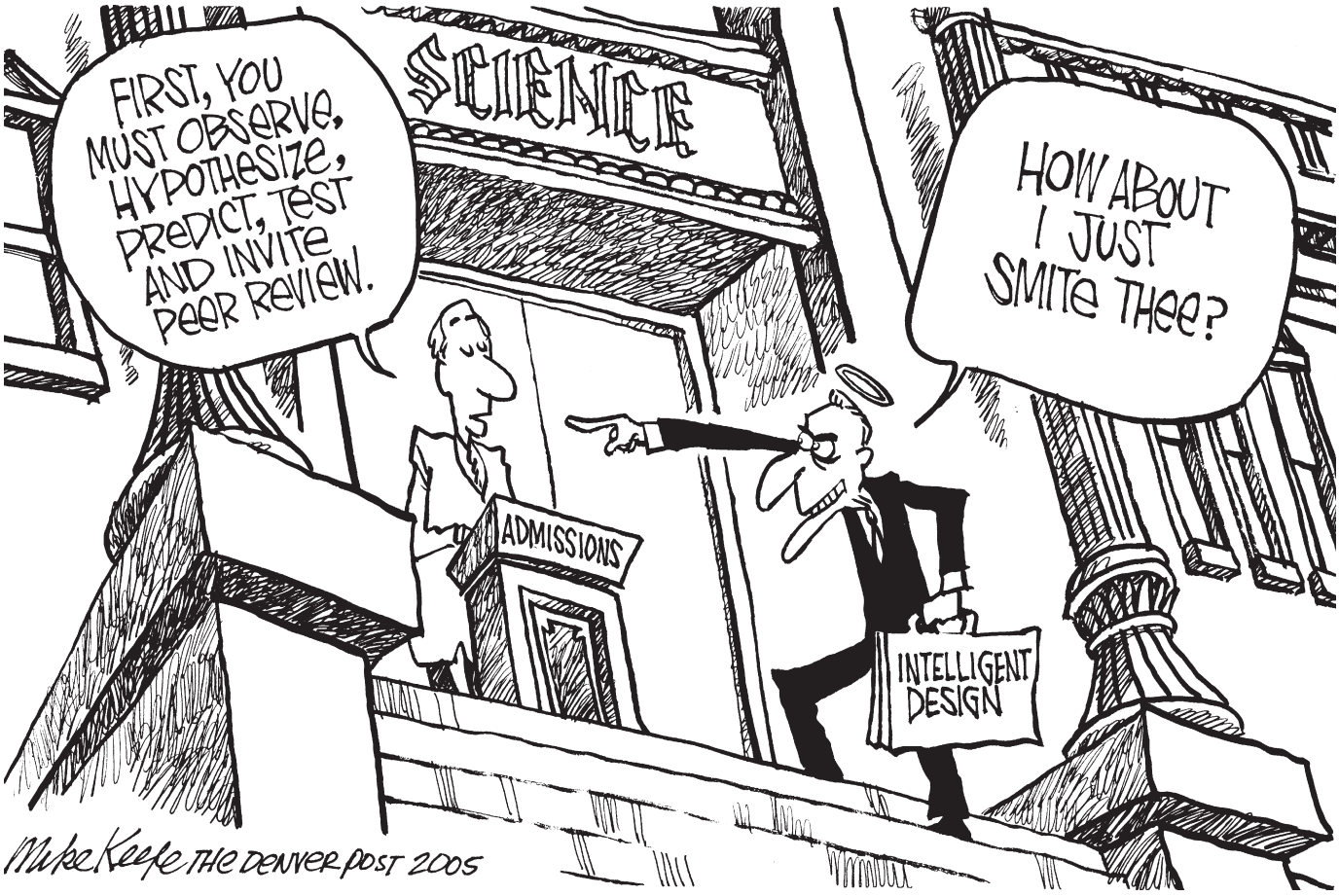
REPORTS OF THE NATIONAL CENTER FOR SCIENCE EDUCATION

DEFENDING THE TEACHING OF EVOLUTION IN THE PUBLIC SCHOOLS

Volume 24, Number 6 **Nov-Dec, 2004**

CONTINUES *NCSE REPORTS & CREATION/EVOLUTION*



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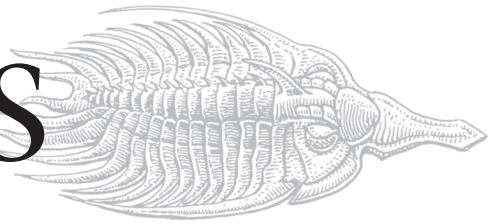

REPORTS OF THE
NATIONAL CENTER FOR SCIENCE EDUCATION
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Eugenie C Scott, *Publisher*
National Center for Science Education
PO Box 9477
Berkeley CA 94709-0477
(510) 601-7203
fax: (510) 601-7204
e-mail: ncse@ncseweb.org
http://www.ncseweb.org

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Debating is an honorable and valuable tradition for exploring values and policy options. Debates in oral tradition and written formats are a part of our intellectual, cultural, and historical heritage. So why is NCSE so opposed to participating in a debate on the validity of creationism or "intelligent design"? Several contributors to this issue provide various answers to that question, but many of them boil down to one general principle: science proceeds by examination and evaluation of evidence, not by scoring rhetorical points by a fine turn of a phrase or by reducing an opponent to incoherent babbling. The difference was well illustrated by Alan Lockwood ("Controversial issues: The teacher's crucial role." *Social Education* 1996; 60 (1): 28–31), writing in a special issue of *Social Education* devoted to teaching controversial issues in social studies classes.

Lockwood argued that important issues facing students (and society) should be divided into two components: (1) empirical issues associated with disciplined inquiry in the relevant field of scholarship, and (2) issues associated with the exploration of values as they arise in public policy discussions . Scientific questions are those that are answered in the first component — disciplined inquiry in a relevant field of study. Indeed, this is the only component that can address *real* scientific controversies. Even though persuasive argumentation is a part of presenting and defending scientific findings, the primary route for developing, testing, and accepting new scientific ideas, models, and theories is via empirical study within relevant scientific disciplines.

Debates, on the other hand, are concerned more with the second component. They are designed around rhetorical strategies that elicit sympathetic responses and score points for cleverness, incisiveness, and wit. One of the chief rhetorical strategies for anti-evolutionists is to present "evidence against" or "weaknesses of" evolution. The inherent assumption in this strategy is that by tearing down some aspect of the scientific support for evolution, the debater automatically provides support for his or her own "alternative" — creation science, "intelligent design", and so on.

The experiences reported in this issue from those who have debated creationists and those who have watched these debates will illustrate the distinction between the scientific enterprise and the mainly political and cultural activities of anti-evolutionists who call for public debates on evolution.

IN THE NEWS

Anti-evolutionism is breaking out all over! In addition to the usual flock of anti-evolution bills introduced in state legislatures, the preparations are moving along for the first trial of a school board policy requiring "intelligent design" in the science classroom in Dover, Pennsylvania. Kansas held a "kangaroo court" on its science education standards (more in future issues). On the whole, scientists and science educators have declined to participate in this sham proceeding. In Gull Lake, Michigan, and in Grantsburg, Wisconsin, local citizens have been active in opposing actions that will introduce "intelligent design" or weaken evolution in the curriculum. In addition to our usual updates, be sure to see our feature reports on Gull Lake, Michigan, and Grantsburg, Wisconsin.

In the NCSE News section, see our latest "Friend of Darwin" and "Clarence Darrow" awards, given to individuals who have promoted evolution and evolution education consistently and energetically. We appreciate their efforts, as we appreciate the efforts of all our members. See our "News from the Membership" to sample some of the ways in which NCSE members support evolution … and send us a note on what *you* have been doing in your own area.

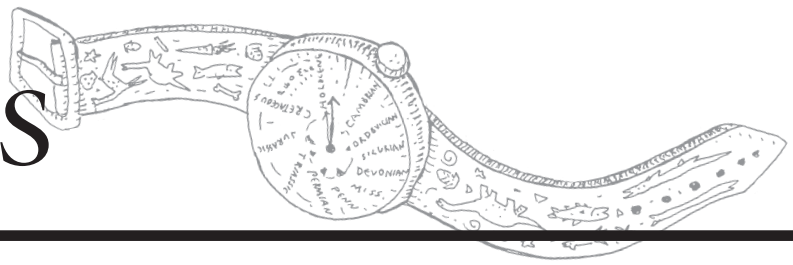
IN PRINT

We also have a number of interesting book reviews for our readers. Karl Giberson reviews *Creationism's Trojan Horse* by NCSE board member Barbara Forrest and Paul R Gross. Bernard Ortiz de Montellano reviews a recent volume by Simon Coleman and Leslie Carlin on the status of anti-evolutionism in English-speaking countries around the world. Finally, Lee Ehrmann reviews *The Genomic Revolution* edited by Michael Yudel and Rob DeSalle. As predicted, genomics has produced additional confirmation of the evolutionary model, and this field promises many other useful additions to evolutionary knowledge in the future.

In upcoming issues, we will be grappling with the presentation of evolution in the classroom and the pressures on teachers and educational researchers to tone down discussions of the central idea of the life sciences. We will also present a view of the nature of biological groupings and the phylogenetic schemes we derive from them. We will explore the whole question of "created kinds" that anti-evolutionists use as arguments against "macroevolution". We are also planning an issue devoted to topics raised by the current approach to evolutionary psychology, and another that will look at physics and earth sciences. So stay tuned: there is certainly something for everyone in the year ahead.

RNCSE 24 (6) was printed in September 2005.

NEWS



Evolution and the Elections

Glenn Branch
NCSE Deputy Director

Evolution surfaced in elections around the country. Here is a sampling of relevant news — some encouraging, some disquieting.

THE PRESIDENTIAL RACE

Five science magazines — *Geotimes*, *Natural History*, *Nature*, *Physics Today,* and *Science* — invited the two major candidates for President, incumbent Republican George W Bush and his Democratic challenger John Kerry, to offer their views on science policy.

Under the rubric "Creationism", *Science* asked: "Should 'intelligent design' or other scientific critiques of evolutionary theory be taught in public schools?" Bush answered: "The federal government has no control over local curricula, and it is not the federal government's role to tell states and local boards of education what they should teach in the classroom. Of course, scientific critiques of any theory should be a normal part of the science curriculum." Kerry answered: "I believe that ideology should not trump science in the context of educating our children. Still, public school curriculum is a matter subject to local control. Communities must decide which sound, scientific theories are appropriate for the classroom." (See <http://www.sciencemag.org/sciext/candidates2004/>.)

Under the rubric "Theory of evolution in schools", *Natural History* asked,"Nearly all biologists consider the theory of evolution to be the bedrock of their science.Yet some people feel that evolution should not be taught in public schools, or that it should be presented as one of several competing theories about the development [*sic*] of life on earth. Would your administration lend its support to any group or initiative that advocates either of these approaches to the teaching of evolutionary theory?" Bush failed to answer, and the editors of *Natural History* were unable to find any pertinent recent statements in the public record. Kerry answered:"I believe in objective standards of scientific inquiry. I support the funding of initiatives, like those of the National Institutes of Health and the National Science Foundation, that advance our understanding of the natural and physical world. Evolution is a part of that understanding." (See *Natural History* 2004 Oct; 51.)

Under the rubric "Science education", *Geotimes* asked, "Do you support creationism and/or 'intelligent design' being co-taught with evolution in public schools? Why or why not?" "[W]hile both campaigns agreed to answer the questions," the *Geotimes* staff reports, "two months later, neither side had answered the questions, despite several follow-ups. Perhaps this is a sign of the times — candidates have too little time and bigger fish to fry — or perhaps it says something about how seriously these policy-makers view earth science issues." (See <http://www.geotimes.org/oct04/feature_issues.html#>.)

None of the questions posed by *Nature* or *Physics Today* was relevant to evolution education policy. (See <http://www.nature.com/news/specials/uselection/index.html> and <http://www.physicstoday.org/vol-57/iss-10/p28.html>.)

Of the various third-party candidates for President, only Michael Peroutka, of the Constitution Party — which describes itself as "the only party which is completely pro-life, anti-homosexual rights, pro-American sovereignty, anti-globalist, anti-free trade, anti-deindustrialization, anti-unchecked immigration, pro-second amendment, and against the constantly increasing expansion of unlawful police laws, in favor of a strong national defense and opposed to unconstitutional interventionism" — seems to have mentioned evolution education as a crucial issue. Reporting on Peroutka's campaign for National Public Radio's *Morning Edition* (2004 Nov 1), Anne Hawke commented, "Creationism and God are central campaign themes," and Peroutka himself was heard to say, "They teach you that your great-granddaddy was some hunk of primordial ooze in some kind of pond somewhere, and that your granddaddy was maybe an eely kind of fish that maybe grew some legs, and that your daddy was a monkey." Evolution education is not specifically mentioned in the Constitution Party's platform.

STATE PARTY PLATFORMS

During the first two weeks of October 2004, NCSE examined the websites for the Democratic and Republican parties of all 50 states for official party statements (usually platforms) on the subject of evolution education. Whether or not any such statements were found, the Google search engine was also used to search for relevant keywords (such as *science*, *education*, *evolution*, *creationism*, and *intelligent design*) on the websites. Thus the search is likely to have uncovered all of the official statements on the subject that were present on the websites, although not necessarily all of the official party statements (since, for example, the Kansas Republican Party's platform was not, and at press time is still not, available on its website).

The result: no state Democratic parties, but seven state Republican parties — those of Alaska, Iowa, Minnesota, Missouri, Oklahoma, Oregon, and Texas — are officially

anti-evolutionist. Four of them — those of Alaska, Oklahoma, Oregon, and Texas — call for teaching creationism and/or "intelligent design" in addition to evolution; the remaining three call only for referring the decision whether to teach such "alternatives" to local school districts. Except for these parties, no state political party, whether Democratic or Republican, mentioned evolution education in particular, although the Texas Democratic Party platform decries "efforts by right-wing extremists to censor textbooks," presumably in part a reference to the state's recent struggle over the adoption of biology textbooks (see *RNCSE* 2003 Sep–Dec; 23 [5–6]: 4–7). For details, see Table 1.

Congressional and gubernatorial races

Arkansas: In the November 2, 2004, election, Jim Holt, the Republican nominee for US Senate, lost to incumbent Democrat Blanche Lincoln, by 44% to 56%. As a first-time representative in the Arkansas legislature, Holt introduced the anti-evolution bill HB 2548 (see *RNCSE* 2004 May–Aug; 23 [3–4]: 4–7 for details). During a televised debate with Lincoln on October 28, 2004, Holt was asked whether he would promote creationism if elected. He responded, "I don't think that's necessary right now," but lamented, "There are teachers who don't know that these evidences [*sic*] have been proven wrong," adding, "If someone wants to teach that [creationism] in schools, why can't they? It's their right to do so, I believe." (See the October 29, 2004, report from CNN available on-line at <http://edition.cnn.com/2004/ALLPOLITICS/10/29/ar.senate.asp/>).

Louisiana: In the November 2, 2004, election, Republican Piyush "Bobby" Jindal, who lost his race for governor against incumbent lieutenant governor Kathleen Babineaux Blanco in 2003, won election to the first congressional district of Louisiana with 78% of the vote. During his campaign against Blanco, he said that "the scientific weaknesses of evolution" should be taught and that "it's appropriate to tell our students that no scientific theory can prove evolution" (see *RNCSE* 2003 Sep–Dec; 23 [5–6]: 13–7).

South Carolina: According to *The* (Columbia) *State* (2004 Oct 24), during a debate on October 23, 2004, between senatorial candidates Jim DeMint (Republican) and Inez Tenenbaum (Democrat), DeMint "took aim at schools for teaching that human beings are a product of evolution instead of God." In the November 2, 2004, election, DeMint won.

South Dakota: *Newsweek* (2004 Jul 26) reported that Republican senatorial candidate John Thune rejects evolution. Clarifying his religious views for the benefit of the *Rapid City Journal* (2004 Oct 29), however, Thune explained, "I believe in creation, the Genesis account that God created us. I believe the Creator could have used any number of means, including an evolu-

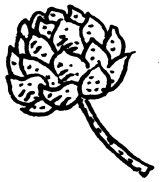
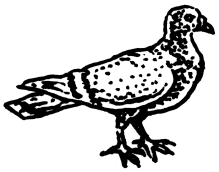


Table 1. State political parties with anti-evolutionist platforms

State	Party	Statement	Document	Source
Alaska	Rep	We support giving Creation Science equal representation with other theories of the origin of life. If evolution is taught, it should be presented as only a theory.	2004 Platform of the Republican Party of Alaska	<http://www.alaskarepublicans.acom/platform.php>, section II.D
Iowa	Rep	We believe that the local choice to teach creation science, or intelligent design science, should be allowed in government schools rather than exclusively teaching evolution as the only viable theory.	Final 2004 Republican State Platform	<http://www.iowagop.org/cgi-bin/fullnews.cgi?newsid1087323170,47556>, section 3.4
Minn	Rep	[W]e support ... Protecting educators from disciplinary action for including discussion of creation science, adopting science standards that acknowledge the scientific controversies pertaining to the theory of evolution.	Republican Party of Minnesota, 2004 Permanent Platform	<http://www.mngop.com/documents/2004%20permanent%20platform.pdf>, section 3.I
Missouri	Rep	[T]he Missouri Republican Party SUPPORTS ... Empowering local school districts to determine how best to handle the teaching of creationism and the theory of evolution.	2004 Missouri Republican Party Platform Party	<http://www.mogop.org/docs/2004%20%20Platform.doc>, p 3
Okla	Rep	We believe that in public schools where evolution is taught, creationism should be taught as well. We support disclaimers on any state-funded science textbook that treats evolution as fact rather than theory.	Oklahoma Republican Party Grassroots Platform 2004	<http://www.okgop.com/documents/State_Platform.doc>, section II.23
Oregon	Rep	Science [instruction in the Oregon public school system] shall include scientific creationism.	Oregon Republican Party Platform	<http://www.orgop.org/about/platform.htm>, section 2.5.c
Texas	Rep	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.	2004 State Republican Party Platform	<http://www.texasgop.org/library/RPTPlatform2004.pdf>, p 17



tionary process. I don't believe we all of a sudden just appeared," adding, "I believe in intelligent design, that there was a Creator. We didn't evolve from primordial slime." In the November 2, 2004, election, Thune narrowly beat incumbent Democrat (and House minority leader) Tom Daschle with 51% of the vote.

Washington: A gubernatorial candidate's views on creationism returned to haunt him. According to *Seattle Weekly* (2004 Oct 13), in 1992 Dino Rossi "told the *Bellevue Journal-American* that he supported the teaching of creationism alongside evolution in public schools. When asked if the quote accurately reflected Rossi's views at the time, spokesperson Lane says, 'If it's in there, it's in there. Let it stand.' Pressed to explain Rossi's current view on creationism, Lane says, 'It's nothing I've ever heard him talk about in recent years.'" In its endorsement of his rival Democrat Christine Gregoire for governor, the *Weekly* cited his past support of creationism as evidence that his views are "way too right wing" and "way outside the mainstream" (2004 Oct 20), although the *Seattle Times* reported him as claiming that "he has 'no recollection' of ever taking such a position" (2004 Oct 24), and he generally portrayed himself as a moderate. The results of the November 2, 2004, election were so close as to require a recount, but after a protracted controversy, including a lawsuit seeking to invalidate the result of the election, Gregoire was declared the victor.

State boards of education and departments of education

Kansas: As predicted (see *RNCSE* 2004 May–Aug; 23 [3–4]: 4–7), the balance of power on the Kansas Board of Education tilted 6–4 in favor of anti-evolutionists after the November 2, 2004, election. In District 4, the only contested seat, incumbent Democrat Bill Wagnon, a supporter of evolution education, faced Republican Robert Meissner. Meissner was cagey about his views on evolution education, saying, for example, that if elected he would not oppose the inclusion of "other scientifically credible theories" in addition to evolution (*Lawrence Journal-World* 2004 Oct 22), but not going so far as to endorse teaching "intelligent design". The race was a squeaker: as the *Lawrence Journal-World* (2004 Nov 3) reported: "Bill Wagnon went to bed thinking he might have lost a bid for his third term on the State Board of Education. But Wagnon, a Democrat, awoke Wednesday a 2600-vote winner ... Wagnon's victory over Meissner, a Topeka dentist, was in doubt until the last precinct was reported in Douglas County. Meissner's early lead dropped to only 70 votes before results from that last precinct swept it away. The final tally was 59 681, or 51%, for Wagnon, to 57 032, or 49%, for Meissner." Hoping to avert the expected battle over the place of evolution in the state science standards, now under revision, Wagnon proposed that the board establish state standards for elective courses in religion; fellow board member Janet Waugh explained, "I see [such classes] as a golden opportunity to introduce all the various forms of creationism, intelligent design because they're all based on faith" (*Lawrence Journal-World* 2004 Nov 11). But the proposal failed to attract support. In January 2005, when Kathy Martin replaced Bruce Wyatt in the District 6 seat on the board, the anti-evolution faction achieved a 6–4 majority.

Montana: Republican Bob Anderson and incumbent Democrat Linda McCulloch, running for the post of Superintendent of Public Instruction, took different views of the proposed "objective origins" policy in Darby (see *RNCSE* 2004 Mar/Apr; 24 [2]: 4–12, 14–7): McCulloch criticized it as a way to smuggle creationism into the science curriculum, whereas Anderson expressed support for the right of local school districts to determine their own curriculum, even if it results in the inclusion of "alternatives" to evolution in science classrooms. In the November 2, 2004, election, McCulloch was re-elected with about 60% of the vote.

Ohio: Mindful of the controversy about the Ohio Board of Education's adoption of the anti-evolutionist "Critical analysis of evolution" lesson plan (see *RNCSE* 2004 Jan/Feb; 24 [1]: 5–6), the *Cleveland Plain Dealer* (2004 Oct 24) asked candidates for the District 11 seat, "The state school board went through a bitter fight recently over Ohio's new science standards, especially in the area of how students should be taught about the origins and development [*sic*] of life on earth. Are you satisfied with the outcome of that debate?" Incumbent Virgil Brown answered, "Considering the debate began 100 years ago and is still not settled, I am satisfied with the result. The standards are based on generally recognized theories of science and proper rebuttals or questions." Christopher M Corrigan answered, "I am not satisfied with the outcome. I believe that our elected officials should not play politics with our children's curriculum. We need a science curriculum which will prepare our children for the jobs of the future." Carole L Lesnick answered, "No. The ruling to allow creationism to be taught in biology classes is an attack on the separation of church and state. Evolutionary theory is undisputed among scientists. Understanding human evolution from ape to man is an opening to understanding human history and the roots of class society." In the November 2, 2004, election, Brown was re-elected. Additionally, the Ohio Roundtable — which describes itself as "dedicated to restoring traditional Judeo-Christian principles to public policy" — circulated a questionnaire to all of the candidates which included the tendentiously worded question "Do you support/oppose policies ... which would encourage students to understand Darwin's theory of evolution, as well as scientific evidence against it?" (For a political scientist and polling expert's discussion of the wording of such questions, see *RNCSE* 2003 May–Aug; 23 [3–4]: 41–3.) See Table 2 for the results (taken from <http://www.usavoter.info>).

State legislative races

Michigan: In the 61st district in Michigan, Republican state representative Jacob W "Jack" Hoogendyk Jr faced a challenge from Democrat Jim Houston,

whom he narrowly defeated in 2002. It was Hoogendyk who in 2003 introduced House Bill 5005 in the Michigan House of Representatives, which would have amended the state school code to allow teaching of "the design hypothesis" — defined as "the theory that life and its diversity result from a combination of chance, necessity and design" — in the science classes of the state's public schools (see *RNCSE* 2003 May–Aug; 23 [3–4]: 5–10). HB 5005 was referred to the House Committee on Education, from which it never emerged. In the November 2, 2004, election,

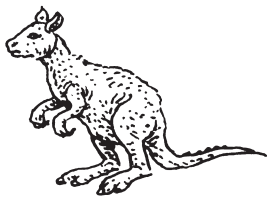
TABLE 2. RESPONSES TO OHIO ROUNDTABLE'S EVOLUTION QUESTION:

"DO YOU SUPPORT/OPPOSE POLICIES ... WHICH WOULD ENCOURAGE STUDENTS TO UNDERSTAND DARWIN'S THEORY OF EVOLUTION, AS WELL AS SCIENTIFIC EVIDENCE AGAINST IT?"

District	Candidate	Response
1	Charles Knight	I support giving students complete information. Both Intelligent design and Creationism.
	Eric Green	Answer not provided.
	Lou Ann Harrold	Students should be encouraged to be aware of their family's beliefs concerning how life began and we are now here. They also should be aware of the prevailing theories of present as well as theories creating political issues now and in the past.
5	**Colleen Grady**	I believe that the position taken by the majority of the State Board of Education members was a fair and reasonable compromise.
	Ed Lepisto	Support.
	Robin Hovis*	I support the teaching of any scientific theory or evidence in science class. When there is scientific evidence against the theory of evolution, it should certainly be taught. I do not know anyone who disagrees with that. The recent controversy over teaching creationism/Intelligent Design arose because the science community does not find the information offered by creationists/Intelligent Design advocates challenging evolution theory to be scientific in nature, but rather to be based on philosophy and religious beliefs. In science class we are trying to teach students to uncover new knowledge or understand existing knowledge by using the scientific method of inquiry, where evidence is [analyzed], experiments performed and [evaluated], and results published for other scientists to try to replicate and confirm. Matters of religious faith by definition are not subject to any sort of earthly scientific "proving." It would not be a matter of "faith" if it was! Religion and philosophy, including religious objections to evolution theory, should be taught in history or social studies, but not in science class. Evolution theory need not be a conflict between science and religion. Most mainstream churches have published statements declaring that evolution theory is not in conflict with their doctrine. The Bible has a higher purpose than to be used as a biology textbook.
6	Adam Miller	Answer not provided.
	James Moyer	Answer not provided.
	Mark Wallace	Public schools should teach Darwin's Theory of evolution. Parents who disagree can teach their children whatever they would like in their homes, communities and Churches.
	Michael Cochran*	I support the teaching of Darwin's theory of evolution, as well as scientific evidence against it.
	Terry Roberts	Answer not provided.
9	David Daubenmire	I believe that both the theory of evolution and the theory of intelligent design should be mandatory in our schools. Although there is a great deal of evidence supporting change within a species ... a wolf becomes a dog ... there is no proof of cross-species evolution ... a dog becoming a bird. To teach evolution as fact is misleading. One of the purposes of education should be to provoke thought. It is essential to give the students a full range of information so that they can come to their own conclusions about what they believe to be true. No matter how much the science community may squeal about the integrity of science, we have an obligation to present to our children both theories and allow them to reach their own conclusions based on all the information available. If the theory of evolution is true, than Science should have no fear of presenting other theories for discussion.
	Jennifer Stewart*	I think that these policies should be developed at the local level and should not be included in the state's academic content standards.
	William Moore	Theory should be presented in public schools but not a graduation requirement.
10	**Jane Sonenshein**	Answer not provided.
	Ralph Schell	Answer not provided. [Schell was not on the November ballot.]
11	Carole Lesnick	Answer not provided.
	Christopher Corrigan	Answer not provided.
	Virgil Brown*	I support policies that teach Darwin's theory as well as scientific evidence against it.

* denotes incumbents; **boldface** denotes winners in the November 2, 2004, election

Robin Hovis, although not re-elected, was subsequently appointed to the board by Governor Taft.



Hoogendyk was re-elected with 55% of the vote.

Missouri: Candidates for the Missouri legislature in several districts answered a questionnaire from the *Sun-News of the Northland* (2004 Oct 21) that included the question "Should 'intelligent design' be taught alongside evolution in Missouri's public school science classes?"

In House District 30, incumbent Republican Jason Brown answered, "All relevant theories should be considered during the educational process as decided by the local school board," while his Democratic challenger Meg Harding answered, "No." In House District 31, incumbent Democrat Trent Skaggs answered, "No. But all scientific ideas should be presented," while his Republican challenger Robert Eshleman answered, "Yes. If we can teach kids about the birds and bees, then why can't we teach kids about who created the birds and bees?"

In House District 32, Republican incumbent Susan Phillips — a cosponsor of Missouri's "intelligent design" House Bill 911 (see *RNCSE* 2004 Jan/Feb; 24 [1]: 10–15) — answered, "Let's look back at some of our schools when 'intelligent design' teaching was the norm. That may answer the question," while her Democratic challenger Jason Grill answered, "No. Only testable, verifiable and repeatable scientific hypotheticals [*sic*] should be taught and tested in public school science classes."

In House District 33, Republican Jerry Nolte answered, "If that is the decision of the parents and the local taxpayers. The state should not micro-manage our local schools." Democrat Pam Payne answered, "No." In House District 34, Republican Tim Flook answered, "The free expression of ideas, both scientific and spiritual, should be allowed in academic settings. Parents and families can be trusted to guide their children on their personal beliefs," while Democrat Bob Saunders answered, "No."

In House District 35, incumbent Republican Doug Ervin answered, "Yes. Nothing in state law currently prohibits schools from teaching alternative theories to evolution. This is a local issue for parents and school boards to decide," while his Democratic challenger Steve Wolcott answered, "No. All generally accepted scientific theories are being covered in most Missouri schools' science curricula." In House District 38, incumbent Democrat Dan Bishop answered, "No," while his Republican challenger Ryan Silvey answered, "Curriculum decisions should be decided by the local school board, not dictated by the state government."

In Senatorial District 17, Democrat Phil Willoughby answered, "No. We must focus on fixing our funding problem before we get diverted into a battle over creationism versus evolution," while Republican Luanne Ridgeway answered, "Yes. All theories of origin should be presented to students who should draw their own educated conclusions in conjunction with parental guidance."

When the newspaper offered its editorial endorsements (2004 Oct 28), it was clear that a relevant consideration was whether a candidate supported teaching "intelligent design" (which it described as "a gossamer attempt to promote religion in public schools"). In the November 2, 2004, election, Brown, Skaggs, Phillips, Nolte, Flook, Ervin, Bishop, and Ridgeway won.

Montana: Discussing the race in House District 70, the *Bozeman Daily Chronicle* described Republican Roger Koopman as having "plans for a slew of bills, including one that would allow state schools to teach 'intelligent design' creationism in science classes" (2004 Oct 10). In House District 87, Democrat Corrine Gantt noted that her opponent, Republican Ron Stoker, was supported by the supporters of the proposed "objective origins" policy in Darby (see *RNCSE* 2004 Mar/Apr; 24 [2]: 4–12) and expressed concern about what educational measures he might pursue in the state legislature; Stoker disclaimed any intention of promoting "objective origins" at the state level (*Ravalli Republic* 2004 Oct 21). In the November 2, 2004, election, Koopman defeated his Democratic opponent Bryon Anderson with 60% of the vote and Stoker defeated Gantt with 64% of the vote. Koopman subsequently submitted a request for his promised "intelligent design" bill to be drafted, but it was never introduced (see *RNCSE* 2004 Sep/Oct; 24 [5]: 12–5).

Ohio: Although newspaper stories on the race for House District 22 failed to mention it, the candidates — incumbent Republican Linda Reidelbach and her Democratic challenger Abramo Ottolenghi — were fiercely divided on the issue of evolution education. During the 2002 battle over the Ohio science standards, Reidelbach sponsored two anti-evolution bills in the Ohio House of Representatives, one parroting the language of the so-called Santorum Amendment (see *RNCSE* 2002 May/Jun; 22 [3]: 4–5 or Glenn Branch and Eugenie C Scott's "The anti-evolution law that wasn't", *The American Biology Teacher* 2003 March; 65 [3]: 165–6) and the other mandating legislative approval of the final draft of the science standards (see *RNCSE* 2002 Jan–Apr; 22 [1–2]: 4–5). Ottolenghi, a retired professor of microbiology at Ohio State University, publicly defended the place of evolution in the Ohio science standards and decried efforts to undermine it (see, for example, his letters to the editor of the *Columbus Dispatch* 2002 Jan 26, 2002 May 27). In the November 2, 2004, election, Reidelbach was re-elected with 53% of the vote.

Local boards of education

Alaska, Matanuska-Susitna Borough: Five candidates for the Matanuska-Susitna ("Mat-Su") Borough School Board expressed their views on a number of controversial issues, including evolution education, at a candidates' forum on September 28, 2004. Four of them — Stephen Fee, Beverly Erbey and incumbent Larry DeVilbiss, all vying for school board seat F, and Sydney Jacobs, running for seat C — said that creationism ought to be taught along with evolution, although they differed as to how; according to *The Frontiersman* (2004 Oct 1), "Fee said students should be able to hear both sides of the debate and suggested offering religious electives if students and parents wanted those courses provided. Sydney

Jacobs, however, held that the Theory of Creation should be taught from a non-religious standpoint, approaching the question from a 'first mover' rather than a god." Daniel Contini, running to defend his spot on seat G, had no comment on the issue. In the October 5, 2004, election, Jacobs lost to Linda K Menard, who was not at the forum, and DeVilbiss and Contini were re-elected.

California, Roseville: In the Sacramento suburb of Roseville, where evolution education was a divisive issue for the past two years (see *RNCSE* 2004 Mar/Apr; 24 [2]: 14–7), nine candidates ran for three seats on the school board: Jack Duran, Karen England, Garry Genzlinger, incumbent Gary Kidder, Tim Herman, incumbent Jan Pinney, Louise Santiago, Matthew See, and Paige Stauss. (Incumbent Dean Forman is leaving the district and therefore did not run for re-election.) England and See were endorsed by Larry Caldwell, the Roseville parent who petitioned the board to require teachers to teach "evidence against evolution", and they expressed their openness to doing so. With the exception of Kidder, who did not actively campaign, the other candidates called for a change in the school board's focus; several said that they would uphold the school board's earlier decision not to include anti-evolution material in curricula. In the November 2, 2004, election, Genzlinger and Stauss were elected, and Pinney was re-elected. Caldwell reacted by saying, "I do have concerns of whether the people I believe I speak for are going to be heard on the board," while Brandon Dell'Orto, who teaches history at Granite Bay High School, said that Roseville's teachers were thrilled: "This moral crusade almost destroyed this little district" (*Sacramento Bee* 2004 Nov 4).

Florida, Martin County: The *Palm Beach Post* (2004 Aug 22) surveyed candidates for posts on the Martin County school board, asking them, "Should the school district teach creationism along with evolution?" Nancy Kline and Audria V Moore (District 4) and incumbent David L "Doc" Anderson and challenger Jacki Garlington Jackson (District 5), answered yes, while Tony "Doc" Beonde (District 2) and Joe Molfetta and David Traill (District 4) answered no. No answer from Sue Hershey (incumbent, District 2) was recorded. In the August 31, 2004, election, Anderson and Hershey were re-elected (*Palm Beach Post* 2004 Sep 1), but Kline obtained only 48.7% of the vote, and was obliged to face Traill in the November 2, 2004, election, which she won with 68.3% of the vote (*Palm Beach Post* 2004 Nov 4).

Florida, Seminole County: In the November 2, 2004, election, Barry Gainer beat Sylvia Pond for the seat on School Board District 4. Pond, according to the *Orlando Sentinel* (2004 Nov 3), wants creationism to be taught in schools.

Indiana, Chesterton: Creationism divided the two candidates for the at-large position on the Duneland School Board. At a candidates' forum held on October 25, 2004, incumbent Janet Custer was asked whether she favored teaching creationism in the district's schools; she replied, "I don't believe so." Her challenger Terry Maple, however, said, "I think it's something we need to consider. I firmly believe in 'intelligent design'" (*Gary Post-Tribune* 2004 Oct 25). In the November 2, 2004, election, Custer narrowly won.

Maryland, Calvert County: The two candidates for the District 1 seat on the Calvert County Board of Education, Jeffrey D Borgholthaus and Frank T Parish, took opposing views about creationism. Borgholthaus told the *Washington Post* (2004 Oct 17), "I don't think that evolution needs to be taught as fact," adding, "They teach it as if it is a much more proven theory than it really is. I think it should be taught as a theory with other possibilities left open." Parish, however, said, "I think that if people want their kids to learn about creationism, they should take them to church ... Public schools should teach science, and creationism is not science by any stretch of the imagination." In the November 2, 2004, election, Parish won with 54% of the vote.

[*NCSE thanks Daniel Phelps and the Nebraska Religious Coalition for Science Education for information used in this article.*]

Grantsburg Activists Budge School Board

Andrew J Petto, University of Wisconsin–Milwaukee

Grantsburg, a small northwestern Wisconsin town of about 1100 people, drew the attention of scientists and educators throughout the state when the school board passed a motion on June 28, 2004, to "direct our science department to teach all theories of origins." Parents and other citizens in the community were alarmed and questioned the school board over the summer about the meaning and intent of the motion. After a number of well-attended and contentious school board meetings, the policy was amended for the first time at the October 12, 2004, school board meeting. The revised statement read: "When theories of origin are taught, students will study various scientific models or theories of origin and identify the scientific data supporting each."

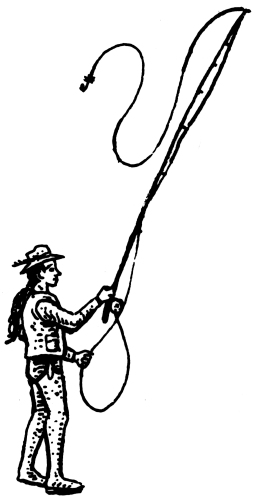
This adjustment made the intent a little clearer, and those concerned about the policy were even more alarmed. When the district's science teachers asked for clarification about the "various scientific models or theories of origin" and about curricular implementation of the policy, the school board responded in early November with a lengthy document consisting entirely of materials downloaded (without attribution) from the Discovery Institute's website, including 42 of the 44 items in the bibliography submitted to the Ohio State Board of Education in 2002 (see *RNCSE* 2002 Aug/Sep; 22 [4]: 12–8, 23–4; also available on-line at <http://www.ncseweb.org/media/Analysis-of-the-Discovery-Institute.pdf>). By this time, the local supporters of good science education had contacted NCSE for sup-

Andrew J Petto is Lecturer in Anatomy and Physiology in the Department of Biological Sciences at the University of Wisconsin–Milwaukee. Active in science education in Wisconsin, he also serves as the editor of RNCSE *and on NCSE's board of directors.*

port, advice, and resources to help them to convince the school board to reverse its policy.

Expert Testimony

Concerned citizens continued to press the school board, asking for clarifications and documentation of their claims that this policy was needed to improve science education in Grantsburg. In response to growing outcry, the school board invited "expert" testimony on the need for balancing the curriculum with alternative "theories of origin". Because none of these experts was a member of the scientific or science education communities, evolution supporters continued to insist that the school board hear testimony from mainstream scientists and educators to respond to the claims made in these meetings by the "expert" witnesses. The school board turned aside all requests, citing a need to "move on" to pressing matters, and one member suggested to concerned citizens that if they wanted a forum to present the scientific side of the argument, then they ought to hold one themselves. Thus, Citizens for Quality Education (CQE) was formed; eventually the group organized, promoted, and held its own half-day forum on evolution and science education (see sidebar, p 12).



During October, Grantsburg's visibility rose throughout the state — and in the nearby Twin Cities' media market. Reporters interviewed a number of citizens, and stories appeared in major newspapers across the state. NCSE members also got involved, including Michael Zimmerman, who recruited 44 deans of Colleges of Letters and Sciences (the liberal arts divisions) in all 26 of the University of Wisconsin campuses to join in warning Grantsburg that this policy was bad for science education in the district and potentially detrimental to the future academic success of Grantsburg's students. Zimmerman also engaged in lengthy conversations and e-mail exchanges with Superintendent of Schools Joni Burgin and School Board President David Ahlquist, but soon found that the board was determined to push this policy through. Zimmerman continued to solicit letters from higher-education faculty throughout Wisconsin with specialties in religious studies, anthropology, life sciences, and geology. He also organized similar letters from the Wisconsin Society of Science Teachers and a coalition of clergy throughout the state. In all, there were nearly 1300 individuals signing on to the letters urging Grantsburg to reconsider its policy.

Grantsburg citizens and NCSE members also sought help from the Wisconsin Department of Public Instruction regarding Grantsburg's obvious flouting of the directive to maintain evolution as one of the unifying themes of science curriculum in the state:

> Students in Wisconsin will understand that there are unifying themes: systems, order, organization, and interactions; evidence, models, and explanations; constancy, change, and measurement; evolution, equilibrium, and energy; form and function among scientific disciplines. (*Wisconsin Model Academic Standards*, Science, Standard A: Science Connections. Available on-line at <http://www.pi.state.wi.us/dpi/standards/scistana.html>)

DPI Science Consultant Shelley Lee, a strong advocate of evolution education, provided parents in Grantsburg with documentation of the DPI's official position, but educational standards in Wisconsin are "advisory" and, except for a few items passed into law, cannot be enforced in opposition to decisions such as the one taken in Grantsburg.

The Policy Evolves

The attention did have some effect on Grantsburg, however. Even though Burgin later told the *St Paul Pioneer Press* (2004 Dec 17) that she and the board were unimpressed by all the protest around the state — "The amount of letters [*sic*] and the number of signatures does not matter. … The school board feels that they [*sic*] must do what is right for Grantsburg students and the Grantsburg community" — the board responded in a way. On December 6, 2004, the school board revised its policy one more time, apparently to avoid charges that the intent of the board was to allow (or require) teaching creationism in one of its forms, including "intelligent design". The new policy read:

> Students are expected to analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information. Students shall be able to explain the scientific strengths and weaknesses of evolutionary theory. This policy does not call for the teaching of creationism or intelligent design.

Despite the school board's claims to the contrary, however, it was unable to provide any examples of appropriate materials that were not based either in "intelligent design" or in other creationist models. In ongoing correspondence with Burgin and the school board, Zimmerman pressed the issue of what it was the policy *did* call for the teachers to teach. To date, the board has provided no guidance about curricular materials and content other than the material downloaded from the Discovery Institute's website in November 2004.

In the waning months of 2004, Citizens for Quality Education organized a 4-hour program addressing the major issues in evolution education and concluding with a panel of local clergy to address concerns raised in the community about the religious implications of evolution education (see sidebar, p 12, for the program). The program was presented on January 8, 2005, and attracted about 100 people who attended all or part of the program. Among the observers were three school board members, including President Ahlquist, and the high school principal. At the end of the program, there was a feeling of accomplishment and genuine respect among participants and observers on both sides of the issue. However, the school board members did not see fit to make any changes in the policy previously implemented on December 6.

Continuing Discord

In the wake of the school board's decision to let the policy stand, two supporters of evolution decided to take political action and file their candidacies for seats on the school board in the April 2005 elections. On April 6, 2005, the *Burnett County Sentinel* reported unofficially that incumbents Cindy Jensen and David Ahlquist had retained their seats with 703 and 669 votes, respectively, while the challengers, Greg Palmquist and Steve McNally, received 644 and 614 votes. Although both pro-evolution candidates lost, supporters pointed out that School Board President Ahlquist retained his seat by less than a 2% margin — quite an accomplishment for political novices with a short time to plan an election campaign.

One unhappy outcome of all the controversy in this small town was a sense of division among the citizens. Suzanne and Blaise Vitale provide a first-person account of the effects of this policy on the fabric of the community (see p 11) reminiscent of the experience of citizens in Darby, Montana (see "Shall we let our children think?" by Victoria Clark in *RNCSE* 2004 Mar/Apr; 24 [2]: 10–1). However, in the end, CQE and its supporters may have underestimated their impact on the quality of education in Grantsburg. One local observer from a nearby community responded this way:

> I am truly sorry that this did not turn out the way we all wanted. The [election] results were close, very close. The folks here did a great job trying to educate the public. The results indicate that a significant number of people got the idea. Don't give up. The school board voted 6–0 less than a year ago to teach creationism as science. They spent the better part of the intervening time back-pedaling from one untenable position to another.

With ongoing legal action in Dover, Pennsylvania, and flare-ups in Kansas and Gull Lake, Michigan, the Grantsburg school board may see reason to retreat even more from the original policy. NCSE continues to advise, monitor, and provide resources in Grantsburg.

[*Thanks to Susan Spath, Wisconsin NCSE members, and concerned citizens of Grantsburg for information used in this report.*]

Author's address
Andrew J Petto
Department of Biological Sciences
University of Wisconsin
PO Box 413
Milwaukee WI 53201-0413
editor@ncseweb.org

Evolution Activism: The View from Grantsburg

Suzanne and Blaise Vitale

Grantsburg has gone through several religious controversies precipitated by actions of the school board, but we were not involved at the time because we had no children in school. Blaise is the medical advisor for the district and the unofficial football team physician. When the first issue arose several years ago, we wrote a letter to School Board President David Ahlquist, asking him to abstain from voting on religious issues because he has a conflict of interest as a Baptist youth minister.

This time around, Blaise was very interested because evolution is a deeply personal matter to him. He went to Catholic schools in New York before they were allowed to teach evolution. He subsequently attended Cornell University and majored in biology. He initially rebelled against the church for withholding the truth. However, several years later, he regained his faith after continuing to study evolution further. He is now on the church council for Faith Lutheran Church in Grantsburg.

We were appalled when the school board decided to teach "other theories of origin". Hoping that this move was made out of naiveté rather than ignorance or frank religious dogmatism, Blaise immediately started to talk about the issue. This caused some conflict in the health care community. The clinic manager and head nurse at the hospital have strong religious convictions and are conservative Christians. The nursing home's head nurse is the school board president's wife. In the past, she gave Blaise a book entitled *Refuting Evolution*. Among the supposed refutations is that even Galileo, a church rebel, believed in creation. Of course, he lived several hundred years before Darwin when there was no "theory" other than creationism, but that fact does not seem to trouble the author of that book. One of the other school board members who supported the anti-evolutionary policies works as an X-ray technician.

After the school board presented a guest "expert" promoting "intelligent design" and showed the full 51 minutes of the *Icons of Evolution* video to a public meeting, we were outraged. The board wants the *Icons* video shown in biology classes.

We joined with other parents and concerned citizens and demanded equal time — a presentation by scientists and/or science educators to refute the misinformation presented at the board meetings, but the board refused to let us bring a speaker to present the opposing view. In response, we formed a group called Citizens for Quality Education and rented the school auditorium for a forum on evolution (*see sidebar, p 12*). Blaise served as a panelist during the second hour of the program, discussing the medical applications and benefits of evolution.

The reception has not been positive everywhere in the community. We have been talking to whatever town leaders will listen to us. Blaise invited Leona Balek (president of the Wisconsin Chapter of Americans United for

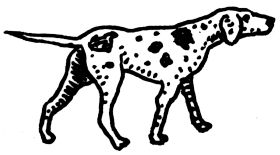
Blaise and Suzanne Vitale have been local leaders in the struggle in Grantsburg. Blaise is a family physician who moved into town in 1991 after he joined the National Health Service Corps, choosing to continue to serve the community after his 3-year obligation ended. Suzanne is the program director of the Grantsburg Public Library. She previously worked as an editor for the Minneapolis Star Tribune *and several other newspapers. Their two children attend Grantsburg's public schools.*

Separation of Church and State) to speak to the Grantsburg Rotary Club, but Rotary leaders refused to let her speak because they thought the talk would be too controversial. In this small town, as in Darby, Montana (*see "Shall we let our children think?" by Victoria Clark in* RNCSE *2004 Mar/Apr; 24 [2]: 10–1*), some longtime relationships ended abruptly, while others sprang up suddenly. We both were pleased by the reactions of many of the 100 or so people who attended the forum. Many people went out of their way to find us and other organizers of the event and thank us for the effort.

We doubt things will change in Grantsburg. As in most small towns, people like us that have lived here for 10–15 years are still considered "outsiders" by many. Those same people never stop to think that none of the "intelligent design" experts that addressed the board — and certainly no one from the Discovery Institute, which provided materials for the school board to use in its anti-evolution policy — could be considered anything other than outsiders. People in Grantsburg, and especially those in our group, have lost friends over this issue and have been accused of being atheists (despite the fact that nearly everyone in the group is an active member in one of the town's churches).

In one sense we were successful. The school board did modify the text of its policy several times, even though the intent remained unchanged. The controversy in Grantsburg also convinced several citizens who support good science education to file for seats on the school board in the spring election. We will continue the educational activism in support of evolution in the science curriculum, and this spring we will join it with political activism. We must have a voice for science education on the school board to resist the domination by the most conservative Christians in the community.

AUTHORS' ADDRESS
Suzanne and Blaise Vitale
c/o NCSE
PO Box 9477
Berkeley CA 92709-0477
ncseoffice@ncseweb.org



Citizens for Quality Education Welcomes You To

A FORUM ON EVOLUTION

1–5 pm, Saturday, January 8, 2005
Grantsburg School Auditorium

PROGRAM

- **What is Evolution? Everything you should have learned in school, but maybe didn't**
- **Applied Evolution: Medical and Agricultural Benefits of Evolution**
- **Science and Religion: What are the differences?**
- **How is the Discovery Institute using its wedge strategy in Grantsburg?**

There will be time for questions after each presentation.

This program was paid for by Grantsburg citizens in an attempt to underscore the importance of teaching evolution in our schools. We thank you for your interest and attendance!

OUR SPEAKERS:

Leona Balek, President, Wisconsin Chapter of Americans United for Separation of Church & State.

Rev Ted Berkland, a retired Lutheran minister living in Grantsburg.

Rev Amy DeLong, pastor of Central United Methodist Church in Grantsburg.

Andrew J Petto, PhD, Biological Sciences, University of Wisconsin–Milwaukee and National Center for Science Education.

Jean Van Tatenhove, Moderator, National Park Service ranger at the St Croix National Scenic Riverway.

Blaise Vitale, MD, a family physician in Grantsburg.

Tracy White, PhD, University of Wisconsin–Barron County.

Michael Zimmerman, PhD, Dean of Letters and Sciences and Professor of Biology at the University of Wisconsin–Oshkosh.

Gull Lake, Michigan: Déjà Vu All Over Again!

Ed Brayton

With eerie parallels to the ongoing controversy in Dover, Pennsylvania (*see* RNCSE *2004 Sep/Oct; 24 [5]: 4–9*), a challenge to the science curriculum has emerged in Gull Lake, Michigan — a suburban community located between Kalamazoo and Battle Creek. The similarities with the Dover lawsuit are many: the same book, *Of Pandas and People*, is involved, and the same Christian legal group, the Thomas More Law Center, is defending the insertion of "intelligent design creationism" (IDC) into public school science classrooms. The twist to this story, though, is that the plaintiffs are claiming that public school science teachers have a right to teach IDC and that not allowing them to do so is unconstitutional.

Two 7th-grade science teachers have been using *Pandas* and other materials to teach IDC in their classrooms for two years without any apparent opposition by school administration until a parent complained. After several months of internal discussion and negotiation, Superintendent of Schools Richard Ramsey declared a moratorium on any teaching of IDC pending a final decision of a

Ed Brayton is a freelance writer, founding board member of Michigan Citizens for Science, and co-founder of the Panda's Thumb (<http://www.pandasthumb.org>).

school district review of the matter. The Thomas More Law Center (TMLC) has written a letter to the school board threatening to sue the district on the teachers' behalf if that decision is not reversed.

This situation first came to light in March 2004, when biologist Jeff Conner, whose daughter is a student in one of the classes, saw the material the teachers were using in her science class. Conner contacted Michigan Citizens for Science (MCFS), which began to work with him and the school administration to resolve the situation. MCFS initially provided information and expertise. Two MCFS board members, geologist Danita Brandt and philosopher of science Robert Pennock, provided a critique of some of the creationist materials the teachers were using. Pennock, Conner, and another biologist who lived in the school district later organized an in-service workshop for all the science teachers in the district. They explained why creationism was not science, discussed legal and religious information that teachers could refer to if they received pressure to teach creationism from conservative religious parents, and identified helpful resources for appropriate scientific information about evolution that met the curriculum standards. The hope was that the teachers would decide on their own to stick to the accepted curriculum.

When it became clear that the teachers could not be persuaded to stop teaching IDC, the school administration decided to form an internal committee to discuss the issue and come to a resolution. That committee was made up of the two teachers involved in the dispute, two high school science teachers in the district, the principals of both the junior high and senior high schools, and the school superintendent. That committee met several times and voted 5–2 against the teaching of IDC. The two teachers were told that they could no longer teach "intelligent design" and that they must adhere to the accepted curriculum of teaching evolutionary theory.

It's Not Over Till It's Over

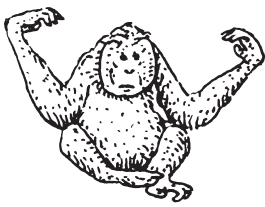
Before the order could be implemented, however, school board president Deb Ryan, herself an apparent advocate of IDC, reopened the issue by ordering the committee to continue its discussions. But the moratorium will remain in place, pending the outcome of these further discussions.

The Thomas More Law Center has agreed to represent the two teachers who wish to continue teaching IDC. In a letter to the school, attorneys for the Center requested that the teachers be allowed to teach IDC and threatened to file a federal lawsuit if they are not allowed to do so. That letter mentioned several possible reasons for such a suit:

- That not allowing them to teach IDC "violate[s] the First Amendment rights of [the teachers] to academic freedom. This right to academic freedom allows teachers to present appropriate material to their students without fear of censorship or retribution from government";
- That refusal to allow "criticism of Darwin's theory of evolution is nothing more than an embodiment of 'orthodoxy' that Supreme Court Justice Jackson held was inconsistent with our constitution" in *West Virginia Board of Education v Barnette*;
- That removing all of the copies of *Of Pandas and People* from the classroom "is clearly in violation of first amendment Free Speech rights to receive information," as found in the decision in *Board of Education v Pico*;
- That Superintendent Ramsey had "strongly suggested" to the teachers that "no public comments should be made" about the situation pending the outcome of the internal proceedings, in violation of their free speech rights;
- That teaching IDC is consistent with the Supreme Court's ruling in *Edwards v Aguillard*, which noted that "Teaching a variety of scientific theories about the origins of humankind to school children might be validly done with the clear secular intent of enhancing the effectiveness of science instruction";
- That teaching IDC reflects the "Santorum Amendment" to the No Child Left Behind Act of 2001, which held that students should be made aware of "the full range of scientific views that exist" on controversial questions; and
- That teaching IDC is consistent with the 7th-grade science curriculum previously adopted by the Gull Lake School Board.

Ironies and Paradoxes

Despite the parallels, there are also some interesting differences between Gull Lake and Dover. For example, in Dover, the school board is requiring teachers to include IDC in the curriculum, and teachers are refusing. There the TMLC is *upholding* the school district's legitimate right to require its teachers to conform to curriculum requirements set by the school district. In contrast, the TMLC is arguing in Gull Lake that it is a violation of the teachers' rights if they are *not* allowed to teach IDC — *despite* the school district's ruling that it is not a part of the standard curriculum. However, a central question in each case will be the same: is IDC a legitimate scientific theory, or is it — like old fashioned "creation science" — just religion wrapped in a veneer of scientific-sounding language? This is a question that has yet to be directly decided by any federal court and the outcome of either case could set a precedent that would have far-reaching implications for science education around the nation.



The Gull Lake case, if it goes to court, is likely to have a narrower ruling, however, since there are already several legal precedents regarding teachers' rights to modify the approved district curriculum. In three well-publicized cases — *Peloza v Capistrano Unified School District* in 1994, *Webster v New Lenox School District* in 1990, and *Levake v Independent School District #656* — state and

federal courts have consistently ruled that public school teachers, in the routine performance of their jobs, must teach what the school board and/or the state agency responsible for establishing school curriculum have determined they should teach, even if they personally disagree with it. (See NCSE's website for a summary of these cases.) Appeals courts have always upheld the lower-court decisions.

While the case in Dover, Pennsylvania, is the one with broader implications for the science curriculum in general, the activity of the TMLC in Gull Lake, Michigan, illustrates a new level of legal activism in the assault on science education by the "intelligent design" community. It is another in a series of attempts to use First Amendment arguments to diminish the proper central role of evolution in science education — perhaps the ultimate irony, since the First Amendment has consistently been the constitutional barrier to creationism in the schools over the past 40 years.

AUTHOR'S ADDRESS
Ed Brayton
1799 N Hillman
Stanton MI 48888
ed@pandasthumb.org

OBITUARIES

Norman D Newell

The eminent paleontologist Norman D Newell died on April 18, 2005, at the age of 96. Newell received his bachelor's and master's degrees from the University of Kansas and his PhD from the University of Chicago. He taught at the University of Wisconsin until 1945, then joined the staff of the American Museum of Natural History in New York. He also taught at Columbia University, where his students included Niles Eldredge and Stephen Jay Gould. He was president of the Society for the Study of Evolution in 1949 and president of the Paleontological Society in 1960–1, and was named a Legendary Geoscientist by the American Geological Institute in 2004. Newell is often credited as one of the first scientists to call attention to the importance of mass extinctions in the history of life; Eldredge described him as "a voice crying in the wilderness" when he began his work on mass extinctions in the 1950s.

In *Creation and Evolution: Myth or Reality* (New York: Columbia University Press, 1982; New York: Praeger, 1985), Newell turned his attention to creationism. Through fourteen glittering chapters, he carefully explained the scientific evidence for evolution on behalf of "those whose scientific background is not adequate to withstand the high-pressure methods and the misleading arguments posed by the creationists," emphasizing especially the paleontological evidence, on which he was a leading expert. "The fact that evolution has taken place in the past and is continuing around us still cannot be refuted by any logical arguments," he wrote. "It is the how and why of evolution that are certainly matters for scientific and philosophical discussion." George Gaylord Simpson wrote, "I think I have never read a book, even among my own in the past, with which I agreed more closely," and Stephen Jay Gould commented, "Creationism, that narrowly sectarian dogma now masquerading as a 'science,' is no match for Dr Newell's analysis."

See also the obituary in *The New York Times* (2005 Apr 23).

Jay Van Andel

Jay Van Andel, the cofounder of Amway, died on December 7, 2004, at the age of 80, in Ada, Michigan. Born in Grand Rapids in 1924, Van Andel attended a number of colleges, including Calvin College in Grand Rapids, and served in the US Army Air Forces during World War II. With Richard DeVos, he founded Amway in 1959. Relying on a network of individual distributors, Amway became and remains one of the world's largest direct sales companies, although its success was marred by controversy: it was investigated as a pyramid scheme by the Federal Trade Commission in the 1970s and accused of fraud by the Canadian government in the early 1980s. Van Andel resigned as Amway's chairman in 1995.

Van Andel was a devout member of the Christian Reformed Church, which rejects "views that support the reality of evolutionary forebears of the human race" as incompatible with "[t]he clear teaching of Scripture and the confessions" (see <http://www.crcna.org/whoweare/beliefs/position_creation.asp>). Among the recipients of his philanthropy was the Creation Research Society's Van Andel Creation Research Center, near Chino Valley, Arizona. His goal in funding it was "to give creationists a fighting chance" (quoted in John R Meyer, "The Van Andel Creation Research Center: A unique creationist resource," *Creation Research Society Quarterly* 1999 Sep; 36 [2]: 68–71).

See also the obituary in the *Washington Post* (2004 Dec 8).

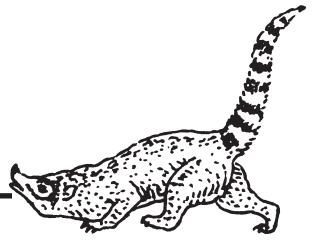
Mel Gabler

Mel Gabler, the conservative textbook activist, died on December 19, 2004, at the age of 89. Born in Katy, Texas, Gabler served in the US Army Air Forces during World War II and worked for 39 years with the company now known as Exxon Mobil, retiring in 1974. He and his wife Norma were best known, however, for their critiques of textbooks used in the state's public schools. They began to scrutinize textbooks for hints of "secular humanism" in 1961. They formally incorporated the nonprofit Educational Research Analysts (<http://www.textbookreviews.org/mainpage.htm>) in 1973; according to ERA's current description of itself, it reviews textbooks "from a conservative, Christian perspective".

Evolution, of course, was among ERA's targets. In 1969, the Gablers convinced the Texas Board of Education to remove the Biological Sciences Curriculum Study textbooks from the list of textbooks approved by the state, and in 1974, the Texas Education Policy Act adopted their suggestion that biology texts prominently display a description of evolution as theory rather than fact. Thanks both to changes in the Texan political landscape and opposition from groups such as the Texas Council for Science Education, ERA's influence waned somewhat in the 1980s. Yet a representative of ERA was on hand during the latest round of biology textbook adoptions (see *RNCSE* 2003 Sep–Dec; 23 [5–6]: 4–7): Gabler's legacy is alive still.

See also the obituary in the *Washington Post* (2004 Dec 23).

UPDATES



Alabama: On February 8, 2005, a pair of bills — House Bill 352 and Senate Bill 240 — was introduced in the Alabama legislature, under the rubric of "The Academic Freedom Act". Virtually identical, these bills purport to protect the right of teachers "to present scientific critiques of prevailing scientific theories" and the right of students to "hold positions regarding scientific views". In language reminiscent of the Santorum language removed from the No Child Left Behind Act, they specify that "[t]he rights and privileges contained in this act apply when topics are taught that may generate controversy, such as biological or chemical origins." Presumably attempting to avert the charge that their provisions would violate the Establishment Clause of the First Amendment, the bills also state that "Nothing in this act shall be construed as promoting any religious doctrine, promoting discrimination for or against a particular set of religious beliefs, or promoting discrimination for or against religion or non-religion." SB 240 was referred to the Senate Committee on Constitution, Campaign Financial, Ethics, and Elections, while HB 352 was referred to the House Committee on Education.

In February 2004, a similar pair of bills — HB 391 and SB 336 — was introduced in the Alabama legislature, with significant overlap in the sponsorship list: Representative Jim Carns (R-District 48) was the sole sponsor of HB 391 and HB 352, and Senators Henry E Erwin (R-District 12) and Wendell Mitchell (D-District 30) sponsored both SB 336 and SB 240. In 2004, Mitchell reportedly defended SB 336 by saying, "I think there is a tremendous ill-balance [*sic*] in the classroom when you can't discuss all viewpoints. This bill will level the playing field because it allows a teacher to bring forward the biblical creation story of humankind"; although he later commented, "We are trying to take every step we can to ensure that the people who are operating under this legislation are not challenged on the idea it is a religious effort." SB 336 was passed by unanimous votes of the Senate Education Committee and the full Senate in 2004, and by a 9-1 vote of the House Education Committee. The legislature adjourned without considering it. (See *RNCSE* 2004 Mar/Apr; 24 [2]: 14–7 and 2004 Jan/Feb; 24 [1]: 10–5.)

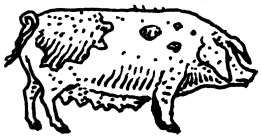
Alabama: On February 10, 2005, the Alabama State Board of Education adopted a revised set of state science standards (the Alabama Course of Study: Science, or ACOSS). The treatment of evolution in the revised ACOSS remains weak: evolution is explicitly mentioned only once in the high school biology standards, under the section on protective adaptations. Evolutionary concepts such as hierarchical classification are described without mentioning evolution. During the board meeting, John Schweinsberg of Alabama Citizens for Science Education protested that evolution was obviously downplayed for religious reasons, despite the fact that "[i]t's just as basic to biology as the periodic table is to chemistry. Teaching biology without evolution is like teaching chemistry without the periodic table" (quoted in the *Montgomery Advertiser*, 2005 Feb 10). The revised ACOSS also continues to contain, in its preface, a version of the evolution disclaimer originally mandated in the 1996 version of ACOSS, but evolution is no longer described as controversial. The relevant portions of the three versions of the disclaimer:

> (1996) This textbook discusses evolution, a controversial theory some scientists present as a scientific explanation for the origin of living things, such as plants, animals and humans.
>
> (2001) The theory of evolution by natural selection is a controversial theory that is included in this textbook. It is controversial because it states that natural selection provides the basis for the modern scientific explanation for the diversity of living things.
>
> (2005) The theory of evolution by natural selection, a theory included in this document, states that natural selection provides the basis for the modern scientific explanation for the diversity of living things.

What prompted the latest changes in the disclaimer is unknown: it is possible that they are intended to shelter the disclaimer against the sort of legal challenge that was brought against the disclaimer used in Cobb County, Georgia. To read the ACOSS standards, visit <http://www.alsde.edu/html/sections/documents.asp?section=54&sort=7&footer=sections>.

Arkansas: House Bill 2607, introduced in the Arkansas House of Representatives as a shell bill on March 4, 2005, and amended on March 10, was intended to allow the teaching of "intelligent design" as "a parallel to evolutionary theory" in the public schools of Arkansas. If enacted, the bill would have required the state Department of Education to include "intelligent design" in its educational frameworks and encourage teachers in the state to include it in their lesson plans. Attempting to immunize itself against a likely challenge to its constitutionality, the bill described "intelligent design" as not necessarily "attributing the creation of the world or it's [*sic*] creatures to any god or gods." Rita Sklar, executive director of the American Civil Liberties Union of Arkansas, however, commented, "This is a blatant attempt to push religious dogma

into our public schools; I feel confident that the Arkansas legislature will reject it. We all remember the 1981 creationism debacle, and we don't want Arkansas to be a national laughingstock again." The bill also echoed the so-called Santorum language stripped from the No Child Left Behind Act of 2001, adding, "The prohibition of teaching alternative scientific theories is the cruelest and most abusive form of censorship because it prevents the very debate necessary for the scientific proof or disproof of competing theory." The sole sponsor of HB 2607 was Mike Martin (R–District 87), a first-term legislator. According to the March 17, 2005, *Arkansas Democrat-Gazette*, the bill died in committee. The bill was referred to the House Rules Committee, for reasons that are unclear: the committee's hearings on HB 2607 focused on why it was referred there, and not to the House Education Committee. Martin, for his part, averred that his intention was not to have schools teach students that God exists or that evolution is false, but only to "restore to science the agnostic viewpoint that there could be or could not be rather than the dogmatism that actually currently exists ... that absolutely precludes the existence of God." The *Democrat-Gazette* also quoted Martin as saying that although he is unsure about evolution, he thinks that it is not necessarily incompatible with "my strict Christian beliefs, or, quite frankly, my belief in the inerrancy of Scripture."



Arkansas, Beebe: It was good news and then bad news from Beebe, a town of about 5000, around 35 miles northeast of Little Rock. In a press release issued on February 10, 2005, the American Civil Liberties Union announced that the Beebe School District agreed to remove warning labels from its science textbooks which describe evolution as "a controversial theory" and refer to an "intelligent designer" as a possible explanation of the origin of life (see p 42 for the text of the labels). An attorney for the school district told the *Arkansas Democrat-Gazette* (2005 Feb 11) that "it was his understanding that the stickers had been placed in the textbooks as long ago as the early to mid-1990s." The school district's decision was prompted by a letter from the ACLU of Arkansas citing the recent decision in *Selman v Cobb County School District*, which held that similar stickers used in Cobb County, Georgia, violate the Establishment Clause of the First Amendment. "We commend the Beebe School District for avoiding unnecessary and costly litigation in this matter," said Rita Sklar, the executive director of the ACLU of Arkansas, adding, "However, we are concerned that these stickers may be present in textbooks around the state," and offering her organization's legal guidance to the Arkansas Department of Education.

The stickers were to be removed at the end of the school year. But then, according to a story in *The Leader* (2005 Feb 16), the Beebe school board decided not to comply: instead, the board will wait for the outcome of the appeal in *Selman*. The Beebe school board is also reportedly seeking the aid of the American Center for Law and Justice, a conservative legal organization founded by televangelist Pat Robertson. A staff attorney at the ACLU of Arkansas commented, "The ACLU of Arkansas will be surprised and disappointed if the Beebe School Board does not fulfill the terms of the agreement by its attorney, Paul Blume, who has advised us twice privately and once through the media that the school board intends to remove the stickers at the end of the school year. Blume has promised to send us a letter confirming that this will be done. Obviously, we will have no choice but to engage in extremely expensive litigation if the School Board does not follow through with its original agreement." A later story in *The Daily Citizen* (2005 Mar 29) quoted Beebe School Board President Butch Rice as saying, "We're standing our ground ... We're not going to bow down to the ACLU on this issue" and acknowledging that the retention of the stickers was religiously motivated. NCSE's deputy director Glenn Branch told the newspaper, "The effect of the sticker is to make the theory of evolution look like a theory in crisis, which it isn't." (For a subsequent op-ed by Branch in *The Daily Citizen*, see p 42.)

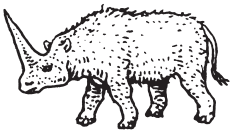
California, Roseville: Larry Caldwell, the parent whose attempts to promote the teaching of what he regards as "evidence against evolution" fomented controversy in the Sacramento suburb of Roseville over the last few years (see *RNCSE* 2004 Mar/Apr; 24 [2]: 14–7), is at it again. A lawyer, Caldwell filed a 96-page complaint in federal court against the Roseville Joint Union School District and several of its employees on January 11, 2005, alleging that his civil rights were violated during the controversy. Caldwell told the *Sacramento Bee* (2005 Jan 16), "You ought to be able to bring a proposal without being treated differently because they don't like what you're saying, or they don't like your religious beliefs." School board president Jim Joiner told the *Bee*, however, that Caldwell received plenty of attention from the board and the district, noting that his proposal was discussed at eight separate meetings. Caldwell's suit was publicized by the Discovery Institute, which issued a press release on his behalf on January 13, and also by such religious right media sources as WorldNetDaily (2005 Jan 15) and AgapePress (2005 Jan 25). On March 24, the Pacific Justice Institute, which describes itself as "specializing in the defense of religious freedom, parental rights, and other civil liberties", announced that it was joining the case as co-counsel.

Florida: House Bill 837, dubbed the Academic Freedom Bill, was introduced in the Florida House of Representatives on February 15, 2005, and a counterpart, Senate Bill 2126, was introduced in the Florida Senate on March 7. These bills are versions of the so-called Academic Bill of Rights (ABR), promoted by conservative political activist David Horowitz, president of the Center for the Study of Popular Culture (<http://cspc.org/>). According to the *Chronicle of Higher Education* (2004 Feb 13; available on-line at <http://chronicle.com/free/v50/i23/23a01801.htm>), the ABR "enumerates several principles that colleges should follow, among which is that they should

foster a variety of political and religious beliefs in such areas as making tenure decisions, developing reading lists for courses, and selecting campus speakers."A committee on academic freedom and tenure of the American Association of University Professors describes it as "improper and dangerous," adding, "Not only is the Academic Bill of Rights redundant, but, ironically, it also infringes academic freedom in the very act of purporting to protect it" (<http://www,aaup.org/statements/SpchState/Statements/billofrights.htm>). In discussions of the ABR across the country, the prospect of creationism is usually raised as a *reductio ad absurdum* by opponents of the ABR. In Florida, however, the sponsor of HB 837, Dennis Baxley (R–Ocala), was quoted by the University of Florida student newspaper as suggesting that a student could sue under the proposed law if a professor were to say, "Evolution is a fact. I don't want to hear about 'Intelligent Design' ... and if you don't like it, there's the door" (*The Independent Florida Alligator* 2005 Mar 23).The student newspaper at the University of South Florida reported, "The bill's sponsor, Baxley, often cites an undergraduate experience at FSU dealing with evolution as a reason he sponsored this bill. Baxley claims that in 1970 he was subjected to a 'tirade' on evolution['s] being right and creationism['s] being wrong. He says that is a situation that students shouldn't have to be put into" (*The Oracle* 2005 Apr 5). HB 837 was referred to three committees: the Colleges and Universities Committee, the Choice and Innovation Committee, and the Education Council. It was withdrawn from the first, was approved by the second, and as of April 15 was under consideration by the third. Its Senate counterpart was referred to the Education Committee and the Judiciary Committee; as of April 15 it was on the agenda of the former.

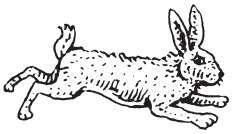
Georgia: House Bill 179, introduced in the Georgia House of Representatives on January 27, 2005, would require "Whenever any theory of the origin of human beings or other living things is included in a course of study offered by a local unit of administration, factual scientific evidence supporting or consistent with evolution theory and factual scientific evidence inconsistent with or not supporting the theory shall be included in the course of study." NCSE's executive director Eugenie C Scott told the *Atlanta Journal-Constitution* that there is no "factual scientific evidence" inconsistent with evolution: "[t]hese are code words for creationism." The bill also contains a subsection claiming that it is "intended to strengthen the analytical skills of students" and "not intended to authorize or promote the presentation of religious beliefs," apparently attempting to render it constitutional under the purpose prong of the *Lemon* test.The sponsor of the bill, Ben D Bridges Jr, introduced a similar bill (HB 1133) in 1998, although it lacked any clause describing its intention.The language of HB 179 and 1133, as well as similar bills appearing in Ohio and Arizona, is patterned after a model bill drafted by John Hansen, a Wisconsin schoolteacher who founded Operation TEACHES (the acronym is for Teach Evolution Accurately, Consistently, Honestly, Equitably, Scientifically) and who crisscrossed the country in the late 1990s to urge state legislators to sponsor it. If enacted, HB 179 would become effective on July 1, 2005. The story in the *Journal-Constitution* indicated that the House Republican leadership was unenthusiastic about the bill, however, stating that the bill is not a legislative priority, noting that Bridges is the sole sponsor, and quoting the speaker *pro tem* of the House as saying that "member[s] of our caucus [are] elected by their district[s] and … [they have] every right to introduce bills they feel their constituents want." Bridges was subsequently awarded a "Jefferson Muzzle" by the Thomas Jefferson Center for the Protection of Free Expression (see <http://www.tjcenter.org/muzzles.html#bridges>); the ironic award is presented by the Center annually to "those who in the past year forgot or disregarded Mr Jefferson's admonition that freedom of speech 'cannot be limited without being lost'."

Indiana, East Porter County: The adoption process for biology textbooks is stalled in the East Porter County School Corporation, at least until the members of the school board are able to review the book for themselves, because the proposed textbook — selected by a committee of parents, teachers, and students over a two-month period — contains material on evolution and none on creationism. "I personally believe that creationism ... ought to be, I think that ought to be out there as something that's taught," board Vice President Tim Bucher told the *Northwest Indiana News* (2005 Apr 13). Creationism is absent from all of the state-approved biology textbooks as well as from the state science standards. A representative of the Indiana Department of Education explained that evolution was part of the state science standards, commented that "within the realm of science, we would be doing students a bit of a disservice to not stick to the scientific part of science," and referred to the department's statement on the teaching of evolution (<http://www.doe.state.in.us/opd/science/evolution.html>). Superintendent Roger Luekens expressed optimism that the controversy would abate: "I think once the board views the texts that they'll be fine with it," he said.



Kentucky: In the course of a piece on the creationism/evolution controversy in northern Kentucky, a reporter for the *Cincinnati Enquirer* (2005 Feb 14) revealed that a law allowing teachers to present "the theory of creation as presented in the Bible, and may accordingly read such passages in the Bible as are deemed necessary for instruction on the theory of creation, thereby affording students a choice as to which such theory to accept" is still on the books (as Kentucky Revised Statute 158.177). Apparently, the bill that became KRS 158.177 was introduced in 1976 by a fundamentalist minister turned state senator and passed both chambers with almost no legislative debate or public comment (see Edward J Larson, *Trial and Error*, third edition [New York: Oxford University Press, 2003], p 143–4). Section 158 includes a number of provisions of dubious

constitutionality, such as 158.170 (authorizing Bible reading in the schools), 157.175 (authorizing recitation of the Lord's Prayer in the schools), and 158.178 (requiring the Ten Commandments to be displayed in all schools). In 2000, a bill was introduced that would have amended section 158 to proscribe "instruction in an evolution theory that postulates that the human species shares a common ancestor with another species or that the human species emerged from a nonlife form," but HB 299 seems to have died in committee. And although the state science standards carefully use the ersatz "change over time" instead of "evolution," they provide no license for teaching creationism. Consequently, it seems likely that, contrary to the implication of the *Enquirer*'s story, KRS 158.177 is a relic. It remains to be seen whether it will now be challenged as unconstitutional.



Maryland, Cecil County: The Cecil County School Board voted unanimously to adopt the biology textbook *Biology: The Dynamics of Life*, despite earlier resistance from one board member who objected to the absence of creationism from it (see *RNCSE* 2004 Sep/Oct; 24 [5]: 12–5). According to the Associated Press (2005 Feb 15), however, two conditions were attached to the approval: that the school district's administrators agree to discuss "a science curriculum change that would allow local teachers to present origin-of-life theories" with the state board of education, and that the school system's media specialist provide students with materials that "present conflicts in Darwin's evolution theories."

Mississippi: A bill calling for "balanced treatment to the theory of scientific creationism and the theory of evolution" was introduced in the Mississippi Senate and referred to the Committee on Education on January 10, 2005. Sponsored by Senator Gary Jackson, who represents the 15th Senate District, Senate Bill 2286 defined "scientific creationism" as "the belief, based on scientific principles, that there was a time in the past when all matter, energy and life, and their processes and relationships, were created *ex nihilo* and fixed by creative and intelligent design," and would have, if enacted, required "instruction in scientific theories of both evolution and scientific creationism if public schools choose to teach either." Only K–12 instruction would have been affected by the bill. In both its title and in particular choices of phrasing, SB 2286 seemed to have been modeled on Louisiana's "Balanced Treatment for Creation-Science and Evolution-Science in Public School Instruction" Act, which was held to be unconstitutional in the Supreme Court's 1987 decision in *Edwards v Aguillard*. The bill died in committee on February 1.

Missouri: The prospects for House Bill 37, which would require that "[a]ll biology textbooks sold to the public schools of the state of Missouri shall have one or more chapters containing a critical analysis of origins" (see *RNCSE* 2004 Sep/Oct; 24 [5]: 12–5), are not bright. Although the bill was assigned to the House Elementary and Secondary Education Committee, the *Kansas City Star* reports (2005 Feb 27) that "Chairwoman Jane Cunningham, a St Louis County Republican, said she had no plans to give it a hearing." The same article quoted HB 37's sponsor, Cynthia Davis, as acknowledging the anti-evolution intent of the bill: "Quite frankly, the theory of evolution is a theory in crisis," she said. "We need to find a way for the students to think for themselves."

Montana: Following last year's debate over evolution education in the small Montana town of Darby (see *RNCSE* 2004 Mar/Apr: 24 [2]: 4–12), two bills were proposed in the Montana legislature taking diametrically opposed stands on the place of evolution in the science classrooms of the state's public schools. On January 7, 2005, Senator Ken Toole (D–Helena) introduced Senate Joint Resolution 8, a resolution in favor of "separation of church & state and quality education." Citing the need for Montana to prepare students in its public schools to participate in today's technologically-driven society, and warning of pressure from "a number of national fundamentalist organizations" to promote "creationism, creation science, and 'intelligent design' theory," SJ 8, if enacted, would have expressed the legislature's support for local science curricula based on sound science and its opposition to the imposition of "religious interpretations of events and phenomena on local schools under the guise of science curricula." The bill was referred to the Education and Cultural Resources Committee, where it eventually died, despite favorable testimony from a number of the pro-evolution education activists from Darby. As for the anti-evolution legislation, during the election campaign, the Bozeman *Daily Chronicle* (2004 Oct 10) reported candidate Roger Koopman as having "plans for a slew of bills, including one that would allow state schools to teach 'intelligent design' creationism in science classes." Following the election, on November 11, 2004, Koopman (R–Bozeman) promptly submitted a request for a bill to be drafted (LC 1199) with the title "Allow teaching competing theories of origin." The *Daily Chronicle* (2004 Dec 30) described it as giving "schools more leeway to teach 'intelligent design' in science classrooms" and reported Koopman as claiming that "few people realize that the scientific evidence disputing evolution is just as strong as the evidence supporting it." Apparently, the bill was never drafted.

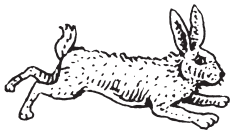
Ohio, Toledo: Annoyed that evolution is taught in Toledo's public schools, 13-year-old Spencer Genson took his case to the city's board of education, the *Toledo Blade* reported (2005 Feb 23). Armed with a petition signed by about 30 of his classmates and teachers demanding the board "abolish teachings of evolution," Genson told the board, "When I read my Bible, it tells me that I'm a descendant of Adam and Eve, and when I read my curriculum at school, it tells me I come from a monkey," adding, "I don't know about you, but I really don't like to be confused. ... I don't think anything involving the evolution of the human species should be involved in the curriculum of the public schools." Genson reportedly impressed the board with his concern and articulateness; he will be allowed to make a presentation to the curriculum committee in April. Superintendent Eugene Sanders told the *Blade* that "we are bound

by state standards with our curriculum," and suggested that Genson would do better to take his concerns to the state. But Genson told WTOL-TV (2005 Feb 23) that if the board refuses to have creationism taught, his next step will be to sue.

Pennsylvania: On March 16, 2005, a bill promoting "intelligent design" creationism was introduced in the Pennsylvania House of Representatives and referred to the Education Committee. If enacted, House Bill 1007 would add a section ("Teaching Theories on the Origin of Man and Earth") to the Public School Code of 1949. That new section would allow school boards to include "intelligent design" in any curriculum containing evolution and allow teachers to use, subject to the approval of the board, "supporting evidence deemed necessary for instruction on the theory of intelligent design." The term "intelligent design" is not defined in the bill. Presumably attempting to prevent a challenge to its constitutionality, HB 1007 explicitly states, "When providing supporting evidence on the theory of intelligent design, no teacher in a public school may stress any particular denominational, sectarian or religious belief." One of the bill's cosponsors, Dennis Leh (R–District 130), was candid about his motivations, telling the Pottsville PA *Mercury* (2005 Apr 14), "I'm a creationist. I'm not embarrassed to say that. I believe the earth and the universe were created by an intelligent design. And I'll go further than that, I believe they were created by God." Reaction from Pennsylvania scientists is so far uniformly negative. Colin Purrington, a biology professor at Swarthmore College, commented that the bill "would encourage local school districts to promote the teaching of 'intelligent design creationism alongside the well-accepted theory of evolution," and Randy Bennett, a biology professor at Juniata College, quipped, "Next we will be asked to teach the revolutionary idea that there are four elements in the universe: Earth, Wind, Fire, and Water." Looking on the bright side, Larry Frankel, the legislative director for the ACLU of Pennsylvania, remarked, "While this bill seeks to advance an anti-science agenda, we should view the introduction of this legislation as a golden opportunity to remind our legislators why it is so important that all Pennsylvania's public school students learn good science."

South Carolina: On December 15, 2004, S 114 was introduced (by pre-filing) in the South Carolina Senate and referred to the Committee on Education. In addition to revising two aspects of the system whereby the state selects textbooks, S 114 would, if enacted, establish a 19-member South Carolina Science Standards Committee, charged to "study standards regarding the teaching of the origin of species; determine whether there is a consensus on the definition of science; [and] determine whether alternatives to evolution as the origin of species should be offered in schools." The idea of such a committee was broached in the last legislative session, in a context that amply revealed its anti-evolutionist motivations. Senator Michael Fair, who "said his intention is to show that 'intelligent design' is a viable scientific alternative that should be taught in the public schools" (Greenville *News* 2003 May 1), proposed amending S 153 to establish such a standards committee. The amendment was adopted by the Senate, which subsequently passed S 153; it then was referred to the Committee on Education and Public Works of the House of Representatives, where it died when the legislature adjourned on June 5, 2003. For details about S 153, see *RNCSE* 2003 Mar/Apr; 23 (2): 12–4 and 2003 May–Aug; 23 (3–4): 5–10. On February 9, 2005, according to the Associated Press, a Senate education subcommittee removed the provision of S 114 that would have established the committee; NCSE member Robert Dillon, who teaches biology at the College of Charleston, told the subcommittee, "There is no alternative to evolution that is science." Now shorn of its anti-evolution language, S 114 headed for the full Education Committee, which returned it to the subcommittee; Dillon reports that in April, a last-ditch effort by Fair to restore his amendment to S 114 was defeated in the subcommittee.

Tennessee, Blount County: The Blount County School Board, which in 2003 rejected the adoption of three new biology textbooks that presented evolution without any treatment of creationism (see *RNCSE* 2003 Mar/Apr; 23 [2]: 12–4), is at it again. On January 13, 2005, the board unanimously adopted a resolution "relating to biological origins". The final clause of the resolution states that "... we hereby encourage our biology teachers to teach the controversy with respect to biological origins. The theory of 'intelligent design' may be taught as part of the current controversy. We also encourage the inclusion of intelligent origins in the State approved textbooks." Because the board's action took the form of a resolution rather than a policy or specific directive, it is unclear what effect it will have on education in the district, which serves about 11 000 students. "Teaching the controversy", of course, is a code phrase often used by anti-evolutionists (see Eugenie C Scott and Glenn Branch, "Evolution: what's wrong with 'teaching the controversy'", *Trends in Ecology and Evolution* 2003; 18 [10]: 499–502). The complete text of the resolution is as follows:



> As Members of the Blount County School Board WE BELIEVE:
>
> As a local public school board we have the authority and responsibility to approve curricula. The teachers in our school system should enjoy academic freedom to present appropriate materials to their students pertaining to the subject matter being covered. Students should not be deprived of current pertinent scientific information. The omission or denial of such information may unfairly deprive students of the opportunity to examine the full range of scientific theories about biological origins. Presently our high school biology textbooks only present the theory of Darwinian evolution and omits [*sic*] teaching a variety of scientific theories about origins. By

restricting content subject matter without academic freedom, biology education becomes indoctrination. Further, we, as members of the Blount County School Board confirm:

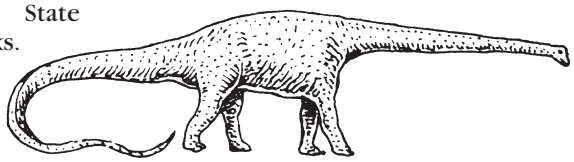
1. Teaching a variety of scientific theories about origins may be done with the clear secular intent of enhancing the effectiveness of science instruction.
2. Design theory, in particular, constitutes an inference from biological data, and is not an inference or conclusion from religious authority.
3. It is constitutionally lawful for teachers and school boards to expose students to scientific problems with current Darwinian theory as well as to other scientific alternatives with respect to theories about biological origins.
4. It is unconstitutional under the Free Speech Clause of the First Amendment to exclude these ideas from a public forum simply because of the content of these ideas.
5. Biological origins is an open forum for free speech and as such cannot be censored based solely on the content of the speech.
6. With respect to biological origins and scientific alternatives our local school board has the freedom to exercise discretion in the selection of curriculum materials.
7. Therefore, we hereby encourage our biology teachers to teach the controversy with respect to biological origins.The theory of intelligent design may be taught as part of the current controversy. We also encourage the inclusion of intelligent origins in the State approved textbooks.

NCSE members and other local citizens are currently monitoring the situation and working to support evolution and oppose teaching of creationism in local schools.

Tennessee, Shelby County: A member of the board of education of the Shelby County Schools has proposed a textbook sticker for biology books used in the district, which includes the city of Memphis. According to the Memphis *Commercial Appeal* (2005 Feb 17), Wyatt Bunker offered the suggestion at the February 15 board meeting. The proposed text of the sticker reads: "This textbook contains material on scientific theories about creation. There are many scientific and religious theories about the nature and diversity of living things. All theories should be approached with an open mind, studied carefully and critically considered." The school board reportedly deferred any action, with several members asking whether a disclaimer was necessary and whether it was likely to trigger a costly court battle. Bunker was quoted by the *Commercial Appeal* as saying that he is "concerned that students are being taught only scientific theories such as evolution and the Big Bang." He also told the newspaper that "several board members have been dismayed that no state-approved texts teach the religious creationism approach along with scientific theories." A flurry of letters and op-ed columns subsequently appeared in the *Commercial Appeal*, with the majority expressing disapproval of Bunker's proposal.

Washington, Burlington: "Intelligent design" was briefly on the horizon again in the Burlington-Edison School District, where Roger DeHart's efforts to teach ID in his classroom provoked turmoil in the community for years (see *RNCSE* 2000 Sep/Oct; 20 [5]: 15 and references therein). The *Skagit Valley Herald* reports (2005 Apr 4) that at the board's March 28, 2005, meeting, school board member Jerry Benson offered a resolution "directing biology teachers to discuss 'intelligent design' with their students." Although elected to the board as a supporter of "intelligent design", Benson had not previously urged the board to take action in its favor before; he was apparently impelled to do so by the recent spate of media coverage across the country. The offer was met with silence, Benson told the *Herald*: "Everyone just sat and listened and maybe looked at their shoes."

Brazil: In the wake of the controversy over the authorization of the teaching of creationism in the public schools of Rio de Janeiro state (see *RNCSE* 2004 May–Aug; 24 [3–4]: 4–6), a survey commissioned by *Época* magazine, one of Brazil's top three general interest magazines, reveals apparent widespread support for including creationism in the curriculum. According to a report on the web site of the Science and Development Network (<http://www.SciDev.Net) dated January 28, 2005, 31% of respondents agreed that humans were created directly by God 10 000 years ago, 54% agreed that humans developed over millions of years under God's guidance, and 9% agreed that humans developed over millions of years without God's intervention. Moreover, 89% of respondents supported teaching creationism alongside evolution, while 75% of respondents also endorsed teaching creationism instead of evolution. Ildeu de Castro Moreira, head of science communication at Brazil's Ministry of Science and Technology, argued that the questions were confusingly worded and biased the responses. Brazilian creationists, for their part, complained that reports of the survey's results were slanted against creationism. (The exact text of the questions was not reported, but they seem to have been based on the questions used in the Gallup polls; see *RNCSE* 2004 Sep/Oct; 24 [5]: 19.) The survey was conducted by the country's main public opinion analyst, IBOPE, between December 9 and December 15, 2004; 2002 Brazilians over the age of 16 were polled, and the margin of error was +/- 2.2%.



NCSE NEWS

NCSE Honorees for 2003

Glenn Branch, NCSE Deputy Director

Every year, NCSE honors a few exceptional people for their support of evolution education and/or their service to NCSE. The "Friend of Darwin" awards are proposed by the staff and approved by the board at its annual meeting; the recipients for the award for a given year are thus selected in the spring of the following year. NCSE usually arranges for the awards to be presented as a surprise to their recipients by their family, colleagues, and friends, so it often takes a while before a public announcement is possible. Here, finally, are the Friends of Darwin for 2003.

Lawrence S Lerner is Professor Emeritus of Physics and Astronomy at California State University, Long Beach. A nationally recognized expert on state science standards, Lerner wrote *State Science Standards: An Appraisal of Science Standards in 36 States* (1998) and *Good Science, Bad Science: Teaching Evolution in the States* (2000) for the Thomas B Fordham Foundation; both documents have been vital resources for those seeking to improve the treatment of evolution in the public school classroom. Moreover, when the place of evolution in the state science standards of Alaska, New Mexico, Ohio, and West Virginia was challenged, Lerner promptly and graciously provided expert evaluations of the challenges, helping to cement evolution in the standards (see, for example, *RNCSE* 2003 Mar/Apr; 23 [2]: 4–6).

Photo by Tracy E Miller

Kenneth R Miller is Professor of Biology at Brown University, a longtime member and Supporter of NCSE, and, quite simply, one of the most effective defenders of evolution education active today. With Joseph S Levine, he is the author of three popular biology textbooks, in which evolution is properly treated as the central unifying principle of biology; he is also the author of *Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution* (San Francisco: HarperCollins, 1999), which Ursula Goodenough described as "[a]n original, affective treatise, beautifully written, that offers new paths toward reconciling science with the faith of the Abrahamic traditions." A skilled debater and a lively polemicist, Miller is widely regarded as a leading public voice for evolution.

For decades, **Steven Schafersman** — a geologist whose career includes stints at Miami University and the University of Texas of the Permian Basin — has been a pertinacious critic of creationism in all its forms. In the early 1980s, for example, he was one of the "Raiders of the Lost Tracks": the team that was the first to publish a scientific evaluation of the so-called Paluxy footprints, supposedly evidence for the coexistence of dinosaurs and humans (see *Creation/Evolution* 1985 Winter; 5 [1]). And through the Texas Council for Science Education and its successor Texas Citizens for Science (<www.texscience.org>), Schafersman has been instrumental in defending the teaching of evolution in the Texas public schools, most recently in the latest round of biology textbook adoptions (see *RNCSE* 2003 Sep–Dec; 23 [5–6]: 4–7).

In a break with tradition, a Friend of Darwin award for 2004 was given to a group: the **Texas Freedom Network** (<http://www.tfn.org>). Founded in 1995, TFN is a nonpartisan grassroots organization, based in Austin, which acts as a watchdog monitoring the state's radical religious right. During the latest battle over the place of evolution in the state's biology textbooks (see *RNCSE* 2003 Sep–Dec; 23 [5–6]: 4–7), TFN — and its then executive director Samantha Smoot, Heather Alden, Casey Kaplan, and Ryan Valentine, to name a few — were invaluable allies to NCSE, Texas Citizens for Science, the Texas Association of Biology Teachers, and all of the dedicated Texas who helped to ensure victory. "Throughout the long hot Texas summer, TFN was always on the ball," commented NCSE executive director Eugenie C Scott.

Photo by Wesley R Elsberry

Robert Mahnke receives NCSE's Clarence Darrow award from Eugenie C Scott.

In addition to the Friend of Darwin awards, a new award was given by NCSE for the first time in 2004. Named for the flamboyant attorney who was on John T Scopes's defense team in 1925, the Clarence Darrow award is to be given to a lawyer whose professional contribution to the cause of evolution education and/or NCSE is nothing short of outstanding. The Darrow award for 2003 was given to **Robert Mahnke**, a lawyer at the San Francisco branch of Heller, Ehrman, White, and McAuliffe. A founding member of NCSE's Legal Advisory Committee, Mahnke has contributed, and continues to contribute, his legal expertise and his seemingly inexhaustible energy to promoting NCSE's goals, for which NCSE is profoundly grateful.

We thank these and all NCSE members for their support of our organization and our mission. We cannot — and do not — do it alone!

Author's address
Glenn Branch
NCSE
PO Box 9477
Berkeley CA 94709-0477
branch@ncseweb.org

NCSE Compiles *Pandas* Resource

Of Pandas and People (first edition, 1989; second edition, 1993) was a supplementary biology textbook intended for use in the public schools. Written by creationists Dean Kenyon and Percival Davis, it was produced

under the auspices of the Foundation for Thought and Ethics (headquartered in Texas) and was widely promoted by creationist groups throughout the 1990s. *Pandas* was the first book to use the phrases "intelligent design" and "design proponent" in their modern senses.

In fact, all of the basic arguments of "intelligent design" are to be found in essentially modern form in the 1989 edition of *Of Pandas and People* (with Michael Behe's "irreducibly complexity" argument appearing in the 1993 edition). The textbook came first, and the "research" claiming to support it came many years later. Thus, if "intelligent design" ever does succeed, it will be the first movement in the history of science that began with a high school textbook and then "filtered up" to acceptance by the scientific research community.

NCSE had accumulated a large amount of material in its files on *Pandas*, but almost none of it was digital, so good resources on the web were few and far between. We have now digitized just about everything published in *NCSE Reports, RNCSE,* or *Bookwatch Reviews* on *Pandas* through the 1990s and put it in one handy central location on the NCSE website for easy access.

Many of the resources have never been available on the web before, including reviews by Michael Ruse and Kevin Padian, as well as Frank Sonleitner's epic "What's wrong with *Pandas*?", a review that is actually longer than the book itself.

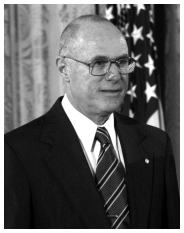
In the short term, we hope that this material will be useful to the folks in Dover, Pennsylvania, where a battle over *Pandas* and ID is ongoing (see *RNCSE* 2004 Sep/Oct; 24 [5]: 4–9). However, since the last edition of *Pandas* is now 11 years old, it seems likely that future controversies will occur over the anticipated third edition of *Pandas*, apparently to be retitled *The Design of Life*. Whatever the title, it will be useful to have some of the long and interesting history of *Pandas*, and thereby "intelligent design", available to the public.

Visit <http://www.ncseweb.org/article.asp?category=21>.

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 a lot to be proud about!



The noted geologist and NCSE Supporter **G Brent Dalrymple** was named a 2005 National Medal of Science Laureate, in an announcement made on February 14, 2005, by President Bush. The medal was awarded at a White House ceremony on March 14, 2005. The National Medal of Science is the nation's highest honor for scientific achievement. Dalrymple worked for the US Geological Survey for 31 years, helping to establish the foundations for plate tectonics and performing fundamental research on the origin and age of the earth and moon, and then taught at Oregon State University, where he also served as Dean of the College of Oceanic and Atmospheric Sciences before retiring in 2001. He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences. Author of numerous scientific papers, he also wrote two books on geochronology: *The Age of the Earth* (Stanford: Stanford University Press, 1991), and *Ancient Earth, Ancient Skies: The Age of Earth and Its Cosmic Surroundings* (Stanford: Stanford University Press, 2004). As the Corvallis, Oregon, *Gazette-Times* (2005 Feb 16) noted in its story on the award, Dalrymple "has also been a passionate advocate for science-based teachings in schools and has worked to keep creationism out of textbooks." As a scientific expert on the age of the earth, he was a key expert witness in the 1981 court case *McLean v Arkansas*, which resulted in the overturning of an Arkansas law that gave "equal time" for creationism. Of his testimony, fellow witness **Michael Ruse** wrote (in "A philosopher's day in court," in *Science and Creationism*, Ashley Montagu, ed. [New York: Oxford University Press, 1984]): "My sense was that Dalrymple was so good and so firm that he rather broke the back of the state's case. He had checked all of the creationist arguments and showed in devastating detail the trail of misquotations, computational errors, out-of-date references, and sheer blind stupidity which allows the creationists to assign the earth an age of 6000 years. After Dalrymple, the state seemed far less ready to tangle with witnesses."

From May 5 to May 7, 2005, in Dayton, Ohio, **Gregory Forbes** again conducted his popular NSF Chautauqua course for college and university professors entitled "Evolution education: A delicate balance between science, controversy, and pedagogy." The goal of the course is to "introduce educators to the socio-political factors that account for the continuation of this debate as well as to provide an overview of contemporary evolutionary theory and pedagogical approaches to teaching this very important body of science." Forbes, a professor of biological sciences at Grand Rapids Community College, was named the Michigan College and University Science Teacher of 2004 by the Michigan Science Teachers Association.

Barbara Forrest was interviewed by Americans United for Separation of Church and State about her book (coauthored with Paul R Gross) *Creationism's Trojan Horse: The Wedge of Intelligent Design* (New York: Oxford University Press, 2004). An excerpt from the interview appeared in the February 2005 issue of *Church & State* (58 [2]: 9–11), the monthly journal of Americans United, and the complete text appears on the Americans United web site, <http://www.au.org>. In it, Forrest describes the Wedge strategy for promoting "intelligent design" and the role of

continued on page 27

Confronting Creationism: When and How

Eugenie C Scott, NCSE Executive Director

Everyone agrees that scientists should confront the claims of creationists, but how? Are debates of the sort that creationists love to promote the right arena? Not in my opinion.

Debaters on our side of this issue, I assume, participate in the hope of improving the public's understanding of evolution and the nature of science, leading to increased support for the teaching of evolution in the public schools uncompromised by religious dogma. It is a worthy goal. (Unfortunately, some debate to gratify their egos.)

As I have argued elsewhere (Scott 1994) and as argued by the other contributors in this issue of *RNCSE*, such debates are counterproductive. They confuse the public about evolution and the nature of science; they increase the membership and swell the coffers of their creationist sponsors; they fuel local enthusiasm for creationism, thereby contributing to public pressure on local teachers to teach creationism or downplay evolution.

"But you've debated creationists," you protest. "I've seen you on *Firing Line* and *Crossfire*, and NCSE even sells a videotaped debate with you, Duane Gish, and Hugh Ross! How can you say 'don't debate creationists' when you debate creationists?"

Well, in fact, I really don't debate. I appear with creationists at public events and on radio and television shows, and sometimes these appearances are called "debates," but they are not formal debates about evolution of the sort that the Institute for Creation Research or Kent Hovind or the Veritas Forum constantly try to organize. I steer clear of such events, and, again, I recommend that my colleagues follow suit.

But I do appear in public with creationists, and you may be asked to do the same. Where, and how, do I draw the line between debating creationists and participating in a public exchange? Here are criteria to consider if you are invited to engage with creationists *mano a mano.*

1. The topic of the discussion should not be the scientific legitimacy of evolution. Evolution is not on trial in the world of science. I will not defend evolution against a creationist, whether young-earth, old-earth, or "intelligent design". I am happy to discuss the scientific illegitimacy of creationism, however. And I am even happier to talk about issues that are central to the controversy in law, religion, philosophy, education, and politics — where, unlike in science, there is real controversy.

2. The format should be conducive to educating the audience about evolution and the nature of science. A useful format, in which proponents of "intelligent design" were required to make their case and defend it in the face of criticism, was used at the American Museum of Natural History's forum on "intelligent design" in April 2002 (a transcript is available: Anonymous 2002). To be avoided are unstructured formats allowing presentation of misconception after misconception — what I have dubbed "the Gish Gallop" in honor of its most avid practitioner.

3. The setting should be neutral. Why debate evolution before an audience consisting predominantly of conservative Christians? Why be the evolutionist Federals to the creationist Globetrotters? The event should be accessible to members of the general public, so in general, a venue in a church is not the first choice, compared to, say, a university auditorium. On the other hand, if the topic is science and religion, then a predominantly religious audience in a church setting is understandable.

Preparation is necessary for any venue, and it's not enough to know the science: you have to know the pseudoscience, too. (May I suggest my recent book [Scott 2004] and Mark Isaak's new book [Isaak 2005] to help you study?) And it's useful to work on your delivery as well. In person and especially on television, affect is often more important than content, so be nice. No matter how technically brilliant your presentation, the effect will be lost if the audience finds you arrogant, boring, or unpleasant, much less all three.

Instead of a face-to-face debate, consider a written one. On the internet, there is unlimited time and space for debates, including the opportunity for documentation and references, impractical in oral debates. A good on-line debate that showed clearly which side has the real science is a debate hosted by NOVA between "intelligent design" advocate Phillip Johnson and NCSE Supporter Kenneth R Miller (Johnson and Miller 1996). Be warned, though: it is increasingly difficult to find a creationist to debate in such a format!

You can be a voice for evolution even without debating, of course. You can write letters and op-eds to the editors of newspapers and magazines, respond to bogus claims on internet blogs, and even organize your own pro-evolution forums, as the residents of Darby, Montana, and Grantsburg, Wisconsin, did in response to assaults on evolution education in their communities. NCSE's pamphlet "25 ways you can support evolution education" (available on-line at <http://www.ncseweb.org/25_ways.asp>) suggests a number of ways to contribute.

In short, scientists, and those who are concerned about the quality of science education, should indeed confront creationism in all its forms as well as support evolution education, but they should do so in ways that advance, rather than thwart, the goal of a scientifically literate public that understands and appreciates science.

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Debates and Dialogs

"In the unlikely event that a significant *scientific* argument should ever emerge from the ranks of creationism/'intelligent design', we will be happy to debate it. Meanwhile, we shall cultivate our evolutionary gardens occasionally engaging in the more exacting and worthwhile task of debating each other. What we shall not do is abet creationists in their disreputable quest for free publicity and unearned academic respectability." Thus Richard Dawkins, in his draft of a joint letter that was to have been signed also by Stephen Jay Gould (see Dawkins's *A Devil's Chaplain* [New York: Houghton Mifflin, 2003]: 218–22). Whether or not you agree with Dawkins on the futility of debating creationists, it is certainly worthwhile to read debates and dialogs about — as well as incisive critiques of — their positions, from creation science to "intelligent design". So check out 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!

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

Collections on creationism

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 young-earth 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. As a whole, the volume provides a lively and provocative spectrum of approaches to the authority of scripture and theological method as applied to the science–religion dialog.

Darwinism Defeated? The Johnson–Lamoureux Debate on Biological Origins
by Phillip E Johnson and Denis O Lamoureux
The godfather of "intelligent design" Phillip Johnson squares off against University of Alberta theologian and biologist Denis Lamoureux, who challenges both Johnson's understanding of science and his view on how Christians ought to respond to evolution. The exchange between Johnson and Lamoureux is followed by essays from a number of scientists and theologians with varying perspectives, including Michael Behe, Howard Van Till, and Rikki Watts. *Darwinism Defeated?* serves as a vivid reminder that the controversy over evolution is very much a religious discussion, in which opposition to evolution is by no means the only voice to be heard.

An Evolving Dialogue
edited by James B Miller
In the introduction to his anthology, Miller explains that "the articles collected herein provide a basic introduction to contemporary evolutionary biology, provide historical and philosophical perspectives on the relationship between evolutionary biology and religious thought, and consider the 'intelligent design' movements from scientific, philosophical and religious perspectives." Among the contributors who will be familiar to readers of *RNCSE* are Francisco J Ayala, Douglas J Futuyma, Ursula Goodenough, Stephen Jay Gould, John F Haught, Ernst Mayr, and Kenneth R Miller — as well as "intelligent design" proponents Michael J Behe and William A Dembski.

Intelligent Design Creationism and Its Critics
edited by Robert T Pennock
According to the publisher, Pennock's massive anthology on "intelligent design" creationism (IDC) "contains articles previously published in specialized, hard-to-find journals, as well as new contributions. Each section contains introductory background information, articles by influential creationists and their critics, and in some cases responses by the creationists. The discussions cover IDC as a political movement, IDC's philosophical attack on evolution, the theological debate over the apparent conflict between evolution and the Bible, IDC's scientific claims, and philosopher Alvin Plantinga's critique of naturalism and evolution. The book concludes with Pennock's 'Why creationism should not be taught in the public schools.'"

Against young-earth creationism

Evolution and the Myth of Creationism
by Tim Berra
Praised by Paul R Ehrlich as "a powerful antidote to those who imagine there is a controversy in the scientific community over evo-

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

lution," this clear, cogent, and comprehensive survey describes the theory of evolution and the evidence on which it rests while also answering the common "arguments against evolution". The closing chapter on "Science, religion, politics, law, and education" discusses the opposition to evolution education and the necessity of resisting it. Berra, a member of NCSE, is Professor Emeritus in the Department of Evolution, Ecology, and Organismal Biology at the Ohio State University at Mansfield.

Science on Trial: The Case for Evolution, revised edition
by Douglas J Futuyma
Michael Ruse describes NCSE Supporter Douglas Futuyma's *Science on Trial* as "the book to show someone who is worried about the threat of creationism. ... It can be read for pleasure and profit by people at all levels of biological sophistication." Originally published in 1982, *Science on Trial* was reissued in 1995 with extensive notes bringing it up to date. "In an age in which some understanding of science is a virtual necessity for everyone," Futuyma writes, "it is incredible that the single most fundamental principle of biology and one of the most fundamental in modern thought should still be an object of controversy and disbelief."

Abusing Science: The Case Against Creationism
by Philip Kitcher
In the words of Stephen Jay Gould, "a brilliant book by a gifted scholar." Martin Gardner, writing in *Discover*, raves, "*Abusing Science* does more than just explode moldy arguments.... As a philosopher concerned with the way science operates, Kitcher is good at showing how creationists distort Karl Popper's views on scientific method, and how they misuse such books as Thomas Kuhn's *Structure of Scientific Revolutions*." Well-written and understandable even by those with little or no scientific or philosophical background. The author, a professor of philosophy at Columbia University, is a Supporter of NCSE.

Science and Earth History
by Arthur N Strahler
In his massive *Science and Earth History*, the distinguished geologist Arthur N Strahler systematically demolishes not only the geological claims of young-earth creationism but also its claims about cosmology and astronomy, the fossil record, human evolution, and the origin of life, concluding that "the fundamentalist creationist view of the universe, based on the literalist interpretation of the book of Genesis ... constitutes pseudoscience." First published in 1987 and reprinted in 1999 with a new preface. "Perhaps the most useful single volume of scientific refutations of creation 'science'," writes Eugenie C Scott.

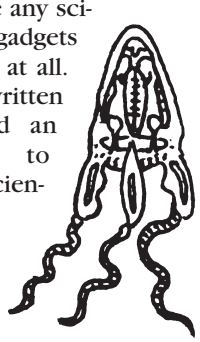
Against "Intelligent Design"

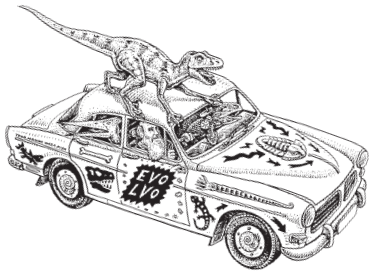
Tower of Babel: The Evidence against the New Creationism
by Robert T Pennock
Simply the most comprehensive philosophical examination to date of the intelligent design movement, *Tower of Babel* was described by Frederick Crews in *The New York Review of Books* as "... comprehensive and consistently rational ... the best book opposing creationism in all of its guises" and by Evan B Hazard in *Choice* as "[e]ssential reading for all social and natural scientists (especially secondary and college teachers), and also concerned pastors, seminarians, and seminary professors." The author, a member of NCSE, is Professor at the Lyman Briggs School and in the Department of Philosophy at Michigan State University.

Unintelligent Design
by Mark Perakh
In *Unintelligent Design*, Mark Perakh offers incisive critiques of the work of "intelligent design" advocates William Dembski, Michael Behe, and Phillip Johnson (whom he describes as a "militant dilettante"), as well as animadversions on "primitive" (or literalist) creationists and thoughts about scientific method. Reviewing *Unintelligent Design* in *RNCSE*, Jason Rosenhouse writes, "I have been a consumer of 'intelligent-design' (ID) literature for several years now, but I don't think I fully appreciated 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."

God, the Devil, and Darwin
by Niall Shanks
In *God, the Devil, and Darwin*, Niall Shanks provides a philosophically acute and politically engaged critique of "intelligent design" that Richard Dawkins describes, in his foreword, as "a shrewd broadside in what will, I fear, be a lengthy campaign." After reviewing and debunking the leading scientific and philosophical claims of "intelligent design", Shanks wryly concludes, "Intelligent design advocates have not merely failed to offer extraordinary evidence but indeed have failed to offer even humdrum evidence to support their case," and describes "intelligent design" as "old medieval theological wine in new biochemical and cosmological bottles." Shanks is Professor of Philosophy at Wichita State University.

Why Intelligent Design Fails
edited by Matt Young and Taner Edis
In *Why Intelligent Design Fails*, a team of scientists — Taner Edis, Matt Young, Gert Korthof, David Ussery, Ian Musgrave, Alan Gishlick, Niall Shanks, Istvan Karsai, Gary Hurd, Jeffrey Shallit, Wesley Elsberry, Mark Perakh, and Victor Stenger — call on their expertise in physics, biology, computer science, and archaeology to examine "intelligent design". NCSE President Kevin Padian describes *Why Intelligent Design Fails* as "[a] terrific book that explores, fairly and openly, whether proponents of ID have any scientifically valid gadgets in their toolbox at all. ... Accessibly written throughout and an invaluable aid to teachers and scientists."





NCSE on the Road

A Calendar of Special Events, Presentations, and Lectures

Date	September 22, 2005
City	Bloomington IN
Presenter	Eugenie C Scott
Title	Tracking Those Incredible Creationists
Event	The Joan Wood Lecture
Time	4:00 PM
Location	Indiana University
Contact	Lucy Cherbas, lcherbas@cgb.indiana.edu

Date	October 15, 2005
City	Richmond VA
Presenter	Eugenie C Scott
Title	Lessons from the Creationism/Evolution Controversy
Event	Association of Science and Technology Centers annual meeting
Time	11:30 AM
Location	Science Museum of Virginia
Contact	Bonnie VanDorn, bvandorn@astc.org

Date	October 28, 2005
City	Salt Lake UT
Presenter	Eugenie C Scott
Title	Lessons from the Creationism Controversy
Event	American Society of Human Genetics annual meeting
Time	8:00 PM
Location	Salt Lake City Convention Center
Contact	Peter Byers, pbyers@u.washington.edu

NCSE Speakers Available

Name	Eugenie C. Scott
Title	NCSE Executive Director
Contact	scott@ncseweb.org
Name	Andrew J Petto
Title	NCSE Board Member
Contact	editor@ncseweb.org
Name	Glenn Branch
Title	NCSE Deputy Director
Contact	branch@ncseweb.org
Name	Wesley R Elsberry
Title	NCSE Information Project Director
Contact	elsberry@ncseweb.org
Name	Nicholas J Matzke
Title	NCSE Public Information Project Director
Contact	matzke@ncseweb.org
Name	Susan Spath
Title	NCSE Public Information Project Director
Contact	spath@ncseweb.org
Name	Philip T Spieth
Title	NCSE Director of Operations
Contact	spieth@ncseweb.org

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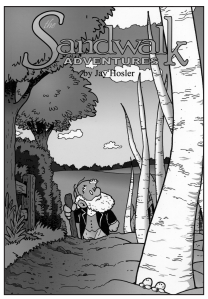
TOTAL _____

continued from page 23

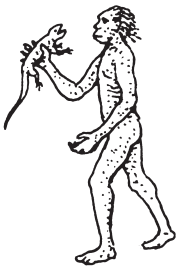
the Foundation for Thought and Ethics and the Discovery Institute in proselytizing for it, discusses the uneasy relationship between "intelligent design" and old-fashioned young-earth creationism, and argues that the claim that "intelligent design" is not a religious view "is a complete sham. ... when speaking to what the Wedge Document calls their 'natural constituency, namely [conservative] Christians,' ID creationists express themselves unambiguously in religious language." She also documents the scientific bankruptcy of "intelligent design," commenting, "As far as publishing original scientific data to support ID is concerned, their scorecard is still blank." And she concludes by warning both of the threat that "intelligent design" creationism poses to the quality of science education and of its broader implications: "intelligent design," she writes, "is more than just creationism's Trojan horse — it is a stalking horse for the Religious Right's effort to steamroll its way into American education and public policy." Forrest is Professor of Philosophy at Southeastern Louisiana University and a member of NCSE's board of directors.

"Wedging creationism into the academy," by **Barbara Forrest** and **Glenn Branch**, appeared in the January-February 2005 issue of *Academe* (91 [1]: 36–41, and available on-line at <http://www.aaup.org/publications/Academe/2005/05jf/05jfforr.htm>), the bimonthly magazine of the American Association of University Professors. In their article, Forrest and Branch discuss the attempts of the "intelligent design" movement to use academia as a base. In light of the scientific sterility of "intelligent design," they argue, "the Wedge needs another way to persuade education policy makers that 'intelligent design' is academically respectable": by exploiting the academic credentials and affiliations of its proponents and supporters for all they are worth. Reviewing such Wedge tactics as holding pseudoacademic "intelligent design" conferences on campuses and recruiting professors to sign anti-evolution statements, Forrest and Branch conclude that supporters of "intelligent design" in academia "exploit their academic standing to promote the concept as intellectually respectable while shirking the task of producing a scientifically compelling case for it." Forrest is Professor of Philosophy at Southeastern Louisiana University, author (with Paul R Gross) of *Creationism's Trojan Horse: The Wedge of Intelligent Design* (New York: Oxford University Press, 2004), and a member of the NCSE board of directors; Branch is the deputy director of NCSE.

NCSE Supporter **Douglas J Futuyma**'s new book *Evolution* (Sunderland [MA]: Sinauer Associates, 2005) is now available. "Evolution is a readily recognized descendant of the author's previous textbook, *Evolutionary Biology*," writes the publisher. "However, it is much shorter and is exclusively directed toward an undergraduate audience. Teachers and students will find the list of important concepts and terms in each chapter a helpful guide, and will appreciate the radically different dynamic figures and lively photographs. The content of all chapters has been updated, and material has been reorganized into new chapters such as 'Conflict and Cooperation' and 'How To Be Fit.' ...A new final chapter on 'Evolutionary Science, Creationism, and Society' treats such topics as the nature of science and the practical applications of evolutionary biology." Futuyma is Professor of Biology at SUNY Stony Brook.



National Public Radio featured scientist-*cum*-cartoonist **Jay Hosler**, scientist-*cum*-cartoonist Jim Ottaviani, and NCSE deputy director **Glenn Branch** on February 14, 2005. The three were interviewed by NPR's art correspondent Neda Ulaby as part of her continuing Science and Art series on *Morning Edition*. Hosler, who teaches biology at Juniata College in Huntingdon, Pennsylvania, also wrote and illustrated two graphic novels on biological themes — *Clan Apis* (about honeybee development, behavior, and ecology) and *The Sandwalk Adventures* (in which Darwin explains evolution to a follicle mite dwelling in his left eyebrow). During the show, Hosler told Ulaby that *The Sandwalk Adventures* was conceived in reaction to Jack Chick's tract "Big Daddy?" — which, as Branch related, in fact inspired creationist legislation in Arkansas in 2001. (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.) Ulaby ended her story with a tantalizing description of Hosler's latest project: "a comic about beetles, glowing fireflies, beetles that shoot explosive spray from their abdomens. To Hosler, these beetles are so magnificent, so hyper-real that it's no stretch to place them in the comic book superhero pantheon."

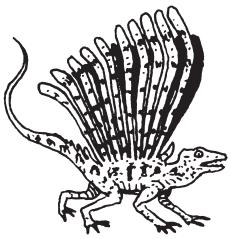


Provoked by reports on the court battle in Georgia over the Cobb County School Board's textbook disclaimer about evolution, **Robert Hopkins** wrote a lengthy letter to the editor of *The* (Youngstown, Ohio) *Vindicator*. Quoting such authorities as **Francisco J Ayala**, he argued that creationism — including its variant "intelligent design" — is not right for science classrooms: "ID is not science. Teach it if you will in a class [on] comparative religion." He also warned: "Religious readers of the radical right, [such as] Dobson, Kennedy, Falwell, Robertson, Colson, Ahmanson, [and] Bauer, have unlimited funds with which to influence local school boards. Their aim is to make sure religion is taught in our public schools. The wedge they use is ID/creationism." His letter appeared on December 20, 2004.

Gale Kerbaugh's op-ed entitled "An obstacle to teaching science" appeared in the Raleigh, North Carolina, *News & Observer* (2005 Feb 10). Noting that "[p]roponents of 'intelligent design' have tried to cast doubt on evolutionary theory and have pushed for their agenda to be included in public school science classrooms," Kerbaugh argued that "'[i]ntelligent design' is the repackaged product of creationists" with no scientific evidence supporting it. "Public schools are already experiencing a significant shortage of trained science teachers, and many universities are struggling to fill their science classes," she warned, urging that "[t]he science and education communities should take a firm stand against

efforts to dilute the science taught in public classrooms. Science educators must do a better job of explaining their endeavors and discoveries to the public."

Responding to a creationist's letter to the editor of the *Birmingham* (Alabama) *News*, **David C Kopaska-Merkel** wrote to explain, "to refer to the theory of evolution as 'controversial' — as a recent letter writer did — reveals a fundamental ignorance of modern biology. Evolution is about as controversial among scientists as gravitation. Few theories are as well supported or have as much explanatory power," adding, "The idea that schoolchildren should not learn about the principle which underlies all of modern biology makes about as much sense as omitting algebra from the mathematics curriculum." His letter appeared on January 2, 2005.



The work of **Denis Lamoureux** was featured in Bill Kaufmann's editorial column in the *Calgary Sun* (2004 Dec 27). "As the rejection of solid science education for the sake of religious–political interests rears its ludicrous head south of the border, don't think that it can't happen here. That's the message of Dr Denis Lamoureux, a University of Alberta biologist who's done frequent battle with America's leading lights of creationist thought masquerading as science," Kaufmann wrote. "For Lamoureux, the awesome wonder of evolution merely elevates the splendour of the natural world while not discounting the possibility those forces were unleashed by a supreme being." Lamoureux contributed a review of Kurt Wise's *Faith, Form, and Time* to *RNCSE* 2004 May–Aug (3–4): 34–5.

Following its strong editorial in support of evolution education (2005 Feb 5), the *Baltimore Sun* published a number of letters reacting to it, including one from **Douglas E McNeil**, who wrote, "This is particularly troublesome because the life sciences are so important to Maryland's economic future that we cannot afford to provide an inferior science education. ... We need biologists from our universities and biotechnology firms to get involved in this fight, before high school science education in Maryland is ruined." His letter appeared on February 11, 2005.

In his op-ed "Remove stickers, open minds," published in the *Boston Globe* on January 22, 2005, **Kenneth R Miller** applauds the decision in *Selman v Cobb County* from a unique standpoint: he is the coauthor (with Joseph Levine) of the high school biology textbook used in the Cobb County School District. Miller comments, "So what's wrong with telling students that evolution is a theory? Nothing. But the textbook they were using already described evolution as a theory, and I ought to know." Challenging the misuse of "theory" in the disclaimer, he writes, "Theories in science don't become facts — rather, theories explain facts. ... Evolutionary theory is a comprehensive explanation of change supported by the facts of natural history, genetics, and molecular biology." Isolating evolution for special attention, as in the disclaimer, is unwarranted: as Miller ironically comments, "The sticker told students that there was just one subject in their textbooks that had to be approached with an open mind and critically considered. Apparently, we are certain of everything in biology except evolution. That is nonsense." Removing the disclaimer is what truly promotes critical thinking, Miller writes, by letting "students see a science of biology in which all theories, not just one, are the result of constant, vigorous, critical analysis." Miller, who teaches biology at Brown University, is a Supporter of NCSE.

On April 13, 2005, **David Mindell** spoke on "What's so controversial about evolution?" for the National Library Week Panel Lecture at the Ann Arbor, Michigan, District Library. Exploring the concept of evolution, Mindell explained why, despite the passage of time, the theory is still so controversial today. In addition to teaching in the University of Michigan's Department of Ecology and Evolutionary Biology, Mindell is curator of birds at the university's Museum of Zoology and director of its Museum of Zoology and the Herbarium.

Responding to a creationist's letter to the editor of the *Lewiston* (Idaho) *Tribune*, **Ralph Nielsen** posed a pertinent dilemma: "He says the ACLU is opposed to teaching 'creation science' in schools because of its 'fanatic opposition to all things religious.' Well, which is it ... ? Is creationism science or religion? If it is science, why do creationists keep referring to religion? If it is really religion, why do they pretend it is science? Who do they think they are kidding?" His letter appeared on January 23, 2005.

Andrew J Petto spoke in Chicago on March 13, 2005, at the Museum of Science and Industry, as part of the Clarence Darrow Commemorative Committee's annual celebration and symposium in honor of Darrow: "80 years after the Scopes trial: The debate continues." A number of NCSE members from the Chicago area turned up for the event, which also included a presentation by local creationist lawyer Andy Norman — who agreed to speak on First Amendment Issues, but instead presented rewarmed "intelligent design" and young earth creationist ideas as "evidences against" evolution. "This was a surprise," Petto said, "but thanks to the work of the Citizens for Quality Education in Grantsburg, I had my 'Evolution 101' slides on my computer to refute the silly claims my opponent made" (see p 12). A member of NCSE's board of directors and editor of *RNCSE*, Petto teaches in the Department of Biological Sciences at the University of Wisconsin–Milwaukee.

Following the decision in *Selman v Cobb County*, NCSE's **Eugenie C Scott**, **Glenn Branch**, and **Nicholas Matzke** teamed up to write "Creation sticker shock" for United Press International. In their column (which appeared on January 18, 2005), they reviewed the use of disclaimers to undermine evolution education. In science, they observe, "theories incorporate facts, laws and hypotheses. They are the central unifying backbones of disciplines. Just as relativity and quantum mechanics are the backbone of physics, and plate tectonics is the backbone of geology, evolution is the backbone of biology." The description of evolution as "a theory, not a fact," in the Cobb County disclaimer, however, exploits the colloquial sense of "theory" as something speculative or conjectural, and — as Judge Cooper recognized — thus "appears to be endorsing the well-known prevailing alternative theory, creationism or variations thereof." Neither disclaimers in particular nor attempts to dilute evolution education in

general is going to disappear in the wake of the *Selman* decision, but neither is the need to teach students about evolution "uncompromised by disclaimers or phony evidence against evolution." Scott (whose first name was unfortunately misspelled in the byline) is the executive director of NCSE, where Branch and Matzke also work.

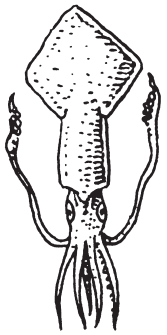
PBS's *NewsHour* broadcast a segment entitled "Creation conflict in schools" on March 28, 2005. Among the people interviewed for the segment were Answers in Genesis's Ken Ham, the Discovery Institute's Stephen C Meyer, the University of Georgia's Edward J Larson, and NCSE's executive director **Eugenie C Scott**, during her recent visit to Centre College in Danville, Kentucky. Shown while conducting a teacher training session in Danville and in conversation with *NewsHour*'s Jeffrey Brown, Scott deplored both attempts to introduce pseudoscientific alternatives to evolution in the science classroom and attempts to discredit evolution by describing it as "just a theory." Addressing a recently revived anti-evolutionist tactic, Scott told Brown, "'Teach the controversy' is a deliberately ambiguous phrase. It means 'pretend to students that scientists are arguing over whether evolution took place.' This is not happening. I mean … go to the scientific journals, … go to universities like this one, and … ask the professors, 'Is there an argument going on about whether living things had common ancestors?' They'll look at you blankly. This is not a controversy." Also noteworthy were appearances by Danville high school biology teacher Matthew Lauer, whose classroom wall holds a copy of the state science standards with the word "evolution" substituted for the ersatz "change over time" and by Centre College biology professor Chris Barton, who explained, "Without evolution, it's very, very difficult to make any sense out of what we see in the biological realm." For streaming video or RealAudio versions of the segment, or to read a transcript, visit: <http://www.pbs.org/newshour/bb/education/jan-june05/creation_3-28.html>.

The spring 2005 issue of *California Wild* features "In my backyard: Creationists in California" (58 [2]: 6–11) by NCSE's executive director **Eugenie C Scott**. Beginning by alluding to the evolution warning labels in Cobb County, Georgia, she comments, "Many Californians chalked up this example of the persistent creationism/evolution controversy to the fact that it happened in, well, Georgia. They were no doubt thinking, I'm glad this problem is not in my backyard." But, as she proceeds to explain, creationism is alive and well in the Golden State, home to the Institute for Creation Research as well as any number of influential creationists, from young-earth proponents like Henry M Morris to "intelligent-design" advocates like Phillip Johnson. And controversies over evolution education at the local level are not uncommon: Scott devotes a portion of her article to reviewing the situation in the Sacramento suburb of Roseville in detail. Concluding, she writes, "Although California is on the cutting edge of scientific research, proponents of teaching creationism in the public schools are nonetheless banging on the doors. … California is not immune to creationism and anti-evolutionism — it is in our backyard." *California Wild* is published by the California Academy of Sciences, of which Scott is a Fellow.

Howard Van Till participated in a dialogue about his views of "intelligent design" in *Perspectives on Science and Christian Faith* (2004 Dec; 56 [4]), the journal of the American Scientific Affiliation. The dialogue began with James Madden and Mark Discher's article "What intelligent design does and does not imply" (286–91), followed by Van Till's reply "Is the ID movement capable of defeating naturalism? A response to Madden and Discher" (292–5), followed in turn by a response from Madden and Discher entitled "What would count as defeating naturalism? A reply to Van Till" (296–8). Especially appealing is Van Till's concluding sentence: "*Consequently, there is no scientific basis for political action promoting the inclusion of the ID hypothesis in the public school science classroom*" (295; emphasis in original). Also of interest in the same issue of *PSCF* are several reviews of books on the creationism/evolution controversy, including Glenn Morton's review (302) of **Mark Perakh**'s *Unintelligent Design* (Amherst [NY]: Prometheus Books, 2004; reviewed by **Jason Rosenhouse** in *RNCSE* 2004 May–Aug; 24 [3–4]: 49–50); while complaining of what he regards as Perakh's captiousness, Morton also describes his discussion of William Dembski's views as "probably the best critique of those views I have ever read."

Responding to a creationist's letter in the *Chicago Tribune*, **Greg Yarnik** wrote (in part), "Why is it that evolution alone among the natural sciences has been allowed to be so scrutinized by so many in the general public who have no idea what it really means or how its many processes operate in nature? 'Intelligent design' is nothing more than the latest wedge inserted by the political and religious right to undermine sound science in public schools. There is no mechanism to investigate such a process as ID, and no peer-reviewed, published evidence for it … It is no more sound science than its earlier incarnation, scientific creationism, and thus deserves no forum or consideration in the science classroom." His letter appeared in the April 15, 2005, issue of the newspaper.

Donald A Yerxa's essay "The evolving debate" (*Science & Spirit* 2005 Jan–Feb; 16 [1]: 75–79) reviewed a number of books about the creationism/evolution controversy, including **Michael Ruse**'s *Darwin and Design*, **Eugenie C Scott**'s *Evolution vs. Creationism*, **Mark Perakh**'s *Unintelligent Design*, **Barbara Forrest** and **Paul R Gross**'s *Creationism's Trojan Horse*, and **Niall Shanks**'s *God, the Devil, and Darwin*. Yerxa, a professor of history at Eastern Nazarene College, is the coauthor (with Karl Giberson) of *Species of Origins: America's Search for a Creation Story* (Lanham [MD]: Rowman and Littlefield, 2002; reviewed by George E Webb in *RNCSE* 2003 Mar/Apr; 23 [3]: 38–9).



[*Publications, achievements, honors? Tell RNCSE so we can pass on the good news to all of our members. Call, write, or e-mail.*]

DEBATES: The Drive-by Shootings of Critical Thinking

Karen E Bartelt, Eureka College

It can start with something as innocuous as a friendly e-mail:

> *Dear Karen,*
> *Would you be willing to debate evolution with a Creationist at a University? I'm curious because as a student I'd like to see one. Currently, I'm in the first stages of finding out how to go about this endeavor. I feel you could have much to offer in way of the evolution side to the debate. Thanks for listening.*
> *Sincerely,*
> *Janet*

As a veteran of such a debate in 1998, I turned Janet down. She did not take kindly to my refusal; in fact, we exchanged another seven e-mails before I finally quit replying. Her responses are very telling, and demonstrate some reasons why I feel that debating scientific issues with creationists is a waste of everyone's time.

Reason #1 not to debate

Initially, Janet claimed:

> *It would be very productive to have a debate because higher-order thinking and decision making is* [sic] *necessary to evaluate one's position on origins of mankind.*

This leads to the first issue: *format*. The summary evidence for evolution is not presentable in a 2–3 hour debate to people who have neither the background nor the inclination to evaluate objectively any evidence that you might present. Though Janet appeared open-minded initially, and was a self-described "seeker of Truth," it became apparent that her science literacy was minimal and that she was merely repeating standard creationist rhetoric and urban legends. Some of her earlier comments included:

> *The importance of this topic is enormous because there is not much objective evidence to support evolution. Isn't the fact that there is so much variation in the planet orbits, numbers of moon* [sic]*, rotation of axis, and more, evidence that maybe, just maybe evolution did not occur and that Someone else possibly created us? If evolution were undeniable, like gravity, then there absolutely wouldn't be all this heated debate.* ["What debate?" I asked.] *Macroevolution cannot be repeated in the lab nor can it be observed. When you have hard scientific evidence, check out <http://www.drdino.com>. He's offering $250,000 for scientific evidence for evolution. Until then, can you at least not insist on this being in the same realm as gravity? Gravity is a principal* [sic]*. Evolution is still a theory which, in macro terms, cannot be repeated. Why are you telling me it's so factual, when so many other scientists admit loopholes in fossil record, transitional links, and the possibility of special design?* ["Which 'other scientists'?", I asked.]

So much misinformation, so little time. If someone who claims to want to learn more about evolution can make these types of statements prior to a debate, someone like me is not going to make a dent in two hours, no matter how compelling my evidence, no matter how snazzy my slides!

I told Janet that I agreed with her about the importance of higher-order thinking, but that debates are "drive-by shootings" when it comes to critical thinking. One simply does not have time to process the information, much less the misinformation, spewed rapid-fire by many creationist speakers. Higher-order thinking may take place when one studies the evidence over a long period of time, becomes well-versed in the basics of biology, chemistry, and geology, and the fundamentals of creationist arguments, and then can slowly and carefully evaluate them. I said that I would be happy to look at any questions she had on evolution in a reflective, higher-order thinking format. This did not interest her.

Reason #2 not to debate

The second reason not to debate a creationist is that the audience is not really searching for scientific evidence, anyway. Janet's later comments revealed the true area of concern:

> *He told us through the Bible that Creation was His way. Not evolution, not Gap Theories, not all the other crap theories. The whole*

Karen E Bartelt is Professor of Chemistry at Eureka College in Eureka, Illinois, and an associate editor of RNCSE.

> *base is Genesis, and if it's faulty, then get rid of the whole thing because you cannot have a house built on a shaky foundation, it'll crumble. The gospel message is an eternal one, and when evolution is preported* [sic] *as truth, then the foundation on which Christians stand, the WHOLE POINT for Christ*['s] *dying and the origin and consequences of sin, THESE things are meaningless. I sincerely hope you realize this because if I'm wrong then I don't lose anything, but if your* [sic] *wrong, you lose everything*. [Pascal's wager is alive and well.]

Janet had initially proposed a debate about evolution, but it became apparent that her fears and misconceptions were religious and philosophical, not scientific. Anyone wanting to make a serious scientific point thus has a huge hurdle to leap! As a friend pointed out at my 1998 debate: The people in "your audience believed that if they began to accept your views, they'd likely face eternal damnation! Karen, you had no chance."

Reason #3 not to debate

I told Janet that my other reason for not debating: Scientists do not debate whether the earth goes around the sun, whether the earth is spherical or flat, or whether humans have 46 chromosomes; instead, they evaluate evidence. I noted that within the scientific world, there is no debate about the fact of evolution. This is another reason not to debate creationists: in the scientific community, theories do not rise or fall based on debate and rhetoric, but on the strength of evidence. It is wrong to imply to general audiences that this is the way science is done.

Since there is no evidence to support a young earth, a sudden creation, or a global flood, one must be prepared for the main rhetorical devices of the creationist: out-of-context quotations and straw-man arguments. Creationists, including "intelligent design" proponents, have raised this tactic to an art form (see Bartelt 2000; NCSE 2001; Bartelt 2001 for examples). This works because the audience cannot believe that a "Christian" is going to lie, and nothing the opponent says will convince them otherwise. It is a tremendous waste of time for the scientist to wade through half-truths and urban legends before even touching upon the science.

Expect dishonesty; you will not be disappointed. When I agreed to a debate, I verbally agreed to allow a taping. Though I never agreed that this tape could be distributed: a highly edited version is being sold by the creationist. (Yes, if I thought I could successfully sue him, I would!)

Reason #4 not to debate

You will *never* get a balanced audience, no matter how hard you try, and this audience will not abandon its religious preconceptions. My debate took place in a Universalist–Unitarian church. It was well-advertised there and at my college. Nevertheless, 75% of the audience came from surrounding fundamentalist churches, where they care more about this issue and see the investment of their time in these endeavors as spreading the Gospel. Perhaps the only chance a scientist has of overcoming all the obstacles to an honest, accurate presentation of the science is to find a way around trying to "debate" science in front of a hostile live audience.

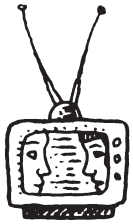
First, suggest a written internet debate instead. In this format, there are opportunities to evaluate the "evidence" and respond thoughtfully. One can furnish links to resources that provide additional information. Creationists avidly avoid internet debates, or are easily beaten when they do agree to this format (see NMSR 2000–1). Second, ask to present the evidence for evolution separately, preferably following a presentation by a creationist. I have a standing offer to present the *real* evidence for evolution — not the skewed straw-man creationist version — to the students at Peoria Christian School. Though I made the offer in December 1993, I am still waiting. I take this as evidence that they really do not want to know anything but their stilted explanations and that a "debate" would also be futile.

The Mother of All Reasons to Avoid Debate

It is easy to see that the creation/evolution "debate" format is not designed to enlighten the audience or to promote higher-order thinking. However, perhaps the best reason to avoid a debate came to me in a reply from a creationist. When I asked creationist Douglas Sharp why creationist websites do not link to evolutionist websites (in contrast, for example, to NCSE's website), he replied:

> In the academic world there is an inordinate emphasis and value placed upon debate. This is really a Marxist-humanist idea: thesis, antithesis, and synthesis. Our purpose is to focus and emphasize that which is Truth. Instead of spending so much time trying to answer a myriad of false arguments, we focus on what we know to be true, and continue to refine that as we grow in our knowledge (Sharp nd).

I could not have said it better myself!



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Author's address

Karen E Bartelt
Division of Science and Mathematics
Eureka College
300 E College Ave
Eureka IL 61530
bartelt@eureka.edu

Then a Miracle Occurs ...

An Obstreperous Evening with the Insouciant Kent Hovind, Young-Earth Creationist and Defender of the Faith

Michael Shermer

Those who cavalierly reject the Theory of Evolution, as not adequately supported by facts, seem quite to forget that their own theory is supported by no facts at all.

—Herbert Spencer, 19th-century social scientist and Darwinist

At 7:00 PM on a balmy Southern California evening, April 29, 2004, I entered the Physical Sciences Lecture Hall on the campus of the University of California, Irvine, to a capacity crowd of over 500 people chock-a-block jammed into a 400-seat venue. I was there at the behest of Pastor Jason, head of the OMC Youth, a campus Christian organization, who invited me to debate Kent Hovind, Young Earth Creationist and Defender of the Faith, on "Creation vs Evolution: Creation (supernatural action) or Evolution (natural processes) — which is the better explanation?"

Before the debate began. Hovind's people were there in force, handing out literature at both entrances: "PhDs who are creationists." (See the National Center for Science Education's list of "Steves" who accept evolution at <http://www.ncseweb.org>.) "Did Jesus say anything regarding the age of the universe?" (Yes, in Mark 10:6, Jesus said: "But from the beginning of Creation, God made them male and female." Uh?) "Biblical reasons the days in Genesis were 24 hour days." "Does carbon dating prove the earth is millions of years old?" "The Flood of Noah: Ridiculous myth or scientifically accurate?" And a 20-page booklet on "Creation vs evolution: Questions and answers." My associates Matt Cooper and David Naiditch accompanied me, staffing a small Skeptics Society book table where we countered Hovind with our magazine, books, and "How to debate a creationist" and "Baloney detection kit" publications. (Matt sensed the deck was stacked against us when they gave us a puny 3-foot table while Hovind luxuriated with a couple of 8-footers — several complaints netted us parity.)

I agreed to participate in the debate at the last minute, after the first debater could not attend. The local skeptics/freethought campus group contacted me at once, encouraging me *not* to participate so as not to give Hovind — and by extension all creationists — the recognition that there is a real debate between evolution and creation. This has always been the position of such prominent evolutionary biologists as Stephen Jay Gould and Richard Dawkins, and they are, of course, correct — there is no debate. That issue was settled a century ago, and evolutionary theory won hands down. They are also right to note that public debate is not how the validity of scientific theories is determined. And, in any case, debate is a questionable forum to determine scientific truth because such an adversarial system more closely models the law, as Gould noted after the Arkansas creationism trial:

> Debate is an art form. It is about the winning of arguments. It is not about the discovery of truth. There are certain rules and procedures to debate that really have nothing to do with establishing fact — which creationists have mastered. Some of those rules are: never say anything positive about your own position because it can be attacked, but chip away at what appear to be the weaknesses in your opponent's position. They are good at that. I don't think I could beat the creationists at debate. I can tie them. But in courtrooms they are terrible, because in courtrooms you cannot give speeches. In a courtroom you have to answer direct questions about the positive status of your belief. We destroyed them in Arkansas. On the second day of the two-week trial we had our victory party!

I had also been alerted to the fact that Hovind was under investigation by the IRS for tax fraud and evasion (<http://newsobserver.com/24hour/nation/story/1295249p-8422005c.html>), that he believes income tax is a tool of Satan to bring down the United States and that democracy is evil and contrary to God's law, and the he recommends people read the infamous anti-Semitic hoax, *The Protocols of the Elders of Zion* (<http://www.splcenter.org/intel/intelreport/article.jsp?aid=

Michael Shermer is the publisher of Skeptic magazine (<http://www.skeptic.com>), a monthly columnist for Scientific American, *and the author of* Why People Believe Weird Things, How We Believe, The Science of Good and Evil, In Darwin's Shadow, *and* Denying History. *His latest book is* Science Friction: Where the Known Meets the Unknown.

205>); apparently Hovind received his doctorate from a diploma mill (<http://home.austarnet.com.au/stear/bartelt_dissertation_on_hovind_thesis.htm>), and even Ken Ham's creationist organization, Answers in Genesis, disavows many of Hovind's more extreme beliefs in a fascinating web document entitled "Arguments we think creationists should not use" (<http://www.answersingenesis.org/home/area/faq/dont_use.asp>).

I inquired of Pastor Jason if he was aware of these charges, which he acknowledged he was, saying that his organization had looked into them; nevertheless, they wanted to stage a debate that had nothing to do with Hovind's personal affairs or religious beliefs, and that was solely restricted to the scientific evidence for evolution and creation. Of course, I am aware that there is no scientific evidence in favor of creation, and that Hovind, like all creationists, can do nothing more than attack evolution in hopes that the default conclusion, obedient to the logical fallacy of the excluded middle (also known as the either/or fallacy and false dilemma fallacy), is that if evolution is wrong then creationism must be right. I entered the debate eyes wide shut to such extraneous matters. Hovind did not disappoint.

Defending Science

I wasn't going to write about this debate, but internet chatter on some freethought forums on the validity of such debates led me to pen a response to the larger issue of whether scientists have a duty to defend science when it is under attack (which, of course, we do), and what is the best strategy for marshalling such a defense. I cannot speak for all scientists, of course, but the Skeptics Society, of which I am Executive Director, is a 501(c)(3) nonprofit scientific research and educational organization with a goal (among many) of promoting and defending science. As such, it is our job to stand up to anti-science attacks, of which the creationist movement is surely one. Of course, there are ways to do this without giving public recognition that there is a real debate between evolution and creation, but if such debates are to be staged anyway, unless there is a universal moratorium among scientists to eschew all such activities, I reasoned, they are going to happen, so we might as well meet them with wit and aplomb.

As a general rule that applies to most paranormal and supernatural claims, we may divide the world into three types of people: True Believers, Fence Sitters, and Skeptics. True Believers will never change their minds no matter what evidence is presented to them. Skeptics are the choir at which we usually preach. The battleground is for the Fence Sitters — those who have heard something about the claim under question, wondered what the explanation for it might be, and perhaps speculated on their own or considered what other explanations have been proffered. Lacking a good explanation, the mind defaults to whatever explanation is on the table, regardless of how improbable it may be. For people who do not understand the physics of heat conductivity between hot coals and dead skin, the improbable theories of positive thinking, endorphins, or Chi power for how people can walk on hot coals barefoot without getting burned emerge as probable. Before the science of biogeography was pioneered and developed in the 19th century by Alfred Russel Wallace, the default explanation for the distribution of species around the globe was independent creation and the Noachian flood (or, among more religiously skeptical scientists, Lamarckian evolution and land bridges between continents and islands). Once Wallace and Darwin demonstrated how natural selection changes varieties into different species when they migrate into different climes, the supernatural explanation could be abandoned in favor of a natural one.

So, one reason for participating in such questionable debates is not to convert True Believers (since their positions are, by definition, non-negotiable), but to show the Fence Sitters that there is, in fact, a sound natural explanation for the apparently supernatural phenomenon under question. On a secondary level, we can also reinforce Skeptics with additional intellectual firepower they can use in their own debates with True Believers and Fence Sitters. On a tertiary level, we can witness to both cohorts that skeptics are thoughtful, witty, and pleasant, and sans horns, rancor, and pathos. To wit, I was handed several notes after the debate from professed Christians whose feedback lead me to conclude that at the very least they were convinced that skeptics are not Satanists. Here are two:

> I am a believer of Creation. However, I wanted to tell you I respected your professionalism in your execution of what you had to say. I almost want to apologize on behalf of some Creationists present tonight.
>
> I cannot say that I agree with you, but I would like to thank you for your professional presentation, unlike your opposition.

I began my opening statement (I went first) with a question: "How many of you are believers in God?" About 95% of the audience raised their hands. I then looked at my watch and declared, "Oh, would you look at the time," as I began to exit stage left. That put the audience at ease. I then began my presentation with a slide of a crop circle with SKEPTIC.COM carved in the middle of it, noting that in skepticism and science we are in search of natural explanations for phenomena — "Is it more likely that an extraterrestrial intelligence fashioned this crop circle or that a terrestrial intelligence created it with Photoshop?" Skepticism and science are verbs, not nouns, I averred. These are activities to understand how the world works, not formalized positions one must defend regardless of evidence to the contrary. I then showed a slide of a cover of the tabloid *World Weekly News* featuring Arnold Schwarzenegger and an alien, with the headline Alien Backs Arnold for Governor. "Before we say something is out of this world, we must first make sure it is not in this world," I noted, adding parenthetically that this is the first alien I have ever seen with a buffed build, presumably from an Arnold workout! More mirth.

Then I got serious, explaining that there is no such thing as *the*

creationist position to debate. There are, in fact, at least ten different creation*isms*, as outlined in Eugenie Scott's brilliant heuristic (<http://www.ncseweb.org/resources/articles/9213_the_creationevolution_continu_12_7_2000.asp>). These include: *Flat Earthism*, *Geocentrism*, *Young-Earth Creationism*, *Old-Earth Creationism*, *Gap Creationism* (in reference to a large temporal gap between Genesis 1:1 and 1:2, allowing an old earth), *Day-Age Creationism* ("day" may mean a geological epoch, allowing an old earth), *Progressive Creationism* (blending Special Creation with modern science), *Intelligent Design Creationism* (design in the world is proof of an intelligent designer), *Evolutionary Creationism* (God uses evolution to bring about life), and *Theistic Evolution* (nature creates bodies; God creates souls). I noted that Hovind would have to defend his creationism not just against evolution, but against all the other creationisms.

Creationists are doing nothing more than squawking at every mystery: "Then a miracle occurs!"

Then I showed how many Christians fully embrace the theory of evolution — I estimate 96 million American Christians, based on a 2001 Gallup Poll in which 37 percent of Americans (107 million people) agree with this statement: "Human beings have developed over millions of years from less advanced forms of life, but God guided this process." Since roughly 90 percent of Americans are Christians, this means about 96 million American Christians accept common genealogy, descent with modification, and an old earth. In addition, one billion Catholics worldwide embrace evolution, as endorsed by Pope John Paul II in his 1996 address to the Pontifical Academy of Sciences:

> New knowledge has led to the recognition that the theory of evolution is more than a hypothesis. It is indeed remarkable that this theory has been progressively accepted by researchers, following a series of discoveries in various fields of knowledge. The convergence, neither sought nor fabricated, of the results of work that was conducted independently is in itself a significant argument in favor of the theory.

I concluded this portion of my opening statement by noting that even Evangelical Born-Again Christians accept evolution, quoting President Jimmy Carter, in his response to an attempt by a Georgia's school superintendent to ban the word "evolution" from state science standards:

> As a Christian, a trained engineer and scientist, and a professor at Emory University, I am embarrassed by Superintendent Kathy Cox's attempt to censor and distort the education of Georgia's students. The existing and long-standing use of the word 'evolution' in our state's textbooks has not adversely affected Georgians' belief in the omnipotence of God as creator of the universe.There can be no incompatibility between Christian faith and proven facts concerning geology, biology, and astronomy. There is no need to teach that stars can fall out of the sky and land on a flat earth in order to defend our religious faith.

I then moved to the most important slide of my presentation: the famous Sidney Harris cartoon of two scientists at a blackboard filled with equations, with the words "THEN A MIRACLE OCCURS" in the mathematical sequence.The caption has one scientist saying to the other: "I THINK YOU NEED TO BE MORE EXPLICIT HERE IN STEP TWO." Throughout the evening I drove home the point that creationists are doing nothing more than squawking at every mystery: "Then a miracle occurs!" This is the "god of the gaps" argument — wherever an apparent gap exists in scientific knowledge, this is where God interjects a miracle.

I also noted quite emphatically that neither Hovind nor any other creationist would ever present positive evidence supporting the creationist position, because none exists. They can always and only attack the theory of evolution and hope that no one notices that they have said nothing that would lead to a creationist conclusion. They offer no mechanism for creationism, other than "God did it."

The remainder of my 25-minute opening statement was dedicated to showing how the various lines of evidence converge to the conclusion that evolution happened. Here I did not pretend to be able to cover the vast numbers of natural facts that support evolution; instead, I focused on the concept of *consilience* — the "jumping together" of facts not related to one another. For example, paleoanthropologists have presented us a fossil record of human evolution quite in accord with that developed independently by geneticists. As I noted, it is not as if these scientists all meet on the weekends in some grand conspiracy: "Okay, look, there are these creationists like Hovind out there, so we've got to get our story straight. Let's agree that we'll tell everyone that humans and chimpanzees diverged from a common ancestor between 6 and 7 million years ago, okay?"

Interestingly, this approximates what many creationists think actually happens in science, and Hovind's is the weirdest conspiracy theory I have ever encountered along these lines. In a 1996 article, "Unmasking the false religion of evolution," he wrote:

> There is definitely a conspiracy, but I don't think that it is a human conspiracy. I don't believe there is a smoke filled room where a group of men get together and decide to teach evolution in all the schools. I believe that it is at a much higher level. I believe that it is a Satanic conspiracy. The reason these different people come to the same conclusion is not because they all met together; it is because they all work for the devil. He is their leader and they don't even know it.

(Another note given to me by someone who called himself "an Evangelist Christian — Born again," reiterated this fear: "I just want to tell you that we fight against a spiritual world and Satan will do anything to blind your eyes

from the truth. I just ask you to consider this as a possibility! I will be praying for you!")

Then the "Debate" Ended

The moment Hovind spoke the debate was over. "I am here to win you over to Christ," he began. "And I'm here to win Michael Shermer over to Christ." Hovind was not there to debate evolution-vs-creation, or natural-vs-supernatural explanations. He was there to witness for the Lord (what we used to call "Amway with Bibles" when I was an Evangelical Christian at Pepperdine University). Everything he said from there on was superfluous: Variations do not lead to new species (dogs come only from dogs). Design implies a designer. There is an afterlife. The Bible is literally true in everything it says. Humans used to live 900 years. There is no right and wrong without God. Noah's Flood explains geological formations and species distribution. Dinosaurs and humans lived simultaneously. Dinosaurs died in the flood. Dinosaurs on the Ark were very young and small. Radiometric dating is unreliable. Jesus said the universe is young. The Bible explains dinosaurs ("behemoth"; "leviathan"). The theory of evolution is a religion that leads to communism, abortion, and atheism. Evolutionists are liars. Scientists are arrogant. Creationists are not allowed to publish in scientific journals. Creationism is censored from public schools. Microevolution may be true, but macroevolution, organic evolution, stellar evolution, chemical evolution, and cosmic evolution are all lies perpetrated by the lying liars who worship at the faux religion of evolution. And, just in case there was anyone present who had not heard, Hovind concluded: "Jesus died for our sins."

Hovind also gave several commercial plugs for his Dinosaur Adventure Land theme park that teaches children biblical-based science. Build a miniature Grand Canyon out of sand to see how quickly it can be done. Participate in Jumpasaurus, a trampoline game where the players toss a ball through a hoop and learn how they can do two things at once for Jesus. And thrill with the Nerve-Wracking Ball, where a bowling ball hangs from a tree limb and the children release it to swing out and back just short of hitting them — they win the game if they don't flinch, thereby demonstrating their faith in God's laws.

I began my ten-minute rebuttal by noting that Hovind is the only guy I know who can deliver a two-hour lecture in 25 minutes (he is the fastest talker I have ever met, with a voice like Ross Perot and a finish to each sentence that seems to say "so there!"). I again emphasized that Hovind had said nothing in support of the creationist position, that he only attacked the theory of evolution in hopes that the audience would then accept creationism by default, and with regard to his divine explanations for the origin of species, I reiterated, "I think you need to be more explicit here in step two." I explained that creationists do not publish in scientific journals because they do not do science; and that creationism is not taught in public school science courses because there is nothing to teach — "God did it" makes for a rather short semester.

Because Hovind had said he was pro-science, I emphasized that if young-earth creationists like him are right, then all of science goes out the window, not just evolutionary biology. If the earth is only 6000 years old, then most of cosmology, astronomy, physics, chemistry, biochemistry, geology, paleontology, archaeology, genetics, and so on are wrong.

I noted that the "fakes and mistakes" of science, trotted out by Hovind and other creationists, were all discovered, publicly revealed, and corrected by *scientists*, not creationists, and that the self-correcting machinery of science is what makes it so successful. I punctuated this point by noting the parallels between evolution deniers and Holocaust deniers, the latter of whom accuse Holocaust historians and survivors of lies and deceit in the same manner as the creationists accuse scientists, and that the strategy is no more effective and no less malevolent when employed by creationists.

Finally, I suggested a number of tests of evolutionary theory: if Hovind could produce just one example of a trilobite embedded in a fossil bed containing hominids, I would concede that the theory of evolution is in trouble. No such disconfirmatory evidence exists, and creationists know it, which is why they always dodge this challenge.

During my rebuttal Hovind was furiously scanning through his hundreds of PowerPoint® slides, preparing something for every point I made, most of them irrelevant and orchestrated to elicit derision and laughter. Even during the Q&A, Hovind was so facile at this process that by the time the moderator finished reading the question, he had a slide prepared!

The Immediate Aftermath

After the debate I was surrounded by a mob of Bible-toting students, most of whom were exceptionally polite, friendly, and desirous to know "Why did you give up your faith?" The question is genuinely asked out of curiosity, but there is often a substrate inquiry implied in the voice and revealed in the eyes: "This couldn't happen to me, could it?" When I answer in the affirmative that, indeed, it could happen to anyone who is intellectually honest in their search for answers to life's most ponderous questions, I am sometimes accused of a false faith *ab initio*: "You were never really a Christian." How convenient, and cognitively bullet-proof. But tell that to my annoyed siblings and non-Christian friends, who tolerated my nonstop evangelizing for seven years. The sentiments were quite real.

Hovind confessed the scientific "sin" of all creationists: Disproving evolution does not prove creationism.

Who won the debate? Intellectually, I did, with Hovind once again conceding defeat on the last question of the evening: "What is the best evidence for the creation?" He answered: "The impossibility of the contrary" (evolution). In that simple statement, Hovind confessed the scientific "sin" of all creationists: Disproving evolution does not prove creationism. "And

Winning the Creation Debate

Frank J Sonleitner, University of Oklahoma

On May 18, 2000, Duane Gish from the Institute for Creation Research (ICR) offered a workshop on "How to win debates against evolutionists" at a motel in Atlanta. Apparently creationists considered it a success, because now ICR is offering a set of six videotapes entitled *Winning the Creation Debate*. The first two tapes instruct viewers in "Preparing for your debate" and "Choosing your subject matter". In the remaining four, Gish discusses his favorite debate subjects: "The fossil record", "Thermodynamics", "Origin of life", and "Evolutionists' tactics & closing remarks".

These tapes are also very instructive for anyone who is even considering getting involved in a "debate" with a creationist. They reveal a tried-and-true strategy used by one of the most successful anti-evolution debaters in the last few decades. And if anyone is not convinced by the other articles in this issue that debating an anti-evolutionist is a difficult and non-productive endeavor, Gish's advice might also be useful to those preparing to debate *against* creationists.

Preparing for Your Debate

Gish points out that debates have proven to be the most effective tool for spreading creationism among the public. They are much more exciting to the public than lectures. Gish has not only an innate talent for debating but also more than 30 years experience, so in this first video he gives his prospective debaters very sound and practical advice:

- Know your subject (read ICR books on the various topics); have an adequate set of notes (especially helpful in the rebuttal);
- Use good professional visual aids (PowerPoint® presentation software is recommended, but be sure to have back-up slides or overheads for emergencies);
- Rehearse your presentation for timing purposes (Gish recommends a debate format of 60 minutes for initial presentation with a 10 minute break, a 15 minute rebuttal and a 5 minute summary);
- Know something of your opponent's background;
- Use quotations from evolutionists to show that scientists challenge evolution;
- Entertain the audience with jokes; and finally,
- Pray!

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then a miracle happens" is not science. To Hovind and all creationists I say: *I think you need to be more explicit here in step two.*

Anyone who was there and assessed the outcome from audience enthusiasm for either Hovind or me, however, would have perceived a different result: one that was, on one level, foreordained. With 95% of people in attendance for the sole purpose of rooting their team to victory, I stood about as much chance of winning them over as the Los Angeles Lakers would in convincing the fans of their bitter rivals, the Sacramento Kings, that they are the better basketball team, regardless of the score. The home-court advantage is a potent force in intellectual venues no less than in athletic ones.

The problem is that this is not an intellectual exercise, it is an emotional drama. For scientists, the *dramatis personae* are evolutionists vs creationists, the former of whom have an impregnable fortress of evidence that converges on an unmistakable conclusion; for creationists, however, the evidence is irrelevant. This is a spiritual war, whose combatants are theists vs atheists, spiritualists vs secularists, Christians vs Satanists, godfearing capitalists vs godless communists, good vs evil. With stakes this high, and an audience so stacked, what chance does any scientist have in such a venue? Thus, I now believe it is a mistake for scientists to participate in such debates and I will not do another. Unless there is a subject that is truly debatable (evolution vs creation is not), with a format that is fair, in a forum that is balanced, it only serves to belittle both the magisterium of science and the magisterium of religion.

Author's address

Michael Shermer
Skeptics Society
2761 N Marengo Ave
Altadena CA 91001

Gish's record of success in creation/evolution debates suggest that this is good advice, but also shows the formula that creationist debaters will likely follow.

Choosing Your Subject Matter

Gish advises creationist debaters that certain subjects are more successful than others in a debate format. His advice includes:

- Don't try to cover too many topics — stick to a few powerful examples and arguments;
- Choose carefully, avoiding arguments that are too technical (the age of the earth) or not focused on the scientific evidence (the biblical record); and
- Start with your own clear definitions (for example, creationists often define "science" in a way that invalidates evolution: "Science can only deal with properties, processes and events that are repeatable. Neither creation nor evolution are scientific; they are both equally religious." And so on).

In the remaining videos, Gish demonstrates these principles. He especially illustrates how to control the debate by framing the questions and choosing the subject matter. Throughout the series, he produces a seemingly unlimited series of outrageously false statements based on out-of-date information, inappropriate quotes, and incredibly outlandish evolutionary scenarios of his own invention. These establish a rhetorical advantage that has nothing to do with the scientific issues, but everything to do with winning debates.

The Fossil Record

Gish claims that the fossil record totally refutes evolution. Billions of fossils document the appearance of vertebrates in the Cambrian Period, but he says that there are absolutely no fossils of their ancestors in the Precambrian; nor, he claims, are there any fossils of the ancestors of fishes. He further claims that the fossil evidence for human evolution represents either apes or humans without any intermediate forms (for example, Neanderthals were modern humans suffering from rickets) or else fakes and hoaxes such as Piltdown or Nebraska Man.

Of course, Precambrian rocks have a rich fossil record of sponges, cnidarians, annelids, and mollusks. Recent research has also reported fossils of a microscopic bilaterian that could represent the ancestor of all bilaterians — including the vertebrates that creationists argue appeared suddenly in the Cambrian without any fossil ancestors. Other forms ancestral to vertebrates have been found in the Burgess shale and more recently in the Early Cambrian Chengjiang formation of China.

What is lacking in the Precambrian is anything like a "modern" vertebrate, so creationist debaters can depend on the ignorance of a general audience to be impressed by the apparent absence of forms that appear similar to fishes, amphibians, reptiles, and mammals. This is a simple objection that forces the evolutionist into a complicated and technical rebuttal — a sure formula for success.

Even though the taxonomic status of the Neanderthals is in dispute, there is a general consensus that they are *not* modern humans with skeletal disorders. Again, the rebuttal of this claim — and of the erroneous claims that Piltdown and Nebraska Man have any place in modern human phylogeny — saddles the evolutionist debater with a complex and highly technical set of historical, biogeographical, anatomical, genetic, and political data that are difficult to present clearly in a debate format.

Both these examples from the fossil record show that winning debates is about setting up a rhetorical contest in a way that puts one's adversaries at a disadvantage. Gish is a master at making complex issues in evolutionary biology seem simple and then using humor, incredulity, and ridicule to engage the sympathy of the audience. Even if his opponent successfully refutes one or two of his claims, time always runs out before they can *all* be refuted.

Thermodynamics

Gish claims that the Second Law of Thermodynamics prevents the natural emergence of order in the universe and of life within it — as well as the evolution of organisms — because that law requires that everything, without exception, goes from order to disorder, increasing randomness in the universe. Matter has no properties or tendencies to go to complexity. He quotes a number of evolutionists who support his definition of the law. But none of them, of course, are specialists in thermodynamics.

There are many problems with Gish's oversimplified, commonsense paraphrasing of the Second Law (*see "Challenging creationist debaters", p 39*). However, his discussion illustrates the power of being able to define terms one's own way — in this case, an oversimplified definition that makes the appearance and maintenance of order in the universe (and in biological systems) seem impossible without some sort of extranatural input. It does not matter that there is no relationship between Gish's notion of the Second Law and the way that it is used by scientists who specialize in studying thermodynamics. It is enough to make the problem *sound* insurmountable and to leave the evolutionists to clean up the mess — which will surely eat up most of the debate time and prevent his opponent from making an affirmative case *for* evolution.

The Origin of Life

To refute the possibility of a natural origin for life, Gish claims that the only way evolution could produce complexity is by pure chance. He then calculates the probability of producing only one of the necessary enzymes. Taking ribonuclease as an example, the probability of the random assembly of the 124 amino acids by pure

Frank J Sonleitner is Emeritus Professor of Zoology at the University of Oklahoma. He is an NCSE Supporter and one of the longest-serving members of the NCSE board of directors.

chance from a giant solution of amino acids is, of course, vanishingly small. Obviously, this approach bears no relationship to the models of the first emergence of life on earth, but the point is to convince the audience that scientists "have faith" in silly things that are so improbable using the laws of nature (as described by Gish) that they amount to little more than "faith" in material causes.

Gish then tries to show that other complex systems could not evolve in order to provide evidence for their design. His favorite example is the metamorphosis of the monarch butterfly. In his Lamarckian scenario, a caterpillar, longing to be able to fly, wraps itself in a chrysalis stage and emerges as an adult butterfly! Since he agrees with biologists that this could never happen, he concludes that metamorphosis could not have evolved and the butterfly life cycle must have been designed. Gish gives the same treatment to homology, Haeckel's embryos, and vestigial organs.

In all these examples, Gish demonstrates the effective use of straw-man arguments: setting up a patently ridiculous or impossible scenario, implying that this scenario fairly represents the position of the scientific community, then *agreeing* with scientists that the scenario is ludicrous and unacceptable. To the scientifically illiterate audiences, he appears to be refuting evolution, but in fact, he is only destroying his own unscientific misrepresentation of scientific knowledge. It is up to his opponent to try to clean up the mess: explain complex models of probability and the emergence of life or evo-devo models of the evolution of complex life histories, including metamorphosis.

Evolutionists' Tactics and Closing Remarks

In this final video Gish advises his audience how to respond to various evolutionist arguments. He warns that debate opponents may attack the Bible as a source of historical and scientific data. Of course, the audiences will "know" that the Bible is inerrant — which is one of the ICR's central tenets, of course. Opponents may also accuse creationists of quoting out of context. Creationist debaters should have other quotes available, since the opponent cannot possibly know the context of them all. It does not matter whether the person being quoted has any relevant scientific credentials or research record as long as the quote appears to question evolution.

Expect personal attacks on creationists. For example, the evolutionist opponent will become desperate at losing the debate and accuse the creationist of distorting, misquoting, misrepresenting, and confusing the scientific facts. Do not hesitate to "rise above" this "uncollegial" behavior. Evolutionists may insist on positive evidence for the creator, but creationists in the audience need none; they will know and accept that evidence against evolution is sufficient evidence *for* creation.

Evolutionists will claim various specimens represent transitional forms, but there really are none — at least as creationists define them as one organism "turning into" another. Everyone can see that a horse is a horse, even when it is quite small and primitive, like *Eohippus*. Evolutionists will try to argue that the laws of thermodynamics apply only to isolated systems not an open system with lots of new energy being added all the time like the earth. Remind them that energy alone does not produce complexity. Even though this is not the argument that you made originally, it sounds like an insurmountable objection to producing complexity by natural processes.

Evolutionists will raise arguments in favor of a very old earth and universe. Your audience will reject this argument as irrelevant because of biblical authority. They may also raise the argument of poor design and vestigial structures; however, you can point out that this is a theological argument (the nature of the designer), not a scientific one. The examples of poor design show God's punishment for the sins of Adam and Eve.

Facing a Creationist Opponent

To be sure, Gish is one of the most accomplished and successful debaters in the creation/evolution controversy. His mastery of the debate format, his ability to present a folksy, common-sense (though usually erroneous) summary of scientific concepts, and his ability to reach and persuade an audience (especially when that audience is packed with creationists) present a formidable combination attested to by his long record of defeating his debate opponents, and these tapes show why.

But more than that, these tapes show that the debate format is not about presenting and evaluating scientific evidence for (or even against) evolution, but rather to present evolution in the most unfavorable light possible without making any affirmative claims for creationism. He expects — and his audiences accept — that creationism wins by default.

This is why trying to have a scientific debate with a creationist — or more recently with "intelligent design" proponents — is a fool's errand. However, those that insist on embarking on this journey could learn a lot from this set of tapes — both about the opposition they will face and about rhetorical tactics that win the hearts of the general public. Of course, scientists are constrained by a respect for the evidence and complete, accurate descriptions of scientific laws, theories, research, and interpretation. Our opponents face no such strictures.

Author's address

Frank J Sonleitner
c/o NCSE
PO Box 9477
Berkeley CA 94709-0477
ncseoffice@ncseweb.org

Challenging Creationist Debaters

Edward E Max

Duane Gish debating in Portland, Oregon, February 19, 2005

NCSE has long taken the position that it is not productive for scientists to debate creationists (*see "Confronting creationism: When and how", p 23*). However, NCSE has figured indirectly in a series of seven debates that I have had since 1989 with Duane Gish from the Institute for Creation Research (ICR).

I have participated in these debates even though I understand the downside of debating creationists: scientific evidence will never convince biblical literalists of the validity of the scientific position, and debates give creationism more stature than it deserves, reinforcing the false claim that evolutionary theory is actively being debated by scientists. However, I have been persuaded by two counterarguments. First, all the debates I have participated in have been attended by some people "on the fence" (*see "Then a miracle occurs", p 32*) who are receptive to evaluating the evidence for evolution. A few of these folks have come up to me after debates and thanked me for helping them to reposition their views on evolution. For these folks I feel the debate has been a success; and for those unconvinced, I hope they see that it is possible to discuss scientific evidence for evolution without explicitly challenging the validity of religious faith. Second, if no one volunteers to present the evolutionist position, the creationists make hay out of this, claiming that evolutionists have so little to support their view that they are afraid to debate.

One other downside of debating creationists is that scientists who are knowledgeable about evolution are not necessarily knowledgeable about creationist claims and tactics; and if they debate without this knowledge they can be made to look like fools even though their arguments are scientifically sound. I have tried to avoid this pitfall by reading creationist books and articles and by coming to the debates prepared to address specific creationist claims (*see "Winning the creation debate", p 36*).

I have opened all my debates by explaining that I was not out to destroy anyone's faith in the Bible, but hoped to dissuade the faithful from relying on the flimsy arguments of "creation science". I introduce the idea that creationism is "non-professional" science, that is, it is based on arguments that have not passed peer-review in professional scientific journals. I distinguish between creation scientists (who may have professional degrees, usually in a field unrelated to evolution) and their creationist claims, which are absent from the professional science literature. To pre-empt the creationist response — that professional journal editors are prejudiced against creationism — I assert that the rejection of creationist arguments is entirely justified by their poor standards of scholarship; and I spend a lot of debate time showing examples of that poor scholarship in major creationist claims. In each case I show how the creationist claim is superficially appealing, so that it sounds reasonable to church audiences not trained as professional scientists; then I explain why the claim could not pass professional peer review. My bottom line is that a faith-based view of creation is fine, but that science classrooms should stick to science that can pass professional peer-review.

One of the creationist claims that I have tried to counter at all my debates is that the Second Law of Thermodynamics would be violated by the evolutionist model of species origins. I show that Gish's Second Law claim is flawed because he fails to recognize that examples of localized negative entropy do not violate the Second Law if they are outweighed by positive entropy elsewhere in the system so that the net entropy is positive. In particular, when Gish claims that the evolution of complex life in the biosphere represents negative entropy in violation of the Second Law, his conclusion is completely invalid because he fails to consider whether this localized negative entropy is outweighed by positive entropy effects such as entropy due to energy radiation from the biosphere into space. Thus Gish's Second Law claim is as invalid as that of an accountant who claims a net profit on the basis of a high gross income, but ignores the possibility that the income is outweighed by expenses.

In my first debate with Gish, I argued that a debate before a non-technical audience would not be

FEATURE

Debating Pseudoscientists

Phil Plait, Sonoma State University

I am commonly asked about debating pseudoscientists over their "theories". This is not a topic that is easy to distill down to a simple answer; in general, directly debating them is useless, so I do not do it. However, I do think it is necessary to stand up and oppose pseudoscientific ideas, so here is my perspective.

Not many scientists will take on "fringe" claims. There are two main reasons for this. The first, and most obvious one is that most real scientists are too busy doing *real* science. However, I am no longer a research scientist. After ten years of research, I found myself gravitating toward education, both formally and through my website and writing. It was a natural extension of what I do to start taking on pseudoscientific "theories" floating around.

The second reason is that most scientists find pseudoscientists irritating. Sometimes it is because the pseudoscientists attack work done by real scientists, and sometimes it is because real scientists get tired of being asked about aliens, UFOs, Planet X, and the Apollo hoax. In fact, many real scientists think that pseudoscientists should be ignored. They do not want to give these guys publicity and are concerned that taking them on legitimizes their "theories".

I disagree; well, partly. I recognize that there is a possibility that by debunking a theory, I might actually be giving it more air time than it would otherwise get. It is a funny sort of no-win situation: if I ignore the pseudoscientists, they claim it is because I am afraid to take them on. And if I do debunk them, they then claim they must be on to something, or else why would I bother to go after them? Aaarrgg! It is (il)logic like that that makes it so aggravating to deal with these kinds of people.

So there is a balance to be sought: I want to make sure that there is correct information on the web to counteract the nonsense spouted by so many of the pseudoscientists, but I also do not want to be seen as giving them more of a spotlight than they already have. This is a difficult balance to find!

I usually err on the side of getting the debunking out there. That is because I would rather have the information available than ignore something too long and have it grow too much. For example, NASA's policy was to ignore the "moon hoax theories". They may have been correct; it is rather beneath their dignity to acknowledge such a silly idea. But that policy came back to bite. When Fox TV made its awful "Moon Hoax" show, NASA would not comment officially, was dismissive, and did not take the show seriously. The way the program portrayed NASA made it look rather bad afterwards.

Crank theories are like bacte-

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an appropriate venue to discuss the details of thermodynamic analyses of the evolution. I challenged him to prepare a technical article supporting his argument, suitable for publication in a professional journal. And, after getting agreement from Fred Edwords, then editor of *Creation/Evolution,* I told him that his article would be granted publication in this journal, where it could be evaluated by scientists interested in creation "science" arguments. He would not have to worry about journal referees rejecting his article out of prejudice; so this venue would be perfect for putting his ideas before an interested community with science training. I had a copy of this challenge distributed to everyone in the audience, and showed a slide of a letter from the journal inviting Gish's contribution. Before each subsequent debate, I have obtained a renewal of the invitation to Gish from the editor of *Creation/Evolution* and subsequently of *RNCSE.* So at each of my recent debates, when I point out that creation "scientists" make claims that sound good at nontechnical debates, but that they do not even try to meet the standards of scholarship that would be acceptable for professional scientists, I can cite the NCSE's still open invitation to accept my challenge, which Gish has sidestepped since 1989.

Gish's reaction, of course, underlines the inference that we draw from the use of the debate format before a general audience: the arguments do not work in a scientific setting *as science.* When challenged to a real exchange of scientific ideas and theories, creationists have nothing to bring to the table.

AUTHOR'S ADDRESS
Edward E Max
8800 Rockville Pike, HFD-122
Bethesda MD 20892
max@cber.fda.gov

ria: at low levels they are fairly benign, but they tend to fester. Once they reach a certain level it becomes time to apply some antibiotics. So sometimes I feel the need to step in.

Debunking fringe theories is usually not trivial. For example, Richard Hoagland has been making his (mistaken) claims about Mars literally for decades. The breadth and depth of his claims are astonishing! It would take forever to debunk everything he says, as it would for most pseudoscience theories. And every time someone debunks one thing, up pops another claim, blissfully ignoring the fact that the last one was completely destroyed. This is another reason most scientists do not bother debunking wacky theories.

However, in general, it is not necessary to take on every claim. What I have found is that there is usually a core set of claims — the "big ones" upon which the rest of the other thousands of claims rest. For Nancy Lieder, it was a giant planet in the inner solar system. For Hoagland, it is geometry of Martian features, a giant "Face on Mars", and things he sees in images. For James McCanney, it is claims about comets and the solar wind. Debunking Lieder really only meant showing that there is no planet roaming around the solar system. For Hoagland, it is showing his math is fallacious, his image analysis poorly done, and his conclusions based on a misunderstanding of how digital images work. For McCanney, it is really just showing that everything he says is contrary to the most basic of observations.

So that is what I have done on my pages. I took on the gist of the claims, and I did not bother with the hundreds or sometimes thousands of minor details. Destroy the foundation of their theories, and all the little claims flutter to the ground on their own.

But then, inevitably, the issue of a debate comes up. Nearly every major (in the loose sense of the term) pseudoscientist has challenged me to a debate at one time or another. Both McCanney and Hoagland have publicly called for me to debate them on, for example, the "Coast to Coast AM" (C2C) radio show. In almost every case, I have refused. Why?

To Hoagland's followers, the answer is obvious: I am afraid to debate him, because I know he will win. That is silly, and obviously so. If I thought I were wrong, why would I write my pages in the first place? Moreover, and this may be more pertinent: why go on C2C and talk about it? After all, there is a chance that one of the people whose theories I am trashing might call in! Clearly, there must be another explanation.

There are several, actually. One is that these people crave attention, publicity. There may be many reasons for it: to sell their product, to get more followers, simply to get attention. Whatever their reasons, I do not feel the need to further their goals. Debating Hoagland, for example, will do nothing to further my cause, which is to educate people about astronomy. I already go on C2C to discuss this stuff, and I have my webpage. Anyone who listens to the C2C show will be able to find both my ideas and Hoagland's. What good would debating him on air do?

Furthermore, these are not really debates. There are countless tales of scientists debating creationists, and these pseudoscientists are very glib. They are excellent at misdirection, avoiding answering direct questions, obfuscating issues. Debating them is a losing scenario, because they seem to many to have won, when in fact they have not said anything of substance at all. Anyone who listens carefully to what they say when interviewed on the radio will find that they commonly are not really saying anything. There are lots of insinuations, lots of accusations, but no real meat to it.

Basically, pseudoscientists ignore huge gaping holes in their logic, and instead focus on small, niggling pieces that the debunker may not be familiar with. Although when I *write* I go after the foundation of their claims — knowing the minor claims will fall away after the major ones are gone — in a *debate* situation the pseudoscientists focus on the small claims, because this gets the real scientist bogged down in details. This way, the pseudoscientist can distract the listener from the real problems in their "theory", and make it sound like they win. I have seen this countless times. Creationists are famous for it, for example. So debating these people on the radio would be like digging a hole in water.

Now, I *have* debated pseudoscientists a couple of times. I debated Bart Sibrel on a radio show once. That was a while ago, when I thought an actual debate would do some good. I trounced him on the radio, but he is still out there, making the same old tired (and very wrong) claims about the Apollo missions.

Perhaps more famously, I debated Nancy Lieder on C2C in May of 2003. I actually rather regret that whole episode. Not because I lost the debate; far from it. Despite her claims (and what the heck, I can chest thump sometimes too), I

NMSR's Strategy for Creation/Evolution Debates

When challenged to a debate on creation/evolution issues, New Mexicans for Science and Reason (NMSR) agreed to a written, on-line exchange. By putting arguments in writing, it is easier to point out the problems with anti-evolutionist formulations and to check references, citations, and sources. Such an exchange, of course, limits the effectiveness of the rhetorical strategies and theatrical elements that tend to contribute to a "win" in a debate before the general public.

See the exchange and other supporting materials at the NMSR web site on debates: <http://www.nmsr.org/debate.htm>.

Phil Plait is an astronomer who maintains the Bad Astronomy *web site <http://www.badastronomy.com>. He is currently working on a NASA-sponsored public outreach program for a satellite named GLAST (Gamma Ray Large Area Space Telescope).*

mopped the floor with her (view the debate transcript on-line at: <http://www.badastronomy.com/phpBB/viewtopic.php?t=5302>). I regret it because it was unnecessary. After all, I knew Planet X was nonsense, and I also knew that her clock was ticking down rather rapidly: she claimed that we would all be dead on May 15, 2003, and the debate was held a few days before that. In my defense, I'll say that I was worried that her garbage might take a turn for the worse, as the Heaven's Gate debacle did. So I was hoping that by debating her, I might actually do some good.

Maybe I did, maybe not. But what I do know is that Planet X's deadline came and went, Lieder made a lot of empty excuses, and in the following months her cult-like following dwindled to zero, for all intents and purposes. Hurray! And I do know that I got quite a few e-mails thanking me for taking on her nonsense, including from people who had loved ones who actually made life decisions based on the garbage she spewed.

That is why I do this. There are people out there who want to scare other people into buying their products (books, pamphlets, what-have-you). Maybe these pseudoscientists believe what they say, and maybe they are evil con artists preying on people who do not know any better. But either way, they are wrong, and I try to minimize their impact. I am not so foolish to think I can stop it. But maybe I can slow it down a little.

But debating them on the air does *not* help, so I do not do it. This may change, if the circumstances warrant. But as I said, the people who listen to C2C already know what I think, and what the pseudoscientists think, so a debate would do no good.

[*Posted on Phil Plait's* Bad Astronomy *blog at <http://www.badastronomy.com/bad/misc/debating.html> on July 5, 2004. Reprinted with permission.*]

AUTHOR'S ADDRESS
Phil Plait
NASA/EPO Education Resource Director (NERD)
Department of Physics and Astronomy
Sonoma State University
1801 East Cotati Ave
Rohnert Park CA 94928
phil@universe.sonoma.edu

The mess behind the message

[*Branch was invited to write the following op-ed about the evolution warning label in the biology textbooks used in Beebe, Arkansas; see Updates, p 15–20, for details.*]

The "Message from the Beebe School Board" — appearing in the stickers in Beebe's biology textbooks warning students about evolution — is, quite simply, a mess.

In the first place, describing evolution as "theory, not fact" is misleading. In ordinary talk, a theory is something speculative or uncertain. In science, however, the term is used quite differently. A theory is not a hunch or a guess, but a systematic explanation, which incorporates laws, observations, hypotheses, inferences, and, yes, facts. Indeed, because theories explain facts, they are central to science.

Characterizing evolution as "a controversial theory" accepted by "some scientists" is ridiculous. Just ask President Bush's chief science advisor John Marburger, who flatly describes evolution as the cornerstone of modern biology. He is not alone: the National Academy of Sciences, which provides authoritative scientific advice to the federal government, refers to evolution as "the best scientific explanation we have for the enormous range of observations about the living world."

And recommending "the idea of an intelligent designer" as an alternative to evolution is downright bizarre. "Intelligent design" is not accepted as legitimate science by the scientific community. Again, just ask Dr Marburger, who recently stated, "Intelligent design is not a scientific theory." Because it is not a scientific theory, it is not appropriate material for Beebe's biology textbooks.

The stickers also make a variety of specific claims — too numerous to examine individually here — that are vague, misleading, or just plain false. Evaluated for their scientific accuracy, they would get a failing grade from any competent biology teacher. Why create a further burden for teachers by con-

A MESSAGE FROM THE

This textbook discusses evolution, a controversial theory some scientists present as a scientific explanation for the origin of living things, such as plants, animals and humans. Many people believe that evolution alone is not adequate to explain the origins of life. For these people, the idea of an intelligent designer seems to make sense.

No one was present when life first appeared on earth. Therefore, any statement about life's origins should be considered as theory, not fact.

The word "evolution" may refer to many types of change. Evolution describes changes that occur within a species. (White moths, for example, may "evolve" into gray moths.) This process is microevolution, which can be observed and described as fact. Evolution may also refer to the change of one living thing to another, such as reptiles into birds. This process, called macroevolution, has never been observed and should be considered a theory. Evolution also refers to the unproven belief that

Glenn Branch, NCSE

fusing their students with the faulty science presented in the stickers?

So it is hard to see how the stickers are helping to educate students in Beebe — especially if, as reported, nobody thought twice about them until the ACLU of Arkansas broached the issue.

The ACLU cited a recent case in Georgia, *Selman v Cobb County*, in which a federal judge ruled similar stickers to be unconstitutional because their primary effect was to convey the message that the Cobb County school board endorsed a particular religious view. The decision is currently under appeal. But the less cautiously phrased Beebe stickers are even less likely to survive the courts.

Why is the board so eager to retain the stickers, even against the advice of the school district's attorney? Nobody seems to remember who wrote the text (although it parallels a disclaimer proposed in Alabama in 1995). But it is difficult to avoid the conclusion that those wanting to retain the stickers are interested in promoting their own religious beliefs. Certainly that was what Beebe School Board President Butch Rice seemed to be telling *The Daily Citizen*.

There's nothing wrong with wanting to promote one's religious beliefs, of course. And although many people regard evolution as compatible with, or even enriching, their religious beliefs, there is no denying that many people regard evolution instead as in tension with, or even contradicting, their religious beliefs. That is their right: it's a free country, after all.

But the problem is when people try to use the government to promote their religious beliefs. That simply is not the American way. Let's hope that it is not necessary to resort to a protracted, divisive, and expensive lawsuit to prove it.

[*Originally published in* The Daily Citizen *(Searcy, Arkansas), on April 7, 2005.*]

Author's address
Glenn Branch
NCSE
PO Box 9477
Berkeley CA 94709-0477
branch@ncseweb.org

BEEBE SCHOOL BOARD

random, undirected forces produced a world of living things.

There are many unanswered questions about the origin of life which are not mentioned in your textbooks, including:

- Why did the major groups of animals suddenly appear in the fossil record (known as the Cambrian Explosion)?
- Why have no new major groups of living things appeared in the fossil record in a long time?
- Why do major groups of plants and animals have no transitional forms in the fossil record?
- How did you and all living things come to possess such a complete and complex set of "instructions" for building a living body?

Study hard and keep an open mind. Someday you may contribute to the theories of how living things appeared on earth.

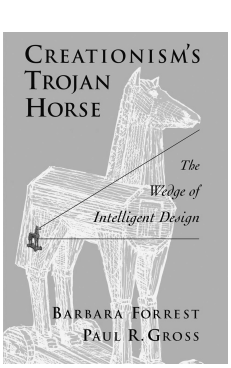
THE ART OF THE DEBATE

My first introduction to creation/evolution debates was in graduate school in the early 1980s when scientists routinely accepted challenges to debate creationists on college campuses. Because of the geography and distribution of campuses in western New England, a few of us graduate students were able to witness a series of debates as Duane Gish made his way across the region, engaging different opponents.

The only time I ever saw the evolution side win was that spring in a debate between Gish and Michael Park at Central Connecticut State University in New Britain. But, as remarkable as that was, there was something else that was even more astounding. At each stop, Gish would be forced to concede an error on one or more points in his argument as scientists with expertise in specific areas ably defended their specialties. However, in the very next debate, Gish would revert to the original statement as though his errors were never pointed out and corrected in public.

We realized that, in the usual course of things, Gish faced a new audience every night that had not been present at the previous exchange; there was not usually a contingent of graduate students following him from place to place reminding him (and his audiences) how he admitted an error less than 48 hours ago and now here he was saying the same thing that he admitted was wrong. And that is when it became clear that these debates were solely about preaching the word and not about science in the least.

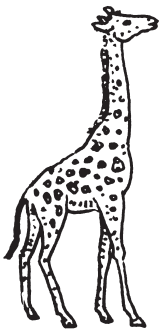
— Andrew J Petto



CREATIONISM'S TROJAN HORSE: THE WEDGE OF INTELLIGENT DESIGN

by Barbara C Forrest and Paul R Gross
New York: Oxford University Press, 2004. 416 pages

Reviewed by Karl Giberson, Eastern Nazarene University



An old truism advised against discussing religion and politics in polite company. Those topics, deeply personal and intensely emotional, were sure to cause eruptions and sabotage whatever social decorum had been established. Now, it would appear, we must add science to this list.

Philosopher Barbara Forrest and biologist Paul R Gross have joined forces to produce a remarkable analysis of the "intelligent design" (ID) movement. ID is a topic that should be familiar to the readers of *Science & Theology News*, which itself appears a few times in the nearly 1000 references.

As their title suggests, Forrest and Gross argue that ID is nothing more than a Trojan horse to sneak old-fashioned creationism past various gatekeepers who might not be paying close attention. The old creationism, promoted so energetically by Henry Morris and the Institute for Creation Research, has all but given up trying to be anything more than a defense of biblical literalism and a gloss on Christian apologetics. In particular, the legal defeats creationism experienced in the 1980s convinced just about everyone that getting this product out of the evangelical subculture and into America's public schools was not going to happen.

THE ENEMY OF MY ENEMY IS MY FRIEND

Creationists have confidence that things do not evolve, but that confidence does not extend to themselves. Because of this, a new daughter species of creationism, called "intelligent design", emerged shortly after the dust had settled on the Supreme Court's summary rejection of creationists' public school agenda.

ID distinguished itself from its parent species in a number of ways. It avoided, in most of its pronouncements, any reference to religion or the Bible. It championed "design" but not a "designer". It did not define its scientific content beyond a vague affirmation that there was evidence for design in the world. By having open questions — about the age of earth, the significance of Noah's flood, and even the extent to which traditional evolutionary mechanisms might explain some of what we find in the natural world — ID created a big tent under which a broad spectrum of anti-evolutionary crusaders could unite.

Finally, and most importantly, ID elected to define its assault on the reigning evolutionary paradigm in political, rather than scientific, terms. The old creationists squandered some of their energies in actually trying to do real research: the Institute for Creation Research made some genuine attempts to look more closely at carbon dating and the fossils in the Grand Canyon, and it tried to create a computer model of the atmosphere that would illuminate the meteorological consequences of Noah's flood. ID, by contrast, spends virtually none of its energies in this way, preferring instead to focus on getting allies elected to school boards or converting politicians to its viewpoint.

(Were ID proponents to start a genuine research program, they would face some challenges. They do not have any generally accepted hypotheses to test beyond a nebulous intuition that Darwinism is incorrect, bad, and fails to acknowledge properly the remarkable design that permeates nature. If they were to do an experiment, for example, on the age of earth, they would have to decide whether to test the hypothesis that earth is either 6000 or 5 billion years old. But deciding this would drive too many of their allies from the big ID tent. They remain, as they like to say, "agnostic on the age of the earth.")

ID, for the most part, has not yet appeared on scientific radar screens. Those who identify with ID have not published research in any of the standard scientific journals and much of the scientific community has not even heard of them, beyond some secondary awareness of a local school board incident in some small town in the Midwest. They have, however, become an influential cultural presence and have been featured in everything from *The Wall Street Journal* to *The Chronicle of Higher Education*.

WAKE UP AND SMELL THE POLITICS

Forrest and Gross think it is time the scientific community sat up and took notice. 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". The authors describe the Wedge as a "movement with a plan to undermine public support for the teaching of evolution and other natural science supporting evolution, while at the same time cultivating a supposedly sound alternative: intelligent design theory." *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, reli-

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Karl Giberson is Professor of Physics at Eastern Nazarene University, editor of Science & Theology News, *and editor-in-chief of* Science and Spirit. *With Donald Yerxa he wrote* Species of Origins: America's Search for a Creation Story *(Lanham [MD]: Rowman & Littlefield, 2002).*

giously driven program to get evolution out of the public schools.

With literally millions of dollars of support from the Seattle-based Discovery Institute, funded by some very deep pockets like Howard F Ahmanson Jr, the ID movement has made considerable progress. Countless state agencies, local school boards from Ohio to Texas and even the US Senate have found themselves suddenly confronted with articulate proposals to teach "alternatives to evolution" or to teach evolution in such a way that students can evaluate contradictory evidence. Often the language of these proposals suggests nothing more than an opportunity for evolution to be taught in a way that encourages critical thinking, a laudable goal.

When Republican Senator Rick Santorum of Pennsylvania introduced his amendment to what was to become the No Child Left Behind Act, he suggested, for example, that "where biological evolution is taught, the curriculum should help students to understand why this subject generates so much continuing controversy and should prepare the student to be informed participants in public discussions regarding the subject." This language sounds very innocent; even Democratic Senator Edward Kennedy of Massachusetts commented positively about it, hedging later when he discovered that Santorum's amendment was itself a Trojan horse that would get ID past the gatekeepers of the public school curriculum.

The Santorum amendment, which was ultimately removed, is a good example of how the Wedge strategy works. It goes like this: Santorum, a conservative Catholic, adds an innocent-sounding amendment to a major education bill one day before the Senate is to vote. The timing and seemingly innocuous language make it difficult for anyone to get too worried. It passes, and public school teachers are required to prepare their students to be informed participants in public discussions regarding the subject of evolution. Public discussion of evolution in America, however, is basically the century-old "Darwin-versus-the-Bible" debate. To be informed about this debate requires knowledge of this controversy, which would require knowledge of the various objections that have been made to evolution. The most sophisticated of these objections, and the only ones produced by credentialed scholars, are primarily those of the ID movement. So, when biology teachers in public schools are looking for materials to "teach the controversy", the first thing they will encounter is a full roster of materials on ID replete with web sites, recommended textbooks, instructional materials, and impressive guest lecturers.

This, in a nutshell, is the Wedge strategy: Insert something small and innocent into whatever openings in the log are available and then pound gently until the log splits.

At the moment, we do not know what happens next. The Wedge strategists do not want to tell us anything more, lest we become alarmed. Forrest and Gross speculate, with some assistance from unguarded comments made by Wedge strategists and an examination of ID funding sources, that the long-range agenda is a full transformation of American culture, the abolition church–state separation, a return to biblical principles in every area of life, and the eventual establishment of a fundamentalist theocracy in America. If all of this sounds even more farfetched than ID's claim that the entire scientific community is deluded about evolution, then you need to read this book and see for yourself.

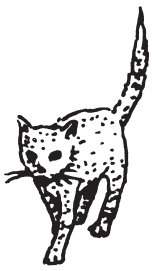
Creationism's Trojan Horse is an aggressive, but scholarly, polemic. Forrest and Gross's rhetoric makes it clear where they stand and they miss no opportunity to heap ridicule on the Wedge, all the while considering it with utmost seriousness. There are not many hints that the authors might sympathize with those, however uninformed, who find themselves attracted to a movement, however specious, that resonates with their deepest and most heartfelt intuitions about the world.

Concluding unscientific postscript

Forrest and Gross understand, as most of their fellow academics do not, that America's struggle to come to terms with evolution is a deeply political and cultural battle, and it must be waged on those terms. The endless books exposing the scientific errors of the old scientific creationists did not destroy the movement or even weaken it. Likewise, the impressive stream of books and articles exposing the errors of the new creationists — the ID movement — will not halt the thin end of the ever-encroaching Wedge.

What Forrest and Gross do not understand, however, in concert with their fellow academics, is that they are a large part of the reason why it is so easy for ID to rally and recruit anti-evolutionary troops. The US is a deeply religious place where belief in God and belief in creation is fundamental. The US is also scientifically illiterate; Americans do not understand science and, for the most part, do not care what their kids are learning in high school science classes. But promote a scientific theory that seems to undermines belief in God as creator, and suddenly millions of Americans *do* care about the high school science curriculum.

The champions of evolution — the self-appointed articulators of the grand vision — must decide where they want to draw the line. Many of them (Richard Dawkins, Daniel Dennett, EO Wilson) insist that the evolutionary inn has no room for the idea that God created the world. Others (Michael Ruse, Ken Miller, John Haught) see in evolutionary theory everything from absence of conflict to encouraging support for the idea that a purposeful creator lies behind the world we experience.



Scientists, like everyone else, can believe that God created the world, or not. They can believe that evolution is compatible with that belief, or not. They can believe that tax dollars should be used to teach evolution to children and that local public schools should re-inforce community values and beliefs, or not. But these decisions belong to everyone, not just to scientists. If the taxpaying parents of America's schoolchildren are concerned that the public schools are undermining their values, those parents need to be heard. The ID movement is listening, and listening carefully, but it is not clear that the scientific community is doing the same.

Fighting anti-evolution in America is akin to fighting drug traffic. In the long run, unless we can reduce the demand for the product, attacking the sources will be of little consequence.

Author's address
Karl Giberson
Physics Department
Eastern Nazarene College
23 East Elm Avenue
Quincy MA 02170
kgiberson@stnews.org

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The Cultures of Creationism: Anti-Evolutionism in English-Speaking Countries

edited by Simon Coleman and Leslie Carlin
Aldershot (UK): Ashgate 2004.
192 pages

Reviewed by Bernard Ortiz de Montellano, Wayne State University

This volume consists of seven chapters first presented as a session at the American Anthropological Association's 1996 annual meeting and of two papers previously published by Ronald Numbers. It is unfortunate that it took so long for this volume to be published and that the data in Numbers's papers are 10 years old, because they do not reflect the role that "intelligent design" has played in recent debates or the rise of non-biblical creationism such as that represented, for example, by Cremo and Thompson (1996).

Francis Harrold, Raymond Eve, and John Taylor point out that the United States is the only country in which creationism has achieved the status of a national issue. They attribute this to the decentralized nature of education, the unusually high degree of religiosity, and an on-going struggle between the opposing world-views of cultural traditionalism and cultural modernism in the United States. The clash of these world views, including creationism, was evident in the division between the "blue states" and the "red states" in the recent national election. The authors trace the shifting tactics of creationists since the formation of the Institute for Creation Research (ICR), from attempts to legislate equal time for Genesis and equal time for "scientific creationism", which have been turned back by the courts, to an emphasis on pushing its message through its many surrogates at the local school board level. Ruse presents a brief discussion and somewhat perfunctory refutation of the work of Phillip Johnson (1991), Michael Behe (1996), and Alvin Plantinga (1991).

The remaining chapters deal with creationism in England (David Knight), a comparison of discourses in England with that in the United States (Simon Locke), and creationism in Canada (John Barker), New Zealand (Ronald Numbers and John Stenhouse), and Australia (Ronald Numbers). Other chapters include a study of indigenous creationism (Robert Layton) and creationist views among young people in Kenya and Britain (Peter Fulljames and Leslie Francis). The book concludes with Ruse's chapter on philosophy and the "new creationism".

The data in Fulljames and Francis's paper date to the 1980s and precede a substantial change in educational policy in Kenya, and thus their conclusion that creationist beliefs among children there are widespread without any campaign by creationists may not be valid today. Robert Layton deals primarily with the question of whether native religious beliefs about the sacredness of particular landscapes and their land management practices can be used as evidence for their right to "own" the land or for the inclusion of these landscapes as part of UNESCO's World Heritage Sites. It is not particularly relevant to the topic of the book.

A common thread is apparent: the importance of the First Amendment in producing the difference between the experience in the US and other countries. One reason why creationism had had little resonance and political importance in Britain and in Canada is that in those countries there is a tradition and practice of governmental support for sectarian schools that defuses the issue and makes proponents of creationism take a less combative stance than is the case in the United States. Locke points out that, due to the lesser separation of church and state in England, their creationist discourse is much more flexible and is able to use philosophical concerns about the fact–theory question in the scientific method to argue that creationism is a valid alternative and, in turn, to support its own version of the Bible by arguing that it is the only literal, and thus, true reading.

In the US, the need to speak to a larger public and to argue for an alternative science in the political context produces a discourse that de-emphasizes the religious features. As Locke puts it: "... in so far as creationists are true to themselves, they talk to no-one else; and in so far as they talk to others, their truth is inevitably compromised." "Intelligent design" may also be less useful as a tactic in other countries, since its primary use in the United States is as a stalking horse for biblical creationism in order to avoid the strictures of the First Amendment, and this strategy is not needed elsewhere.

Another thread is the differing approaches of indigenous creationism. Barker points out that in Canada the creation stories of the First Nations are not totalizing, but deal with specific places and people. Their belief in these creation stories does not produce a direct confrontation and does not require a denial of the validity of evolution. In contrast, this *is* the case for Native Americans in the United States: Vine Deloria Jr (1995), a prominent spokesperson, uses some of the same arguments as the ICR to assert the scientific superiority of Native American myth to that of evolution. Unfortunately, Numbers's chapter only asserts that the Maori's conservativism makes them amenable to creationism, but we do not get enough

Bernard Ortiz de Montellano is Professor Emeritus of Anthropology at Wayne State University.

detail to see their case is similar to that of the Canadian First Nations.

The case of Australia is an anomaly in that creationism has achieved a greater salience there than in any other country besides the United States. Paradoxically, this has been a consequence of the aggressive and over-the-top attack tactics of skeptics, which gave creationists enormous publicity and made them sympathetic underdogs.

This volume suffers from the repetition inherent in symposium collections and from the delay in its publication. It would have been enhanced by inclusion of non-biblical creationism such as those promoted by Cremo and Thompson (1996), indigenous groups, or Islamic creationists (Edis 1994).

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Author's address

Bernard Ortiz de Montellano
Department of Anthropology
Wayne State University
Detroit MI 48202

The Genomic Revolution: Unveiling the Unity of Life

edited by Michael Yudell and Rob DeSalle
Washington DC: Joseph Henry Press, 2002. 207 pages

Reviewed by Lee Ehrman, Purchase College/SUNY

In September 2002, the American Museum of Natural History hosted a conference entitled "Sequencing the human genome: New frontiers in science and technology". Its president, Eileen Futter, provides the preface to this 20-chapter anthology, divided into four parts devoted to genome science, applications to medicine and agriculture, human variation, and financial, legal, and ethical issues. The awesome contributors list reads like a *Who's Who* of science, bioethics, and law.

None of these chapters is long, all are eminently worthy, and some are familiar. They are all addressed to a general audience. To many academics, this task is much more difficult than the one we face when we address our own peers — and success is not always guaranteed. Here, the endeavor is handled and edited graciously, so that I feel that an enthusiastic recommendation to readers of *RNCSE* is not only justified, but mandatory. In this review I shall concentrate on three entries that are significant for different reasons.

The first, "Gene diversity in the endorphin system" (appearing in part II), contributed by MJ Kreek of the Laboratory of Addictive Diseases at Rockefeller University, surveys a complex topic that is rarely presented to lay audiences. Endorphins are made up of peptides that act as hormones or neurotransmitters. Some are critical stress and pain hormones; others relate to heroin, cocaine, and alcohol, among other addictive substances; and still others are involved in mood, and perhaps even in cognition. Kreek finds that of all factors contributing to an individual's vulnerability for developing a specific addiction, genetic ones contribute 25–40%. The rest is divided between environmental factors and induced effects of the drug itself (but not necessarily equally divided).

What are the genetic effects of specific addicting drugs themselves? They produce alterations in levels of mRNA (messenger ribonucleic acid) affecting in gene expression, and producing altered reception of this drug later.

The second entry is "Social side effects of the new human molecular genetic diagnostics" (appearing in part IV), contributed by Troy Duster, a renowned sociologist at New York University. Duster concisely surveys possible and actual uses of DNA databases to categorize genotypes and, of course, their bearers. Further, microchip nucleotide arrays, "SNPs on chips," may be employed to predict disease vulnerabilities, behaviors, and even the pharmacologic performance of various interventions. Duster warns that these technologies will have differential effects on different human populations, so non-medical uses will predominate.

The third significant entry is from editor Rob DeSalle, who, as always, speaks for himself (introduction to part III, p 130):

> [T]he contributors to this book were adamant that we are not headed for a social version of eugenics like that which arose in the early part of the twentieth century. But we must always be mindful of the capacity to abuse or misuse any biological information, and we should not fool ourselves into thinking that some people will not attempt to misuse these technologies. To combat such attempts, we must make the public aware of the history of our species, and knowledgeable about the future beneficial applications of information derived from the human genome.

I therefore urge fellow members of the National Center for Science Education to read, teach with, and present as gifts this noble collection. Useful supplementary materials that complement the essays in *The Genetic Revolution* include the National Institutes of Health's "A revolution in progress: Human genetics and medical research" website (<http://history.nih.gov/exhibits/genetics> and a news report about the Broad Institute and its goal of transforming genetic research into clinical medicine (*Science* 2003 Jun 20; 300 [5627]: 1856–7).

Lee Ehrman is Distinguished Professor of Biology at Purchase College/SUNY.

Author's address

Lee Ehrman
Division of Natural Sciences
Purchase College/SUNY
Purchase NY 10577
lee.ehrman@purchase.edu

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