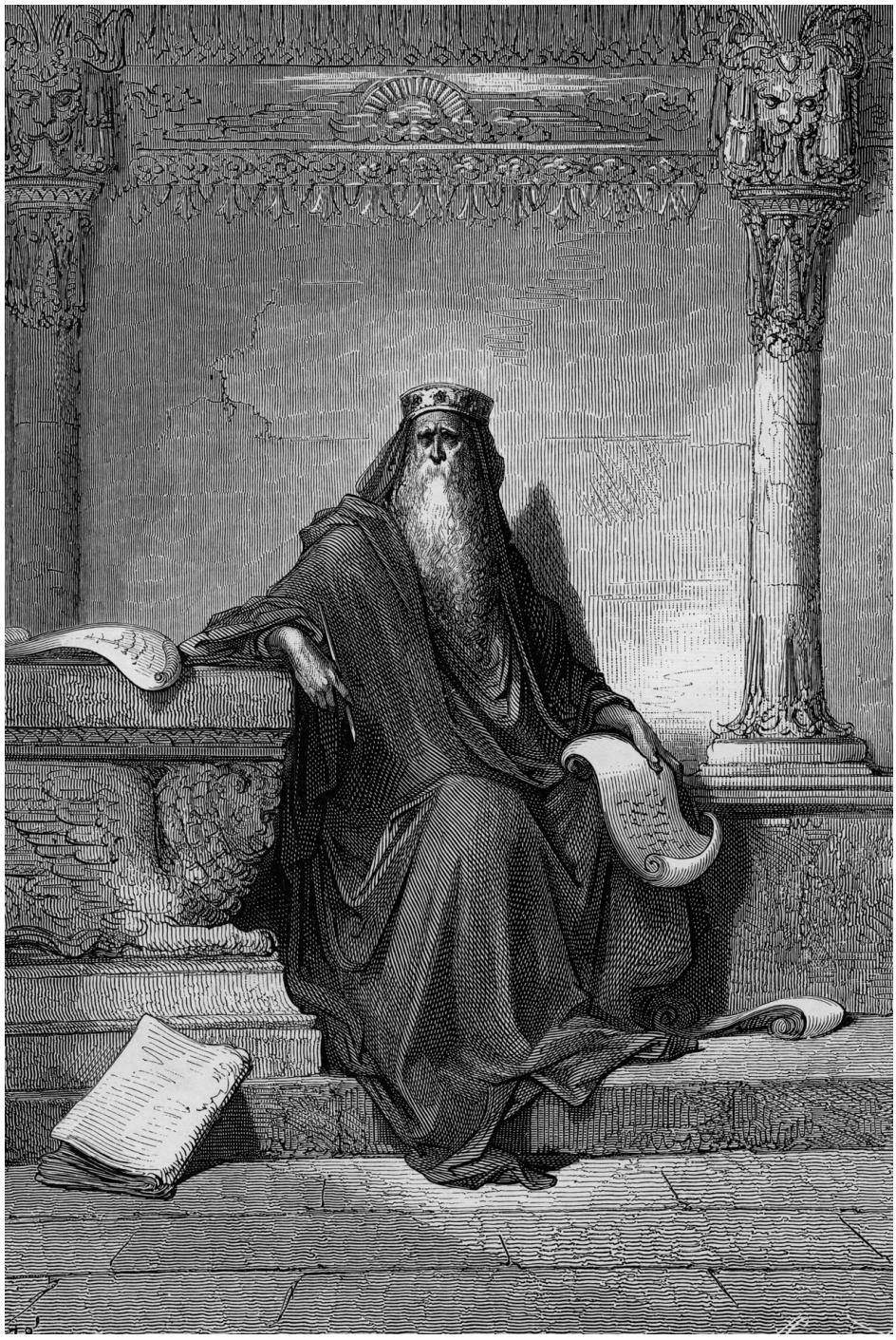
REPORTS OF THE NATIONAL CENTER FOR SCIENCE EDUCATION

DEFENDING THE TEACHING OF EVOLUTION IN THE PUBLIC SCHOOLS

Volume 24, Numbers 3-4 **MAY–AUG, 2004**

CONTINUES *NCSE REPORTS* & *CREATION/EVOLUTION*



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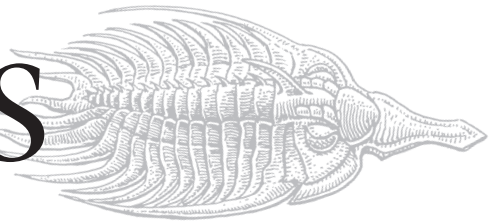

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Cover:
Solomon, from the Doré Bible

I felt a pang of sympathy recently when I read Bill Allen's editor's column in the special issue of *National Geographic* devoted to global warming. Allen wrote that there are certain themes that after several years as editor at *NG* he knows will generate vigorous responses from the readership, and one of those is global warming. For *RNCSE*, of course, the science–religion theme is one of those issues. Our experience with this theme is the same as Allen's with global warming — about half of our readers tell us how happy they are that we grappled with this issue; the other half tell us how *un*happy they are. Among the latter, about half will tell us that we were too soft on religion, and the other half that we were too tough.

We are not complaining. We love to hear from readers because your responses are usually thoughtful, well-reasoned, and thought-provoking. Besides, when we receive a lot of mail about an issue, it tells us two important things: (1) people are really reading it; and (2) what we publish really matters to you, our readers.

WHY DO IT?

There are several reasons for us to consider the interaction between science and religion in US culture at this time. The first is that this is an active area of scholarly work and community organizing in contemporary society. There have been some interesting developments in theological and doctrinal perspectives over the past decade which have opened the door for religious organizations to be more cognizant and accepting of contemporary science. We need to keep informed about these changes so that we are able both to assist in the process of informing religious institutions and scholars about science and also to identify supporters of science — especially evolution — for the inevitable confrontation with school boards and community organizations that oppose good science education on what they claim are religious grounds.

Second, much of the current opposition to evolution education is still religiously based. Even — or especially — the newest version of anti-evolutionism, "intelligent design", has clear religious foundations and makes many of the same objections and criticisms as the old-style creationism. It is important to know how these religious positions differ from those that find evolution acceptable. We recognize that this is primarily not scientific scholarship, but the ways in which different denominations view the natural world, science, and evolution are important to NCSE's mission of supporting and defending the teaching of evolution.

Third, whenever religious organizations or scholars grapple with the issues raised by evolution, it is important that they are using accurate information to make those decisions. We recognize that the ultimate decision is not a scientific one, but if the members of a particular denomination tell us that their theology can accommodate evolution, we want that decision to be based on an accurate contemporary understanding of evolutionary theory. It helps us in our mission to provide that information if we understand — at least generally — the sorts of questions that these denominations are asking.

Finally, it is important to remind our readers that NCSE's mission does not involve opposing religion or its role in contemporary society in general. Our objections to religious explanations is limited to their masquerading as science. Religious expression and practice simply does not engage NCSE until and unless its supporters propose to include it in the science classroom in place of or alongside contemporary science. We often join freethought and skeptic organizations in opposing these efforts, but our own mission extends only to the issues related to science education and scientific literacy.

IN THE ISSUE

This special double issue features a few thoughtful pieces and a number of book reviews. Phina Borgeson explores the theological foundations of ID and why it fails in that realm the way it fails as science. We reprint an editorial by Peter McKnight examining how ID tries to avoid the "creationism" label. John R Cole reports on a lesser-known group that promotes church–state separation — Americans for Religious Liberty, and Phyllis Rodgerson Pleasants tells us about a diversity of views on biblical literalism and scientific creationism among Baptists.

We have more book reviews than we could fit in the table of contents! Predictably, they focus on books that propose some sort of rapprochement between science and religion — and those that say there can be none. Running the gamut from hard-core biblical literalism through "intelligent design" on to forms of theistic evolution, the books discussed in these reviews demonstrate the panoply of religious attitudes toward contemporary science.

FOR MEMBERS

Our centerfold provides a short listing of books about science and religion for readers to consider. We also are reprinting our offer for copies of *God, Darwin, or Both* — a videotaped discussion among Eugenie Scott, Hugh Ross (of Reasons to Believe), and Duane Gish (of the Institute for Creation Research).

We also provide a summary of all the ways that various members have been contributing to promoting good science education in our "News From the Membership" column by Glenn Branch. We acknowledge the generous financial support of members over the past several months.

So, read and respond. We are eager to hear from you.

RNCSE 23 (3–4) was printed in November 2004.

UPDATES

Alabama: At its July 13, 2004, meeting, the Alabama State Board of Education unanimously voted not to conduct a national search for a new state Superintendent of Education — which might have cost $100 000 — and instead to hire the current interim superintendent, Joe Morton (*Mobile Register* 2004 Jul 14; available on-line at <http://www.al.com/news/mobileregister/index.ssf?/base/news/1089796501260380.xml>). Morton served as deputy superintendent for eight years. *The Birmingham News* reported that the board's list of criteria for the position included "conservative and Christian" (2004 Jun 6; available on-line at <http://www.al.com/news/birminghamnews/index.ssf?/base/news/1086513737227090.xml>), but members of the board characterized that criterion as a mistake, explaining that it was inadvertently included on a laundry list of suggested qualifications for the job assembled in 1995. On March 3, 2004, Morton testified before the Alabama Senate Education Committee on SB 336, the anti-evolution "alternative theories" bill (see *RNCSE* 2004 Jan/Feb; 24 [1]: 10–5 and 2004 Mar/Apr; 24 [2]: 14–7). Neither supporting nor opposing the bill, he nevertheless stated that he thought that the issue of evolution was already adequately addressed by the textbook disclaimer in use in Alabama and expressed concern that the bill would open the door to teaching "alternative theories" such as reincarnation and Satanism.

Arkansas: In the primary election conducted on May 18, 2004, Jim Holt won the Republican nomination for US Senate, with 69% of the vote. Currently a state senator, Holt introduced the anti-evolution bill HB 2548 in the Arkansas legislature as a first-term representative in 2001. If it had been enacted, the bill would have required specified state agencies, including public schools, to ensure that the information in instructional materials is accurate as possible. It contained a list of examples of what it labeled as false or fraudulent science, including Haeckel's embryos, the Miller–Urey experiment, and peppered moths; some of the bill's text was derived from Jack Chick's cartoon tract "Big Daddy?". Among those testifying before the legislative committee hearing the bill was flamboyant young-earth creationist Kent Hovind. The bill was never enacted, although due to a complicated series of parliamentary maneuvers it was not officially defeated. (For information about and commentary on HB 2548, see *RNCSE* 2000 Sep/Oct; 20 [5]: 5–6, 6–7, and 7–8, and 2002 Nov/Dec; 22 [6]: 30–4.) Holt is not expected to succeed in his campaign against incumbent Democrat Blanche Lincoln, which was described as "quixotic" and a "long shot" in a news story in *The* (Searcy) *Daily Citizen* (2004 Jul 28; available on-line at <http://www.thedailycitizen.com/articles/2004/07/29/news/local_news/top01.txt>).

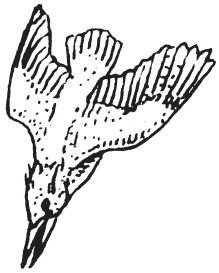
Kansas: With the results of the August 3, 2004, primary election, the balance of power on the Kansas Board of Education is likely to tilt in favor of anti-evolutionists for the first time since 1999, when the board voted to de-emphasize evolution in the state's science standards (see *RNCSE* 1999 Jul/Aug; 19 [4]: 7–9, 9–15). The board is currently split 5–5 between supporters and opponents of evolution education. In District 6, Kathy Martin defeated moderate incumbent Bruce Wyatt to become the Republican candidate. On July 11, during a candidates' forum, Martin said that evolution should be taught as a "theory" and alongside "alternative theories" such as "intelligent design", which she described as "accepted by professors around the US." Noting that evolution was the consensus view among scientists, Wyatt warned that changes to the standards such as those proposed by Martin would compromise the academic standards of Kansas's schools: the state's schools should "keep the science in science" (*Clay City Dispatch* 2004 Jul 12; available on-line at <http://www.zwire.com/site/news.cfm?newsid=12313749&BRD=1160&PAG=461&dept_id=190958&rfi=6>). In District 10, incumbent Steve Abrams, who submitted an evolution-free version of the standards to his colleagues in 1999, defeated Tim Aiken, who reportedly supported keeping the standards as they are, to become the Republican candidate. In Districts 2 and 8, moderate Republican incumbents Sue Gamble and Carol Rupe, supporters of evolution education, are running unopposed, apparently because their would-be conservative Republican rivals missed a filing deadline by seconds (*Lawrence Journal-World* 2004 Jun 18; available on-line at <http://ljworld.com/section/politics/story/173327>). Martin, Abrams, Gamble, and Rupe are running unopposed in the general election. The only contested seat will be in District 4, where incumbent Democrat Bill Wagnon, a supporter of evolution education, is running against Republican Robert Meissner, whose views on evolution education have not been reported. It is thus likely that anti-evolutionists will have at least a 6–4 majority on the board, which will be reviewing a revision of the state science standards — currently under development — in 2005 (*Wichita Eagle* 2004 Aug 4; available on-line at <http://www.kansas.com/mld/kansas/news/local/9315092.htm>).

Montana, Darby: More news from Darby, the little Montana town with the big debate over evolution education (see *RNCSE* 2004 Mar/Apr; 24 [2]: 4–12). On July 5, 2004, the second reading of the proposed "objective origins" policy was held; the Darby school board, which previously approved the policy by a 3–2 vote, rejected it by a 3–2 vote. Board member Mary Lovejoy commented, "Today the community is beaming with relief" (*Ravalli Republic* 2004 Jul 8; available on-line at <http://www.ravallinews.com/articles/2004/07/08/news/znews02.txt>).

The board's about-face was due to the results of the May 4 election, in which one incumbent who favored the policy was defeated while another incumbent who opposed it was re-elected, despite the fact that proponents of the policy spent about twice as much money on campaigning (*Ravalli Republic* 2004 Jun 24; available on-line at <http://www.ravallirepublic.com/articles/2004/06/24/news/news03.txt>). In related news, on June 9, 2004, the Darby school board in effect withdrew its offer to a candidate for school superintendent who was favored by the proponents of the "objective origins" policy by voting 3–2 "not [to] approve any written employment contract with Jim McLaughlin for the position of superintendent" (*Ravalli Republic* 2004 Jun 11; available on-line at <http://www.ravallinews.com/articles/2004/06/11/news/news02.txt>). Supporters of the "objective origins" policy both on and off the board, including its author the Reverend Curtis Brickley, protested the vote. On June 21, the board voted 3–2 to negotiate a contract with a new candidate, Bruce Wallace (*Ravalli Republic* 2004 Jun 24; available on-line at <http://www.ravallinews.com/articles/2004/06/24/news/znews 04.txt>); on June 30, the contract was signed, despite threats of a lawsuit from a Billings, Montana, attorney acting on behalf of a client he declined to name (*Ravalli Republic* 2004 Jul 2; available on-line at <http://www.ravallinews.com/articles/2004/07/02/news/news02.txt>). The suit was subsequently filed; the client turned out to be Bruceen "Peanut" Fleenor, a major financial contributor to Montana Advocates for True Science, which supported the school board candidates in favor of the "objective origins" policy. The complaint alleges that the school district failed to give proper notice before the vote not to approve any contract with McLaughlin. The attorney for the school district subsequently filed a motion asking for the suit to be dismissed, on the grounds that there was no meeting held on the date specified in the suit and that Fleenor lacks legal "standing to sue the district for decisions regarding the selection of a superintendent" (*Ravalli Republic* 2004 Aug 3; available on-line at <http://www.ravallinews.com/articles/2004/08/03/news/znews03.txt>).

Pennsylvania, Dover: Creationism is on the agenda in the Dover Area School District. Although the high school science department and district administration recommended that the district adopt the 2002 edition of Kenneth R Miller and Joseph Levine's *Biology: The Living Science*, William Buckingham, a board member and head of the curriculum committee, complained of its focus on "Darwinism" and vowed to seek a textbook in which both evolution and creationism are presented (*The York Dispatch* 2004 Jun 9). Buckingham is reportedly unconcerned that such a textbook would violate the separation of church and state, which he regards as a myth. Two other members of the board, Alan Bonsell and Noel Wenrich, have expressed support for Buckingham's proposal (*York Daily Record* 2004 Jun 10); another member, Heather Geesey, explained, "All we are trying to accomplish with this task is to choose a biology book that teaches the most prevalent theories. The definition of theory is merely a speculative or an ideal circumstance. To present only one theory or to give one option would be directly contradicting our mission statement" (*York Sunday News* 2004 Jun 27). Assistant Superintendent Michael Baksa said that the current textbook, the school's science curriculum, and the state science standards all teach evolution. The local newspapers then saw vociferous debate in their letters-to-the-editor columns. At the board meeting on August 2, the board initially deadlocked 4–4 (with one absence) on whether to adopt the Miller and Levine textbook. Buckingham then offered to vote in favor of the book if and only if the board voted also to adopt the "intelligent design" text *Of Pandas and People* as a "companion" book, a proposal that board member Jeff Brown characterized as blackmail. Subsequently, Angie Yingling, who previously voted against adopting the Miller and Levine textbook, switched her vote, and the book was adopted a vote of 5–3. On October 18, the board voted to require the teaching of "intelligent design"; details and reactions in the next issue of *RNCSE*.

Pennsylvania, Quakertown: "The Darwin theory is written about in this book, and it is proven lies." So said Linda Martin, a director of the Quakertown Community School District Board, during a June 24, 2004, meeting of the board, adding, "This earth is not millions of years old, and I can't handle our teachers teaching these lies" (*The* [Allentown] *Morning Call* 2004 Jun 26; available on-line at <http://www.mcall.com/news/local/all-b3_2qschooljun25,0,4128868.story?coll=all-newslocal-hed>). The book in question, Eric Strauss and Marylin Lisowski's *Biology: The Web of Life*, was under consideration for use in a general science class for high school juniors and seniors. Despite Martin's objections, the board voted 6–1 to adopt the book; the president of the board, Philip Abramson, commented, "It's not controversial, it's a textbook, and it has the current theory." Both Abramson and Superintendent James Scanlon cited the need to maintain church/state separation in the school system.



Texas: The 2004 platform of the Texas Republican party includes the following plank under the rubric "scientific theories": "The Party supports the objective teaching and equal treatment of scientific strengths and weaknesses of all scientific theories, including Intelligent Design — as Texas law now requires but has yet to enforce. The Party believes theories of life origins and environmental theories should be taught only as theories not fact; that social studies and other curriculum should not be based on any one theory" (p 17 of <http://www.texasgop.org/library/RPTPlatform2004.pdf>). The 2002 platform contained the following plank under the same rubric: "The Party believes that scientific topics, such as the question of universe and life origins and environmental theories, should not be constrained to

one opinion or viewpoint. We support the teaching equally of scientific strengths and weaknesses of all scientific theories — as Texas now requires (but has yet to enforce) in public school science course standards. We urge revising all environmental education standards to require this also. We support individual teachers' right to teach creation science in Texas public schools" (p 14 of <http://www.texasgop.org/library/RPTPlatform2002.pdf>). The 2004 platform of the Texas Democratic Party, while not mentioning evolution in particular, decries "efforts by right-wing extremists to censor textbooks" (<http://www.txdemocrats.org/about/platform/page2/index.php>).

Virginia, Madison: C Douglas Farmer, an ordained Baptist pastor and third-year member of the Madison County School Board, wants creationism to be given equal time in the county's public school science classes, according to a report in the *Charlottesville Daily Progress* (reprinted in the *Richmond Times-Dispatch* 2004 Jul 31). "If we're going to approve textbooks that are biased toward evolution, there should be some sort of appendix glued in the front cover that emphasizes or points out that this text seems to be slanted toward the origin of species as strongly supporting evolution," he said, adding, "It doesn't make sense to me to teach character and responsibility and then turn around and teach kids that they came from a monkey." Farmer also said that there was popular support for his views in the county, and suggested that parents may have removed their children from the schools over evolution. Fellow school board member James L Nelson Jr and Superintendent Brenda Tanner expressed skepticism about the need for such a disclaimer, referring to the board's policy of neutrality regarding religion.

National: A Texas-based group called Christian Exodus was in the news recently for its plan to recruit conservative Christians to move to South Carolina, form a biblically inspired government, and (if necessary) secede from the United States (see, for example, the Knight Ridder story published in *Tallahassee Democrat* 2004 Jun 26; available on-line at <http://www.tallahassee.com/mld/democrat/9016765.htm>). Christian Exodus's leader, Cory Burnell, hopes to accomplish the secession by 2016, with the first wave of his followers migrating to South Carolina in 2006. Among the eight "atrocities" listed on the group's web site as reasons for the exodus is: "Our schools continue to teach the discredited theory of Darwinian evolution" (<http://www.christianexodus.org>). Burnell's plan was described as "bizarre" by the Rev Brenda Kneece, executive minister of the South Carolina Christian Action Council, and as "preposterous" by Eldon Wedlock Jr, professor of law at the University of South Carolina. Whether the residents of the state will have to contend with the exodus is doubtful; Mark Potok of the Southern Poverty Law Center, which monitors secessionist groups, considers it probable that Christian Exodus will collapse before its first wave of migration.

National: Evolution was strangely downplayed on a commercial excursion to the Galápagos, according to a sidebar to a *Miami Herald* story on the maiden voyage of Celebrity Cruises's *Xpedition* (2004 Aug 1). Although the fact that Darwin visited the islands for 5 weeks in 1835 was mentioned — and the *Xpedition*'s eateries include Darwin's Restaurant and the Beagle Grill — there was little discussion about his theory of evolution on the cruise. Naturalists on board told curious guests that Celebrity instructed them not to mention evolution unless asked, for fear of causing offense to creationist vacationers. Celebrity characterized the incident as a "misunderstanding," said that it was "absolutely" not its policy to downplay evolution, and described its plans to upgrade enrichment programs for future cruises to the Galápagos.

Brazil, Rio de Janeiro: Controversy erupted in Brazil recently after the governor of the state of Rio de Janeiro, Rosinha Mateus, authorized the teaching of creationism in public schools, declaring, in an interview in the Brazilian newspaper *The Globe*, "I do not believe in the evolution of species. It's just a theory." Physicist Ennio Candotti, president of the Brazilian Society for the Advancement of Science, said that creationism "is not supported" and called creationism education "propaganda." The controversy appears to be focused on what will be taught in religion classes. In December 2000, the then-governor of Rio de Janeiro, Anthony Garotinho (husband of the current governor), signed decree 3.459/2000, which established confessional religious lessons in public schools. The state hired 500 religion teachers — 342 Catholic, 132 Protestant, and 26 representing other denominations — to provide religious instruction; today, the state employs 793 religion teachers. Opponents of the move argued that Brazilian federal law requires that religious lessons in public schools be nonconfessional. The current governor's encouragement for teaching creationism in these classes caused an uproar, covered widely in the Brazilian media, including a four-page article "Rosinha contra Darwin" in *Época*, a major weekly Brazilian news magazine (2004 May 24; available on-line in Portuguese at <http://revistaepoca.globo.com/Epoca/0,6993,EPT731549-16641,00.html>). According to the article, creationism is being promoted in Brazil by groups such as the Brazilian Creationist Society, headed by Seventh-Day Adventist Ruy Vieira. The Centro Universitário Adventista de São Paulo, an Adventist university in São Paulo, offers courses and programs that promote creationism. There are also non-Adventist creationist groups in Brazil, such as the Brazilian Association for Creation Research, which boasts of having brought Duane Gish of the Institute for Creation Research to Brazil five times. The arguments of Brazilian creationists appear to be entirely derived from those of creationists in the United States. A petition to reverse the move is underway.

[*NCSE thanks Sarah Berel-Harrop, Victoria Clark, John Schweinsberg, and Daniel Sottomaior for information used in this article.*]

NCSE NEWS

Comings & Goings

Glenn Branch, NCSE Deputy Director

Susan Spath

Alan Gishlick

We are pleased to announce that **Susan Spath** is now working for NCSE as Public Information Project Director, replacing **Skip Evans**, who resigned in April 2004 (see *RNCSE* 2004 Mar/Apr; 24 [2]: 18). Spath earned her AB *magna cum laude* in biology at Harvard University and went on to complete a PhD in history of science at the University of California, Berkeley, with her dissertation *CB van Niel and the Culture of Microbiology*. She taught history of science courses at Berkeley and at the University of California, Davis, before starting her own technical writing and consulting business. With a biologist's understanding of the nature of scientific research, a historian's perspective on how cultural beliefs are shaped and sustained, and a teacher-cum-writer's expertise in communicating complex scientific ideas, she is a good match for NCSE, where she is assisting local activists to defend the teaching of evolution in their communities and helping NCSE to revise and update our informational materials. She is currently helping local activists to handle challenges to evolution education in California, Wisconsin, and the United Kingdom. Please join us in welcoming her aboard! Her e-mail address here is spath@ncseweb.org.

We bid a fond farewell to NCSE's Postdoctoral Scholar **Alan Gishlick**, who joined NCSE in 2001 for a 3-year appointment (see *RNCSE* 2000 Nov/Dec; 20 [6]: 7–8). With a range of biological knowledge at once broad and deep, NCSE's very own "Gish" was a constant source of scientific information, for his colleagues, for teachers at workshops, and for the public at large. (Indeed, *The New York Times* [2003 Jan 17] solicited his commentary on Kenneth Dial's work on the origin of avian flight.) With NCSE President Kevin Padian he reviewed Jonathan Wells's *Icons of Evolution* for *The Quarterly Review of Biology* (2002; 77 [2]: 33–7), followed by a comprehensive debunking effort, "Icons of evolution? Why much of what Jonathan Wells writes about evolution is wrong" (available on-line at <http://www.ncseweb.org/icons/> or in PDF format at <http://www.ncseweb.org/icons/pdfs.html>). His study of the textbooks assailed by Wells turned out to be extremely useful during the controversy surrounding biology textbook adoption in Texas, where he spoke before the state board of education (see *RNCSE* 2003 Sep–Dec; 23 [5–6]: 4–7). He also spoke in Darby, Montana, to rally support for evolution education there (see *RNCSE* 2004 Mar/Apr; 24 [2]: 4–12). Although Gishlick is leaving NCSE, we have not seen the last of him yet: a number of articles and reviews by him are in the publication queue for *RNCSE*, and he is scheduled to help to guide the next NCSE excursion through the Grand Canyon in 2005 (see *RNCSE* 2004 Jan/Feb; 24 [1]: 23).

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News from the Membership

Glenn Branch, NCSE Deputy Director

From time to time we like to report on what our members are doing. As the following list shows, they — and we — have good reason to be proud!

Bruce Alberts, president of the National Academies and Supporter of NCSE, and Jay Labov of the Center for Education at the National Research Council wrote an article on "Teaching the science of evolution" for the journal *Cell Biology Education* (2004; 3 [2]: 75–80; available on-line at <http://www.cellbioed.org/articles/vol3no2/pdfs/04-03-0038.pdf>). Alberts and Labov write, "Cell and molecular biologists have provided some of the most compelling evidence to support the theory of evolution and should therefore be among those who raise their voices the loudest to support science curricula that help students understand the processes of evolution. As scientists, we also should make it our responsibility to present the evidence for biological evolution to all of our students, especially in introductory courses. Most students who enroll in our introductory courses will use them as their terminal courses in science. At least some of those students will go on to careers as teachers or as public servants who will be asked to make decisions about whether to allow nonscientific approaches to teaching evolution to appear in science curricula. It is our responsibility to equip them with the knowledge and understanding of science that they will need to confront such challenges."

In the July–August 2004 issue of *American Scientist* (92 [4]: 298; available on-line at <http://www.americanscientist.org/template/AssetDetail/assetid/33930>), **Francisco J Ayala** — University Professor and the Donald Bren Professor of Biological Sciences at the University of California, Irvine;

president of the scientific research society Sigma Xi; and Supporter of NCSE — calls for the improvement of science education in the American public schools. One of the problems with science education as it exists today, Ayala comments, is "the conviction, common among biblical literalists and other Christian fundamentalists, that certain teachings of science — concerning the origin of the universe, the living world and humans — are contrary to biblical texts and the Christian faith." Firmly rejecting the idea that pseudoscientific "alternatives" to evolution deserve to be aired in the public school science classroom, Ayala argues, "The theory of evolution needs to be taught in the schools because nothing in biology makes sense without it. ... Students need to be properly trained in science in order to improve their chances for gainful employment and to enjoy a meaningful life in a technological world."

NCSE Deputy Director **Glenn Branch** was invited to write a piece about current assaults on evolution education for *Seed*, "a popular science magazine for our times aimed at smart, young, and curious men and women who are passionate about science and its fast-changing place in our culture"; it appeared, under the title "The intelligent design controversy", in the spring 2004 issue (9: 19–21; photocopies are available from the NCSE office). Branch discusses the continuing anti-evolutionist ploy of calling for "teaching the controversy", remarking, "Couched in attractive secular terms such as 'analysis', 'objectivity', and 'balance', the policies appeal to Enlightenment values. But their focus on evolution reveals a darker agenda." Since the article was written, the proposed "objective origins" policy in Darby, Montana — referred to in the opening and closing paragraphs — seems to have disappeared, following an electoral shakeup of the school board (see *RNCSE* 2004 Mar/Apr; 24 [2]: 4–12). Of interest in the same issue of *Seed* is "The Seed salon" (60–5, 103–5), a wide-ranging discussion between philosopher **Daniel Dennett** and biolo-

Francis Crick Dies

Susan Spath and Glenn Branch, NCSE

Francis Crick, the co-discoverer of the structure of DNA, died on July 28, 2004, in San Diego, at the age of 88.

Crick is probably most famous for determining the structure of DNA in 1953 in collaboration with James D Watson. At the time, the chemical basis of the gene was not understood. Only a few scientists considered DNA to be the likely carrier of genetic information, in part because DNA is composed of only four subunits, adenine (A), thymine (T), cytosine (C), and guanine (G). Once the structure of DNA was known, however, numerous research programs were developed to investigate the structure and function of genes. One of the most important was the deciphering of the genetic code in the 1950s and 1960s. In collaboration with Sydney Brenner and others, Crick determined that the precise order of bases in DNA specifies the order of amino acids in a protein. They found that each amino acid is represented by a sequence of 3 DNA bases. It then became possible to study in elegant detail the molecular mechanisms by which the proteins are synthesized with the proper sequence of amino acids. In the past two decades, Crick turned his attention to neuroscience, investigating the nature of the mind and consciousness. Over his career, Crick received numerous awards, most notably the Nobel Prize in Physiology or Medicine in 1962, which he shared with Watson and Maurice Wilkins for determining the structure of DNA. Crick's intellectual spirit, wit, and open-mindedness were admired and emulated by molecular biologists all over the world.

A long-time member of NCSE, Crick was no friend to creationism, although his speculative writings about the possible extraterrestrial origin of life are routinely quoted by anti-evolutionists. In *The Astonishing Hypothesis* (New York: Charles Scribner's Sons, 1994), he wrote, "The age of the earth is now established beyond any reasonable doubt as very great, yet in the United States millions of Fundamentalists still stoutly defend the naive view that it is relatively short, an opinion deduced from reading the Christian Bible too literally. They also usually deny that animals and plants have evolved and changed radically over such long periods, although this is equally well established. This gives one little confidence that what they have to say about the process of natural selection is likely to be unbiased, since their views are predetermined by a slavish adherence to religious dogmas." Crick signed the *amicus* brief of 72 Nobel laureates in the Supreme Court case *Edwards v Aguillard* (1987) that argued "'Creation-science'" simply has no place in the public-school science classroom," and recently signed a letter calling for the establishment of Darwin Day as a British national holiday "[a]t a time when creationism appears to be gaining ground in English schools."

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gist EO Wilson about "God, evolution, incest, and of course, ants."

NCSE Deputy Director **Glenn Branch** and NCSE Executive Director **Eugenie C Scott** were invited to write a Perspective essay for the *San Jose Mercury News*; it appeared, under the title "Assaults on evolution have evolved as well", in the February 15, 2004, issue of the newspaper (available on-line at <http://www.mercurynews.com/mld/mercurynews/news/editorial/7959864.htm>). In their essay, Branch and Scott reviewed the checkered history of evolution education in the United States, concluding, "anti-evolutionist attempts to undermine evolution education have failed, by and large, thanks to the efforts of scientists, teachers, clergy, civil libertarians and parents concerned about the quality of science education. But with about 40% of Americans continuing to reject evolution for religious reasons, Darwin's legacy is anything but safe." Photocopies of the essay are available from the NCSE office.

Kevin M Bohacs, a sedimentologist with ExxonMobil Upstream Research Company, and **Carl W Stock**, Professor of Geological Sciences at the University of Alabama, were both elected as Fellows of the Geological Society of America on April 25, 2004 (*GSA Today* 2004 Jul; 14 [7]: 13–5). Fellows are elected "in recognition of significant contributions to the science of geology."

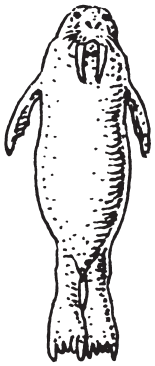
Stephen G Brush, Distinguished University Professor of the History of Science at the University of Maryland and a Supporter of NCSE, was named as the 2004 recipient of the Geological Society of America's History of Geology Award (see *GSA Today* 2004 Jul; 14 [7]: 12). In addition to his 3-volume history of modern planetary physics, the announcement in the newsletter of GSA's History of Geology division (2004 Jun; 28 [2]) mentioned his classic 1982 paper "Finding the age of the earth: By physics or by faith?" (*Journal of Geological Education* 30: 34-58), describing it as "a marvelous critique of claims by creationists that the earth is only a few thousand years old, coupled with an exposition of the radiometric dating method." His award was presented at the GSA's annual meeting in Denver on November 6, 2004. Additionally, Brush's book *The Kinetic Theory of Gases: An Anthology of Classic Papers with Historical Commentary* (London: Imperial College Press, 2003), edited by Nancy S Hall, is now available. The publisher writes, "This book introduces physics students and teachers to the historical development of the kinetic theory of gases, by providing a collection of the most important contributions by Clausius, Maxwell, and Boltzmann, with introductory surveys explaining their significance. In addition, extracts from the works of Boyle, Newton, Mayer, Joule, Helmholtz, Kelvin, and others show the historical context of ideas about gases, energy and irreversibility."

Two letters from **Jim Bullion** to the editor of the *Bellingham Herald* were recently printed. On March 13, 2004, he replied to a letter that recommended the Institute for Creation Research's resources by urging readers instead to get in touch with NCSE for "reliable information on evolution from the legitimate science community" — thanks, Jim! On May 1, he urged that the writers of "several letters recycling tired, discredited criticisms of evolution" study textbooks in the relevant disciplines. "Stated briefly," he recommended, "study science. Evolution's 'considerable opposition' comes almost entirely from the scientifically illiterate."

Robert A Cooper contributed "How evolutionary biologists reconstruct history: Patterns & processes" to *The American Biology Teacher* (2004 Feb; 66 [2]: 101–8). In his article, he argues that evolutionary biology's status as a science is widely misunderstood because of the tradition of regarding physics as the science *par excellence* and a resultant tendency to suppose that there is a single infallible scientific method. The important issues for teachers, he writes, are "How can we convey the message to students that there is a diversity of method used in all sciences, and that evolutionary biology is not different or unique in its theorizing about the past? How can teachers demonstrate that it is possible for scientists to have a high degree of confidence in their knowledge of the past?" Cooper's "The goal of evolution instruction: Should we aim for belief or scientific literacy?" appeared in *RNCSE* 2001 Jan–Apr; 21 (1–2): 14–8. Also of interest in the same issue was **Mary Wuerth**'s "Resources to teaching evolution" (109–13), which describes "some of the latest and most well-designed resources available for teaching evolution" and for defending against challenges to evolution education, including NCSE's web site.

Robert Dennison appeared on National Public Radio's "Science Friday" on May 21, 2004, to discuss the state of evolution education with the show's host, Ira Flatow. "[W]hat I want everyone to be aware of," he said, "is that the battle is maybe a social one, a political one. It's not a battle where real science is being done. And my fear is that the public thinks, because of these campaigns, that there is some active debate among scientists about evolution and, of course, there's not. If you go to a science conference or read scientific journals, there's no mention of these so-called weaknesses of evolution that they wanted to put into our books." (Dennison was referring to the campaign of the Discovery Institute and its allies to undermine the treatment of evolution in Texas's biology textbooks; see *RNCSE* 2003 Sep–Dec; 23 [5–6]: 4–7 for details.) Dennison teaches biology at Jersey Village High School in Houston.

Stephen Q Dornbos contributed "Intelligent design: Exhumation of an old, failed, idea" to *The Sedimentary Record* (2004; 2 [1]: 10; available on-line at <http://www.sepm.org/sedrecord/sedrecord2.1.pdf>), a publication of the Society for Sedimentary Geology. Arguing that "ID is simply an attempt to sneak creationism into the backdoor of our public schools", Dornbos went to describe his own encounter with the "intelligent design" movement at a 1999 paleontological meeting near Chengjiang, China (see



RNCSE 2000 Sep/Oct; 20 [5]: 16–22, 27): "I learned that ID proponents are essentially trying to create their own alternative pseudoscientific universe, complete with 'Senior Fellows' with advanced degrees, often in philosophy and religion, free-lance 'science' writers whose job is to blatantly misquote scientists in later newspaper articles, and even a young-earth creationist paleontology graduate student who goes "deep undercover' at scientific meetings." Dornbos is a postdoctoral fellow in the Department of Earth Sciences at the University of Southern California; he is also Steve #330 in NCSE's Project Steve.

Paleontologist **Niles Eldredge** of the American Museum of Natural History was profiled in a story in the March 9, 2004, issue of *The New York Times*. The story, subtitled "Bursts of cornets and evolution", discusses the affinities between Eldredge's scientific vocation and his musicological avocation — studying the history of the cornet. Eldredge is a Supporter of NCSE, to which he dedicated his book *The Triumph of Evolution: And the Failure of Creationism* (New York: WH Freeman, 2000).

Gregory Forbes was named the 2004 Michigan College Science Teacher of the Year by the Michigan Science Teacher Association. Forbes, who teaches at Grand Rapids Community College, is also co-founder of Michigan Citizens for Science (<http://www.michigancitizensforscience.org/>), the state's grassroots organization that defends the teaching of evolution in the public schools, and director of education for the Michigan Scientific Evolution Education Initiative (<http://web.grcc.cc.mi.us/mseei/>), a federally funded program that trains teachers how to educate students about evolution. Referring to MSEEI's work, he told the *Grand Rapids Press* (2004 Apr 17; available online at <http://www.mlive.com/news/grpress/index.ssf?/base/news-14/1082386513163190.xml>), "Because it's been a controversial issue, most people never receive proper instruction [in scientific evolution] as a student. ... Instructors recognize this is a problem and are trying to learn how to do this and retain their relationship with colleagues, parents, students and still have fidelity to their role as a science teacher."

Barbara Forrest and **Paul R Gross**'s *Creationism's Trojan Horse: The Wedge of Intelligent Design* (New York: Oxford University Press, 2004) and **Mark Perakh**'s *Unintelligent Design* (Buffalo [NY]: Prometheus Books, 2004) received a glowing review from Rudolf Raff in *Evolution & Development* (2004; 6 [4]: 89–91): "Both," he wrote, "are excellent well-informed books and should be on every evolutionary biologist's reading list." He praised *Unintelligent Design* as "elegant, informed, and thorough — and good intellectual fun" and *Creationism's Trojan Horse* as "a detailed and devastating dissection of the sociology of the ID movement." Forrest and Gross's book also received a glowing review from Karl Giberson, writing in *Science & Theology News*, for which it was the Editor's Choice of the July/August 2004 issue (64–6; available on-line at <http://www.stnews.org/books_id_0704.html>). Giberson writes, "Philosopher Barbara Forrest and biologist Paul R Gross have joined forces to produce a remarkable analysis of the intelligent design movement. ... Their carefully documented account is the first full-length treatment of the political agenda of what Phillip Johnson, the acknowledged leader of ID, has called the 'Wedge.' ... *Creationism's Trojan Horse*, in the course of more than 300 well-documented pages, does exactly what the authors set out to do: uncover a sophisticated, well-funded, religiously driven program to get evolution out of the public schools. ... *Creationism's Trojan Horse* is an aggressive, but scholarly, polemic. Forrest and Gross's rhetoric makes it clear where they stand and they miss no opportunity to heap ridicule on the Wedge, all the while considering it with utmost seriousness." Of interest in the same issue of *Science & Theology News* is a news report on the controversy in Italy over evolution education (1, 5; and see *RNCSE* 2004 Mar/Apr; 24 [2]: 12–3), an interview with historian of science Ronald L Numbers (40–1), especially interesting on account of Numbers's discussion of the relationship between creation science and "intelligent design", and reviews of John F Haught's *Deeper than Darwin* (59) and Lee Strobel's *The Case for a Creator* (67).

Patrick Frank contributed "On the assumption of design" to *Theology and Science* (2004 Apr: 2 [1]: 109–30). The abstract of his essay: "The assumption of design of the universe is examined from a scientific perspective. The claims of William Dembski and of Michael Behe are unscientific because they are a-theoretic. The argument from order or from utility are shown to be indeterminate, circular, to rest on psychological as opposed to factual certainty, or to be insupportable as regards humans but possibly not bacteria, respectively. The argument from the special intelligibility of the universe specifically to human science does not survive comparison with the capacities of other organisms. Finally, the argument from the unlikelihood of physical constants is vitiated by modern cosmogonic theory and recrudesces the God-of-the-gaps." Of interest in the same issue of *Theology and Science* are David Ray Griffin's "Scientific naturalism: A great truth that got distorted" (9–30), Martinez Hewlett's review of **Michael Ruse**'s *Darwin and Design* (151–3), and Tom Hamilton's review of Richard Dawkins's collection of essays *A Devil's Chaplain* (163–5).

Carl Frieden, Professor of Biochemistry and Molecular Biophysics at Washington University in St Louis, and **Loren H Rieseberg**, the Class of '54 Professor of Biology at Indiana University, are among the 178 new Fellows of the American Academy of Arts and Sciences announced in an April 30, 2004, press release issued by the Academy (<http://www.amacad.org/news/new2004.htm>). "I am honored to welcome these outstanding and influential individuals to the nation's oldest and most illustrious learned society," said Academy President Patricia Meyer Spacks. "These new members have made extraordinary contributions to their fields and

disciplines through their commitment to the advancement of scholarly and creative work in every field and profession."

The Race Myth: Why We Pretend Race Exists in America (New York: Dutton, 2004) by **Joseph L Graves Jr** is now available. The publisher writes, "*The Race Myth* debunks the ancient fallacies still held as fact and perpetuated in everything from damaging medical profiling to misconceptions about sports. Through accessible and compelling language, Graves reveals the impossibility that any group of humans now in existence has a separate genetic line of descent. *The Race Myth* also explains why defining a race according to skin tones or eye shape is woefully inaccurate and why applying these false categories to assumptions about IQ, behavior, or predisposition to disease has devastating effects. Demonstrating that racial distinctions are social inventions, not biological truths, *The Race Myth* brings much-needed, sound science to one of America's most emotionally charged debates." Graves is also the author of *The Emperor's New Clothes: Biological Theories of Race and the Millennium* (New Brunswick [NJ]: Rutgers University Press, 2000), which was reviewed by C Loring Brace in *RNCSE* 2001 Jan–Apr; 21 (1–2): 50.

A letter to the editor of the Newark, Ohio, *Advocate* from **Marie Greider** was published (2004 Mar 25), arguing that "[e]volution, and not intelligent design, should be taught in our public schools." Greider explained that "Evolution is the single unifying scientific theory of life," adding that "It is my hope that Ohioans become more knowledgeable and understand the science that is behind our changing world."

Werner G Heim reviewed a 2003 reprinting of Thomas Henry Huxley's classic *Man's Place in Nature* for *The American Biology Teacher* (2004 Mar; 66 [3]: 225–6). "[T]he modern reader will find this book has not only a fascinating glimpse of biology as it was practiced about a century and a half ago," he concluded, "but also the roots of much that is still being discussed in biological and anthropological circles in our time." Heim is Professor Emeritus of Biology at Colorado College.

NCSE Supporter **Philip Kitcher**'s essay "Responsible biology", originally delivered as a plenary address to the 54th annual meeting of the American Institute of Biological Sciences, appeared in *BioScience* (2004 Apr; 54 [4]: 331–6). Kitcher, Professor of Philosophy at Columbia University, argues that "scientists have an obligation to reflect on the ends of scientific research; that scientists should work for the public good, directing their efforts toward an ideal of well-ordered science; and that the ideal of well-ordered science should be understood in a global and democratic fashion."

Denis O Lamoureux's "Theological insights from Charles Darwin" appeared in *Perspectives on Science and Christian Faith* (2004 Mar; 56 [1]: 2–12). Lamoureux, who is Assistant Professor of Science and Religion at St Joseph's College of the University of Alberta, writes, "Regrettably, both secularists and numerous evangelical Christians have painted a dark and sinister picture of the religious implications of Charles Darwin's theory of biological evolution," and suggests, "The time has come to let the historical record speak in order to move beyond the ill-informed myths of Charles Darwin's religious beliefs and the misunderstood theological implications of the theory of biological evolution." Of interest in the same issue are Del Ratzsch's "Design: What scientific difference could it make?" (14–25), Walter Thorson's "Naturalism and design in biology: Is *intelligent dialogue* possible?" (26–36), and a number of book reviews, including NCSE Faith Network Project Director **Phina Borgeson**'s review of WB Drees's *Creation: From Nothing to Now* (69).

A letter to the editor of the Mansfield, Ohio, *News Journal* from **Andrew O Lutes** was published (2004 Apr 11), defending Darwin against personal attacks from both a local anti-evolutionist and a recent issue of the Institute for Creation Research's *Impact* (2004; 367) asking "Was Charles Darwin psychotic?"

The eminent evolutionary biologist **Ernst Mayr** — whom NCSE is proud to have among its members — celebrated his 100th birthday on July 5, 2004. Writing in the July 2 issue of *Science* (305 [5680]: 46–7; available on-line at <http://www.sciencemag.org/cgi/content/full/305/5680/46>), he reflects on his 80 years of "watching the evolutionary scenery," from his education in Germany through the development of the Modern Synthesis to the discoveries of molecular biology. "[E]volutionary biology is an endless frontier," he concludes, "and there is still plenty to be discovered." NCSE is pleased to join its voice to the chorus of those around the world who are wishing him a very happy birthday. Others to celebrate the occasion included the historian Edward J Larson, who dedicated his new book *Evolution: The Remarkable History of A Scientific Theory* (New York: Modern Library, 2004) to Mayr; the science journalist Keay Davidson, writing in the *San Francisco Chronicle* (2004 Jul 5; available on-line at <http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2004/07/05/MNGFV7GBAS1.DTL>); the journal *Naturwissenschaften*, which devoted a special issue to evolution in Mayr's honor (2004; 91: 6); and *Scientific American*, which published a long interview of him by Steve Mirsky, Claudio Angelo, and Marcelo Leite on its web site (available on-line at <http://www.sciam.com/article.cfm?chanID=sa004&articleID=00004D8E1-1778C-10EB-978C83414B7F012C>). Mayr's influence was even acknowledged, if backhandedly, by creationists; the young-earth creationist ministry Answers in Genesis offered a discussion on its web site with the title "*Still* fighting God!" (<http://www.answersingenesis.org/docs2004/0709fighting.asp>).

With the Reverend Barbara A Pursey and Derek L Pursey, **Wesley McCoy** led a week-long discussion during July 2004 on "God and the new biology: Discovering God in the age of Darwin and DNA" at Ghost Ranch, an education and retreat center of the Presbyterian Church (USA) in Abiquiu, New

Mexico. McCoy teaches science at North Cobb High School in Kennesaw, Georgia.

Douglas W Mock's *More than Kin and Less than Kind: The Evolution of Family Conflict* (Cambridge [MA]: Harvard University Press, 2004) was published. The publisher writes, "Blending natural history and theoretical biology, Mock shows how Hamilton's rule illuminates the study of family strife by throwing a spotlight on the two powerful forces — cooperation and competition — that shape all interaction in the family arena. In *More Than Kin and Less Than Kind*, he offers a rare perspective on the family as testing ground for the evolutionary limits of selfishness. When budgets are tight, close kin are often deadly rivals." Mock is Professor in the Department of Zoology at the University of Oklahoma.

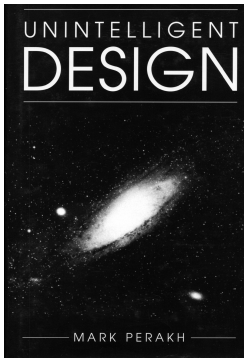
Randy Moore's latest editorial in *The American Biology Teacher* (2004 Feb; 66 [2]: 85–7), entitled "The dark side of creationism", discusses "a lesser known and much darker side" of creationism: "its longstanding links with racism." Acknowledging that "[r]acism has never needed much of an excuse" and that "neither creationism nor evolution is inherently racist," Moore documents that "some creationist[s] and creationist organizations have been (and remain) racist." Moore also contributed "State standards and evolution" to *The Science Teacher* (2004 Summer; 71 [6]: 41–4), in which he investigates whether science education in Minnesota's high schools reflects the emphasis on evolution in the state science standards, concluding that "little relationship exists between what is mandated by Minnesota's state educational standards and what is actually being taught (or not taught) in its science classrooms." In addition to serving as the editor of *The American Biology Teacher*, Moore is Professor of Biology at the University of Minnesota. He wrote on "Racism and the public's perception of evolution" in *RNCSE* 2002 May/Jun; 22 (3): 16–8, 23–5.

According to a press release from NASA, the American Astronomical Society's Division for Planetary Sciences (DPS) has awarded its 2004 Carl Sagan Medal to NASA scientist **David Morrison**. The Sagan Medal is awarded annually by the DPS, the world's largest organization of planetary scientists, to an active member researcher for long-term excellence in communicating planetary science to the public. Throughout his distinguished science career — as an expert on solar system small bodies and an as investigator for numerous spacecraft missions, including Voyager and Galileo — Morrison has enthusiastically dedicated himself to sharing the excitement of planetary exploration with the public. He received the award at the organization's annual meeting held November 8–12, 2004, in Louisville, Kentucky. Currently the senior scientist for the NASA Astrobiology Institute, Morrison recently contributed a pair of articles on astrobiology to *RNCSE* (2003 May–Aug; 23 [3–4]: 15–9 and 34–8).

David Morrison

Antonio B Nafaratte was named runner-up in *Skeptical Brief*'s "Citizen Sane" contest, which honors people who write effective letters to the editor "to defend reason and clear thinking against the constant assault of pseudoscience and other nonsense currently at work in our society (*Skeptical Briefs* 2004 Jun; 14 [2]: 6, 10). *Skeptical Briefs* is a quarterly newsletter of the Committee for the Scientific Investigation Claims of the Paranormal. In the letter for which Nafaratte was honored, he argued that "although continuous refinements are added almost daily to Darwin's idea, the fundamental structure remains in place and it is currently a basic tenet of modern biology" (*Lincoln* [California] *News Messenger* 2003 Oct 23). Of interest in the same issue is **Victor J Stenger**'s "The evolution of creationism" (12–3), which briefly outlines the modern anti-evolutionist movement, including young-earth creationism, "intelligent design", and attempts to undermine evolution education in the name of critical thinking.

Mark Perakh's book *Unintelligent Design* (Buffalo [NY]: Prometheus Books, 2004) was reviewed in *Skeptical Inquirer* (2004 Jul/Aug; 28 [4]: 53–5) by **Matt Young**, who wrote that it "is a well-designed book; Perakh has taken aim at a dozen or more targets, not the least of which is [William] Dembski, and skewered them all." Young concentrates on Perakh's critique of Dembski, Michael Behe, and Phillip Johnson, but takes time also to mention his animadversions on "primitive" (or literalist) creationists and his thoughts about scientific method, ending, "his main concern in this book is to refute the faulty arguments of creationists ... I have only minor reservations in claiming that he has done exactly what he has set out to do." Of interest in the same issue of *Skeptical Inquirer* are Massimo Polidoro's "Down with Darwin!" (18–9; a discussion of the recent creationist episode in Italy [see *RNCSE* 2004 Mar/Apr; 24 (2): 12–3]) and Robert Carroll's "Pranks, frauds, and hoaxes from around the world" (41–6; examples include the Objective Ministries Creation Science Fair at <http://objective.jesussave.us/creationsciencefair.html> and the Ica stones).



Mark Perakh's book *Unintelligent Design* (Buffalo [NY]: Prometheus Books, 2004) was also reviewed in *Skeptic* (2004; 11 [1]: 75–8) by **Paul R Gross**, who wrote, "As a whole, the book is a skeptic's feast of high class science-piffle, and the patient debunking thereof." Like Young in his *Skeptical Inquirer* review, Gross concentrates on Perakh's critique of "intelligent design". Of

interest in the same issue of *Skeptic* are L Kirk Hagen and Lisa Morano's "The Texas textbook wars" (18–20), several letters responding to **Eugenie C Scott's** "The creation–evolution continuum" and other articles about creationism in the previous issue (29–32), and William Harwood's review of Richard Dawkins's *A Devil's Chaplain* (78–80; Dawkins's book was also reviewed by **Michael Ruse** in *RNCSE* 2004 Mar/Apr; 24 [2]: 38–9).

NCSE Executive Director **Eugenie C Scott**'s article "The creation–evolution continuum" (*RNCSE* 1999 Aug/Sep; 19 [4]: 16–7, 21–3) was reprinted, with revisions and a new preface, in *Skeptic* (2004; 10 [4]: 48–54), the quarterly publication of the Skeptics Society. In the preface, *Skeptic*'s editor Michael Shermer described Scott as "the world's leading expert" on dealing with religiously motivated opposition to evolution education. Also of interest in the same issue of *Skeptic* are Brandon Muller's "New 'isn't round' theory demands equal time" (a parody of equal-time-for-creationism campaigns; 10), **William Stansfield**'s "Hamlet revisited: How evolution really works" (a discussion of typing-monkey metaphors for evolution; 16–8), several letters to the editor about previous articles on creationism (21–2; see "News from the membership" in *RNCSE* 2004 Jan/Feb; 24 [1]: 10–15), **Jeffrey Shallit**'s review of Armand M Nicholi Jr's *The Question of God* (78–80), Massimo Pigliucci's review of Iris Fry's *The Emergence of Life on Earth* (80–1; Fry's book was also reviewed by **Paul R Gross** in *RNCSE* 2003 May–Sep; 23 [3–4]: 46), and **Norman Levitt**'s review of *From Complexity to Life*, edited by Niels Henrik Gregersen (83–8).

Eugenie C. Scott

Writing in *Trends in Ecology and Evolution* (2004 Mar; 19 [3]: 116–7), NCSE Executive Director **Eugenie C Scott** and Deputy Director **Glenn Branch** responded to two published comments on their "Evolution: What's wrong with 'teaching the controversy'" (*TREE* 2003 Oct; 18 [10]: 409–502). Replying to Tom A Langen (*TREE* 2004 Mar; 19 [3]: 114–5), who suggested a different reason to "teach the controversy", they wrote, "Langen is not 'teaching the controversy' in the sense in which we use the phrase: he is not telling his students that evolution is scientifically controversial. Rather, he is teaching about anti-evolutionism in the service of clarifying the nature of science (a worthy goal)." They also replied at length to Stephen C Meyer of the Discovery Institute's Center for Science and Culture (*TREE* 2004 Mar; 19 [3]: 115–6), concluding, "Such systematic misrepresentation of the scientific literature [as Jonathan Wells's in *Icons of Evolution*] characterized the recent criticism by the CSC of the treatment of evolution in biology textbooks in Texas, where scientists and educators recognized it as a manifestation of what is, in spite of Meyer's protestations to the contrary, anti-evolutionism." Copies of both the response and the original article are available from the NCSE office.

Niall Shanks's *God, the Devil, and Darwin: A Critique of Intelligent Design Theory* (New York: Oxford University Press, 2004) and **Barbara Forrest** and **Paul R Gross**'s *Creationism's Trojan Horse: The Wedge of Intelligent Design* (New York: Oxford University Press, 2004) both received favorable reviews in *Science* (2004 May 7; 304: 825–6). In his perceptive review of these two books along with the "intelligent design" anthology *Darwinism, Design, and Public Education* (East Lansing [MI]: Michigan State University Press, 2004), Steve Olson noted that "studying 'intelligent design' hypotheses can be frustrating because they seem so obviously inspired by nonscientific considerations. When rebutted, 'intelligent design' theories tend to ignore the objections, claim that all will be revealed in the future, or [they] rework their arguments to draw the same conclusions in a slightly different way." Olson said that Shanks "deftly skewers the scientific pretensions of 'intelligent design' creationists" and praised Forrest and Gross for thoroughly describing and meticulously documenting their motivations and strategies, warning that "creationism appears again to be in a period of ascendancy."

William D Stansfield and Matthew A Carlton's article "Bayesian statistics for biological data: Pedigree analysis" was published in *The American Biology Teacher* (2004 Mar; 66 [3]: 177–82). In it, they seek to "underscore the importance of Bayes' formula in pedigree analysis and a wide range of other biological applications" as well as to illustrate the potential divergence between the results of Bayesian and non-Bayesian methods. Stansfield is Professor Emeritus of Biology at California Polytechnic State University and the author of *Death of a Rat* (Amherst [NY]: Prometheus Books, 2000; reviewed in *RNCSE* 2001 May–Aug; 21 [3–4]: 38–9).

Victor J Stenger's *Has Science Found God?* (Amherst [NY]: Prometheus Books, 2003) received favorable reviews in *Free Inquiry* (2004 Apr/May; 23 [4]: 53–4) and *Perspectives on Science and Christian Faith* (2004 Mar; 56 [1]: 64, 66). In the former, William Harwood comments, "*Has Science Found God?* makes clear that 'Intelligent Design' is a fraudulent attempt to pass off a religious hypothesis as science"; in the latter, Gary De Boer says, "This book gives an excellent overview of the physical science based arguments for the existence of God." Stenger is Professor Emeritus of Physics and Astronomy at the University of Hawai'i, Adjunct Professor of Philosophy at the University of Colorado, and president of Colorado Citizens for Science (<http://www.coloradocfs.org/>).

Joan E Strassmann, Professor of Ecology and Evolutionary Biology at Rice University, received a fellowship for 2004 from the John Simon Guggenheim Memorial Foundation in order to research a

microbial model for the genetics and evolution of social interactions. According to a press release from the foundation, "Guggenheim Fellows are appointed on the basis of distinguished achievement in the past and exceptional promise for future accomplishment."

John M Suarez contributed "The path to theocracy: The purgation of the First Amendment" to Kimberly Blaker's anthology *The Fundamentals of Extremism: The Christian Right in America* (New Boston [MI]: New Boston Books, 2003). Suarez argues that the First Amendment, "the most powerful remedy against the establishment of a theocracy", is under siege by the radical religious right; "the current intense tendency to bypass or nullify the First Amendment may," he warns, "outweigh in effort and enthusiasm the commitment among the rest of us to preserve it." He also devotes a paragraph to the judicial history of evolution, which "models the nature of the conflict between the First Amendment and fundamental[ist] Christianity." Suarez, a lifetime member of NCSE, is also on the Board of Trustees of Americans United for Separation of Church and State.

Rapture of the Deep: The Art of Ray Troll, with an introduction by Brad Matsen and commentary by **Ray Troll** himself, was published by the University of California Press in September 2004. "For more than two decades," writes the publisher, "Ray Troll has been luring, hooking, and landing fans around the world with his zany, irreverent, and often surreal art. ... *Rapture of the Deep* contains some of Troll's best-known art along with many images never before published. The book makes powerful connections between biological diversity, the evolution of life on earth, and the careless habits of people." And of course Troll's delightful illustrations ornament every issue of *RNCSE*.

At the National Science Teachers Association national meeting in Atlanta in early April 2004, **William J Tucci** was elected as president-elect of the Council of State Science Supervisors, a professional organization composed of science education specialists who serve at the state, territorial, or the protectorate educational agency in the United States and US Territories. Tucci works for the North Carolina Department of Public Instruction.

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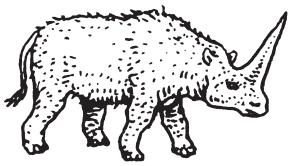

The NCSE Board of Directors and staff would like to acknowledge and extend their warm gratitude to all individuals, organizations, and firms that donated to NCSE. We also extend special thanks for their much-appreciated support to the following people who donated $100 or more between July and December 2003 (* indicates an NCSE board member or supporter).

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Memorials

Dudley & Marion Bolyard, Lawrence G Davis, Neil F Dunbar, Steven M Goolsby, Duncan O'Brien, Catherine H Petros, Margaret A Reidy, Catharine P Rhodes, Mary B Rushing, Charles L Severy, and John & Phyllis Zumwinkel, in memory of John F "Jack" Rathbone

Joan E Borden, in honor of her loving mother, Adele Borden

Glenn Branch, in honor of Ronald and Susan Branch's fortieth wedding anniversary

Anne E Jacobs, in memory of Walter Sinclair

Anne Neuenschwander and the Potts family, in memory of William Meikle

David Wake, in memory of his father Thomas G Wake

Leslie Wilbur, in memory of Norma Wilbur

Is there two-way traffic on the bridge? Why "intelligent design" is not fruitful theologically

Phina Borgeson, Faith Network Project Director, NCSE

In "Why NCSE should be involved in the science–religion dialog" (Borgeson 2002), I offered some reasons for NCSE's decision to participate in this arena. There is a good deal of ferment in science–theology conversations today, and, interestingly, less emphasis on physics and more on biology. Indeed, there is increasing interest among theologians in complex systems, emergent features, and the evolutionary sciences, as reflected by many recent books in the field (such as Barbour 2002 and Peters and Hewlett 2003). At a recent symposium honoring him on his 80th birthday, Ian Barbour, *de facto* dean of the dialog in the United States, called for the continuation of this shift in emphasis.

Where does the "intelligent design" movement fit in the dialog? Representatives of the movement, most often William A Dembski, are from time to time invited to the table with scientists and academic theologians. Dembski subtitled his 1999 volume "The bridge between science and theology." But is "intelligent design" the bridge? Or is it just muddying the waters?

NCSE members are well informed on the scientific objections to "intelligent design". Many may not be aware that a number of scholars and religious leaders have raised theological objections, too. Here is a brief review of some of those points. I offer it in the hope that it will be helpful especially to our supporters and activists who are people of faith, and to other grassroots organizers who have asked for approaches that can counter "intelligent design" theologically.

Dembski has said on more than one occasion (2001; 2003) that "intelligent design" is theologically minimalist. Yet the literature of the "intelligent design" movement is laced with theological allusions, and its big tent has hosted many a religious revival. While one wants to believe the openness and modesty of Dembski's assertion, it is hard to do so given the religious orientation of the publishers of much of the movement's literature (InterVarsity Press leads the pack; others include Harvest House Publishers, Broadman and Holman, Ignatius Press, and Brazos Press, a member of Baker Publishing Group). At the IDEA conference held at the University of San Francisco in September 2002 (Branch 2002), several speakers seemed to assume a conservative Christian worldview among their audience, and one workshop leader, Cornelius Hunter, began his session with prayer. So, while explicit theological propositions may be rare in the "intelligent design" movement, implicit assumptions about the worldviews and pieties of those who are attracted to it abound.

Natural theology or Theology of Nature

Perhaps the first question theologians ask of "intelligent design" might be, "Is this Paley's natural theology in new clothes?" Many Christian theologians today would follow Barbour in finding greater integrity in a "theology of nature" approach than in natural theology. The distinction is that a theology of nature starts from a particular faith perspective, and then enters into dialog with what we know about nature through the sciences, rather than developing arguments for the existence of God from nature. When people of faith begin with an understanding of divine revelation from their scriptures and tradition, and then bring that into dialog with science, they are constructing a theology of nature. Not all theologies of nature are equally appealing to all people of faith; in fact, they can be quite narrow. For example, when an Answers in Genesis speaker exhorts his audience to "Start your thinking from the Bible!" he is building a theology of nature.

Perhaps some members of faith communities still think that natural theology has its place, since it starts with an experience of nature common to all people. But the question then becomes, from what aspects of nature is one developing one's apologetic? Is it from the artifacts and appearances of nature, or from its undergirding processes and propensities? At the 2003 Ecumenical Round Table on Science, Technology, and the Church, Kendall Harmon, a conservative Anglican theologian, pointed out just how seductive "intelligent design" is. People perceive design in nature, and then find it very easy to jump to the conclusion, "God must have made it." When we perceive great beauty in nature, or an apparently cunning adaptation, our awe may be stopped short in just this way. Most of the theologians of evolution, though, suggest that we need to look to a deeper level for the truly awe-inspiring. In their view, it is the freedom God gives creation which inspires an awe that can be sustained. It is the providence undergirding the billions of

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years of evolving life that leads to a faith that is not shaken when we know the scientific explanations as well (for examples, see Edwards 1999; Haught 2003; Peacocke 2001). "Intelligent design", on the other hand, seems to ask us to look at the details we cannot now explain, rather than to the sweeping story of which our understanding continues to grow.

View of Creation

This leads me to another objection to "intelligent design" raised by theologians of evolution. "Intelligent design" seems to close off the future unfolding of life and our understanding of it. Those of us who have studied the movement can see how a "god of the gaps" approach fails to stimulate scientific inquiry. But it also fails us in constructing an open and hopeful future of our life with God. Haught points out that God is the ground of novelty, not just order, and the one who "makes all things new", as asserted in both Hebrew and Christian scriptures. In fact, Haught goes so far as to assert that "the central theme in the Bible's vision of God" is that of promise. God reduced to the role of designer cuts off the possibilities of emergent new realities, and ultimately, hope (Haught 2001, 2003).

"Creation" is used in two ways in Christian theology. It is used as roughly synonymous with nature, meaning all that exists because of God's loving it into being. But it also means the ongoing process by which God is continuously creating, sustaining and being present to all that exists, called classically *creatio continua.* Creation is thus not a once-and-for-all done deal, as in deism, nor is it an intermittent activity, as in a little flagellum assembly here, a little clotting cascade tinkering there. The "intelligent designer", then, somehow seems less than the ever-immanent and providential God of Christian theology.

The little we know about God from "intelligent design" is not congruent with an understanding of God that takes Hebrew and Christian scriptures seriously. When we read the pivotal texts and explore the key themes of scripture — in fact, even when we read Genesis 1–3 — looking for metaphor and deep meaning, not empirical science, we find little or no emphasis on a God who is designer and artificer. Instead, when we read the scriptures as a whole, we find a God who is first and foremost relational, that is, a loving God.

In Christian scripture, the central way in which God is related to his creation is, of course, through Christ's redemption of the suffering of the world. Out of this emerges a theodicy that embraces as the price of the freedom God has bestowed on creation what we often read as the cruelty and caprice of nature. A *designer* God, though, must also be the designer of pain and death. In theological terms, "intelligent design" offers no articulation of how salvation is accomplished and constructs a God that is hard to square with the God who is steadfast love and suffering servant. George Murphy, working within his Lutheran tradition, has placed much emphasis on a theology of the cross as central to an understanding of God's interaction with creation (Murphy 2002, 2003). Jürgen Moltmann stresses God's suffering with God's people, drawing on the Hebrew concept of *shekinah* and the kabbalistic concept of *zimzum* along with the Christian understanding of the *kenosis* (self-emptying) of God (Moltmann 2001). WH Vanstone pointed out in prose and hymn that the image of God as a creator, omnipotently, serenely, and detachedly presiding, then occasionally condescending to manipulate things to his will, is totally incongruent with what Christians know in the divine self-emptying of Christ (Vanstone 1977).

William Dembski has said that "intelligent design" is not a doctrine of creation, and we can agree with him. Yet "intelligent design" remains attractive to many believers. This can be attributed in part to the continuing polarization of science and faith in much of the media. But the appeal of "intelligent design" may also be attributed to its resonance with a theology of creation, persistent in favorite hymns, liturgical texts, and popular piety, where images and concepts remain untouched by the last century and a half of scientific discovery. So those of us who work in academic and popular theology can thank "intelligent design" for a great stimulus to do *our* work — developing a contemporary theology of creation — while we also recognize that "intelligent design" has offered little of substance to the science–theology dialog.

Instead, it has, in its equating of methodological naturalism with philosophical naturalism, and its recycling of a god of the gaps, attempted to colonize science with religion. It seems that the bridge has been hastily constructed for purposes of invasion, not to sustain the two-way traffic of an enduring dialog. A true dialog (Bohm 1996) allows each party to retain its integrity, while making its assumptions transparent to the others. Clearly this has not happened with "intelligent design". A constructive theology of evolution, or, as members of some faith communities might call it, an evolutionary understanding of creation, requires that science be itself, bring its best work to the dialog. Only good science, methodologically natural science, will offer a theology of nature the freedom it needs to express its own truths. As Robert J Russell, the founder and director of the Center for Theology and the Natural Sciences in Berkeley, California, commented in a response to Dembski (2003), "I don't need to change biology to make it fit my theology."

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MYTH:
Baptists are Scientific Creationists

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Current literature promoted by the Southern Baptist Convention (SBC) endorses the "scientific creationism" (belief in a literal 6-day creation and a "young earth" that is just several thousand years old; an example is LCR 2002). Nothing in these materials indicates that there are Baptists who do not believe these views. Therefore, it would be easy for people in churches using these materials to assume that believing these views is part of being Baptist.

PROPONENTS OF SCIENTIFIC CREATIONISM

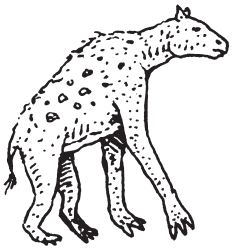
Most of the prominent proponents of scientific creationism are Baptists. While the Seventh-Day Adventist George McCready Price originally developed in the early 20th century the flood-geology theory that today defines scientific creationism (Numbers 1992: xi), highly visible promoters of Price's theory are Baptists. Henry M Morris, who along with John C Whitcomb Jr wrote *The Genesis Flood*, is credited with the resurgence of Price's views in the 1960s. At the time, Morris was a professor at Virginia Tech in Blacksburg, Virginia, and a member of the Blacksburg Baptist Church where he was active as a teacher (Numbers 1992: 211–2).

By 1970, Morris was in San Diego, California, having been invited by Tim F LaHaye, pastor of the Scott Memorial Baptist Church, to be on the faculty of the Christian Heritage College. LaHaye had founded the college to teach scientific creationism and establish the Creation Science Research Center (CSRC). In 1972, the CSRC split and Morris reorganized his research center as the Institute for Creation Research (ICR). This institute has issued textbooks for high school teachers, offered "expert witnesses" in court cases, and sent scientists to various universities to debate against evolution. Not only are many of the scientists involved with Morris from the Baptist tradition, but Baptist churches and colleges are the network through which ICR's work has spread and achieved prominence (Numbers 1992: 232–90).

A BAPTIST DISTINCTIVE?

Nevertheless, scientific creationism is certainly not a mark of Baptist identity. Many non-Baptists hold this view while many Baptists reject it. No denomination has adopted this view as a fundamental of the faith even though denominational institutions such as Liberty University and Christian Heritage College require it (Numbers 1992: 314). Using Southern Baptists as an example, there is historical precedent why this is so.

In the 1920s, the SBC experienced controversy over the issue of evolution, and fundamentalist leaders attempted to have an anti-evolution statement included in the 1925 Baptist Faith and Message. Southern Baptists defeated that motion but not because the majority of Baptists at the convention in Memphis believed in evolution. They defeated it because they did not believe that scientific theo-



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ry had a place in a confession of faith (CBFM 1925: 12). EY Mullins, president of the Southern Baptist Theological Seminary and chairman of the committee, stressed that none of the committee believed in evolution, but neither did they want a statement on science in a statement of faith. The committee did not accept science as the arbiter of ultimate truth, nor did they want to give scientists the right to pass judgment on the truth of religion (*Religious Herald* 1925: 11, 22–3).

In 1926, the year after the adoption of the Baptist Faith and Message, the SBC adopted the "McDaniel Statement". It said, "This convention accepts Genesis as teaching that man was the special creation of God, and rejects every theory, evolution or other, which teaches that man originated in, or came by way of, a lower animal ancestry." This was followed by the "Tull Resolution", which imposed the McDaniel Statement on all SBC agencies. Southern Baptists never gave the McDaniel Statement or the Tull Resolution any doctrinal weight. However, the issue of science as final arbiter of truth raised earlier is still part of the current discussion.

Baptist distinctives should preclude adopting a uniform theory about creation. Christopher Toumey studied creation scientists in North Carolina and particularly questioned why, with the number of Baptists involved in creation science and the dominance of Baptists in that state, teaching creation science never became law in North Carolina. His study noted three characteristics of Baptists that were the "critical mechanisms that prevented factions of Baptists from converting their moral sentiments into enforceable policies": (1) the autonomy of the local church, (2) the practice of reaching decisions by consensus, and (3) the principle of separation of church and state. So far, the courts and legislatures have defined scientific creationism as a religious belief rather than a science (Toumey 1994: 193–5).

The influence of geography

Geography also contributes to the fact that Baptists have not made creation science part of their belief system. In California, Arkansas, and Louisiana, where there has been a great deal of activity regarding creation science in the legislatures and courts, Baptists are more aware of the debate, even if not uniform in their stance. In Virginia and North Carolina, though, Baptists have paid minimal attention to the issue. In the 1980s, the Virginia and North Carolina Baptist state papers paid much more attention to the takeover of the Southern Baptist Convention than to scientific creationism and evolution. RG Puckett, then editor of the *Biblical Recorder*, said scientific creationism was not of significant interest to the majority of North Carolina Baptist readers.

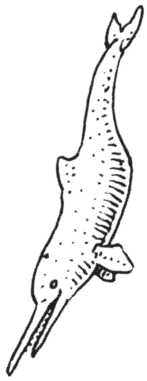
From 1974 to 1989, the *Religious Herald* in Virginia had no editorials on scientific creationism and no evidence from legislative reports that a law advocating the teaching of scientific creationism was before the Virginia legislature. Five brief articles reproduced from other state papers about what was going on in those states did deal with scientific creationism. Baptists in Virginia have not been guided to a uniform understanding of creation by the state Baptist paper. Where one lives as a Baptist clearly affects one's exposure to scientific creationism.

Only one view?

In addition to Baptist distinctives and geography, division among scientific creationists also prevents scientific creationism from being the only view espoused by Bible-believing Christians. Furthermore, scientific creationists are split between those who understand the Bible to be the basis of their belief, the criterion for truth in every arena of life including science, and those who believe creationism is science that can be proven without ever bringing the Bible into it (Numbers 1992: 242–3, 285). As Toumey pointed out, those who believe science makes the Bible more credible inadvertently risk making "the Bible answer to secular scientific standards" and minimizing God's role (Numbers 1992: 242; Toumey 1994: 8, 259). This risk led to the split between Whitcomb and Morris and still makes many Christians uncomfortable with "scientific" creationism.

Of course, many Baptists define themselves as creationists. They believe God created the world, but they do not agree on the plethora of available explanations as to how God did this or how to reconcile scientific data with the biblical record. Nor do they believe that it is necessary for one theory to be the biblical theory, since theories come and go, and they stand firm on the affirmation, "In the beginning, God ...."

That there is a uniformity about Baptists' beliefs and creationism is surely a myth. Many Baptists are scientific creationists. However, many people who are not Baptists are also scientific creationists, while many Baptists will never subscribe to this view. Many Baptists, regardless of what kind of creationists they are, will never believe that it is right for either church or state to coerce uniform belief in any scientific theory. Baptists are guided by the belief in the freedom to follow voluntarily to the best of one's ability the God who continues to reveal himself. This belief is more at the heart of being Baptist than is the acceptance or rejection of any scientific theory.



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"New" Creationists Try an End Run on Science

Peter McKnight

Creationism ain't what it used to be, but it still ain't a scientific theory.

In the beginning, creationists relied on the biblical account of creation. So they argued that everything was created in six days, and that the earth is about 6 000 years old.

However, science suggested that the earth is much older, so creationism evolved into the misnamed "creation science", and then, with the publication of Phillip Johnson's *Darwin on Trial* in 1991, it evolved into its currently accepted form — "intelligent design" (ID).

Unlike traditional creationism — now called "young-earth creationism" — IDers claim their beliefs are based in science rather than in the Bible. And, indeed, many IDers have scientific qualifications.

Yet despite its proponents' qualifications, ID has itself failed to gain any scientific credentials. To see this, we need only look at the work of Johnson and other leading lights of ID, including mathematician–philosopher William Dembski, biochemist Michael Behe, and biologist (and Moonie) Jonathan Wells.

Essentially, the IDers argue that the complexity and design in nature reveal that there must be an intelligent designer.

While IDers dress up the theory with scientific language and with examples from mathematics and microbiology, it is not substantially different from the one propounded by William Paley in *Natural Theology* in 1802 (a book which influenced a young Charles Darwin). In fact, ID is remarkably similar to the centuries-old "teleological" argument — the argument from design — for the existence of God.

As such, it's vulnerable to all of the criticisms that have been directed at Paley and at the old theological theory. Most obviously, IDers fail to explain who designed the designer, though some suggest the designer is self-designing (which, curiously, is the "cosmological" argument for the existence of God — God "caused" the universe, but is Himself an uncaused cause).

That, of course, is a patently untestable, and therefore unscientific, theory. But even if we leave that aside, how do we test the general theory of ID? Frankly, we do not — the theory makes few predictions because IDers never tell us who the designer is (it could be God or an alien intelligence), what role the designer plays, or when he plays it.

Consistent with the unscientific nature of their theory, IDers rarely conduct empirical studies, and they have not published a single research paper in a peer-reviewed journal.

Instead, their "research" consists of promoting their theory through popular books rather than scientific studies, and in attempting to convince the public, rather than scientists, of the merit of ID.

All of this reveals that ID is a political movement and a philosophical, rather than a scientific, theory. But do not take it from me. Take it from ID "godfather" Phillip Johnson, who admitted that, "This is not really, and never has been, a debate about science. It's about religion and philosophy." Precisely.

There is nothing wrong with philosophical theories, of course, but it is wrong to claim a philosophical theory is scientific — particularly when the theory dismisses contrary scientific evidence — because it harms both science and philosophy (and faith).

And faith is at the root of this, whether IDers admit it or not. Many IDers consider evolution necessarily atheistic and cast evolutionists as fire-breathing atheists, so if evolution is confirmed, they believe all is lost.

Yet there is no reason why one cannot embrace both evolution and a theistic philosophy. Brown University cell biologist Kenneth Miller, who is both a devout Christian and a staunch defender of evolution, argued exactly that in his superb book, *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution*.

Essentially, a theistic evolutionism leaves evolution to science, but employs philosophy to explain matters that are beyond science — metaphysical matters — such as the existence of God.

As such, theistic evolutionism, like ID, has no place in science classrooms. Unlike ID, it is an intellectually defensible theory that recognizes where science ends and faith begins, and, in so doing, serves to strengthen both.

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SEVENTH-DAY ADVENTISTS REAFFIRM CREATIONISM

At its annual council meeting in October 2004, the Seventh-Day Adventist Church reaffirmed its stand "that the seven days of the Creation account were literal 24-hours days forming a week identical in time to what we now experience as a week; and that the Flood was global in nature," according to a Religion News Service story dated October 23.

Americans for Religious Liberty

John R Cole

While NCSE is the only national organization specifically dedicated to confronting the opponents of sound science education (which often equates with opposition to creationists and work on church–state separation issues), other organizations are sometimes allies. Scientific and educational associations are obvious examples, and then there are the groups such as the American Civil Liberties Union that advocate church–state separation but are neutral on the issue of good science. Somewhat more partisan groups that are well-known from the national news are People for the American Way and Americans United for Separation of Church and State. A smaller group also deserves attention: Americans for Religious Liberty (ARL). ARL has been involved in court cases, including the famous *Edwards v Aguillard* case, in which it provided impetus for the Nobel Prize winners' *amicus* brief. Research has been the ARL forte, which sometimes leaves it out of the public eye, so the purpose of this note is to introduce this organization to *RNCSE* readers.

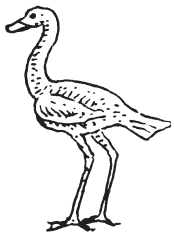
ARL has produced a "Statement of Principles" that outlines the group's position on and approach to religious expression in our society:

> We believe in the unique American principle of separation of church and state and the philosophy of Thomas Jefferson and James Madison that gave birth to this tradition.
>
> We believe that federal and state governments should be religiously neutral, guaranteeing equal freedom to the religious and the non-religious.
>
> We believe in the free and religiously neutral system of public education which protects the integrity of science and free inquiry and also provides for moral instruction to foster respect for the rights and dignity of all persons in our society.
>
> We believe in the free exercise of conscience and religion, restraining persons from such exercise only when they harm others or the public welfare. We oppose any effort to place any ethnic, racial, religious, sex or age limitation on the enjoyment of rights or equal treatment.
>
> In a world where many voices of extremism seek to subvert freedom, we need to be voices of reason and to rally to its support.

In February 2002, the ARL Board adopted its mission statement:

> The Mission of Americans For Religious Liberty is to defend the core constitutional principle of separation of church and state and, in so doing, help to preserve our nation's historic tradition of religious, intellectual, and moral freedom in a secular state. Providing a public voice for those who support these aims, and in cooperation with like-minded organizations and individuals, Americans For Religious Liberty pursues its mission through research, education, advocacy, and publishing.

ARL has long been headed by Edd Doerr, who remains its principal spokesman and editor of *Voices for Reason*, the ARL newsletter. The organization was formed by the merger of Voice of Reason (led by Rabbi Sherwin Wine) and Ed Erickson's Center for Moral Democracy in 1982. Since then, it has attempted to build coalitions of and bridges between religious and secular organizations and people, says Doerr. The ARL newsletter and books are published from a Maryland address: ARL, PO Box 6656, Silver Spring MD 20916 (e-mail Doerr at arlinc@erols.com). ARL's website is found at <http://www.arlinc.org>.



RESOURCE: CTNS'S JOURNAL THEOLOGY AND SCIENCE

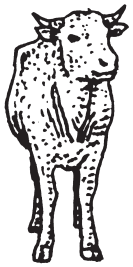
The Center for Theology and the Natural Sciences (CTNS), part of the Graduate Theological Union in Berkeley, California, publishes the peer-reviewed journal *Theology and Science*. The premiere issue in April 2003 featured articles by Francisco Ayala, John Polkinghorne, Ted Peters, Nancey Murphy, Philip Hefner, and Willem Drees. The senior editors are Robert John Russell, Founder and Director of CTNS, and Ted Peters, President of Pacific Lutheran Theological Seminary. Subscriptions to both the print and the electronic versions are available to CTNS members. Contact the CTNS Office for details (<http://www.ctns.org>).

John R Cole is a contributing editor to RNCSE, *former editor of* Creation/Evolution *and* NCSE Reports, *and a member of the NCSE board of directors.*

Evolution in Mexico

Antonio Lazcano, Universidad Nacional Autónoma de México

I am frequently asked by American colleagues if I have faced problems due to my work on the origin and early evolution of life or when I lecture on these subjects in a Catholic country such as Mexico. In fact, in more than 25 years of doing so, only twice I have encountered opposition from individuals and groups that objected to an evolutionary description of the appearance of life in favor of the Genesis account. In both cases, they were led by American preachers visiting Mexico! Readers may wonder why this is the case, and I suspect that the answer lies in the history of the doctrinal divisions within Christianity that may have their own origins in the Protestant Reformation early in the 16th century.



Thomas H Huxley wrote in 1843 in the preface of his book *Science and Hebrew Tradition,*

> For more than a thousand years the great majority of the most highly civilized and instructed nations in the world have confidently believed and passionately maintained that certain writings, which they entitle sacred, occupy a unique position in literature, in that they possess an authority, different in kind, and immeasurably superior in weight, to that of all other books. Age after age, they have held it to be an indisputable truth that, whoever may be the ostensible writers of the Jewish, Christian, and Mahometan scriptures, God Himself is their real author; and, since in their conception of the attributes of the Deity excludes the possibility of error and — at least in relation to this particular matter — of deception, they have drawn the logical conclusion that the denier of the accuracy of any statement, the questioner of the binding force of any command, to be found in these documents is not merely a fool, but a blasphemer. From the point of view of mere reason he grossly blunders; from that of religion he grievously sins.

What Huxley wrote in the 19th century still holds true: literalism is found in every contemporary society. In no place, however, is this more evident than in the United States, though such attitudes are also found in Australia, England, and in the Islamic world (Numbers 1998). Among Roman Catholic churchgoers, the more conservative may oppose scientific models of the emergence and evolution of life in favor of beliefs derived from the first two chapters of Genesis. Of course, the idea of a supernatural origin of life is shared by many believers who would subscribe to a literal reading of Genesis, but it is also true that in many Spanish-speaking countries most Roman Catholics follow a tradition that goes back to Augustine of Hippo which views the Bible not as a literal record but as an allegorical depiction of the ways in which divine creation took place.

It is true that the arrival of Darwinism was an unsettling event for many Latin American Catholics (Glick 1972). However, no major controversies developed within Roman Catholicism after the publication of the *Origin of Species,* since Rome, which did not follow the doctrinal imperative of literal reading of biblical texts promoted by many Evangelical Protestant denominations, had much less of a quarrel with Darwin's ideas. With time, the original clash faded into a more-or-less peaceful coexistence between the theories and discoveries of evolutionary biology and the teachings of the Church, consistent with an age-old tradition of the compatibility between science and Roman Catholics that frequently goes unnoticed (Ruse 1997).

Not surprisingly, major attempts by Roman Catholic thinkers to criticize the philosophical tenets of Oparin's hypothesis of an heterotrophic origin of life have been undertaken (Wetter 1958; Schmitt 1968), but even these tend to accept the results of experimental research and the general evolutionary framework, while maintaining a spiritualist stand (see, for instance, Russell and others 1998; Colombo and others 1999). This attitude — which has been prevalent among Vatican theologians, especially since the times of Pius XII — became rather explicit in the famous address to the Pontifical Academy of Sciences in which John Paul II accepted that the theory of evolution is not "a mere hypothesis", but insisted on the supernatural origin of the human soul (Wojtyla 1997). Yet Roman Catholics do not view the premises and developments of evolutionary theory as a potential battleground or as major theological risk. In contrast, the most

important source of conflict between the Catholic hierarchy and contemporary biology lies in the recent developments in genetic manipulation, work on embryos, birth control, and fertility research.

The most aggressive version of contemporary fundamentalist creationism in Latin America is an American phenomenon, where it has been growing in fertile soil. In Mexico, as in much of Latin America, the opposition to evolution does not come from any official position, doctrine, or tenet of faith of Roman Catholicism. Rather, the rise of anti-evolutionism in Mexico and throughout Latin America reflects the success of the missionary efforts of conservative and evangelical Christian groups for whom a literal interpretation of Genesis is necessary because of their prior doctrinal commitment to the sort of literalist interpretation of the Scripture that Huxley described a century and a half ago.

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Presbyterians and evolution

During the 2002 controversy over the Ohio state science standards, the 214th General Assembly of the Presbyterian Church (USA), convening in Columbus, Ohio, approved a resolution on evolution reading as follows:

> The 214th General Assembly of the Presbyterian Church (USA):
>
> 1. Reaffirms that God is Creator, in accordance with the witness of Scripture and The Reformed Confessions.
>
> 2. Reaffirms that there is no contradiction between an evolutionary theory of human origins and the doctrine of God as Creator.
>
> 3. Encourages State Boards of Education across the nation to establish standards for science education in public schools based on the most reliable content of scientific knowledge as determined by the scientific community.
>
> 4. Calls upon Presbyterian scientists and science educators to assist congregations, presbyteries, communities, and the public to understand what constitutes reliable scientific knowledge.

In "God vs Darwin" (*Presbyterians Today* 2003 Oct; 93 [8]: 7), Jack Marcum, associate for survey research in the Research Services arm of the Presbyterian Church USA, reports on rank-and-file Presbyterian views on creationism as revealed in a 1998 survey. He comments:

> Most Presbyterians are happy to leave the timing and other details about matters of creation to God, and many accept that scientific accounts of the beginning of the universe and the development of life may accurately describe the divine plan. They become troubled, however, when scientific accounts alone are used to explain why stars, planets and people exist. That is why statements like "The universe began with a huge explosion" or "Human beings ... developed from earlier species of animals" are viewed skeptically by majorities of laypeople and large minorities of clergy.

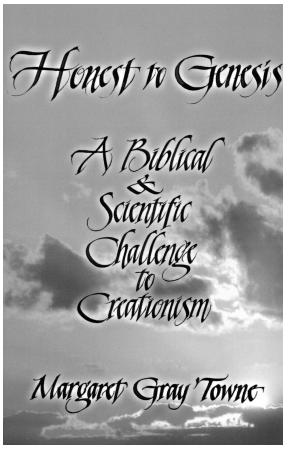
For specific data, see Table 1, as well as the summary report of the 1998 Presbyterian Panel on Science, Technology, and Faith (available on-line at <http://www.pcusa.org/research/panel/pp1198.htm>) and the complete report, *Science, Technology, and Faith: Report of the November 1998 Presbyterian Panel Survey*.

The Presbyterian Church USA is one of the largest denominations in the country, with 11 097 congregations and 2 451 969 members (as of late 2002, according to the PCUSA web site).

Table 1. PCUSA opinions on evolution and creation

	% of pastors agreeing	% of members agreeing
The universe was created by God	99	96
Life is so complex that it has to be the outcome of intelligent design	92	78
God controls the fate of the universe	88	86
Evolution theory is compatible with the idea of God as Creator	85	61

BOOKREVIEWS



Honest to Genesis: A Biblical and Scientific Challenge to Creationism

by Margaret Gray Towne
Baltimore (MD): PublishAmerica, 2003. 381 pages.

Reviewed by
Phina Borgeson, NCSE

When I was ordained in the Episcopal Church, I took the oath of conformity, which says, among other things, "I do believe the Holy Scriptures of the Old and New Testaments to contain all things necessary to salvation." Notice it does not say, as my co-religionist John Polkinghorne has quipped,"all necessary truth about pretty well everything". Margaret Towne is clearly in that middle ground of those who take scripture seriously, but not literally, while valuing knowledge from other sources, most notably science.

Towne, who teaches in the biology and philosophy departments at the University of Nevada at Las Vegas, and is also a devout Presbyterian with a ministry in adult education, is ideally suited to put forth the arguments both for a careful historical–critical reading of Genesis and for the value of an understanding of evolution to a theology of creation.

Her purpose in writing seems to be evangelical, in both the Christian and the general sense. She shows that understanding evolution and a contextual reading of scripture both contribute to a life of faith; that it is important to use mind as well as heart in matters of religion; that openness, humility, and honesty in the face of new ideas are important to both science and faith. Along the way, Towne offers support to Christians who are struggling with evolution–creation issues and validation to those who have always felt that work in science is an honorable Christian vocation.

The volume is written for the "lay" person in both science and biblical studies. Towne defines terms as she goes, explains carefully, and has included a raft of helps in the back of the volume. Among these are a list of creation references in the Bible, an evolutionary time line, and a compendium of quotations, but regrettably neither a general index to the book nor a glossary or index of terms defined in the text. In addition, each chapter has an extensive bibliography. Thus *Honest to Genesis* can be used as a reference book as well as a good read for Christians beginning to approach the creation–evolution dialogue.

Towne's basic purpose is to justify the position of theistic evolution; she remarks,"Religion and science were and are not in conflict. What was and is in conflict is modern science and the prescientific beliefs of the ancient Hebrews" (p 88). She fleshes this out with preliminary chapters on examining one's authorities and developing one's critical thinking skills before launching into lengthy expositions of both knowing about the Bible and understanding evolutionary theory.

In the later chapters, Towne offers many great rejoinders that can be used in countering the claims of creationists. These are laid out topic by topic, contrasting views of creationism and theistic evolution. My favorite puzzler, which I would like to pose to some prominent creationists in US politics today, is, "Those who deny the data of geology with respect to evolutionary theory must explain why these same methods and data are so useful, practical, and accurate when applied to petroleum science" (p 173).

Chapter 10 lays out questions and puzzles for young-earth creationists, including 50 questions to direct to those who subscribe to the idea of a worldwide Noachian flood. As I was finishing up this review, a mural of the ark, with the animals dispersing in refracted rainbow light, was being painted on the wall of the new preschool space at my parish church. I know from years of experience in religious education what a delightful story this is for children, and I rejoiced in the artist's selection of pairs of animals to portray, but I could not get all of Towne's questions out of my mind. How were the kangaroos going to get from the semi-arid Middle East to Australia? And why are there no marsupials in Turkey?

I wish that Towne had said more about problems with "intelligent design", for what she does say is very good indeed. She has also offered some obfuscation prevention in clarifying that the myriad questions about the origin of life are not the same as questioning the truth of evolution. Whatever scientists' research questions or religious beliefs about the origin of life, very few would question evolution *per se*, that is, that living things share a common ancestry.

Towne may be strongest in her central critique of the appropriation of scripture without considering its cultural context(s). She offers the antidote (antiham?) to the Answers in Genesis slogan "I don't interpret the Bible, I read it" by developing an appreciation that truth may be expressed in scripture, but that is not the same as scientific truth. Throughout the book

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she advocates solid education in both the life sciences and theology for those who speak on the dialogue between them.

This book is essentially a witness — a witness to Christian faith by someone who is also conversant with contemporary life science. While I found myself demurring from a few of the theological points, I applaud the basic intention of witnessing to the compatibility of scientific thinking and certain faith in the Christian believer. This volume ought to be on the shelf of every pastor and adult educator in the church who has ever had to answer a question about what Christians accept about evolutionary theory. And my guess is that, given the current cultural climate and aggressive efforts of the various creationist movements, it is not just conservative evangelicals who need to have *Honest to Genesis* at hand. In fact, I would recommend buying two copies, one for reference and sermon preparation, and one to loan to those who come questioning. The volume also provides plenty of material for a study group of adults, young adults, or older teens. Educating youth on these themes is crucial given the peer pressure many Christian young people feel to conform to the tenets of popular fundamentalism.

A bumper sticker current some years back proclaimed, "Jesus came to take away your sin, not your mind." Margaret Towne has lived the truth of this slogan in her life of research, teaching, and especially in the writing of this book. She reveals this most clearly when she says on p 227, "It doesn't seem consistent with God's order and dependability that we should ignore the minds we were given and deny the scientific reality that is before us. To some, to do so is not only irrational and unscholarly, but dishonest. It dishonors the Lord who has blessed us with amazing, questioning minds and commanded us to ask, seek, and knock (Matthew 7: 7–8)."

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God and Evolution: Creation, Evolution and the Bible

by RJ Berry
Vancouver: Regent College Publishing, 2001. 189 pages.

Reviewed by Keith B Miller, Kansas State University

> There is no reason why any thoughtful, religious man should fear evolution, evolution is not an attempt to get rid of God in nature, but an attempt to show how God acts in nature.
>
> — SC Schmucker, in an address to the Pennsylvania State Education Association, December 28, 1927 (Anonymous 2003).

In essence, this book is a modern restatement of the position articulated above. RJ Berry is a British evangelical Christian and Professor of Genetics at the University College of London. Berry has a solid grasp of the wide range of evidence that undergirds evolutionary theory, as well as a well-reasoned orthodox Christian theology. *God and Evolution* was originally written in 1988 in response to the growing "creation science" movement. It was written for the evangelical Christian community and seeks to address the specific concerns of that faith community.

The preface of the book makes passing reference to advances in molecular biology and paleontology since the book was originally published. It also briefly mentions the claims of "intelligent design" advocates and cites critiques by Robert Pennock, Kenneth Miller, Denis Lamoureux, and others. It references a few of the many helpful works by evangelical scientists now available. However, given the recent developments in anti-evolutionary arguments and the many recent works by both scientists and theologians at the interface of religious thought and evolutionary theory, it is disappointing that this is a reprint and not a revised book.

In this small book, Berry attempts to address many of the fundamental issues involved in the popular science/faith discussion of evolution. Individual chapters are devoted to the nature of scientific description, the basics of evolutionary theory, the interpretation of the Bible, relevant doctrinal questions such as the nature of humanity and the origin of sin, an evaluation of "creation science", and a final plea for integration of theological and scientific perspectives.

Berry begins with a critique of "nothing buttery" (a term coined by British neuroscientist Donald MacKay to describe a thoroughgoing reductionism), and a discussion of the idea of multiple internally complete descriptions and multiple types of causation. He stresses that questions exist whose answers lie outside of any conceivable scientific investigation. He thus forcefully argues against a "warfare metaphor" to describe the relationship of evolutionary science and the Christian faith, and presents biological evolution and divine creation as complementary explanations.

In his chapter "The idea of evolution", he gives a very brief overview of the history of ideas about organic change from Plato to the *Origin*. He summarizes the essential elements of Darwin's ideas and the objections raised by Darwin's contemporaries. These objections are countered by the arguments used by Darwin himself, as well as by reference to more modern research. An important omission in this review is a discussion of the history of discovery and interpretation of the fossil record. Given that the fossil record is a common target of anti-evolutionary arguments, this omission is unfortunate. (A clear and entertaining description of how the rock and fossil records were constructed is given in the excellent book *The Meaning of Fossils* by MJS Rudwick [1976].)

In another chapter, Berry covers the subsequent history of evolutionary thought from Darwin through the neo-Darwinian synthesis of the 1940s and up to the advent of punctuated equilibria and cladistics in the 1970s. In

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recounting these developments, Berry does a good job of giving a sense of the internal debates within evolutionary science. In the process, he shows it to be a dynamic and maturing science involving a wide range of disciplines. Berry writes:

> It is this unifying element which apparently makes evolution into something more than a simple scientific theory, and allows such diverse topics as fossil sequences, gene frequency changes and polymorphism, extinctions, adaptation, and so on, to be brought within a single umbrella. There may be disagreement about the interaction or relative importance of particular mechanisms, but there is no viable scientific alternative to Darwinian evolution for understanding nature (p 87–8).

This perspective helps to counter the common anti-evolutionary arguments that see every legitimate scientific dispute as a refutation of evolution.

In two chapters, Berry addresses concerns about the interpretation of Bible texts and specific doctrinal issues. He repeats the nearly universal theological understanding that the creation narratives in Genesis 1–3 must not be read as scientific accounts. They are theodicy, "stating and justifying God's goodness in an evil world" (p 47). He accepts the literary framework interpretation of the Genesis passages as proposed by leading evangelical theologians (such as Blocher 1984). Berry effectively argues that the Bible does not support the view that God's creative activity implies the absence of known or knowable mechanisms. He states, "the most persistent misapprehension about God and creation, however, is that knowledge of causal mechanism automatically excludes any possibility that God is acting in a particular situation" (p 51). The assumption that if evolution is true then God cannot be creator is "nonsense".

As to the origin of humanity, Berry argues that human distinctiveness is spiritual and relational, not anatomical. The "image of God" is not the same as physical form, nor can it be tied to particular mental capacities possessed uniquely by humans. Our creation in the "image of God" is thus not in conflict with an evolutionary origin. Unfortunately, in this discussion, Berry does not convey any real feeling for the abundance and complexity of the human and hominid fossil records.

Probably one of the most critical theological issues is that of the Fall. Particular understandings of this doctrine lie at the foundation of much of the popular resistance to evolutionary science. Referring to evangelical theological scholarship, Berry argues that the death that came into the world at the Fall was spiritual death, not physical death. That death was not determined or spread by some type of genetic inheritance. Adam thus need not have been the physical ancestor of all humanity, but can be understood as humanity's federal head with whom we are united in our sin. The broken relationships among humans, God, and nature resulting from that sin have brought discord to the rest of nature. In this view, the long historical record of human-induced environmental degradation can be understood as our failure to act as nature's appointed stewards and caretakers. Articulated within a thoroughly orthodox Christian theology, such views are critical for demonstrating that, far from undermining traditional doctrines, an evolutionary perspective can give them renewed relevance.

Berry concludes the book with two chapters on "creation science". In the first of these, he rebuts several of the standard young-earth creationist claims and responds to a few of the arguments made against macroevolution. This is one of the weaker chapters in the book, and readers should look to other sources for much more thorough and up-to-date responses to "creation science" arguments. However, the author does make the useful observation that "Many of the questions in the evolution and Christianity debate only arise because they wrongly assume some basic premise: time and time again it is worth probing behind the question to find if it is worth asking …" (p 103).

His chapter "Whence 'creationism'?" is arguably the most important in the book because it directly confronts the false science/faith warfare metaphor. He presents a history of the theological response to Darwin, beginning with Charles Hodge, who saw "Darwinism" as denying divine agency, and James McCosh, who saw it as part of divine providence. This historical discussion includes the beginning of the fundamentalist movement in which important figures such as James Orr, George Wright, and BB Warfield saw no inherent conflict between orthodox Christian faith, with a high view of scripture, and evolution. Berry also covers social Darwinism, the rise of populist anti-evolutionism in the early 1900s, and the birth of modern "scientific creationism" in the 1960s. He concludes this historical survey with the diagnosis that "… the mainspring of American 'creationism' is a simple fear of change; a fear that challenge to the accepted framework of belief will irreparably damage that belief, never mind opening a Pandora's Box of uncontrolled social and behavioural consequences" (p 147).

It is books such as Berry's that demonstrate the degree to which that fear is unwarranted. I highly recommend *God and Evolution*, especially for those who feel caught between their faith and modern evolutionary understandings of our world.

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Book reviews continue on page 31

God, Darwin, or Both?

Duane Gish, Hugh Ross, and Eugenie C Scott in Conversation

On September 29, 2001, at the Santa Clara First Baptist Church in Santa Clara, California, the Institute for Creation Research's Duane Gish, Reasons to Believe's Hugh Ross, and NCSE's own Eugenie C Scott participated in *God, Darwin, or Both?* — a discussion of the relationship between science and religion in general, and the relationship between the biblical story of creation and the deliverances of modern science in particular. The discussion was not a debate — as readers of *RNCSE* know, NCSE considers creationism/evolution debates to be counterproductive (see Eugenie C Scott, "Debates and the Globetrotters", *Creation/Evolution* 1994 Winter; 14 [2]: 22–6; available on request from the NCSE office) — but a civil and uncontentious venue in which the participants expressed their respective views — which is not to deny the occasional tone of asperity!

Each of the participants spoke for 20 minutes; a panel discussion (moderated by Bob Smithson) and a question-and-answer period followed. The proceedings were professionally videotaped, and NCSE is pleased to offer VHS videotapes of the event to its members for $20.00 apiece (plus $3.00 shipping; plus 8.75% sales tax for California residents). To order, either call 1-800-290-6006 or fill out and return the form below.

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Science and Religion Redux

Illustration by Dave Smith, used with permission of the University of California Museum of Paleontology.

"Enemies, strangers, or partners?" — the subtitle of Ian G Barbour's *When Science Meets Religion* (San Francisco: HarperSanFrancisco, 2000) suggests the basic options for science and religion. Yet their vexed relationship continues to fascinate, if the spate of new books on the topic is any indication. Featured here are books on science and religion — especially the interface between the evolutionary sciences and Christianity — from authors who write from a variety of perspectives: as scholars and historians, as Christians, as evangelical Christians in particular, and as agnostics and atheists. Indeed, beyond accepting the methods and results of modern science, perhaps the only conviction they share is that it is important to think about the issues carefully. So for insights on science and religion, consult the following books, now available through the NCSE web site: <http://www. ncseweb.org/bookstore.asp> — look in the "In the latest *RNCSE*" section. And remember, every purchase benefits NCSE!

A little history

Religion and Science: Historical and Contemporary Issues, revised edition
by Ian G Barbour
In *Religion and Science*, Barbour actually provides more than just a little history. In fact, he presents a thorough historical theological treatment of major themes in science. This volume is not for the faint of heart or the casual reader, but it may be the definitive text for basic courses in science and religion. "For a generation to come, anyone setting out to explore the subtle relationships between science, religion, ethics, and technology will begin with Barbour as the guide," writes the reviewer for *Religious Studies Review*. Barbour was the recipient of the 1999 Templeton Prize for Progress in Religion.

Summer for the Gods: The Scopes Trial and America's Continuing Debate over Science and Religion
by Edward J Larson
Edward J Larson's Pulitzer-Prize–winning account of the events in Dayton, Tennessee, in the 1920s and their continuing impact on American life provides a historical perspective on the persistent conflict between creationism and science. *Summer for the Gods* is endorsed by such diverse readers as Phillip Johnson, Will Provine, and Ronald L Numbers, who says that it "is, quite simply, the best book ever written on the Scopes trial and its place in American history and myth." Larson's latest book is *Evolution: The Remarkable History of a Scientific Theory* (New York: Modern Library, 2004).

Can a Darwinian be a Christian? The Relationship between Science and Religion
by Michael Ruse
In the epilog to *Can a Darwinian be a Christian?*, Michael Ruse summarizes: "Can a Darwinian be a Christian? Absolutely! Is it always easy for a Darwinian to be a Christian? No, but whoever said that the worthwhile things in live are easy? Is the Darwinian obligated to be a Christian? No, but try to be understanding of those who are. Is the Christian obligated to be a Darwinian? No, but realize how much you are going to foreswear if you do not make the effort, and ask yourself seriously (if you reject all forms of evolutionism) whether you are using your God-given talents to the full."

Christian perspectives

Responses to 101 Questions on God and Evolution
by John Haught
From the author of *God after Darwin* and *Deeper than Darwin* comes *Responses to 101 Questions on God and Evolution*, which distills his insights in a convenient question-and-answer format. "Too much time and energy is wasted trying to show that evolution is wrong," Haught writes, "when religious believers should be asking whether our understanding of God might not be too small to accommodate Darwin's world." Phina Borgeson wrote in *RNCSE*, "for those who want the fruits of reasoned thinking on evolution and Christian theology that may be mined for succinct answers, this is the book of choice." Haught is Landegger Distinguished Professor of Theology at Georgetown University.

Finding Darwin's God
by Kenneth R Miller
Subtitled "A scientist's search for common ground between God and evolution", *Finding Darwin's God* is a perennial favorite. Francisco J Ayala writes, "*Finding Darwin's God* is an artfully constructed argument against both those who deny evolution and those using science to justify a materialist worldview. Yet it is a book for all readers. I know of no other that would surpass it in being mindful of different views, while still forceful. Miller has an uncanny gift for expressing profound ideas in clear and graceful prose." The author, Professor of

<http://www.ncseweb.org/bookstore.asp>

Biology at Brown University, is a Supporter of NCSE.

Evolution From Creation To New Creation: Conflict, Conversation and Convergence
by Ted Peters and Martinez Hewlett
In *Evolution from Creation to New Creation*, theologian Peters and molecular biologist Hewlett team up to provide a detailed and astute examination of the continuum of positions on religious faith and biological evolution, as well as their own theological contribution to the debate. NCSE Executive Director Eugenie C Scott writes, "There is much to ponder in this informed, informative, and thought-provoking book by a scientist and a theologian. I learned a great deal from this small, well-organized, and well-written book, and I strongly recommend it to theists or nontheists seeking to understand the rich taxonomy of Christian views on evolution."

Evangelical Christian Perspectives

Coming to Peace with Science: Bridging the Worlds Between Faith and Biology
by Darrel R Falk
Dismayed by the prospect of a chasm opening between evangelical Christianity and the deliverances of modern science, Falk wrote *Coming to Peace with Science* "to explore what science, especially biology, has to tell us about God's mechanism of creation." Loren Haarsma writes, "Theologically sound, scientifically accurate, understandable at the high school and early college science level, this is a superb book for evangelicals and other Christians who want to learn about the history of life that God is revealing to us in the book of his creation." The author is Professor of Biology at Point Loma Nazarene University. Reviewed in this issue on p 32.

Perspectives on an Evolving Creation
edited by Keith B Miller
From the publisher: "According to the authors of this book, who explore evolutionary theory from a clear Christian perspective, the common view of conflict between evolutionary theory and Christian faith is mistaken. Written by contributors representing the natural sciences, philosophy, theology, and the history of science, this thought-provoking work is informed by both solid scientific knowledge and keen theological insight. The three sections of the book address (1) relevant biblical, historical, and scientific background, (2) the scientific evidence for an evolving creation, and (3) theological issues commonly raised in connection with evolution, including the nature of God's creative activity, the meaning of the miraculous, and the uniqueness of humankind."

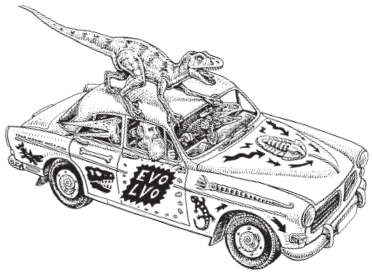
Science & Christianity: Four Views
edited by Richard F Carlson
While many volumes of science and theology are series of isolated contributions, this book from a conservative Christian press actually includes dialog among the contributors. The perspectives represented are creationism (Wayne Frair and Gary D Patterson), "intelligent design" (Stephen C Meyer), independence (Jean Pond), and partnership (Howard J Van Till). Christians who are already firm in their commitment to evolution will benefit especially from the responses of Pond and Van Till to the other writers. For congregations with a wide spectrum of approaches to the authority of scripture and theological method, the whole volume can stimulate critical and constructive conversations.

For the Skeptic

The Ghost in the Universe
by Taner Edis
Edis argues that "[w]ith science, we have stumbled upon an excellent way of learning about the world, and the best of our scientific knowledge consistently undermines our hope that there is a God." The reviewer for *Choice* writes, "Well written and amply documented, Edis's book should be read by anyone who has even the remotest interest in science, religion, or both," and *The Ghost in the Universe* won the Morris D Forkosch award for the outstanding secular humanist book of 2002 from the Council for Secular Humanism. The author is Assistant Professor of Physics at Truman State University and *RNCSE*'s associate editor for physics and astronomy.

Science and Religion: Are They Compatible?
edited by Paul Kurtz
A stimulating collection of essays on science-and-religion topics — including the Big Bang and the origin of the universe, "intelligent design" and creationism versus evolution, the nature of the soul, near-death experiences, communication with the dead, why people believe in God, and the relationship between religion and ethics — by a stellar panel of contributors, including Steven Weinberg, Richard Dawkins, Arthur C Clarke, Martin Gardner, Owen Gingerich, and NCSE's own Eugenie C Scott. The reviewer for the *Times Literary Supplement* describes it as "strong stuff ... an important counterweight to the accommodationism that has dominated recent discourse." Reviewed in this issue on page 45.

Has Science Found God?
by Victor Stenger
From the publisher: "Stenger critically reviews the attempts of many contemporary theologians and some scientists to resurrect failed natural theologies in new guises. Whether these involve updated arguments from design, 'anthropic' coincidences, or modern forms of deism, Stenger clearly shows that nothing in modern science requires supernatural explanation. He offers naturalistic explanations for empirical observations that are frequently given theistic interpretations: for example, that information in the universe implies an intelligent designer, that a universe with a beginning requires a Creator, and that the elegant laws of physics suggest a transcendent realm. He shows that alleged spiritual, nonmaterial phenomena do not lie beyond the experimental reach of physics."



NCSE on the Road

A Calendar of Special Events, Presentations, and Lectures

Date December 2, 2004
City Richmond VA
Presenter Eugenie C Scott
Title Creationism as Voodoo Science
Event Society of College Science Teachers symposium at the National Science Teachers Association
Time 1:00 PM
Location Richmond Marriott
Contact Randy Moore, moore@tc.umn.edu

Date December 19, 2004
City Atlanta GA
Presenter Barbara Forrest, Eugenie C Scott, et alia
Title Creationism Lite: The New Wave of Anti-evolutionism
Event American Anthropological Association Annual Meeting Panel Discussion
Time 4:00 PM
Location TBA
Contact Eugenie Scott, scott@ncseweb.org

Date January 11, 2005
City San Diego CA
Presenter Eugenie C Scott
Title "Intelligent Design" and the Creationism/Evolution Controversy
Event Plenary Lecture, American Astronomical Society
Time 8:30 PM
Location Towne and Country Hotel
Contact Joe Burns, jab16@cornell.edu

NCSE Speakers Available

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Title NCSE Executive Director
Contact scott@ncseweb.org

Name Glenn Branch
Title NCSE Deputy Director
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Name Wesley R Elsberry
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Biology Through the Eyes of Faith, revised and updated edition

by Richard T Wright
San Francisco: HarperSanFranciso, 2003. 309 pages.

Reviewed by Andrew J Petto, University of Wisconsin, Milwaukee

When we examine the interplay between science and religion in contemporary society, many of the books we review rely on simplistic caricatures of at least one of these enterprises. For those interested in the complex realities of practicing Christians who are also practicing scientists, there have been very few books that engage in thoughtful and honest explorations of the ways in which these people succeed in having rich scientific *and* rich religious lives. Richard Wright wrote one of the most engaging and thoughtful books in this genre when the first edition of *Biology: Through the Eyes of Faith* appeared. I recommended this book to readers of *Creation/Evolution* in 1996 (Petto 1996). The revised edition is even better — not just because the information is more up-to-date, but because Wright's perspective and practice of his science and his faith have obviously matured, and this is evident throughout the book.

Wright is an evolutionary ecologist and has been very active in the American Scientific Affiliation. This book is meant to address the "central dogma" of biology head on:

> Biological evolution is probably the most controversial and — in some circles — unpopular scientific theory ever advanced. It is also one of the most fruitful and foundational theories in its impact on the life sciences, and, indeed, has profoundly influenced modern thought (p 119).

There is no getting around it: Evidence from every relevant scientific field supports the evolutionary model. The problem, Wright understands, is with "worldviews". His discussion here relies on Del Ratzsch's work (1996, 2000) — in particular, in the use of the notion of "shaping principles" — in itself a useful point of departure for those who really wish to understand some of the different ways in which Christians view the sciences and their relationship to faith.

Throughout the text there is lucid and well-informed discussion of matters that are recurring themes to those who follow the creation–evolution controversies. Wright understands these in a way that perhaps only comes from years of teaching at an evangelical college and helping students grapple with the various objections to and "evidences against" evolution that fill the anti-evolution literature. Wright faces these objections head-on and, though he is sympathetic to the need for believers to feel re-affirmed in their faith, tells his readers why these positions are really *bad* for their spiritual life. Relying too much on specific interpretations of data from nature (and supposed gaps and shortcomings in evolutionary theory) to support one's religious beliefs can be disastrous — especially if those interpretations turn out to be wrong!

If there is any criticism of the book, it is that it is sometimes difficult to know when Wright is speaking in his own voice or when he is speaking in the voice of the proponents of some of the positions he is trying to explain. This is a problem when he engages the views on astronomy and cosmology of Hugh Ross (p 101–2) and the nonstandard view of biological "information" from Stephen C Meyer (p 113). These, however, are relatively short passages in a book that illustrates a mature understanding of both the faith and the science that have contributed to Richard Wright's career as a scientist and a teacher.

Perhaps because of his career as an evolutionary ecologist, Wright proposes cooperation between members of religious and scientific bodies to preserve and conserve natural resources and a healthy environment.

> [S]tewardship … [is] *the ethical and moral framework that should inform our private and public interactions with the environment*. Recall that stewardship is a call to all people to care for creation. …
>
> Sound science is *the basis for understanding how the natural world works and how our human systems interact with it and impact it*. By sound science, I mean knowledge that is the outcome of painstaking scientific research using the best available methods (p 238, emphasis in the original).

Niles Eldredge took a similar stance at The College of New Jersey a few years ago (see "Niles Eldredge welcomes biology honors students" in *RNCSE* 2000 May/Jun; 20 [3]: 8–9) — that sound science and a strong moral framework are mutually reinforcing and together can be very productive in solving real-world problems of consequence to human survival.

The new edition of this book stands as a clear beacon amid the smoke and fog that often obscures books about science and faith. It is one of the few written by someone who understands *both* evolutionary biology and a Christian faith — because he has actively practiced both. This is a serious book that deserves serious attention.

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Ratzsch D. 2000. *Science and Its Limits: The Natural Sciences in Christian Perspective*. Downers Grove (IL): InterVarsity Press.

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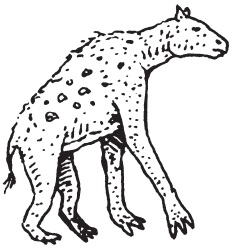
Coming to Peace with Science: Bridging the Worlds Between Faith and Biology

by Darrel R Falk
Downers Grove (IL): InterVarsity Press, 2004. 235 pages.

Reviewed by Andrew J Petto, University of Wisconsin, Milwaukee

This is a surprising book. It is one that most *RNCSE* readers should know about and be able to recommend to those they encounter who insist that their faith is incompatible with modern science. The book does not start out that way. In the opening chapters, Falk really seems to buy into the "Culture Wars" perspective about the competing, incompatible worldviews of science and faith. However, readers who persist will be rewarded by an intelligent and sympathetic discussion of the *different* positions that Christians have on the meaning of science and Scripture. An important aspect of Falk's exposition of these different perspectives is the discussion of the historic struggles between evangelism and "liberalism" in Christian denominations. He argues that much of the animus generated against evolution over the past century is at least in part driven by the struggle for dominance between holders of these differing perspectives on the proper understanding of the Bible, not specifically because evolution is a problem in and of itself.



Falk's perspective is similar to that taken by Richard Wright in *Biology Through the Eyes of Faith* (reviewed on p 31) — that Christians are called to study both the *Word* and the *world* (p 62). In taking scientific studies seriously, Falk shows his intended audience — committed Christians who are grappling with scientific ideas and theories — that the earth is unquestionably very old, that multiple scientific disciplines support evolutionary models of the history of life, and that most of the arguments against evolution only succeed when those hearing them are ignorant of science. He addresses these objections in detail and disposes of them one after another.

Falk works hard to provide both a strong theological framework for his readers to use in approaching science *and* a strong scientific framework for understanding what scientists know about the history and diversity of life and how they know it. His own experience tells him that a proper knowledge of science should deepen and strengthen one's understanding and contribute to the development of a mature Christian faith.

However, this book is not so much a prescription as an admonition: a dogmatic opposition to science, particularly evolution, is not conducive to a healthy Christian faith. He writes that Christians are not drawn closer to their God "through some scientific 'proof' that the creation of cells is contrary to the second law of thermodynamics" (p 207). Neither is it productive to try to make tenets of faith "scientifically respectable" through various experiments or scientific research.

The "bottom line" in Falk's final chapter is this: focusing too much on a small part of the Bible and getting into doctrinal disputes about its interpretation interferes with the real work that Christians have to do in the world. Nature holds the history of the earth and the life that emerged on it; it is both fruitless and irresponsible to argue otherwise. It also turns people against the religious views of those who make these arguments. And that is Falk's parting advice to his readers: Coming to peace with science ultimately will bring more people to God.

Whether he is correct remains to be seen, but at least if his audience takes his advice to heart, we will see less recycling of old, discredited anti-evolution arguments and a willingness really to understand contemporary science on its own terms. Falk is optimistic that this is so, despite our experience to the contrary.

This book is a good resource for those who need to explain to Christian anti-evolutionists in language that they will find familiar why they would be strengthened and matured in their faith if they could find a way to come to peace with science.

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Developing a Christian Worldview of Science and Evolution

by Charles Colson and Nancy Pearcey
Wheaton (IL): Tyndale House Publishers, 2001. 196 pages.

Reviewed by Andrew J Petto, University of Wisconsin, Milwaukee

It is not until after the end of this book that we learn what it is really about:

> Only the Christian worldview provides a rationally sustainable way to understand the universe. Only the Christian worldview fits the real world and can be lived out consistently in every area of life (p 197).

This book is about salvation — how to assure one's own, and, perhaps more important, how to assure that of one's children. However, it is clear very quickly that this is emphatically *not* a book about science or evolution.

> *The core of the controversy is not science; it is a titanic struggle between opposing worldviews — between naturalism and theism.* Is the universe governed by blind material forces or by a loving personal being? Only when Christians understand this — only when we clear away the smoke screens and get to the core issue — will we stop losing debates. Only then will we be able to help our kids … face the continual challenges to their faith (p 82–3, emphasis in the original).

Although the words *Science and Evolution* are prominently displayed on the cover and title page, this book is part of a series of texts by Colson accompanied by study guides and discussion materials aimed at promoting a particular view of what it means to be a Christian in the 21st century. There is, of course, plenty of room for disagreement about their conclusions in *that* realm, but the presentation of science and evolution is so bizarre and error-laden that it is difficult to explain all the ways in which it is wrong.

In a nutshell, this book continues the tradition in creationist texts of gleaning any inconsistencies in scientific research and proclaiming them as "proof" that scientists are conspiring to deny the bankruptcy of their practice, then adding nuggets from other studies that seem consistent with a literal biblical perspective. Needless to say, there is little more than a superficial understanding of the history and methods of scientific disciplines, the problems currently under study, or the context in which scientific questions are asked and answered. For those familiar with Colson's *Breakpoint* programs and with prior writings by both Colson and Pearcey, this book repeats the theme that evil and various social ills are directly traceable to the decline in religious faith and the rise of "naturalism" in our society — and, in particular, the undermining of the Bible as the guiding text in our common life as well as in the scholarly disciplines.

For example, there is an extensive but superficial review of origins-of-life research — a scientific field that is still a long way from settled. *Science and Evolution* reviews decades-old research on the formation of amino acids and organic compounds in various laboratory experiments, telling us first that scientists have failed to create anything remotely relevant to the origin of life: "Yet, in laboratory experiments, all we get are random, scrambled sequences" (p 50). Later they conclude that this research "proves" that "*life can be created only by an intelligent agent directing, controlling, and manipulating the process*" (p 53, emphasis in the original), because what was produced in the laboratory was only possible with intelligent (human) intervention. This discussion ignores recent research — much of it presented in general science publications written for the nonspecialist — on self-organizing and self-replicating chemical systems (Lehn 2002; Orgel 2001; Kauffman 1993), the appearance of sugars, salts, and organic molecules in galactic dust clouds (Ball 2001; Berstein and others 1999), and the tendency for amino acids throughout the universe to favor "left-handed" forms (Ball 2000; Cronin and Pizzarello 1997; Horgan 1997).

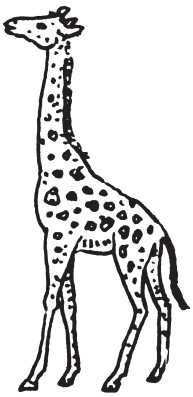
But this dependence on old research is in keeping with the authors' characterization of modern biology as "Darwinian" — as though evolutionary theory has stood still since the mid-19th century. To be generous, it seems that the authors really do not understand science on its own terms — or want to. It is sufficient for their purposes to point our that their *view* of science is antithetical to their *view* of a contemporary Christian life. However, they bolster their arguments with patently false claims.

For example, they claim on page 83 that creationists are *losing* debates. They are not, of course, but public debates have little impact on the professional practice of science and science education. Creationists *are* losing in the courts and in the curriculum, so maybe that is the "debate" to which Colson and Pearcey refer.

Earlier they argue that "the dominant view in our culture today" is the "radically one-dimensional" view that "*this life is all there is, and nature is all we need to explain everything that exists*" (p 18, emphasis in the original). However, according to recent Gallup polls, this view of life is accepted by no more than about 14% of those polled in the US (Anonymous 2002). The pervasiveness of this so-called "naturalistic philosophy" in US popular culture, which concerns Colson and Pearcey so much, does not seem to have much effect on people's personal beliefs or their support for teaching creationism in public schools (for example, Gallup 1999).

In essence, Colson and Pearcey are concerned about the moral decline of our society. They are convinced that the current practice of science — in particular, evolutionary science — is to blame for the dismal state of contemporary society. However, the empirical data contradict them. For example, when Colson was writing the original text (copyrighted in 1999), the nation was experiencing a long-term decline in violent crimes — during an administration that few would tout as the moral acme of public service (FBI 2002). The fact that crime rates have increased during the early years of an administration that is more active in bringing religion into political life suggests that public religiosity is not the solution; perhaps economic data would be more enlightening in this regard.

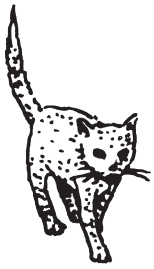
In other administrations, public religiosity — prayer breakfasts and meetings with religious leaders, calling on the Almighty to endorse national or international policy, public statements in support of creationism, and so on — has not gone hand-in-hand with high moral and legal standards. Even though it was before his "Christian conversion" (p 159), Colson's experience in the Nixon White House (discussed in *Science and Evolution* in the context of the character of Richard Nixon and the funeral eulogy for him delivered by Billy Graham) should be evidence enough that the public embrace of Christian ideals does not guarantee the link "between the material order and the moral order" (p 87).



But there is a more troubling aspect of this book: the question of what causes bad behavior. Colson and Pearcey seem to accept bad behavior in Christians as a result of the sinful nature of humans and their imperfections. This is to be forgiven as a temporary lapse in those who have accepted Christ. However, in those who are not Christians — or at least not the type of Christians of which Colson and Pearcey approve — these very same acts, even in the context of a record of greater good, are evidence of the systemic evil and perdition visited upon society — especially on society's children — by philosophical naturalists. Colson and Pearcey even assert that the only alternative to a Bible-

based Christian morality is a utilitarian ethical system (p 139). Of course, this would come as a great surprise to moral philosophers throughout the Western world and to anyone whose religious worldview is nonbiblical.

In sum, I have two recommendations for our readers about Colson and Pearcey's *Science and Evolution*. First, read this book for a window into the worldview of certain Christian writers and how science appears to them. "Through a glass, darkly" is the phrase that comes to mind here (1 Corinthians 13:12). Second, read this book as a prime example of the superficial scholarship characteristic of anti-evolution and antiscience books that we often review in *RNCSE*. The discussion focuses on decades-old research and makes sweeping generalizations that the most perfunctory investigation shows to be either false or at least seriously confused. For those interested in supporting good science education in our society, *Science and Evolution* is a prime example of how scientific misunderstandings are perpetuated among those who get their science "education" from sources such as this one — and why we need *more* natural science in public education (and public life), not less.



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Faith, Form, and Time

by Kurt P Wise
Nashville (TN): Broadman and Holman, 2002. 287 pages.

Reviewed by Denis O Lamoureux, University of Alberta

Kurt Wise's *Faith, Form, and Time* is a significant contribution to the modern origins debate. This book is a defense of young-earth creationism that provides proof of the power of evolutionary theory. In brief, young-earth creation is the process of evolving under the selective pressures of the scientific evidence for evolution.

To be sure, this was never Wise's intention. Rather, armed with an impressive educational background (BA in geophysics at the University of Chicago, MA and PhD in paleontology at Harvard under the supervision of Stephen Jay Gould), he sets out to offer a Christian fundamentalist apologetic. Like many before him (including the present reviewer 20 years ago), Wise's agenda is evangelistic. Perhaps this is most clear in the closing chapter, where he writes, "All who look upon the cross and trust in the completed work Jesus has done to take care of their sin are brought back from the death of the curse and adopted into the family of God. If you have not done this, won't you do it today?" (p 241).

In order to understand Wise's creation science evangelism and apologetic, it is necessary to appreciate a deeply ingrained hermeneutical assumption of Christian fundamentalists. Concordism (or better, scientific concordism), which is foundational to their principles of biblical interpretation, is the belief that there exists an accord between science and Scripture. It is not an unreasonable presupposition. If God is both the Creator of the world and the author of the creation account in Scripture, then an accord between his works and his words could be expected. For that matter, the great majority of Christians throughout most of history have been scientific concordists (Jaki 1992 is an excellent review of the history of scientific concordism and its influence in professional exegesis up to the beginning of the 20th century), and Wise continues in this hermeneutical tradition as clearly reflected in the subtitle of his book: "What the Bible Teaches and Science Confirms."

This concordist hermeneutic fuels Wise's agenda. According to this approach, if the science in the early chapters of Bible aligns with modern scientific evidence, then this is powerful proof that God inspired the writers of Scripture, and no rational person can reject the Christian Creator. However, the apologetic and evangelistic purpose of Wise's book is thwarted should scientific concordism be an erroneous assumption.

The most important and influential book in the young-earth creation tradition is John C Whitcomb and Henry M Morris's *The Genesis Flood* (1961). Pivotal to their position is the belief that God created a canopy of water above the earth on the second day of creation (Genesis 1:6–7). The belief in the existence of a sea of water in the heavens was found throughout the ancient Near East. From a phenomenological perspective, this is exactly what it looks like — the sky is blue and rain falls from

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above. It is the collapse of these "waters above" that results in Noah's worldwide flood. However, Wise steps away from this classic young-earth creationist tenet, recognizing that the Bible undermines it. He notes correctly that "'the waters above the heavens' were still in existence during the time of David (Ps 148:4) … [t]herefore, the 'waters above' did not fall to the earth at the time of the Flood as many canopy theorists claim" (p 15; see also p 265 n 2).

However, instead of bringing into question the veracity of scientific concordism, as most professional exegetes have accepted in the last 100 years (Bailey 1993: 172–85), this hermeneutic unrelentingly grips Wise. He accepts the reality of the "waters above", but relegates them to the outer edges of the universe to serve as its boundary (p 90). In effect, this hermeneutical dynamic is like the God-of-the-gaps. In the light of evidence, it pushes traditional theological interpretations further and further outside the cosmos.

The powerful lure of scientific concordism is further seen in Wise's view of the origin of life. As one quite familiar with the fossil record, he certainly sees the evidence for evolution. For example, he is aware of transitory forms such as early amphibians (for example, *Seymouria*), mammal-like reptiles, and *Archaeopteryx* (p 199). In addition, he knows that vestigial structures, such as the underdeveloped hip and leg bones in whales, point to descent from earlier ancestors (p 219). And he even asserts that "abundant homology" exists and that it can be used to formulate "hierarchal trees" (p 123). But instead of accepting the obvious and parsimonious standard model of evolution, Wise recasts this scientific evidence within a 6000-year time period in order to defend the theory of Intrabaraminic Diversification.

The terminology for this model of origins comes from the first chapter of the Bible. The Hebrew word *bara'* means "to create" and *min* refers to species or kinds. In Genesis 1, God creates basic taxonomical groups. According to Wise, these taxa "were created with the capacity for substantial change" (p 123). More specifically, "In young-age creation theory, intrabaraminic diversification after the Flood produced many new species from pre-existing species … these changes occurred both *rapidly* and *recently* (only thousands of years ago)" (p 222; emphasis added). In other words, Wise accepts evolutionary change at a rate that is orders of magnitude greater than that posited by the standard theory of evolution. Deliciously, he is an anti-evolutionist with a view of speciation many times faster than that of most evolutionists!

Of course, the stumbling block between Wise and the modern theory of evolution is his acceptance of scientific concordism. Because of this assumption, he has to repackage the evolutionary evidence within a 6000-year framework. But this is not to say that he does not feel the weight of the scientific evidence for an old universe. Wise asks, "So why does the world, in so many ways, look old?" (p 63). To his credit, he acknowledges that starlight, coral reefs, and ocean salinity could be indicative of age (p 63–6). Moreover, he confesses that chalks, trace fossils, and sand dunes in the sedimentary records have yet to be explained within a Noachian flood model (p 201–5). In other words, Wise is not an obscurantist; he sees the physical evidence. He is working within a fundamentalist category set, and in a way he cannot be faulted for that. However, the "evolved" model of young-earth creation in his book is proof of the power and persuasive nature of the evidence for evolution.

Wise's fundamentalist categories lead to the final point. The greatest difficulty with the origins debate today is the popular category set that tyrannically controls this controversy. Most individuals, both religious and non-religious, are trapped in a false dichotomy. Accordingly, one is either a creationist believing in God or an atheist accepting evolution. This black-and-white type of thinking and resultant deep ditch in the mind of people runs throughout *Faith, Form, and Time*.

For example, Wise asserts, "The most popular atheistic theory for the origin of the universe is the Big Bang theory" (p 89). Like most, he fails to recognize that scientific theories are metaphysically neutral and that many scientists are theists (Larson and Witham 1997; Easterbrook 1997). Moving beyond the origins dichotomy is necessary for fruitful dialog regarding origins. An expanded category set is required, and the possibility that evolutionary theory can be interpreted within a theological framework must be entertained.

In closing, I must add a personal caveat. My soul shuddered while I was reading this book. Twenty years ago I began a similar apologetic and evangelistic crusade. I wanted to become a creation scientist to take on the evils of evolutionary biology. However, I sensed a calling to study the early chapters of the Bible before beginning a program at the Institute for Creation Research. It was at a leading evangelical graduate school that my fundamentalist hermeneutical foundations were shattered. It became abundantly clear to me that the Bible is not a book of science.

Today, scientific concordism is rejected by Old Testament scholars within the evangelical academy. It is a grassroots hermeneutic. I suspect that if I had not studied Genesis 1–11, I would still be clinging tenaciously to a view of origins similar to Kurt Wise's. Thankfully, I studied the words of God before examining His works. Being unhampered by scientific concordism, I am now able to see and enjoy the overwhelming scientific evidence for biological evolution, which for me is the Creator's method for creating life.

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Battle for the Beginning: Creation, Evolution and the Bible

by John MacArthur
Nashville (TN): W Publishing Group, 2001. 237 pages.

Reviewed by Thomas Buratovich

John MacArthur, the senior pastor of Grace Community Church in Panorama City, California, has developed a well-deserved reputation as an outstanding expository preacher and author, with a radio and tape ministry that reaches into the international community. MacArthur's boldness has made him no stranger to controversy, and he has recently made a contribution to the creation/evolution debate with this book. According to MacArthur, he wrote this book to "examine what the biblical text teaches about creation" (p 29). Despite the noble intentions, MacArthur draws several exegetical conclusions that are simply erroneous. There is only space to point out a few such examples.

MacArthur uses 2 Peter 3:4 to discredit the geological concept of uniformitarianism. This passage reads:

> First of all, you must understand that in the last days scoffers will come, scoffing and following their own evil desires. They will say, "Where is this 'coming' he promised? Ever since our fathers died, everything goes on as it has since the beginning of creation. (*New International Version*)

Peter is here addressing the problem of eschatological delay — the Apostles are dying off and Jesus has yet to return — hoping to encourage the next generation of Christ's followers not to lose hope. There is no indication that this has anything to do with the age of the earth and especially not with modern geological theories that came centuries later. Peter's words most likely refer to the fact that the fathers of the New Testament faith (the Apostles) have come and gone, and everything continues the way it always has; the scoffers ask, Where is this final judgment of God that culminates in the dissolution of the universe? Interpreting this verse as referring to geology is a simple case of reading something into the text that is plainly not there.

MacArthur also critiques Hugh Ross, who has a PhD in astronomy and worked for a time as an astronomical researcher, arguing that the serious reader of Scripture cannot allow scientific conclusions to influence her interpretation of Scripture. Ross believes that the findings of scientific inquiry can and should inform our interpretation of Scripture, when appropriate. According to MacArthur, Ross's approach is hopelessly flawed, since, for the Christian, "Scripture therefore speaks with more authority than nature and should be used to assess scientific opinion, not *vice versa*" (p 61). To this end, MacArthur flatly states that one cannot read Genesis honestly without concluding that the universe is relatively young.

Despite his laudable commitment to the authority of Scripture, the fundamental problem with MacArthur's thesis is that there are several ways one can read the first three chapters of Genesis. Commentaries on Genesis by numerous evangelical scholars do not agree with MacArthur's interpretation of Genesis. This shows that there is disagreement by devout, learned men and women of God on the clear meaning of the text and how it should be understood.

MacArthur's insistence that we cannot read our scientific categories into the Genesis narrative conflicts with his own interpretation. For example, he suggests that the first day of the creation week found the earth "already rotating on its axis, with light illuminating one side and darkness veiling the other" (p 80). This is a modern scientific conclusion, and we have no indication that the author of Genesis had any knowledge of it. Of course, to have an evening and a morning without the sun makes no sense in our modern astronomical understanding, but all attempts to rescue such a hermeneutic with models of a luminous body somewhere in space surely go far beyond the text. If MacArthur can use these scientific conclusions to interpret Genesis, then why must we exclude all other conclusions about the age of the universe?

Second, when MacArthur states, "Our understanding of science should never govern whether we take God's Word literally or not" (p 93), he seems oblivious to the fact that we do exactly that to this day. Martin Luther, who had an extremely positive view of science and Scripture, honestly believed that Copernicus was wrong in his proposal of heliocentrism because he thought that Joshua 10:12 teaches geocentrism. We now know that Luther was wrong, but we do not use biblical interpretation to determine this. Instead we know it because the scientific evidence for a heliocentric solar system is overwhelming. If we were to use MacArthur's strategy, then more people might be justified in believing in a flat earth or geocentrism. Again, if we acknowledge that we already use such scientific data in our interpretation, then what is the rationale for opposing a more generalized use of science to inform our hermeneutic?

MacArthur also reads modern scientific understandings foreign to the intent of the authors into the meaning of Scripture when he comments on the firmament, "But the firmament itself was the breathable atmosphere, or the sky" (p 92). Unfortunately the meaning of the Hebrew word *raqia* leaves no room for any such assumption. According to the *Brown-Driver-Briggs Hebrew Lexicon*, "*raqia*" refers to an extended surface. The image implied is one of a solid surface, hammered out in order to support whatever is above it. Thus, the ancient view of a firmament emphasized the support of the elements above it; that is, the stars, the moon, the sun, the clouds, and so on. There is no implication of a breathable atmosphere in any of the places where this word appears (Ezekiel 10:1). The use of *raqia* to designate

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the lower atmosphere of the earth is unwarranted.

On page 216, MacArthur writes, "Apparently, prior to the curse, serpents had legs like other reptiles." It is highly questionable to take the phrase "on your belly you shall go and you shall eat dust all the days of your life" (Genesis 3:14) to have any biological implications. Since we do not surmise that all pre-Fall snakes could hear sounds transmitted through the air and talk, we cannot generalize this curse to all snakes. A non-literal interpretation fits the passage much better. In the curse upon the serpent, Satan, masquerading as a snake, is humbled and sentenced to future defeat at the hands of the ones he deceived.The seed of a woman, namely Jesus Christ, will be born through a woman and deliver Satan his *coup de grâce*. This is clearly not a story of how snakes lost their legs.

In summary, MacArthur has written a book that contains several exegetical fallacies as well as harsh words for those who disagree with him. For example, on pages 25–6 he writes, "So-called theistic evolutionists who try to marry humanistic theories of modern science with biblical theism may claim they are doing so because they love God, but the truth is that they love God a little and their academic reputations a lot." Surely such statements are not helpful where substantial disagreement prevails within Christian scholarship and informed, levelheaded debate is required.

Battle for the Beginning will probably become a standard work for recent creationists, but there are much better works available for those who want a Christian viewpoint on science and Scripture, such as Forster and Marsden's *Reason, Science and Faith* (1999).

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Battle for the Beginning: Creation, Evolution and the Bible

by John MacArthur
Nashville (TN): W Publishing Group, 2001. 237 pages.

Reviewed by
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In his contribution to the creation/evolution debate, acclaimed Christian radio preacher and author John MacArthur did not want "to get into in-depth scientific arguments related to the origin of our universe" (p 29). However, his book contains much more scientific discussion than one would expect from a work that purports mainly to deal with the text of Genesis, and *The Battle for the Beginning* is largely a restatement of many recent creationist arguments. The result is a book whose scientific discussions are badly flawed.

MacArthur equates a belief in biological evolution with metaphysical naturalism, and he asserts that the theory of biological evolution is completely antagonistic to biblical Christianity and that any attempt to accommodate it within a Christian belief system is pure compromise. Historically, the situation is more complex. David N Livingstone in *Darwin's Forgotten Defenders* (1984) and James R Moore in *The Post-Darwinian Controversies* (1981) have documented that many scientists who accepted evolutionary theory were evangelical Christians who were just as revolted by naturalism as MacArthur. Therefore acceptance of biological evolution does not automatically make one a metaphysical naturalist.

In the next chapter, MacArthur informs the reader why he thinks the geologic principle of uniformitarianism is unbiblical and inadequate to explain the geological record. MacArthur writes, "Uniformitarians assume that the forces at work in nature are essentially fixed and constant" (p 50).

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First of all, modern methodological uniformitarianism, or actualism, understands the geologic record as the product of both slow, gradual processes (precipitating salt deposits or lakes drying up over time) and fast-acting catastrophes (tsunamis, local floods, earthquakes, meteorite impacts, and hurricanes) whose rates are not constant over time. Second, the rejection of "flood-based explanations for geological formations" (p 50) did not start with Lyell or even Hutton. Diluvialism provided the impetus for much of the geologic research in the 17th–18th centuries but was rejected by most Christian geologists by the mid-19th century because it was unworkable even after extensive attempts to fit it into the geologic data. Other geologic hypotheses were tried, but in the end Hutton's uniformitarianism won out because of its *explanatory power*.Today, uniformitarianism has been refined in light of our knowledge that geologic processes do not act at the same intensity over time, but are often episodic and catastrophic. Third, the acceptance of a relatively old earth began at least a century before Lyell and was shared by virtually all geologists in the late 18th and early 19th centuries because of the extensive cumulative geological evidence. Acceptance of an old earth was well in place before Darwin took his historic trip on the *Beagle*.

Some statements by MacArthur seem to intimate some sort of grand plan among contemporary geologists to increase the age of the earth. For example:

> Fossils of sea creatures are even found on many of the world's highest mountain tops. How do uniformitarians explain such phenomena? The only way they can: They constantly increase their estimate of the age of the earth (51–2).

There is no conspiracy here. This observation is easily explained by tectonic plate theory, according to which continental shelves, which were underwater at one time, are lifted by collisions between denser oceanic plates and less dense terrestrial plates.

MacArthur also depends somewhat heavily on the "apparent age" thesis, which states that God's cre-

ation of the world included building some indication of age into the world and universe. Therefore, God made Adam and Eve as sexually mature adults and plants as adult organisms with fruits and flowers.

The problem that so many Christians in the sciences have with this idea is that stars, galaxies, pulsars and so on all give us information as we view them. The information they give us is historical — it tells us about their *past*, their *ancient* past, since many of the objects we observe through telescopes are several million light years away. The apparent age view requires that the historical information we receive from the stars — presumably placed there by God — is unreliable. Many Christians are not ready to accept that God has authored a gigantic hoax on humanity, and therefore opt for an old universe. This same problem extends beyond astronomy to the geologic information gleaned from observations of the earth itself. For many Christians in the sciences God would not give us false data, since such an act would be inconsistent with His character. Therefore another interpretive framework for the first few chapters of Genesis is justifiably utilized.

On pages 116–7, MacArthur attempts to generate a controversy over how the sun generates its energy — even though no controversy exists among scientists. He insists that the inability of previous neutrino detection experiments to detect the predicted quantity of solar-derived high-energy neutrinos sinks the standard solar model, and suggests that the sun produces its energy via a combination of nuclear fusion and gravitational contraction. However, the Sudbury Neutrino Observatory in Ontario, Canada, has succeeded in detecting the predicted quantity of neutrinos; a finding that was confirmed by the Super-Kamiokande detector in Japan. Therefore, the standard solar model has emerged from another challenge intact, and the neutrino deficit that MacArthur uses to question the standard solar theory — which argues for an old sun — does not exist. This should be a lesson to all Christians who depend upon gaps in our present scientific understanding to bolster their claims.

These examples underscore the way MacArthur picks and chooses which scientific summations to believe with little thought for consistency. He accepts the spectrographic data that establish the composition of the sun and the measurements that establish its distance from the earth (p 110), but rejects the same physics that plainly tells that the sun is 4.55 billion years old. Contemporary Christians in the sciences understand that the observations of nature do have some authority and cannot be dismissed quite so cavalierly, but should inform our reading of Holy Scripture, when appropriate, to understand God's truth better.

MacArthur writes, "Crossbreeding cannot produce new species" (p 99). However, the process of crossbreeding is precisely how several new plant species have been produced and this is amply documented in the scientific literature. *Raphanobrassica*, the Kew primrose (*Primula kewensis*), several species of *Brassica* (cabbage), and our own modern bread wheat are just a few of the many examples of new plant species that have been made by crossbreeding.

In summary, MacArthur has written a book filled with scientific errors that inflames the already elevated emotions of the creation/evolution controversy and suppresses constructive discussions between scientists and theologically astute Christians.

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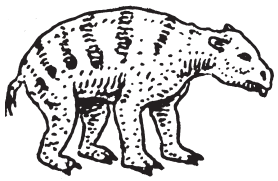

Fossils & Faith: Understanding Torah and Science

by Nathan Aviezer
Jersey City (NJ): Ktav Publishing House, 2002. 270 pages.

Reviewed by Alexander Nussbaum, St John's University

Orthodox Jews in all but the most liberal segments of Orthodoxy have difficulty accepting scientific facts that contradict biblical creation accounts and, in the past, were often not permitted to pursue secular higher education (see "Creationism and geocentrism among Orthodox Jewish scientists", *RNCSE* 2002 Jan–Apr; 22 [1–2]: 38–43). However, two related developments have recently produced a culture of Orthodox Jewish scientists with legitimate, even distinguished, scientific credentials who nonetheless have beliefs at odds with mainstream science. One is that some Orthodox groups have permitted their members to obtain a secular education for employment purposes, and the other is that of "repentance" — a return to Orthodoxy — on the part of the secularly educated.

Nathan Aviezer, Professor of Physics at Bar-Ilan University, earned a PhD in physics from the University of Chicago and is the author of more than 100 physics articles, a Fellow of the American Physical Society, and a Research Professor of the Royal Society of London. His books are examples of the use of secular materials and mainstream science in support of Orthodoxy. Aviezer wrote both *In the Beginning* (Hoboken [NJ]: Ktav Publishing House, 1990) and *Fossils & Faith* to prove "the comprehensive agreement between science and Genesis" (p 7). This book could well have been entitled *Fossils (no) & Faith (yes)*.

Aviezer claims that "the religious person has no cause to oppose the scientific findings about evolution"

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(p 84). Yet he spends a third of the book debunking evolution. His view of evolution is summed up in his "conclusion":

> One stands in awe at the welter of confusion and mystery that abounds in evolutionary biology. Although this field has been the subject of intensive research for many decades, the expected scientific consensus regarding the basic principles has not yet materialized (p 217).

These two statements may seem contradictory, but the explanation is straightforward: a popular idea in Orthodox Judaism is that no scientific finding can even *potentially* be a problem to acceptance of the Torah. Therefore, adherents usually claim that evolution, if true, would not be a problem for their faith. Since this is not the case, however, evolution must be in reality an unproved hypothesis concocted only to enable disbelief in God. Aviezer emphasizes that he is speaking as an "active research scientist" when he dismisses evolution. So, according to Aviezer, he is rejecting evolution not on religious grounds, but because, after a 150-year search, it has no scientific basis. An implicit assumption he shares with most "creation scientists" is that if science is found wanting, we must slip back into Judaeo-Christian mythology.

Over and over again, Aviezer harps on the idea that any controversies or revisions, even over long-resolved issues, discredit that branch of science entirely, rather than demonstrate the triumph of the scientific method. For example, in a sophistic attack, Aviezer asks how evolutionists can assert any authority in the discussion of speciation when there is still substantial disagreement on how to define a species.

Aviezer claims that "competing theories of evolution" alongside Darwin's theory renders Darwin's theory nonscientific, and that the existence of such theories is a dirty *"trade secret among evolutionary biologists*" (p 222). What are these competing theories of evolution that Darwinian fundamentalists are hiding from the naive public? Punctuated equilibria, of course, and "impact theory". For Aviezer, the idea that a meteor hastened the extinction of dinosaurs (now accepted by almost all scientists including "Darwinian fundamentalists") somehow debunks evolution. The proof offered is the following: "Darwinian fundamentalist supreme" Richard Dawkins does not mention "impact theory" in a particular book, so obviously mentioning it would undermine the Darwinian theory!

Aviezer shows his ignorance of the process of science when he uses disagreement between Gould and Dawkins to debunk evolution. If Aviezer had done more homework, he would have found even more acrimonious disagreements among other scientists, but all of these are limited and brought into order by empirical evidence. Their resolution will demonstrate the strength rather the weakness of science and in no way challenges the validity of evolutionary theory.

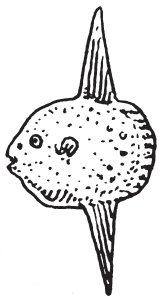
For Aviezer, the alleged poverty and speculative nature of the fossil evidence make evolution readily disposable. In a chapter entitled "Misreading the fossils", Aviezer contends that lay believers have been needlessly despairing over false challenges to their faith, because they have been misled by paleontologists into thinking that a decipherable fossil record exists. He writes:

> One naturally assumes that the fossil evidence and its interpretation (the science of paleontology) have been presented by serious scientists who are objective in their pursuit of knowledge and apply accepted standards of scientific rigor. In this chapter, we shall see that nothing would be further from the truth (p 179).

His proof is that, when paleontology was new, numerous inaccuracies and mistakes occurred. Aviezer repeatedly uses the progressive and self-correcting nature of the scientific method as evidence against science's veracity. The centerpiece of the chapter is "Piltdown Man", but he gives equal attention to the inaccurate reconstruction of the original Neanderthal skeleton and the "Nebraska Man" tooth. For Aviezer, these three mistakes that occurred over 80 years ago are central to the assessment of the hominid fossil record.

As for more recent discoveries, Aviezer concludes that the scientific disagreement about the relationship among various *Australopithecus* species disqualifies them from informing us about hominin evolution: "Today's new theory for the origins of humankind is discarded on the basis of tomorrow's fossil discoveries" (p 199). To illustrate the bankruptcy of human evolution research, Aviezer reminds us that there are still two models of the emergence and dispersal of early *Homo sapiens*:

> The correct conclusion to draw from all these claims and counterclaims is that both groups of scientists are right in dismissing their opponents' methods of analysis, and therefore neither side has reliable arguments — or reliable theory. The reader should keep these thoughts in mind the next time a well-known professor announces a new theory for the origins of mankind (p 203).



For Aviezer, evolutionary scientists are not mere human bumblers; they are also dishonest: so the only reliable truth left for him is revealed truth. He dismisses the flood of fossil and molecular evidence that paints a consistent picture of human evolution, but completely accepts the flood of Noah. According to Aviezer, evolutionary theory is not in the hands of scientists, but of rabid Darwinian fundamentalists who hold to a religion of evolution despite a lack of evidence, and he asserts that "a basic characteristic of Darwinian fundamentalism is that all new ideas are to be fought" (p 242). As evidence for this position, Aviezer quotes Gould's identification of Dawkins and Daniel Dennett as the main fundamentalists behind "the religion of evolution" (p 240). This tactic, of course, is an old one — attributing to one's enemies one's own prejudices.

This book can be a valuable read for professional scientists who want to see what they are up against. At nearly every paragraph they will have to pause to remind themselves that it was written by a PhD in physics from a 20th-century university. But then it occurred to me that maybe I had fallen for an elaborate practical joke on the tar-

get audience of true believers seeking "a real scientist" to bolster their nonscientific views. In that case — well done!

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Biblical Classification of Life: A Framework and Reference for Authentic Biblical Biology

by Chad Berndt
Filer (ID): Elihu Publishing, 2000.
226 pages.

Reviewed by Andrew J Petto and Stephen C Meyers

Ethnobiology is the study of how people understand nature and their place in it. It examines how they name and classify living things, and, although the subjects of these systems of classification are biological, the systems themselves are not. The fundamental tools and materials of ethnobiology are linguistic, because how and why organisms are classified as they are is more important than how well the categories match modern scientific taxonomy.

Biblical Classification of Life is a prime example of ethnobiology; it exhibits every aspect of the discipline: linguistic analysis, mythological roots, and organization of living things into categories consistent with a unique cultural perspective — what anthropologists call a world view. Throughout the book we are reminded that the driving force behind Berndt's classification system is to understand living things from a young-earth biblical perspective. Any correspondence between his system and modern biology is, as they say, purely coincidental — and irrelevant. In fact, throughout this book, we are reminded of Edward Sapir's seminal admonition to those comparing ideas and systems across cultures:

> The worlds in which different societies live are distinct worlds, not merely the same worlds with different labels attached (1929: 209).

Biblical Classification of Life is an insider's look at the question of biblical classification, and it represents a thorough review of how one might approach the classification of living things if the primary organizing principle of the system were the sequence of creative acts laid out in Genesis 1–2. Its proper assessment requires an expertise in both biblical studies and in biology, and this joint review will consider these in turn.

Biblical Studies

The biblical premises of this book reveal numerous problems. Berndt makes several assumptions about the Bible that can be challenged either theologically or on the basis of biblical scholarship. The primary problem is that he assumes that the Bible is infallible about biology (p 17), but the more widely accepted theological view is that the Bible is meant to instruct in *righteousness* (2 Timothy 3:16) — not in biology or any other science.

A second assumption Berndt makes is that Adam named the animals according to thematic associations (p 13). Thematic associations, of course, vary significantly among languages and translations, but he does not address the fundamental question on which his assumption must rest: What language did Adam speak when he named the animals? Surely Berndt must realize that Hebrew is not the oldest language in the world and that the narratives that make up the Bible existed in various linguistic forms long before they were codified into Hebrew.

Berndt's third assumption is an *ex nihilo* Creation — a theological term that refers to the universe's not being made out of pre-existing matter and which did not enter biblical scholarship until the 2nd century BCE (May 1994). This concept is not found within the biblical text itself. Indeed, an alternative interpretation understands the statement, "the earth brought forth" plants and animals to *contradict* the *ex nihilo* interpretation. The Hebrew verb "bring forth" comes from the *Hif'il* stem, which indicates that the earth *produced* the plants and animals (Seely 1997).

Berndt further assumes that Genesis 1 must be chronological, but this creates problems for the other creation narratives in the Bible if they are also to be considered "true". The story of the Creation is told in different ways in Genesis 1, Genesis 2, Psalm 104, and John 1:1–3. Each of these has a different form, a different focus, and a different style to describe the Creation. Berndt provides no rationale for why Genesis 1 should take precedence, except, we suppose, that it appears first in the modern version of the Bible.

Berndt compounds this problem by asserting that the order of Creation in Genesis 1 represents a hierarchical scale of life: the life of any aquatic animal life is worth less than that of a land animal because land animals were created later. Animals on Day 6 take precedence over animals created on Day 5, and so on. This leads to very strange conservation strategies (chapter 13), but more important, it plays havoc with the story of the Flood. Noah was commanded to bring birds and *domesticated* animals on the ark, but not wild ones. Berndt must presume that all the wild animals drowned, only to be replaced by … what? And in only about 4000 years!

Perhaps most important, however, is that applying Berndt's biblical literalism is problematic because (according to his view) the qualities of living things before and after the Fall would make the original Creation categories *irrelevant* for understanding post-Fall characteristics. Since contemporary biology in Berndt's view is post-Fall biology, then the original classification categories and descriptions (such as they are) are not useful in telling us much about modern organisms. For example, why did some animals become carnivorous, but not others?

Berndt takes a courageous, but

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ultimately fruitless, step in trying to systematize the Bible into a biology book, but on close examination falls far short. The basic assumptions of his book are questionable, even among those who accept biblical authority in matters of faith. Modern scholarship understands the Bible both as a historical document and a text that needs interpretation — a living text, rather than a closed case. Trying to force the Bible into a biology book is not really in the spirit of the way the text was supposed to be used, and using it this way runs the risk of diminishing the use it was meant to serve — spiritual guidance, formation, and instruction.

Biological Studies

Berndt's principal goal is to set up classification criteria that allow "Christian teachers and biologists who believe in the biblical Creation to fully integrate their study within this biblical framework" (p 11) and in contrast to "Modern Taxonomy". Derived from the six days of Creation in Genesis 1, Berndt's classification is based on "Life Mode" (vegetation, creatures, humans), "Habitat" (terrestrial, aquatic, avian), "Distinction" (herbaceous and woody plants, insects and birds, and creeping, hoofed, and unhoofed beasts), and "Kind" (plants of the field and of the forest, aquatic beasts with lungs, scales and fins, and no fins, and so on). Humans, of course, are a unique "kind". The relationships among organisms that Berndt wishes to illustrate in *his* classification is God's creative plan (p 123–31).

First, Berndt tells us that "Taxonomy" is in "opposition to biblical classification" (p 11), a point he later expands by pointing out biology's "atheistic, naturalistic, and thus evolutionary belief system and agenda" (p 14). This, of course, sets up the contrast between Berndt's position that one accepts the Creation event "first by faith (revelation), and only then … by naturalistic science" (p 15). This contrast pits one "belief system" against another, and the primary distinction between them, of course, is accepting the True faith. Berndt's main objection to scientific classification is that is contradicts biblical priorities, some of which, he says, are not about physical form at all (p 23).

Second, Berndt misconstrues the practice of "Modern Taxonomy" as grouping "life on the basis of physical similarity from the general … to the specific" (p 23). Contemporary taxonomy is not just "naming" and "grouping", but rather a discipline devoted to extracting underlying phylogenetic relationships among organisms — even some organisms that appear quite *dis*similar physically. For a lucid explanation of contemporary taxonomy with respect to the specific example of dinosaurs and birds, see Padian (2000, 2001).

The main problem with this book as a *biological* resource, however, is that it contains so many errors of fact. This may be due to the author's practice of using secondary and tertiary sources. Berndt commonly cites textbooks, encyclopedias, popular science magazines, and other general references to support his conclusions — which are often quite different from those in the sources he cites.

Berndt's greatest error in this book is to overlook the fact that, in contemporary biological studies, the taxon in which an organism is placed tells us a lot about that organism, and *that* is why organisms are sometimes reassigned to new groups. We know a lot about the physiology, reproduction, immunology, neurobiology, cardiovascular anatomy, and so on of a whale *because* it is in the class Mammalia — knowledge that is obscured by Berndt's classification of whales as "aquatic" creatures, a group containing fishes, cyanobacteria, mollusks, crustaceans, sponges, tubeworms, corals, and others. This practice makes Berndt's classification *biologically* useless — no more about biological relationships than stamp collecting is about zip codes (Mayr, quoted in Lewin 1982).

Conclusions

Readers will find no more comprehensive volume that maps living things onto the six days of Creation and how an alternative, though nonbiological, biblical view might organize them. However, the subtitle of this book, *Authentic Biblical Biology*, is a misnomer. What biology there is in this book is secondary to Berndt's questionable interpretation of the Bible. He typically dismisses scientific data and conclusions by asserting merely that they contradict the Bible and therefore could not be true (for example, p 84). A good deal of the biological material is incorrectly or inaccurately presented, including the main foil of the book — "Modern Taxonomy" — and much of the biblical material ignores contemporary scholarship on Scripture.

We can only recommend this book for readers wishing to see how *this* literal biblical world view perceives the natural world. But readers interested in biology or in modern biblical scholarship would be best advised to look elsewhere.

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Finding God in the Questions: A Personal Journey

by Timothy Johnson
Downers Grove (IL): InterVarsity Press, 2004. 216 pages.

Reviewed by Stephen B Hager, Augustana College

The primary purpose of *Finding God in the Questions*, written by Timothy Johnson, Medical Editor for ABC News, is stated in the preface: "In a sense, writing this book has been an attempt to be totally honest about my religious beliefs for the first time in forty years." As this first sentence suggests, Johnson is reflective about his religious past and hopeful for a future that focuses on not only bolstering his Christian beliefs, but also living his life according to the teachings of Jesus. Johnson's religious convictions and his aim at honestly expressing those in this book are admirable.

He divides his book into three sections, each titled as a question. Section 1, "Does God exist?", provides an outlet for Johnson to proclaim his belief that the universe, and indeed everything contained in it, was created by God, the designer. He uses most of the four chapters of this section to conclude that the evidence from scientific studies in mathematics, physics, chemistry, and biology shows the designer's "footprints". Section 2, "What is God like?", explains Johnson's personal beliefs in God and the importance of Jesus in this belief system. "What difference does it make?" is the title of the last section. Here Johnson tries to reveal how his Christian faith guides the way he lives his life.

On the surface, the book is formatted as a chain of thought-provoking and fundamental questions that stimulate insightful answers. Indeed this seems to work for Sections 2 and 3. Below the surface, however, it is obvious in Section 1 that his beliefs, which really are the answers, guide the questions and not vice versa. This inverts the logic of the question-and-answer format, suggesting that either Johnson is deliberately attempting to mislead the uninformed reader about the evidence of design in nature or he does not understand that scientific evidence is used not to support a religious belief system, but rather to test hypotheses about the natural world.

In addition, the content of Section 1 is vastly different from, and thus fits poorly with, the balance of the book's subject matter. For Johnson, scripture provides the lenses for viewing and understanding the world, as he explains in Sections 2 and 3. It is obvious in Section 1 that Johnson is viewing the science through similar lenses, derived from the New Testament. If Johnson would have elaborated on this instead of on the scientific evidence, then the book would have been consistent and understandable throughout. It is these two problems in Section 1 of *Finding God in the Questions* that undermine the book's basic goal: honestly examining Johnson's religious beliefs.

So why do I think that Johnson's beliefs guide the questions in Section 1? First, he states several times that he believes the universe is designer-driven (for example, p 40–1). If this is what he believes, then how can he ask in any objective sense about the creation of the universe? He already knows the answer: it prompted the question. Such circular reasoning, to which he admits at the bottom of page 54, is pervasive in Section 1. Moreover, the way that Johnson poses his questions shows that he is not seriously considering any alternatives to design. On page 36, he asks: "Is the creation of the universe a result of chance or design?" So he indicates that there are only two answers, but he dismisses the former outright as being impossible, in part because of his peculiar way of defining "chance" as being the result of nothing more than random processes — a usage that is not consistent with modern scientific understanding. Johnson concludes that this sort of chance is impossible by invoking (1) the "typing monkeys" argument (p 38), which claims that just as it is impossible for an army of monkeys to type all the books in the British Museum, so too is it impossible that the universe happened by chance; (2) the tornado argument (p 38), which states that just as it is impossible for a tornado to assemble a Boeing 747 by sweeping through a junk yard, so too is it is impossible that the universe formed by chance; and (3) the irreducible complexity argument, which states that if the machinery of cellular genetics were dismantled, then genetic processes would not occur and the individual pieces of the cell would not be able to operate on their own (p 40). Maybe I am missing something, but I do not see how this idiosyncratic and erroneous usage of "chance" invalidates scientific theories that use "chance" to include probabilistic processes, many of which are decidedly non-random. Johnson's formulation of this problem is simply a false dichotomy.

Aside from being answer-driven rather than question-driven, Section 1 seems enormously out of place relative to the rest of the book. (The book's disjunct structure is curiously similar to that of Cornelius Hunter's *Darwin's Proof*; reviewed on p 43 of this issue of *RNCSE*.) In this first section, Johnson argues in anthropic style that the scientific evidence supports the view that a designer designed the universe. He states that there are too many "cosmic coincidences" (p 43) in the universe that allow for the existence of life, and especially of humans: gravity is just strong enough, but not too strong; water, light, carbon, and oxygen "act and interact" in just the right proportions; and DNA works just as we need it to work. Then, rather abruptly, Johnson switches to biblical references in Sections 2 and 3 to help explore and discuss his relationship to God and how to live as Jesus lived.

Why not also use biblical accounts, such as those found in Genesis, for Section 1 rather than scientific evidence? This would have codified the book into a more enjoyable, unified, and sincere exploration of his religious beliefs and allowed for an honest question-and-answer (in that order) dia-

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log. If he believes that there is a designer, then why not justify this with the literature that provided his belief system in the first place?

Aside from the inconsistencies highlighted above, there are other problems with the content of Johnson's book that are worth noting: his belief that natural selection is goal-driven (p 40); his attempt to make legitimate the idea of a designer by invoking the names of famous scientists who publicly consider the possibility of a designed universe (for example, p 45; visit Project Steve for an illustration of why this reasoning is erroneous: <http://www.ncseweb.org/resources/articles/3541_project_steve_2_16_2003.asp>); his painting evolutionists as "bad", evil, and amoral creatures when they attempt to understand natural phenomena (p 64–5); his apparent weak grasp of the breadth of the literature on human sexuality (contrary to Johnson's assertion, the concept of rape is not extensively used by evolutionary biologists to understand reproductive behavior in humans; p 65); and, in the Suggested Reading portion associated with Section 1, his citation of mostly creationist literature (as opposed to a healthy balance of evolutionist and creationist sources). When viewed in the appropriate context, Section 1 is unfortunately nothing more than the rhetoric of creationists, who claim that evolution is untrue and irrelevant to the nature of life but who also claim that everyone should understand life's phenomena only through the story of Christian origins.

On the one hand, it is exciting for me to learn about the enormous success of an alumnus, such as Johnson, of the institution where I teach, and I am pleased by the more noble aspects of his book. However, it is disheartening and frustrating to see that this alumnus also used his book to advance a creationist agenda that ultimately threatens the integrity of public school science education, as well as that of society in general (Berman 2003). Without any doubt, Johnson knows what he believes, but for some reason he is not honest with the reader about why he believes that God designed the universe.

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Darwin's Proof: The Triumph of Religion Over Science

by Cornelius G Hunter
Grand Rapids (MI): Brazos Press, 2003. 168 pages.

Reviewed by Jason J Williams, Stephen B Hager, and Bradley J Cosentino, Augustana College

Darwin's Proof: The Triumph of Religion over Science is meant to be like an old-fashioned baptism. Hunter attempts to plunge his readers headfirst into the turbid waters of the creationism/evolution "controversy" and pull them out cleansed of their evolutionary thoughts and with a re-invigorated faith in God. But, for the most part, Hunter's evangelism does not work. Though he is passionate about his cause and knows Scripture well, Hunter is not careful or charismatic enough to bring new members into his church.

While spritzing his readers with holy water, Hunter breaks out all the old stand-by anti-evolution arguments. The robust collection of molecular, morphological, and fossil record data that has gained acceptance in scientific circles for well over 100 years simply will not do for Hunter; he thinks the evidence simply is not there to support the theory. In addition, he believes that there is a fundamental problem with evolution: "Living things don't look like they evolved" (p 14). To Hunter's eyes, the biotic world is extraordinarily complex, and that makes evolution too unlikely to be believable.

Hunter is most insistent, though, about what he calls the philosophical and theological failures of evolution. Echoing arguments from his previous book *Darwin's God* (Grand Rapids [MI]: Brazos Press, 2001; reviewed by Donald Nield in *RNCSE* 2002 Jan–Apr; 22 [1–2]: 49–51), Hunter is primarily concerned to argue in *Darwin's Proof* that evolutionary biology is more like a flawed set of religious beliefs than an objective scientific discipline. Though all of modern science subscribes to methodological naturalism, Hunter criticizes only evolutionary biology for its assumptions about the relationship between God and nature. Because it assumes that God is not directly involved in natural processes, Hunter believes that evolution oversteps its bounds and makes religious claims: it states what God is and is not capable of doing in nature.

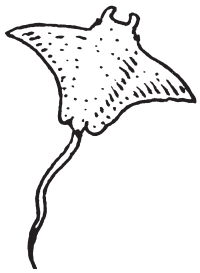
"The philosophical argument against evolution," Hunter writes, "is that it contains an internal contradiction. Darwinists claim religion plays no role in their theory, but religion lies at its very foundation … Declaring what or how God may not create is just as religious as declaring what or how he does create" (p 81). And, of course, the religious claims Hunter sees in evolution do not correspond with his own religious beliefs.

Evolution, in addition to compromising its scientific objectivity by making religious claims, relies on what Hunter believes is an incorrect perception of God. Hunter says, "Evolutionists are not seriously considering an Absolute God. Instead they appeal to a simplistic, feel-good God; indeed they require such a God to make their theory appear convincing" (p 96). Hunter's God is one that is intimately involved in creation. In chapter 10, he even goes so far as to say that the theory that God was responsible for creating all species "out of nothing, or out of nonliving matter" is "the best empirically-based and parsimonious explanation for the origin of species" (p 124). Evolutionists, of course, disagree.

And they should. Hunter's philosophical and theological criticisms stem largely from his misunderstanding of evolution itself. Throughout the book, Hunter has difficulty discerning when biolo-

This review was the outcome of a reading project of the Darwin Club, which is a student organization at Augustana College that seeks to inform the public about evolutionary theory.

gists are making scientific claims and when they are extrapolating from them (that is, making religious claims). He confuses what Michael Ruse (2003) has termed professional evolutionary biology and popular evolutionism. Professional evolutionary biology is experimental, quantitative, and only concerned with making scientific claims; this is what scientists do. Popular evolutionism, in contrast, takes the information supplied by professional evolutionary biology and derives value statements from it; this is the moral and philosophical side of evolution — the side upon which essentially everyone, not just scientists, has an opinion. When Hunter criticizes evolutionists for making religious claims, popular evolutionism is usually what he attacks, even if he thinks he is debunking scientific evidence.



For instance, on page 71, Hunter criticizes Stephen Jay Gould for the following statement (Gould was paraphrasing Darwin):

> If God had designed a beautiful machine to reflect his wisdom and power, surely he would not have used a collection of parts generally fashioned for other purposes. Orchids were not made by an ideal engineer; they are jury-rigged from a limited set of available components. Thus, they must have evolved from ordinary flowers (Gould 1980: 22).

"Notice," Hunter writes, "how easy it is to go from a religious premise to a scientific-sounding conclusion. The theory of evolution is confirmed not by successful prediction but by the argument that God would never do such a thing" (p 71).

While it is sometimes difficult to sort out when scientists are making scientific statements or extrapolating from them (Ruse's article was meant to make scientists distinguish more explicitly between the two), it is still ridiculous to assume, as Hunter does, that Gould's statement actually serves as evidence fit for professional evolution. The supporting evidence for evolution is published in peer-reviewed journals and supported by scientific data, not by religious or philosophical statements. Hunter has difficulty seeing that these two sides of evolution are separate.

Unfortunately, Hunter's misunderstanding of evolution is just one of many problems with *Darwin's Proof*. Both structurally and logically, *Darwin's Proof* is a confusing, contradictory mess. Problems start on the cover. The book's subtitle, "The Triumph of Religion over Science," is misleading, if not entirely unsupported. Only a few scattered sentences hint at its meaning. At some points, Hunter argues that the biblical creation story is a more accurate explanation of life on earth than evolution, hinting that perhaps religion is a better way to explain life on earth than evolution. Yet, at other times, Hunter insists that science and religion are not in conflict at all. "It is disappointing," he writes, "that this 'science vs religion' myth persists, especially after the good scholarship of the last half century that has shown how this view fails both historically and philosophically" (p 118). Hunter does not come to a final decision on the subtitle's meaning until the last page of the book. And in the end it is just a fancy restatement of his primary (and incorrect) thesis: that evolution is a religion rather than a scientific discipline. "In Darwinism," he says, "religion triumphed over science to the detriment of both" (p 134).

The structural arrangement of *Darwin's Proof* does not help Hunter's cause either; it makes his writing seem scatterbrained and the entire book difficult to follow. After staging his attack on the scientific, philosophical, and religious problems with evolution in chapters 1–7, Hunter begins what is essentially a sermon in chapters 8 and 9. Citing Bible passages as his evidence, Hunter explains that he knows what scripture says and he knows what has been discovered about nature, and that these two sources of information tell the truth: the biblical creation story.

Then, in chapters 10 and 11, Hunter shifts from the Bible-based discussion in chapters 8 and 9 and offers his opinion on "intelligent design" creationism (IDC). Because of his fundamental criticisms of evolution — that life on earth does not look (to him) as though it evolved and that evolution is simply unlikely — Hunter welcomes IDC with open arms. He insists, too, that IDC allows scientists and creationists alike to conduct research that evolution does not, making several ridiculous claims in the process — for instance, that IDC will allow scientists to see microevolution "correctly" and create "higher crop yields, freeze-and pest-resistant crop varieties, ecological control and habitat recovery, vaccines and healthier livestock," apparently forgetting all such things have been developed already, largely with the assistance of evolutionary theory (p 123). Finally, to conclude his book, Hunter tacks on a 20-page appendix with "faulty arguments for and against evolution". In addition to being plagued by the same misunderstandings Hunter has in the rest of the book about biology and evolution, the appendix seems structurally out of place; Hunter offers no explanation for its presence and does not attempt to tie it to the rest of the book in any way.

Overall, *Darwin's Proof* looks as it were very hastily written. In the first two chapters alone, Hunter, who holds a graduate degree in biophysics, manages to describe the fundamental structure of RNA incorrectly (he forgets that RNA contains uracil instead of thymine) (p 21) and erroneously cites fishes' evolving into frogs as an example of evolution (p 9). It seems that Hunter published the book only to proclaim the specifics of his own religious beliefs in chapters 8 and 9 rather than to contribute a novel or compelling argument to the creationism/evolution debate. If that is the case, he certainly succeeded. *Darwin's Proof* gets Hunter's religious convictions across, but it doesn't do much else. In its wake, the waters of the creationism/evolution controversy only get muddier.

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Science and Religion: Are They Compatible?

edited by Paul Kurtz
Amherst (NY): Prometheus Books, 2003. 368 pages.

Reviewed by Evan B Hazard, Bemidji State University

After two introductory essays (the first by the editor), the remaining 37 in this anthology are grouped in seven sections: 1, Cosmology and God; 2, Intelligent Design (Creationism versus Science); 3, Religion and Science in Conflict; 4, Science and Ethics (Two Magisteria); 5, Scientific Investigation of Paranormal Claims; 6, Scientific Explanations of Religious Belief; and 7, Accommodating Science and Religion. Some essays have bibliographies, notes, or both; others have neither. Regrettably, there is no index.

In his introduction, Paul Kurtz outlines a history of science/religion conflicts (as do some other essays), then notes that many scientists claim "mutual harmony and support of science and religion," a view he rejects. (Disclaimer: I am a skeptical believer who has no trouble integrating his faith with a fully natural view of the universe's properties and history.) Kurtz says that many conferences have furthered this notion of "mutual harmony and support" (but cites no resulting anthologies). In 2001, because of this perceived "din of proreligious scientific believers," the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP) and the Council for Secular Humanism (CSH) held a conference, "Science and Religion: Are They Compatible?"

They "invited scientists and scholars predominantly skeptical of the paranormal and religion ..., though other speakers sympathetic to theistic religions were also invited to engage in debate (some declined ...)." The subtitle implies the book grew out of the conference and "debate", but only five essays are actually conference talks. The others are mostly articles from *Skeptical Inquirer* or *Free Inquiry*. Some are from books. There is neither a roster of conference speakers nor any record of conference "debate", so we do not know which authors participated. Most contributions were first published before the conference (1990–2001). One author, Richard Feynman, died in 1988. His insightful comments are from lectures published posthumously. The latest contribution is William A Dembski's "intelligent design" creationist (IDC) challenge to skepticism from a 2002 CSICOP conference. Though scientifically flawed, it raises important non-scientific points that Massimo Pigliucci's excellent 2001 conference critique of IDC does not cover.

Thus, the book primarily samples mostly hostile and some neutral views of religion (primarily Christianity) as it relates to science generally, not just evolution. Many *RNCSE* readers will have seen them in *Skeptical Inquirer*, *Free Inquiry*, or earlier works. Richard Dawkins's essay first appeared in *The Quarterly Review of Biology* as one response to the Pope's "Message on evolution". Readers should also look up the other three in *QRB* (1997;72 [4]), and also Stephen Jay Gould's remarks in this book, which clarify a mistranslation in the Pope's message. Gould's essay, incidentally, contains the book's largest typo: his copious "Notes" appear twice. I found few other typos and citation errors, but one unfortunate omission: no footnote indicates the source of Vern L Bullough's thoughtful "historical perspective" on science and religion.

The only scientific content in most essays is, appropriately, specific to particular religious or supernatural claims. Some of the physics is beyond my ken. However, it is disappointing that some science writers, anthropologists, and philosophers of science perpetuate erroneous or outdated science. Martin Gardner asks, "Can anyone believe that a million years from now, . . . our brains will not have evolved far beyond their present capacities?" Any who understand natural selection can. This will happen only if appropriate genetic variants have a reproductive advantage. I doubt that they do. Such "straight-line" orthogenetic thinking was still common among evolutionists at mid-20th-century, but little evidence supports it. Today, it persists in the media and among creationists (as a straw man).

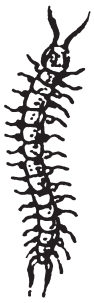
Concerning our ultimate demise, Kurtz writes, "at some point it seems likely that our sun will cool down." For decades, the consensus has been that Sol is heating up. In a billion years earth will become unbearably hot, and, four billion years hence, Sol will leave the stellar Main Sequence, becoming a red giant that fries the inner planets.

Concerning cultural evolution, Anthony Layng writes, "Human populations no longer adapt to environmental change by evolving genetically." I heard this in beginning anthropology in 1950, but kept mum. If populations vary genetically, and if some of that variation affects reproductive success in local environments, then only divine action could prevent evolution. Most contributors would probably agree that this is unlikely.

Many essays provide insight into diverse viewpoints among skeptics who are hostile to, or neutral toward, religion. Some contradict one another; skeptics are not a monolithic group. Most agree that science is the only valid way to understand the operation and history of nature, and that it invalidates any religious claims in this area. It does. Some hold that science's success proves there can be nothing beyond nature, nothing transcendent. That, it seems to me, goes beyond the science (Phillip Johnson will love those essays).

Jacob Pandian holds that "religion" is a narrow "subset of supernaturalism" developed by medieval Christianity to "represent Christian supernaturalism as scientific truth." Historians of religion might know of other traditions that do this, and no other contributor seems to adhere to this interesting distinction.

Victor J Stenger and others effectively refute the "anthropic principle", the notion that the universe is fine-tuned to result in us, or beings like us. Owen Gingerich (self-described as "the token theist in your curiously unbalanced exploration of the compatibility between science and religion") likes some of the anthropic principle's points, but I doubt that his Christianity depends upon them. Some essays note the mathematical possibility of multiple universes, denying the



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anthropic principle by saying we apparently arose in one friendly universe among many unsuitable ones. Again, does this not go beyond the science? The only way to know a conceivable universe is possible is to observe it; that is what empirical science is about. We can observe only ours. That a physically different universe is mathematically possible does not prove it could, in fact, exist, much less that it does.

Neil deGrasse Tyson, Barry A Palevitz, and others claim that science cannot provide us with ethics or a moral code. (Several note correctly that we can do that without religion. We likely have, using religion to bolster such codes.) GG Simpson pointed out the possibility of arriving at a contingent moral code without a religious basis in his *The Meaning of Evolution* (1949), still a good read.

Jacob Bronowski showed that science *does* provide a moral code because its practice requires independence of observation and thought, and therefore dissent. Dissent requires freedom, including free speech, and tolerance (not just indifference, but respect). These, all democratic values, derive from the practice of science, not from religious dogma. Bronowski's *Science and Human Values* (1965) was popular undergraduate reading decades ago, but today's scientific community seems unaware of it. Several essays also note the harm done by the certainty claimed for religious or other dogmas. Bronowski eloquently illustrated this at Auschwitz in his 1973 BBC television series and accompanying book, *The Ascent of Man*.

Section 6, Scientific Explanations of Religious Belief, is intriguing. The authors, none seemingly persons of faith, approach the question from various viewpoints. Kurtz asks, "*How do we explain* the willingness of so many people—no doubt a majority of [humankind]—to outstrip the evidence and to weave out fantasies *in which their deepest psychological longings are expressed and their national mythologies fulfilled?*" (italics added). My answer: "Paul, you just did."

Many essays consider religious *belief*, particularly about testable claims. Perhaps the failure to include more scientists who are "believers" has caused a serious omission, one hinted at in Kurtz's essays and in James Lovelock's. Religion fails in the area of scientific evidence, despite Dembski's claims. But wouldn't we expect that? A first-century tentmaker who, more than any contemporary, founded institutional Christianity, said that faith is about things not seen (2 Corinthians 4:18). As Kurtz and Lovelock note, valid faith is more akin to the arts than science.

"Religion," in Pandian's sense, (mis)uses empirical evidence to bolster faith. Creationists (including IDCs) misuse evidence to attack evolution (and all natural science). Basically, they are insecure in their faith and need evidence and an absolute authority to sustain it. Their faith requires "things seen" for support. Thus, they are "putting God to the test" (Matthew 4:7; Deuteronomy 6:16), and are essentially faith*less*. "Scientific" creationism and IDC are bad science, and also bad faith. No author in this anthology notes this.

In their discussion of the maturation of human cognition, Mary Belenky and others (1986) describe "received knowers", who accept knowledge primarily on authority. Later stages learn by objective analysis of experience and perhaps integrate this creatively with subjective knowledge, which they can only report to others, who cannot directly experience it. Most people stick with received knowledge, because of "their deepest psychological longings." It is vital to some religions and other institutions that their flocks remain received knowers. Encouraging people to move beyond this is our problem. This interesting book does little to solve it.

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Evolution as a Religion: Stranger Hopes and Stranger Fears, revised edition

by Mary Midgley
London: Routledge, 2002. 212 pages.

Reviewed by
Nicholas J Matzke, NCSE

Steven Rose, writing in the *Times Literary Supplement*, described Mary Midgley as "one of the sharpest critical pens in the West." Her favorite targets are the academic barons that attempt to take human psychology and reduce it to a single factor. In recent times, the two major psychological paradigms have been based on selfishness and social conditioning, the favorites of sociobiology and social science, respectively. These are two large and powerful academic camps, and few can match Midgley's dexterity in staking out a position in the no-man's land between them and defending it against all comers.

Midgley's central point is always that there is a deep psychological commonality among humans — that is, that human nature is quite real, and has a definite, but complex, structure. After all, says Midgley, we should expect nothing less than this based on the theory of evolution — we even share substantial psychological commonalities with other social mammals. This is philosophically important because it gives everyone some common ground on which philosophical and moral questions can eventually be resolved.

Midgley staked out this position in the first sentence of her first book, *Beast and Man: The Roots of Human Nature* (1978): "Humans are not just rather like animals, humans *are* animals." This put her directly in opposition to the then-popular "blank slate" view, which states that cultural conditioning

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makes us what we are. The cultural determinists developed their view in reaction to early 1900s social Spencerism (commonly known by the misnomer "social Darwinism"), which often justified racism, sexism, and economic oppression as "natural". Midgley acknowledges that these abuses occurred, but points out that the "blank slate" view is an overreaction, and is just as easily abused by oppressors: "blank slate" humans, fully determinable by conditioning, are a dictator's dream.

This side of Midgley's work, anticipating books like Steven Pinker's *The Blank Slate* (2002) by 20 years or more, should have made her quite popular among evolutionary biologists. However, it is not well known because Midgley gained notoriety primarily as a critic of sociobiology. In *Beast and Man*, after demolishing the cultural determinists, Midgley turned right around and went after the sociobiologists, who were in the ascendant with the publication of works such as *Sociobiology* (Wilson 1976).

Her primary problem with sociobiology was not its evolutionary premises or population genetics methods, but rather its egoist rhetoric that portrayed psychology as unreal fluff that could be reduced to selfishness. This seemed unnecessary and likely to cause the repetition of many Spencerist mistakes, thereby harming Midgley's central project of rehabilitating the concept of human nature for philosophical use.

The publication of Richard Dawkins's *The Selfish Gene* (1976) and its description of humans as "robot vehicles blindly programmed to preserve the selfish molecules known as genes" did nothing to assuage Midgley's concerns, and her discontent with this work led her to start a rather bitter feud with Dawkins in the august pages of the journal *Philosophy.* The initial exchange (Midgley 1979; Dawkins 1981) is infamous for its venomous prose and makes for unusually entertaining philosophy reading, but it should be remembered that Midgley apologized for her barbs (perhaps the only time this has happened) and summarized the positive goals behind her bomb-throwing (Midgley 1983).

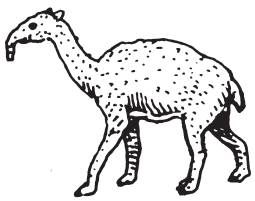
The first edition of *Evolution as a Religion* was published in 1985. To forestall worries based on the title, Midgley is neither claiming that evolution is a religion and criticizing it on this basis, nor saying that evolution should be turned into a religion. Instead, Midgley remains concerned with discerning the proper philosophical implications of the theory of evolution, and criticizing the various metaphysical confusions that get in the way of doing so.

In *Evolution as a Religion*, her list of targets has expanded beyond just Dawkins. She begins by noting that popular books by prominent scientists often contain surprisingly grand statements that are very difficult to construe as scientific. One example is Dawkins's moral conclusion in *The Selfish Gene* that we should "try to teach generosity and altruism, because we are born selfish."

Other examples abound. Molecular biologist Jacques Monod wrote in *Chance and Necessity* (1971) that man "must realize that, like a gypsy, he lives on the boundary of an alien world." In the conclusion to *Sociobiology* (1976), EO Wilson wrote that by the end of the 21st century, the social sciences would be reduced to biology, neurobiology would cannibalize psychology, and that this would produce "a genetically accurate and hence completely fair code of ethics." Similar ambitious conclusions about humanity and humanity's place in the universe can be found in more recent works as well, for example Stephen Jay Gould's philosophy of contingency in *Wonderful Life* (1989) and Carl Sagan's vision of humanity migrating to and speciating on different planets in *Pale Blue Dot* (1994).

Midgley calls these statements scientific "myths" — in her usage, imaginative visions connecting facts and values into a unified picture. What are we to make of them? Are they to be taken as confident scientific conclusions, as they are sometimes presented, along with the plain science presented in the books? They are certainly not found in the peer-reviewed journal articles on which these authors all built their scientific reputations. Midgley points out that these visions share some peculiar features with something that these authors go out of their way to critique, namely religion. Religion is often criticized for numerous failings — Midgley lists some: "priesthoods, prophecies, devotion, exaltation, heresy-hunting and sectarianism, ritual, sacrifice, fanaticism, notions of sin and absolution and salvation, and the confident promise of a heaven in the future" (Midgley 1987) — yet many of these characteristics can be found, to various degrees, in typically anti-clerical popular science books. They do not really get well-organized enough to amount to full-fledged religion (although some older imaginative "scientific" visions — Marxism, for example — seem to have come close), but it appears that when religion is kicked out the front door, its elements have a tendency to sneak in the back and reappear unrecognized.

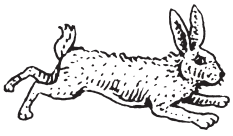
Midgley does not think that scientific myth-making is necessarily a bad thing — all major advancement in social, scientific, and moral matters is guided by these kinds of imaginative visions — but she does argue that it is very important that we recognize what is going on. Myths should be stated explicitly and held up for comparison with alternatives just like anything else. They certainly should not be accepted simply on the basis of their being "scientific", a mistake which is very common given the prestige of science and the common lack of philosophical education among the public and even professional scientists. It is far better, says Midgley, if we consciously assemble our myths with an eye towards current human problems and the current human position — that is, the human scale in both space and time. Whether or not the cosmos is indifferent, we clearly have some pressing concerns down here on earth. Migration across the galaxy is an intriguing idea, but surely the current priority is to make sure we do not destroy the planet that we currently inhabit. Midgley suggests that the Gaia Hypothesis advocated by James Lovelock may be the kind of scientific myth that should be taken more seriously in this context. Although commonly derided for its religious overtones, it is not clear that it is on worse metaphysical ground than selfish genes.



The second edition of *Evolution*

as a Religion contains a new foreword by Midgley commenting on some of the changes in the myth-scene since 1985. Marxism has completely died in the interval, but remains a useful running example of the extent to which a secular myth can develop. Midgley also notes approvingly that much of the brasher rhetoric of sociobiology has calmed, although it is now widespread in the popular imagination (just think of the analyses of Clinton during the Lewinsky scandal).

Evolution as a Religion remains relevant in the 21st century. Concerning the creationism/evolution scene, Midgley, like others (Miller 1999; Ruse 2003) argues that much of the motivation for anti-evolutionism is the bleak, harsh visions of humanity and the universe so common in the popular science writing of the 20th century. She was somewhat prophetic here — *The Blind Watchmaker* (Dawkins 1986) was a major influence in the development of Phillip Johnson's anti-evolutionism.



Midgley's argument that a diversity of imaginative visions can be constructed on the same basic facts has been confirmed now that we are beginning to see scientists writing books for the public that explicitly advocate imaginative visions opposed to those of the 1970s and 1980s. For example, Simon Conway Morris's recent books (1998, 2003) are essentially a theistic evolutionary rebuttal to Stephen Jay Gould's philosophy of contingency in *Wonderful Life*. Stuart Kauffman's *At Home in the Universe* (1995) is a rebuttal to existentialist views such as those of Monod.

Both of these authors try to defeat one cosmic vision by constructing another one out of the same mainstream scientific facts. The writers in the "intelligent design" movement take this several steps further, thinking that to repair the metaphysical situation they have to assail basic scientific facts. But perhaps all of these works, from ultra-Darwinist to anti-evolutionist, share a similar flaw, namely undue concern about determining the cosmic status of humanity. Midgley might suggest that we should worry a little less about questions of cosmic status and focus on changing the *status quo* down here on earth.

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Nature, Human Nature, and God

by Ian G Barbour
Minneapolis: Fortress Press, 2002.
170 pages.

Reviewed by Stacey E Ake, Drexel University and University of the Arts

Given the title, *Nature, Human Nature, and God*, one might have been led to expect a book of gargantuan proportions, for there is very little that is left uncovered by that tripartite rubric. Strangely enough, there is even a kind of echo of Douglas Adams's *Life, The Universe, and Everything* inasmuch as Ian Barbour's latest book is something of a handbook or guidebook to what is out there now in the world of science and religion, or, at least more specifically, science and Christianity.

At a pleasant 170 pages, the book takes the form of a thoroughgoing and exceedingly up-to-date review article of five timely topics in science and religion: God and evolution; evolution, genetics, and human nature; neuroscience, artificial intelligence, and human nature; God and nature: A process view; and theology, ethics, and the environment. As with Barbour's previous work, such as *When Science Meets Religion* (San Francisco: HarperSanFrancisco, 2000) and *Religion and Science: Historical and Contemporary Issues* (San Francisco: HarperSanFrancisco, 1997), the style of book is that of a detailed and orderly outline of the topics under discussion. Lucid, clear, and articulate in structure and presentation, the book gives one the impression of going by somewhat quickly, rather in the way that objects are seen in one's peripheral vision while driving down a country road. My guess is that this sensation is indicative of a certain peculiarity of the book; namely, that

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the breadth of material covered here in passing only allows for a cursory development of that material.

This situation, however, does not diminish the book's appeal, as I suspect it will be of interest to two very distinct groups of people. The first group would be those folks who are looking to get their feet wet in the science–religion dialogue for the first time or who still consider themselves novices and would like to read something that speaks to how theology is being affected by cutting-edge science. And the second group would be those who have been long involved in the science–religion debate and who would like an overview of the contemporary playing field. In this regard, Barbour, Bean Professor Emeritus of Science, Technology, and Society at Carleton College in Northfield, Minnesota, as well as a member of the advisory board for the book series Theology and the Sciences, of which *Nature, Human Nature, and God* is a part, is in a position *par excellence* for giving such an overview. One strong reflection of Barbour's expertise is the simple fact that, as a resource, the Notes section at the end of the book is invaluable. It is a shame, however, that there is not a simple bibliography, although an Index of Authors is provided (in which David Ray Griffin and Donald R Griffin seem to have become as one, much to Donald's detriment).

Concerning the content of the book, in the first section, "God and Evolution", newer elements, such as self-organization, chaos theory and indeterminacy, information theory, and top-down causality, are added to this somewhat more traditional point of conversation in the science–religion debate. In the section on evolution, genetics, and human nature, there is a much greater discussion of the biology concerning the theological and ethical topics that are of such great interest today; for example, cloning and stem cells, sociobiology and genetic determinism, and the evolution of religion, as well as a detailed exploration of human nature in theology given the inputs of modern biology, are all considered.

In the part devoted to neuroscience, artificial intelligence, and human nature, arguments concerning the nature of the self arise, especially as regards what both neuroscience and artificial intelligence have to say *vis-à-vis* consciousness. The importance of the emotions and the role of the symbolic are also examined in this section. In this section as well as in the previous section, intimations of the implications that process theology might have for the science–religion dialog appeared, but it is only in the section entitled "God and Nature: A Process View" that an explicit and full-bodied discussion takes place. Of particular interest are the subsections on evil, suffering, and human nature, and on the adequacy of God's power.

The final section, on theology, ethics, and the environment, explores the relationships between God and nature and between humanity and nature. In doing so, and in discovering the interrelatedness of all nature, the conversation naturally turns to social, global, and environmental justice. The fact that these problems of ethics are aptly separated from other ethical issues such as stem cell research deftly reflects the two very different streams running through bioethics, which are often lumped together as if they were part and parcel of the same thing.

Here the book ends. There is neither conclusion nor summation, and perhaps that is an appropriate ending for a text about the current state of things in the science–religion dialog, since the future is, in fact, wide open and full of possibilities. *Nature, Human Nature, and God* is a book very much worth reading for one's own further edification in these matters or to give to someone just beginning their own foray into the field of science and theology.

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Unintelligent Design

by Mark Perakh
Amherst (NY): Prometheus Books, 2004. 459 pages.

Reviewed by
Jason Rosenhouse,
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I have been a consumer of "intelligent-design" (ID) literature for several years now, but I think I did not fully appreciate the sheer extent of its awfulness before reading Mark Perakh's *Unintelligent Design*. Perakh dissects the arguments of the leading ID proponents with unusual care and thoroughness.

First up is mathematician William Dembski, who has lately been the only ID theorist pretending to do actual scientific work. It is Dembski's claim that one can, via a judicious use of probability theory, distinguish the products of design from the products of natural causes. In defending this claim, he uses generous quantities of technical jargon, mathematical symbolism, and endnotes, all of which creates the illusion of great profundity.

Perakh is not amused. In a chapter spanning nearly one hundred pages, he analyzes and rejects every aspect of Dembski's work. As a mathematician, I especially appreciated his comments on Dembski's misuse of probability theory. It is essential to Dembski's method that we be able to discuss the probability of an event's occurrence without knowing anything of the causal history of that event. For example, in his book *The Design Inference* (Cambridge: Cambridge University Press, 1998), Dembski writes, "Thus, if E happens to be an HP event, we stop and attribute E to a regularity." Here E denotes an event and HP stands for "high probability". His point is that if the event occurs with high probability, then we can reasonably attribute it to natural law, as opposed to chance or design. Perakh points out that this is

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precisely backward. It is only after we assume that some particular law is operating that we can assess whether the event is a likely product of that law. The event by itself tells us nothing about its probability of occurrence. More generally, it is effectively impossible to carry out empirically defensible probability calculations of the sort Dembski requires.

Perakh also explains, clearly and patiently, the extent to which Dembski abuses scientific terminology. Words like "complexity" and "information" have precise definitions within mathematics, but they are very different from the definitions Dembski gives to them. This is significant, since much of Dembski's credibility among nonscientists stems from his seemingly erudite use of modern mathematics. Perakh argues persuasively that he uses only the form, and not the substance, of professional mathematical discourse.

Perakh then devotes chapters to each of ID's other leading lights: Michael Behe and Phillip Johnson. His response to Behe (who argues that the "irreducible complexity" of certain biochemical machines implies that they were intelligently designed) is interesting in that Perakh is a physicist, not a biochemist. Showing a level of modesty the ID people would do well to imitate, he does not attempt to discuss the biochemical minutiae of Behe's chosen systems. Instead he observes, among other points, that it is a combination of functionality and simplicity that suggests design, and not the sort of extravagant complexity Behe seems to prefer.

A further point is that "intelligent design" has two components to it. One is the question of design *per se*; the second involves the wisdom of that design. Perakh devotes most of his time to the second point. This is useful. Having decided a biochemical system is the product of design, it is certainly reasonable to draw inferences about the designer from the nature of the system. ID advocates routinely try to skirt this point, knowing that from an engineering standpoint the human body is less than impressive. Still, I would have preferred a more thorough discussion of the first point. Behe's central claim is that the dependence of biochemical machines on every one of their parts implies that natural selection could not have crafted them. This claim is false, but Perakh addresses it only briefly.

The book includes several chapters addressing various attempts to reconcile the biblical story of creation with modern scientific findings. Perakh devotes one chapter each to Hugh Ross, Grant Jeffrey, Fred Heeren, Nathan Aviezer, Lee Spetner, and Gerald Schroeder, all of whom have parlayed dubious science and, at times, even more dubious theology, into successful books. Though many of the arguments offered by these writers are not directly relevant to the creationism/evolution issue, any reader will benefit from Perakh's lucid treatment of their work. There are also chapters addressing the nature of science, the basic elements of probability theory, and the infamous Bible codes.

Most of the chapters can be read independently of one another, and many of them are based on essays Perakh previously published at his internet web site <http://www.talkreason.org>. This leads to a certain amount of repetition, some of which could have been avoided by more judicious editing. Perakh covers so many topics and makes so many points that everyone will find things here and there with which to disagree. Overall, however, this is a devastating refutation of ID nonsense in all its forms.

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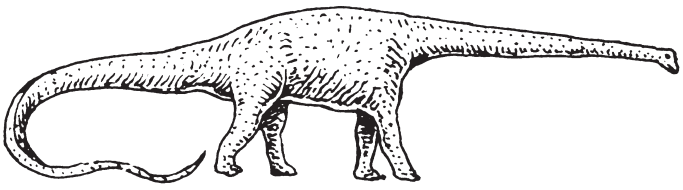

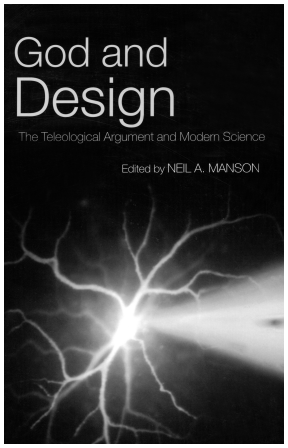

God and Design: The Teleological Argument and Modern Science

edited by Neil A Manson
New York: Routledge, 2003. 400 pages.

Reviewed by Niall Shanks, East Tennessee State University

This volume consists of nineteen essays devoted to the merits and failings of the argument from design from the standpoint of modern science. The contributors include distinguished scientists, philosophers and an assortment of creationists — a veritable mix of the good, the bad, and the ugly. The volume is divided into four parts. Part 1 is concerned with the characteristics of the argument from design, part 2 with physical cosmology, part 3 with the multiple universes hypothesis, and part 4 with biological versions of the argument from design.

The volume opens with an essay by Elliott Sober that provides a clear characterization and critical analysis of the various forms of the argument from design. The argument has biological and cosmological variants, and these need to be sharply differentiated. Sober raises critical points against both the biological and the cosmological ("fine-tuning") versions of the argument from design.

This essay is followed by John Leslie's reflections on the meaning

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of design. Where Sober's essay was rooted in rigorous analysis of the structure of arguments trading in probabilities, Leslie's essay is rooted in more traditional philosophical concerns about the nature of God-the-designer.

Robert O'Connor's essay considers claims by contemporary "intelligent design" theorists that their latest versions of the argument from design go beyond traditional versions from the standpoint of scientific respectability and philosophical presupposition. He draws a useful distinction between *local-design arguments* and *global-design arguments*. The latter try to infer design from the very presence of life in the universe, whereas the former try to infer intelligent agency and design from facts in the domain of contemporary science (for example, the biochemical pathways that have bewitched creationists such as Michael Behe). O'Connor's conclusion is that notwithstanding claims to the contrary, the new "intelligent design" arguments are nothing more than old creationist wine in new designer-label bottles.

The first part of the anthology also contains essays by Jan Narveson (critical of the design argument), Del Ratzsch (who explores a perceptual, non-inferential approach to the evidence for design rooted in the philosophy of Thomas Reid), and Richard Swinburne (who supports the design argument on the basis of [uncalculated and unsupported] claims concerning the improbability of atheism).

To give a taste for Swinburne's style of argumentation: he comments on the multiple-universes hypothesis favored by some cosmologists, "Rational inference requires postulating one simple entity to explain why there are many complex entities. But to postulate many complex entities to explain why there is one no less complex entity is crazy" (p 117). While there is no reason (certainly none provided by Swinburne) to suppose that the postulation of a supernatural designer is either simple or even coherent, it is far from clear that Swinburne is right about the requirements of rational inference. After all, we believe complex objects such as tables are made up of vast multiplicities of atoms. These are objects with complicated internal structures and incredibly complex mutual interactions, as any quantum chemist or quantum field theorist knows. Not since the 18th century have scientists tried to explain the complex manifestations of matter — water, for example — by postulating a simple, elemental substance!

Part 2 of the anthology is concerned primarily with cosmological versions of the argument from design. In the comic novel *Right Ho, Jeeves* by PG Wodehouse, the immortal Bertie Wooster, himself no great genius, described an acquaintance, Miss Madeline Bassett, as follows: "her conversation, to my mind, was of a nature calculated to excite the liveliest suspicions. Well, I mean to say, when a girl suddenly asks you out of a blue sky if you don't sometimes feel that the stars are God's daisy chain, you begin to think a bit." The disputes about the cosmological versions of the argument from design are essentially disputes between those who think that the stars (or the fundamental cosmological constants ...) are God's daisy chain, and those who are frankly skeptical.

Physicist Paul Davies opens this part of the anthology with a discussion of the appearance of design in physics and cosmology. The essay is largely speculative in nature, and Davies contends (though he does not argue) that the emergence of life and consciousness were somehow written into the basic laws of nature (he knows not how). Reading this essay, one cannot help but feel that Davies should stick to his field of expertise — quantum gravity — and leave metaphysics to those who at least have some arguments up their sleeves.

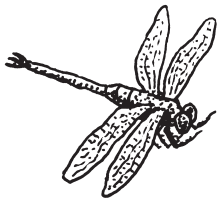
This essay is followed by William Lane Craig's ruminations on the anthropic fine-tuning of the universe. Put bluntly, many numbers appear in the standard cosmological model that are not predicted by basic theory but have to be fixed empirically. If these numbers were slightly different, then we would not be here for the universe would be inhospitable to our kind of life. Craig (and numerous others) see this fine-tuning of nature's constants as evidence of providential design. On the face of it, this is a colossal argument from ignorance: we currently do not have a good physical theory that explains why nature's constants take the values they do, so they must have been fixed by God.

In responding to the claim that the postulation of a providential designer only pushes the problem back one step (what then explains the designer), Craig argues, "It is widely recognized that in order for an explanation to be the best, one need not have an explanation of the explanation. ... If the best explanation of a disease is a previously unknown virus, doctors need not be able to explain the virus in order to know that it caused the disease" (p 175). As Craig must surely be aware, the hypothetical virus only becomes the best explanation after independent evidential warrant for its postulation is forthcoming from empirical medical and virological inquiries ("It enters the body this way ...", "It parasitizes intracellular mechanisms this way ...", "It propagates this way ...", and so on). Until these inquiries are conducted, the viral hypothesis for the cause of a disease is an unsubstantiated hypothesis that explains nothing. Postulating a hitherto unknown supernatural being simply to explain the fine tuning of the universe, with no further evidence of mechanism and details, is mere idle speculation.

Craig's essay is followed by essays by Robin Collins (supportive of claims about fine-tuning in the face of skeptics such as Steven Weinberg); and by Timothy McGrew, Lydia McGrew, and Eric Vestrup (skeptical about the role played by probabilities in fine-tuning arguments).

Part 3 of the anthology is concerned with the "multiple universes" hypothesis as a non-supernatural device to explain the anthropic coincidences. This section opens with an essay by astrophysicist Sir Martin Rees. Rejecting explanations of fine-tuning in terms of either chance or providential design (and, for that matter, ignoring that the apparent need for such explanations arises from the current incomplete state of cosmological science), Rees suggests that the fine-tuning could be explained by the postulation of many universes (in which the laws and physical constants differ from those obtaining in

our universe). Our universe, far from being either designed or being a freak of nature, would then belong to a subset of the set of universes that offered habitats conducive to the emergence of complex life and consciousness. The basic idea is as follows: the probability of rolling a fair die five times and getting five 6s in a row is very small (0.00013). But if you have many millions of people rolling dice, there will be thousands, who, by chance alone, will roll five 6s in a row.



Personally I find the postulation of multiple, unobservable universes to be less than compelling. The probability that you get five 6s in a row in a given trial involving five rolls of the die may be 0.00013. But this same probability attaches to any other sequence outcomes from five rolls of the die (for example, two 5s, a 4, and two 2s). This probability, moreover, tells us nothing about when, in a sequence of trials, each involving five rolls of the die, you will get five 6s. Perhaps it happens in the first run of five rolls of the die, perhaps in the 27th. That we anthropically care about five 6s in a row — perhaps we get a prize — hardly merits the postulation of either natural or supernatural entities in a realm invisible.

DH Mellor's essay also expresses skepticism about the "multiple universes" hypothesis. Mellor questions whether it offers an explanation of our existence. In ostensibly dealing with the question "Why do we exist?" in terms of multiple universes, Rees seems to answer another, very different question (that is, "Why do we exist where we exist?"). As Mellor observes, "to change the question in this way is like turning the question of why there are fish (say) into the question of why they live where they do, namely in water: to which the obvious answer is that water, unlike dry land, has what fish need" (p 223).

Roger White's essay continues the exploration of fine-tuning and the explanatory value of multiple universes. I find myself uneasy with White's conclusion that "assuming there is just one universe, the fact that it is life-permitting is surprising. For this otherwise extremely improbable outcome of the Big Bang is more probable on the assumption that there is a cosmic designer who might adjust the physical parameters to allow for the evolution of life" (p 243). Physicists know virtually nothing about the details of the instant of the Big Bang (as opposed to what happened a miniscule fraction of a second later). It is hard to say what is probable and what is not. Nothing follows about nature from our ignorance of it. That one can tell a theological science-fiction story about cosmic designers tweaking cosmological parameters hardly renders the existence of a single, life-permitting universe more probable than otherwise. It would be different if we had some independent evidence that there were such a being with the requisite wherewithal, but we do not.

White's essay is followed by a piece by creation scientist William Dembski. Dembski's work has been widely criticized elsewhere, and I will not rehearse those criticisms here.

While I share Dembski's unease with the postulation of multiple universes, I find his counter-proposal to be deeply problematic:

> We already have experience of human and animal intelligences generating specified complexity ... Thus, when we find evidence of specified complexity in nature for which no embodied, reified or evolved intelligence could plausibly have been involved, it is a straightforward extrapolation to conclude that some unembodied intelligence must have been involved. Granted, this raises the question of how such an intelligence could coherently interact with the physical world. But to deny this extrapolation merely because of a prior commitment to naturalism is not defensible (pp 266–7).

The problem here lies not with a prior commitment to naturalism, but with Dembski's failure to adequately address the question of coherent interaction between the physical realm and the nonphysical realm, for unless this matter is properly dealt with, the extrapolation he envisions is in fact highly problematic. That evolved physical beings such as ourselves can design complex artifacts is evidentially irrelevant to the issue as to whether there are nonphysical supernatural beings who can design universes — objects that are, on the face of it, very different from the artifacts of human experience.

Finally we arrive at Part 4 of the anthology, which involves essays devoted to the issue of "intelligent design" in biology. Michael Behe opens this section with a discussion of the modern "intelligent-design" hypothesis. Behe, like Dembski, has been widely criticized in other forums, and Behe's essay is followed here by an excellent critical essay by Kenneth Miller which does much to dismantle his uncritical speculations about biological "intelligent design".

Behe's strategy is to point to known features of biochemistry and to argue that since there is currently no obvious way (given our present state of knowledge) in which these systems could have evolved (we are ignorant of how they came to be — though not as ignorant as Behe would have you believe), then they must be fruits of "intelligent design". This is essentially the same pattern of inference underlying the leap from our ignorance of the details of fine-tuning to the conclusion of supernatural design.

Michael Ruse's essay on modern biology and the argument from design is perhaps one of the best essays in the entire volume from the standpoint of scientific insight and philosophical depth. Readers seeking a subtle account of the interface between science and religion need look no further than Ruse's essay in this volume. Following Ruse, there is a speculative essay by Simon Conway Morris that purports to see evidence of a cosmic teleology in the facts of evolutionary convergence.

The final essay in the volume is by Peter van Inwagen, who explores the issue of the compatibility of Darwinism with the argument from design. Like the essay by Michael Ruse, this essay exhibits a considerable degree of philosophical and theological sophistication, and like Ruse's essay, it too will repay serious study. For van

Inwagen, if unaided natural selection could produce the ordered diversity we see in the biological world, why could not a God (or some other intelligent being) desiring such diversity have used this same elegant mechanism? "Anyone who thinks that the history of terrestrial life is inconsistent with its being the vehicle by which God's purposes have unfolded in time really should have something to say about how the history of life *would* look if it were the vehicle of God's unfolding purposes" (p 362). Perhaps, after all, one can have one's cake and eat it. Maybe so, but we are a long way here from the hostility to modern science implicit in the work of creationists, "intelligent design" theorists, and biblical literalists. If van Inwagen is right, it may be possible after all to rise above the din generated by the clash of naïve scientism with naïve theology.

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The God Hypothesis

by Michael A Corey
Lanham (MD): Rowman and Littlefield, 2001. 347 pages.

Just Six Numbers

by Martin Rees
New York: Basic Books, 2000 (first published 1999). 195 pages.

Reviewed by Adrian Melott, University of Kansas

Michael Corey has clearly made an enormous effort in producing his book. It is almost encyclopedic in its mining of the discussion of what's become known as "fine-tuning" (FT). FT concerns the values of certain combinations of numbers known as physical constants. An example of a physical constant is G. If one takes the product of the masses of two objects, divide by the square of the distance between them, and then multiply this result by G, the result is equal to the force of gravitational attraction between them.

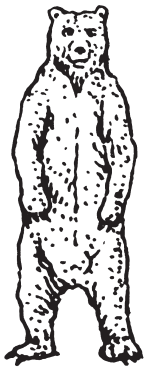
FT concerns apparently narrow ranges of values for certain combinations of these constants. For example, if the ratio of the electrical to the gravitational force between elementary particles were very different, stars as we know them could not exist. This in turn would mean the absence of such elements as carbon and oxygen, manufactured in stars and distributed in their violent deaths, which are necessary for the existence of life as we know it. For a clean and very readable discussion of FT, I recommend Martin Rees's book. A note of skepticism regarding FT can be found in some chapters of Steven Weinberg's book *Facing Up* (Cambridge [MA]: Harvard University Press, 2000).

A variety of reactions is possible, including ignoring the apparent FT as a kind of delusion. It is well known that we notice and remember the remarkable, which fuels superstitious beliefs. Another skeptical response is to note that a concept of life that depends on carbon and oxygen may be too narrow, projecting our failure of imagination onto the universe.

A stronger response is to consider that our existence would not be possible were the universe much different, so we should not be surprised at such coincidences. This is called the Weak Anthropic Principle, though some dispute dignifying it with a name. On the other hand, the *Strong* Anthropic Principle asserts that the universe *must* contain properties that allow life to develop within it. Theologians of various stripes have taken the small next step to argue that God designed the universe so that we could live in it.

In his book, Corey openly admits that he is participating in the rebirth of natural theology, an effort to find religious knowledge by studying nature. He appears not to be aligned with what we know as creationists, or the "intelligent design" movement, who try to deny large parts of modern sciences. He does argue for design — the design of the kind of universe we live in. He appears to see himself as a theistic evolutionist. It is a perfectly valid faith-based position to take our universe as a place designed so that something like us might appear.

Unfortunately, he does not do justice to this position in several ways. The first is that, as an apology for a particular point of view, it tries to dredge out every possible argument that might bolster his case. Sometimes this merely looks ridiculous and weakens his case. One example is that since the sun has 400 times the diameter of the moon, but is 400 times further away, we on earth can experience "perfect" eclipses in which the moon just covers the sun. He cannot seriously believe that this is anything but a coincidence, can he?



More damaging are moments when he tries to make scientific arguments for which he clearly has no background. For example, he says, "It is very difficult to see how the universe could possible be infinite in spatial extent and yet simultaneously be finite in age." Yes, it is difficult to see, but that does not make it false. Universes of infinite size and finite age are standard fixtures of modern cosmology, and in fact are the best fit to the data at this time. Like the creationists, he finds it acceptable to deny what he does not understand. In the same paragraph he drags out Olber's Paradox, which says that an infinite universe should be bright since every line of sight ends on a star. This is well-understood to be resolved by a combination of finite age and the redshift of light.

These errors are important, because they are used to reject what may be the most important new hypothesis in cosmology — the idea of a "multiverse" resulting from inflation. Corey does not

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understand these errors' lack of relevance to standard cosmology, so he feels free to dismiss this expanded concept. In the multiverse picture, there are many zones beyond our cosmic "horizon", in which physics takes different forms. In this context observers will find themselves in zones of FT, if they find themselves anywhere.

Rees prefers the multiverse option, but mentions others. More importantly, he understands what he writes. I recommend his book, for its own merits as well as for preparation for abuse such as Corey's.

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Defending Science—Within Reason: Between Scientism and Cynicism

by Susan Haack
Amherst (NY): Prometheus Books, 2003. 411 pages.

Reviewed by Taner Edis, Truman State University

This is a good book. Philosopher Susan Haack has a lot to say about science, what makes it tick properly, and how it relates to other areas such as law, ethics, religion, and social concerns. And she says it well, without drowning the reader in jargon or in disputes about technical details.

In fact, this may come across as a surprisingly good book. Many scientists, in particular, are suspicious about philosophical commentary on science: too often, we think, philosophers get grandiose ambitions about capturing the essence of science, be it by discovering a special logic which guarantees the success of science or by exposing science as another mythic narrative no better than witchcraft. This is not entirely a well-deserved reputation — there are plenty of philosophers who are deeply engaged with the science they examine, who have modest but exciting insights, and whose work is continuous with the best science itself has to offer. Nevertheless, many scientists do see philosophy as irrelevant to science, and Haack's work could be a welcome counterexample, precisely because she aims to deflate grandiose approaches whether they aim to sanctify science or to dismiss it.

Defending Science is also worth reading because scientists and educators often take bad philosophical advice, or we play at philosophizing about science ourselves and make a hash of it. This is particularly a problem when we have to respond to paranormal and religious-oriented claims from outside of mainstream science, such as anti-evolutionary ideas. We easily are tempted into trying to rule creationism out because it fails to exhibit some supposedly essential feature of science such as "falsifiability"; we say "intelligent design" does not qualify as science because it is not naturalistic. Such attempts to cut off debate without having to explain why evolution succeeds as an explanation, however, are mistaken. They even play into creationist hands, as they are not difficult to portray as evolutionists' shouting down the opposition rather than relying on the scientific evidence. Haack shows how the whole project of finding a special logic or essential method to science is misconceived. Far from securing our knowledge on a firm foundation, this approach leads to a lot of cognitive relativist mischief through its inevitable failure. Haack is, of course, just as strong when criticizing the relativists, whether their ideas have roots in philosophy, political ideology, or fashions within the sociology of science.

This is not to say Haack always gets it right. She does, on occasion, exalt common sense carelessly. She also seems too concerned about protecting philosophy, particularly her discipline of epistemology, from assimilation into science — this leads her to overlook some fruitful continuities between philosophy and science, and to be unduly skeptical about the promise of cognitive science.

Her chapters on the broader social issues related to science, though thoughtful and thought-provoking, also strike a few false notes. Her chapter on science and religion, where she includes a brief discussion of creationism and "intelligent design", is an example. It restates the conventional wisdom current among liberal secularists well enough, but religious believers of all stripes are likely to find her position superficial. And it is; our liberal conventional wisdom owes more to political demands than any coherent analysis of science and religion, and some common perceptions of religion among secular academics do not do justice to the complexities of religious life.

All this, however, is nitpicking. Haack has put together an ambitious, wide-ranging book about science, and this is not possible without compromising on the depth some subjects might otherwise require. By and large, she succeeds in her overall task. Even more than any specific argument, her overall approach and attitude — consistently supportive of science and its claims to knowledge while remaining clear-eyed about its imperfections — sticks with the reader at the end of the book. No matter what their background, defenders of science and good science education will put this book down feeling illuminated.

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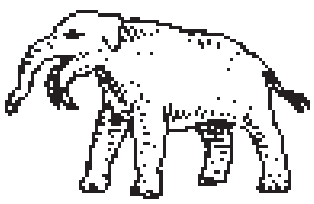

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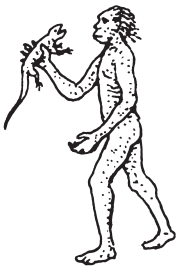

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