REPORTS OF THE NATIONAL CENTER FOR SCIENCE EDUCATION

DEFENDING THE TEACHING OF EVOLUTION IN THE PUBLIC SCHOOLS

Volume 24, Number 2 MAR/APR, 2004

CONTINUES *NCSE REPORTS* & *CREATION/EVOLUTION*

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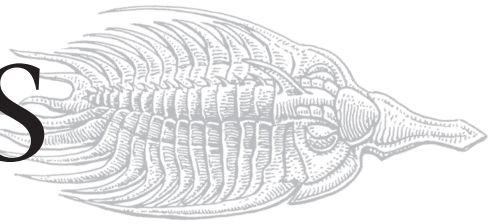

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The theme of the last issue is intricately intertwined with the theme of this one. Excavated materials in archaeology and human paleontology can only be understood and interpreted properly within the historical framework that geology provides. Thus, it is not surprising that many anti-evolutionists also feel compelled to revise and refute standard interpretations of studies in these archaeology and human paleontology.

In this issue, we present two features that highlight creationist attempts to "reimagine" archaeological and paleontological research. In the first, Pierre Stromberg and Paul Heinrich have allowed us to print a version of their tale of the Coso Artifact — a mysterious conglomeration recovered on a collecting trip by rock-shop owners. Since speculation is much more interesting than research, the story of Coso as an "out-of-place artifact", or OOPART, became grist for anti-evolutionary mills that proved that the standard interpretation of human prehistory was badly flawed. Of course, the real story, while every bit as interesting, does not affect in the least the consensus view of human evolution. It is still, however, a wonderful detective story that shows how a little bit of work can usually explain so many of the "unexplained phenomena" that baffle television show hosts.

The second feature is an appraisal of the use of the research literature in human paleontology by Michael Cremo and Richard Thompson. Although their spiritual roots are nonbiblical, their work shows all the hallmarks of typical creationist "scholarship" in the hunt for "anomalous" data, so-called "suppressed" evidence, and occasional cases of scientific dissent. Michael Brass, whose book *The Antiquity of Man* was reviewed in *RNCSE* 23 (1), p 22, explores the peculiar mix of misinformation about human fossil specimens, their meaning, and their interpretation that litters the work of Cremo and Thompson.

Our book reviews also examine books about human prehistory. Richard Sherwood reviews Robert Eckhardt's book on human paleontology and his opinion is mixed. The book contains many valuable insights, but also much that gets in the way of seeing them. And Colin Groves reviews Dennis Bonnette's book on human origins. When it comes to human origins, Groves concludes, Bonnette is clearly out of his depth, relying on out-of-date and irrelevant "authorities" — including Michael Cremo — to make his case.

IN THE NEWS

As this issue goes to press, the fallout from the "objective origins" policy proposal in Darby, Montana, is settling. The policy was defeated, but not without some serious effects on the social fabric of this small town. In the end, the "local" controversy was noticed in state races for governor and Superintendent of Public Instruction. We are fortunate to have first-hand reports from the front by Victoria Clark and Rod Miner and Martha Stromberg.

One result of the real grass-roots efforts to defend evolution education in Darby was the victory of two pro-evolution members of the school board in the May 2004 elections. We will report on the consequences for the "objective origins" policy and the related issue of the new superintendent of Darby's schools in the Updates section of the next issue of *RNCSE*.

NCSE NEWS

In this issue, you will meet the 2002 NCSE Friends of Darwin. This annual award is given to people who work hard to preserve and promote evolution education throughout the world. Sometimes we manage to benefit directly from their talents, as we did when Wesley Elsberry joined the NCSE staff or when Barbara Forrest joined the NCSE Board of Directors. We are all richer for the steadfast efforts of these people; we only wish that we could honor everyone who helps support evolution year in and year out.

We also say goodbye to Skip Evans. It seems as though we have always had Skip in the office, but it has truly been only a couple of years. He was a great ally to NCSE even before joining the staff, and we all wish him the best in his life's journey.

Phil Spieth comments on a growing trend among NCSE members — donating stocks to NCSE. These generous gifts are greatly appreciated and very helpful to us. Now Phil has some advice for those who are considering such donations that will make the gift more rewarding — for both NCSE and the donor.

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NOTICE

As of August 23, 2004, all correspondence to the editor of *Reports of the National Center for Science Education* should be addressed as follows.

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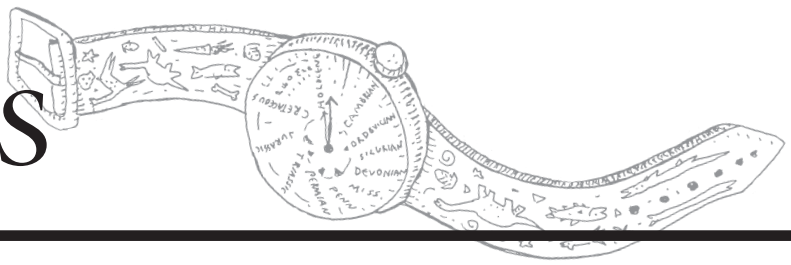
NEWS



"Intelligent Design" in the Bitterroot Valley

Skip Evans and Glenn Branch, NCSE

Darby, Montana, located in the Bitterroot Valley of western Montana near the Idaho border, is a modest town of about 1000 people, where "everybody knows everybody" is not just a cliché. But Darby recently became a flashpoint in the perennial creationism/evolution controversy, when a local minister attempted to have the school board add "intelligent design" to the biology curriculum of the town's public schools. The ensuing acrimonious debate received national attention, including pieces in *The New York Times* and on National Public Radio. With the results of the May 4, 2004, school board election, however, the debate is over — for now.

The campaign began with a public presentation held on December 10, 2003, in the junior high school gymnasium. The Reverend Curtis Brickley conducted what was described as "a two-hour, high-tech presentation on "intelligent design'," and called on the Darby School Board to include "intelligent design" in the science curriculum. Two members of the school board, Gina Schallenberger and Doug Banks, were receptive to the proposal. But not all of those attending the meeting were impressed. John Schneeberger, the coordinator of the Bitterroot Human Rights Alliance, commented, "It's fairly apparent that 'intelligent design' points directly to God as a creator and that doesn't have any place in a science class" (*Ravalli Republic* 2003 Dec 12).

Brickley hoped to present his "intelligent design" proposal to the school board at its next regular meeting on January 5, 2004. Speaking to the weekly *Missoula Independent* (2003 Dec 25), Brickley was unwilling to provide details, although he was careful to say that he was not calling for evolution to be omitted from the curriculum. "They need to teach evolution more critically," he said, "and teach evidence that challenges the neo-Darwinian theory." By teaching "intelligent design" alongside evolution, he said, the Darby schools would thereby "teach origin science more objectively."

Meanwhile, a group of residents in Darby and surrounding communities who opposed Brickley's proposal organized Ravalli County Citizens for Science. Rod Miner of RCCS told the weekly *Missoula Independent* (2003 Dec 25) that the proposal "is a politically and religiously motivated action that seeks to place a religious agenda ahead of the interests of students" and warned of the possibility of a lawsuit if the Darby School Board adopted it. The school board accordingly deferred considering Brickley's proposal until it heard from "the other side" (*Ravalli Republic* 2004 Jan 7).

On January 21, 2004, in the junior high school gymnasium, Ravalli County Citizens for Science conducted its own presentation, attended by over 200 people. Speaking were Jay Evans, a local molecular and cellular biologist, NCSE's post-doctoral scholar Alan Gishlick, and Karen Hedges, a Darby science teacher. Hedges explained, "If we are not teaching evolution as the best explanation of what we see here, we are short-changing our students when it comes to moving on to higher education and standardized testing" (*Ravalli Republic* 2004 Jan 23). Another teacher, Trevor Laboski from nearby Corvallis, added that science teachers already discuss the social controversy surrounding evolution when students broach the topic, assuring the audience, "We're sensitive to the community that we teach in and the religious culture that exists."

School board actions

The school board met to consider the policy on January 26. The meeting was attended not only by Darby residents but also by people from Hamilton, Victor, and even Missoula, about 60 miles away. Speaking first was Brickley, whose proposed "objective origins policy" would encourage teachers in Darby's schools to "help students assess evidence for and against theories, to analyze scientific strengths and weaknesses of existing scientific theories, including the theory of evolution, by giving examples of scientific innovation or discovery challenging commonly held perceptions." The purpose of the policy was not, he said, to add creationism to the curriculum; what he sought, he said, was "a qualified and responsible criticism of Darwinian evolution" (*The Missoulian* 2004 Jan 27). Responding, Rod Miner of RCCS described "intelligent design" as having "no legitimacy in scientific theory" and argued that Darby's schoolchildren "need more science, not less".

Judging from the public comment period of the meeting, the "objective origins" policy was popular: a reporter from the *Ravalli Republic* (2004 Jan 28) estimated that its supporters outnumbered its opponents by two to one. (According to Dixie Stark of RCCS, however, the numbers were about equal if nonlocal speakers were not counted.) But it was not so popular among the school board's legal advisors. Letters from Deputy Ravalli County Attorney James McCubbin and Montana School Boards Association attorney Elizabeth Kaleva strongly cautioned the district not to change the curriculum in a way unapproved by the state. "Failure to

meet state standards for your curriculum could result in loss of accreditation for the Darby schools," McCubbin wrote. "This, in turn, could result in litigation and/or make the Darby schools ineligible to receive state and/or federal funding. Thus, it is absolutely imperative that your curriculum continue to meet those state standards" (*The Missoulian* 2004 Jan 27).

The meeting adjourned until January 28. Michael Moore, a reporter from *The Missoulian*, managed to interview Brickley on the intervening day. "In hindsight," Moore wrote (2004 Jan 28), "Curtis Brickley thinks he shouldn't have presented the case for teaching 'intelligent-design' theory at Darby High School when he argued for changing the school's science curriculum in early December." Brickley told Moore, "I don't think that 'objective origins' and 'intelligent design' are one [and] the same," adding, "I just want us to look at evolution critically, at the evidence for it and the evidence against it. I think the policy is quite modest."

In his article, Moore also discussed the Discovery Institute, whose Center for Science and Culture serves as the institutional home of "intelligent design". Like Brickley, the Discovery Institute is increasingly disavowing any desire to have "intelligent design" taught in the public schools and concentrating instead on "teaching the controversy" (for a critical discussion of the slogan, 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). Although Brickley emphasized that he was not speaking for the Discovery Institute, he acknowledged that he requested its assistance while he was preparing his presentation to the school board.

When the meeting resumed on January 28, dozens of speakers commented on the policy, as in the previous session of the meeting. David DeWolf, a Senior Fellow of the Discovery Institute's Center for Science and Culture and Professor of Law at Gonzaga University in Spokane, Washington, told the board, "I believe that a careful review of the legal implications of this policy would reveal that it is fully consistent with state educational requirements, and that there is no reason to fear that it would violate any constitutional restrictions." He added that even if a lawsuit were to be filed, "there are a variety of organizations who are committed to open discussion in this area and who I believe would agree to defend the board's position if it were to adopt this policy. I personally would volunteer to assist the board in identifying such counsel." (DeWolf's testimony is available on-line at <http://www.discovery.org/scripts/viewDB/index.php?program=CSC&command=view&id=1750>.)

Speaking against the policy, Dixie Stark of RCCS wryly told the board that the grassroots pro-science organization needed no attorneys to help it to make its case: "We are not the ones who are about to break the law," she said. "The school board is" (*The Missoulian* 2004 Jan 29). While not describing the policy as illegal, Montana School Boards Association attorney Elizabeth Kaleva told the board that it was unwise to enact such a

RCCS member Rod Miner

policy as Brickley's "objective origins policy" without describing how it is to be implemented. The policy encourages teachers to help their students to analyze the scientific strengths and weaknesses of evolution, she noted, but fails to specify how they are supposed to do so or whether they are required to do so.

No decision was reached at the January 28 meeting. Discussion resumed on February 2, with comments from supporters and opponents of the policy continuing. Particularly telling were comments from the principals of the Darby schools, who expressed their worries about adopting a policy in the absence of any plan for implementing it, and from high school student Zach Honey, who reported that the "vast majority" of his schoolmates were opposed. Nevertheless, the board finally voted 3–2 to adopt the "objective origins" policy, with Gina Schallenberger, Doug Banks, and Elisabeth Bender voting for it and Mary Lovejoy and Bob Wetzsteon voting against it. Both Lovejoy and Wetzsteon expressed concern that the board was flouting the advice of its own attorney; indeed, according to *The Missoulian* (2004 Feb 3), "Wetzsteon repeatedly asked the majority why they were disregarding Kaleva's advice, but he got no answer."

Political and legal entanglements

The vote on February 2 was not the final word, since in Darby, such a policy change requires approval (by a simple majority) in two separate meetings. The flurry of letters to the editors and op-eds in the local newspapers increased in intensity, as both sides sought to bolster their positions and support in anticipation of a second vote. Also significant was the upcoming election on May 4, in which one supporter of the "objective origins" policy (Schallenberger) and one opponent (Wetzsteon) were up for re-election; the views of the candidates would prove to be crucial in their campaigns.

Those opposed to the "objective origins" policy welcomed the intervention of Montana's Superintendent of Public Instruction, Linda McCulloch, who characterized the policy as a way to smuggle creationism into the science curriculum. "It is not science," she told *The Missoulian* (2004 Feb 4). "You won't find any credible group of scientists or science teachers who advocate these philosophies as science." She also described "intelligent design" as creation science retooled to survive constitutional scrutiny. Her stance was subsequently attacked by John Fuller,

hoping to be the Republican candidate for McCulloch's post, who complained, "Given the reverence of local control of schools in Montana, if Darby wishes to investigate such a curriculum, shouldn't they be permitted to do so without the self-righteous threats of the superintendent?" McCulloch responded, "Mr Fuller is fooling himself if he thinks 'objective origins' and 'intelligent design', or whatever you want to call them, is anything more than an attempt to put religion in our classrooms" (*Billings Gazette* 2004 Feb 5).

Also inveighing against the policy was Eric Feaver, the president of the Montana Education Association and Montana Federation of Teachers (MEA–MFT), the organization that represents Darby's teachers. Echoing McCulloch's remarks, he said, "no matter what the proponents of this 'objective origins' policy say, this is all about religion. The Montana Constitution just forbids this" (*The Missoulian* 2004 Feb 4). He also said that MEA–MFT was concerned about the lack of a curriculum corresponding to the "objective origins" policy and would insist that teachers be involved in the development of any such curriculum. Additionally, Ravalli County Attorney George Corn went on record as endorsing the opinion of James McCubbin and Elizabeth Kaleva that the policy was problematic (*The Missoulian* 2004 Feb 5).

But proponents of the "objective origins" policy were not idle in securing legal advisors of their own. During the school board's debate over the policy, Harris Himes, a pastor at the Big Sky Christian Center in nearby Hamilton (and unsuccessful candidate for the school board there; see Updates, p 16), produced a letter

Objective Origins Policy will be Challenged

Rod Miner and Martha Stromberg

To the Darby School Board of Trustees:

We are taxpayers in the Darby district, and parents of two children who attend Darby school. The objective origins policy currently before you, if approved, will direct Darby science teachers to present to our children as scientific what are in fact religious teachings, thus establishing government-sponsored religion in our school. This policy is illegal, and we will challenge it.

As members of Ravalli County Citizens for Science, we have sought the expertise of local and national scientists, science educators, and legal affiliates. We will demonstrate that you have not exercised due diligence in considering the need for and the consequences of this policy.

We will demonstrate that the purported need for this policy substantially rests on the claims of the "intelligent design" body of argument. We will demonstrate that the central apologists for ID have grossly distorted and misinterpreted the work of scientists in creating their anti-science claims, and will document and defend many examples of this fraud.

We will provide precise and complete refutations of all major ID claims, supported by and documented by legitimate working scientists and credible science organizations. Further, we will show that you could have also obtained these already existing refutations, and have either chosen not to do so, or have chosen to remain complicit in this misrepresentation.

Curtis Brickley, the primary proponent of this policy, has declared that the present practice of scientific inquiry is flawed and its practitioners conspire against those who would produce evidence "against evolution". This is an extraordinary claim and demands extraordinary evidence. Such evidence has not been provided to the full board, or by you to the public.

Doug Banks has stated that "if evolution is being taught as a 'fact', we have a problem." However, you have not clearly stated why you believe that the scientific theory of evolution has been discredited, and have not presented to Darby parents and taxpayers evidence to support this assertion and thus the need for this policy. In the absence of this evidence, your actions must be unavoidably interpreted as seeking to introduce religious doctrine into our school.

Perhaps you think that the presentation and public testimony given in favor of the policy is enough to validate and justify the policy, and that you can remain passive in regard to presenting evidence. If you remain passive, the legal defensibility of this policy will then rest upon the strength of two variations of creationist argument raised against the theory of evolution in public testimony and Curtis Brickley's presentation; these are creation "science" (CS) and "intelligent design" (ID).

Each of these is proposed by its apologists as a "scientific" alternative to the theory of evolution. Nevertheless, no court has ever recognized that to be the case. CS has been revealed in court for what it is, religious doctrine.

We will demonstrate that ID also is not valid scientific inquiry. It, like CS, has been fabricated by individuals and political organizations with a religious mission. The intent of ID organizations is the creation of a "lowest common denominator" version of creationism, acceptable to a maximum number of religious constituencies.

The esoteric nature of ID arguments is its strategic strength, as it is not easily critiqued except by knowledgeable scientists, and thus (as shown in the Darby debate) it can gain a great deal of political momentum that is not easily slowed by the few who recognize that its claims are false. Although this has worked in the political arena, it will fail in the judicial system, where rigorous analysis replaces chaotic and ill-informed public debate.

from the Alliance Defense Fund offering its legal assistance to the board. Then, on February 2, the ADF formally offered its services directly to the board in case it were to be sued over adopting the policy. Bridgette Erickson, a lawyer from Lincoln, Montana (a town about 140 miles away), subsequently emerged as the ADF's *de facto* representative, addressing the Darby school board at a meeting on February 24 to explore the possibility of the ADF's representing the board if necessary (*The Missoulian* 2004 Feb 16).

The ADF, based in Scottsdale, Arizona, describes itself as "a servant organization that provides the resources that will keep the door open for the spread of the Gospel through the legal defense and advocacy of religious freedom, the sanctity of human life, and traditional family values" (<http://www.alliancedefensefund.org/about/>). Among those listed as its founders are Bill Bright of Campus Crusade for Christ, D James Kennedy of Coral Ridge Ministries, and James Dobson of Focus on the Family. It was also involved in the controversy over the presence of a creationist book in the bookstores at Grand Canyon National Park (see *RNCSE* 2004 Jan/Feb; 24 [1]: 4–5).

At the school board meeting on February 24, Erickson offered her services to the board *pro bono*, supplementing the ADF's offer to pay her fees to defend the board in the event of a lawsuit. Describing the "objective origins" policy as "on the cutting edge of modern education" (*Ravalli Republic* 2004 Feb 26), she also offered to help the district to develop a corresponding curriculum. Elizabeth Kaleva again warned the board about the perils of adopting the policy, noting that Erickson's affiliation with

We will demonstrate comprehensively and precisely the falsity of ID claims. ID is based on the writings of a handful of apologists; it is therefore relatively easy to analyze the actions, content, and intent of each of these writers. Clear and unambiguous evidence of the artificial and false nature of ID is well documented.

A single general example (Dr Evans's example of 26 000 new evolution articles and zero ID articles in the last 2000–2004 National Institutes of Health archives) reveals yet again that ID is not to be found in legitimate science publications; we have found it mentioned only in the form of sharp dismissals. The absence of participation by ID apologists in normal scientific research, publishing, peer review, and conferencing reveals the non-scientific nature of their argument, and leaves a planned imposition of religious values as the sole explanation for the activity of ID proponents, the reason behind ID, and its use in the creation of the objective origins policy.

We will demonstrate that the implementation of such a policy is designed to bring religious teachings into the public school classroom. The proposed Ohio Board of Education "Critical Analysis of Evolution" presents links to CS and ID Web sites as part of student study. This lesson plan is badly nonscientific, with false historical information, incorrect or missing footnotes, and footnotes directly from books on intelligent design, false definitions, outdated scientific information, and errors of fact.

The lesson plan wrongly defines a theory as a "supposition", whereas scientists formally define a theory as an explanation of phenomena built up from tested hypotheses. This plan was designed to permit the inclusion of ID claims, not to reflect the best science methodology. We will further show through bibliometric analysis that ID and CS both quote badly outdated information, and both ID and CS critique research errors and tentative findings that have long since been rectified; thus neither qualifies as "scientific innovation".

You are trustees of the school district's money. If you pass this policy at second reading, you will

Board members Mary Lovejoy and Bob Wetzsteon

choose to risk a great deal of the district's money on opposing lawyer's fees and the costs of litigation incurred by both the district and opposing parties. If you pass the policy on second reading you will abrogate your greatest responsibility, the care of our children's education.

Your uncritical acceptance of the claims of the Rev Brickley and the Discovery Institute demonstrate to our children the polar opposite of what you are claiming as the intent of this policy, the practice of critical thinking. There is a tremendous amount of available evidence that shows that this policy is wrongly conceived and that the arguments that it substantially rests on are gross distortions and outright lies.

As school trustees, you can exhibit due diligence and obtain this information yourselves before you give this policy final approval, or you can waste hard-earned taxpayer money to have attorneys and judges bring this evidence to you in a court of law.

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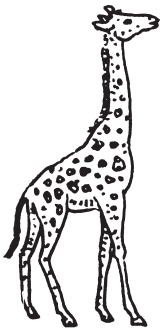
[*Originally published in the* Ravalli Republic *2004 Mar 4. Reprinted with permission.*]

the ADF was problematic: "If you're challenged in state or federal court, you'll be asked to defend your motives as completely free of religious motives," she said. "And that's hard to do with an organization like ADF defending you." Kaleva also said that the Montana School Boards Association was unwilling to defend the school board against a lawsuit over the policy. Nevertheless, the board voted 3–2 to retain Erickson as counsel; the three in favor of retaining her were the same as those who voted in favor of adopting the "objective origins" policy.

Real grassroots reactions



The decision of the board to retain Erickson was greeted with displeasure by students at Darby's high school. On February 25, about one-third of the school's 170 students — as well as one teacher — walked out of school to demonstrate against the "objective origins" policy. Slogans on their signs included "Creationism in a cheap tuxedo" and "Objective origins: Just say Noah" (*Ravalli Republic* 2004 Feb 26; *The Missoulian* 2004 Feb 26). Aaron Lebowitz, the senior who organized the demonstration, explained, "I just thought that we needed a way to get the community and the board to listen to us. We're important. We're what this is all about."

As the controversy continued to rage, rumors about a boycott of the Darby schools circulated. Writing in the weekly *Missoula Independent* (2004 Feb 26), Josh Mahan reported "that as many as 30 families may want to yank their children from the Darby school system if the proposal passes." Since the school system receives about $5000 per student, such a mass withdrawal would be financially disastrous. Science teacher Karen Hedges lamented, "That breaks my heart. We have a good school. On top of losing good kids, that's a lot of money. Then we'll lose staff."

In the course of noting that the "objective origins" policy was on everyone's lips in Darby, Mahan also remarked, "There's even a curious *New York Times* reporter holed up in Bud & Shirley's Motel." Emerging from his quarters there and returning to New York, James Glanz subsequently published a long piece on the situation in Darby. Glanz is a respected science reporter for the *Times*, with a PhD in physics from Princeton University; his previous articles include "Darwin *vs* design: Evolutionists' new battle" (*The New York Times* 2001 Apr 8), which proponents of "intelligent design" are fond of citing as evidence that their view is taken seriously.

"Montana creationism bid evolves into unusual fight" (*The New York Times* 2004 Feb 29), however, focused not on anti-evolutionists but on grassroots resistance to their efforts, as exemplified in Darby. Glanz was evidently impressed by the quick formation and effective advocacy of RCCS. NCSE's role in advising and supporting groups such as RCCS was also noted: "Some of the groups take their leads from umbrella organizations like the National Center for Science Education in Oakland, Calif., which tracks the disputes and supports the teaching of mainstream evolution." Additionally, the article quoted NCSE's executive director Eugenie C Scott and mentioned NCSE's postdoctoral scholar Alan Gishlick's appearance in Darby.

On March 2, Rod Miner and Martha Stromberg, whose two children are in the Darby school system, increased the pressure on the board by sending a letter announcing their intention to sue the board if the "objective origins" policy were adopted. In their letter, published in the *Ravalli Republic* (2004 Mar 3) and reprinted on p 6, they remarked, "The objective origins policy currently before you, if approved, will direct Darby science teachers to present to our children as scientific what are in fact religious teachings, thus establishing government sponsored religion in our school. This policy is illegal, and we will challenge it." "We want the board to listen to us seriously, and we want them to talk about why they're doing this," Miner told *The Missoulian* (2004 Mar 3). "Ravalli County Citizens for Science is very willing to sit down with the board and the proponents without a judge and without a lawyer and explain to them how they're being misled."

Mary Lovejoy and Bob Wetzsteon, the two members of the board who opposed the policy, welcomed the letter and the invitation to discuss the issue with RCCS, but they expressed skepticism about their fellow board members' willingness to do so. "I don't think, based on the action of the majority of the board, that the meeting will ever take place," Wetzsteon said (*The Missoulian* 2004 Mar 4). Although Bridgette Erickson also welcomed the letter, saying, "I would like us to sit down and talk about the specifics to see if we really have any substantive disagreements," board chair Gina Schallenberger refused to comment on the letter, and no such meeting ever took place.

If the letter from Miner and Stromberg was a new weapon for the opponents of the "objective origins" policy, a different letter served as a new weapon for its supporters. In early February, Montana's Superintendent of Public Instruction Linda McCulloch wrote to the Secretary of Education, Rod Paige, to seek clarification about the so-called Santorum Amendment. "We had been getting questions from people who said that Rev Brickley was claiming that No Child Left Behind required schools to teach 'intelligent design'," McCulloch told *The Missoulian* (2004 Mar 11). "So I wanted to make clear with the secretary that that wasn't true."

She received a reply from Eugene Hickok, Acting Deputy Secretary, dated March 8. After explaining at length that the Department of Education is largely prohibited from influencing curriculum, Hickok wrote, "The NCLB Act does not contain any language that requires or prohibits any particular scientific views or theories either as part of a state's science curriculum or otherwise." He then quoted the Santorum language from the conference report (for details, 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 [30]: 165–6), adding, "The Department, of course, embraces the general principles ... of academic freedom and inquiry into scientific views or theories."

(Hickok was Pennsylvania's Secretary of Education when creationism was allowed into the draft standards for science and technology education; see "Creeping creationism in Pennsylvania's science standards", *RNCSE* 2000 Jul/Aug; 20 [4]: 13–5.)

In a press release dated March 9 (available on-line at <http://www.discovery.org/scripts/viewDB/index.php?command=view&id=1897&program=News-CSC>), the Discovery Institute's Stephen C Meyer tendentiously construed Hickok's letter thus: "[T]he executive branch of the federal government has just joined the Congress in making clear that states and local school boards have the right to teach students the scientific controversy that exists about Darwinian evolution and to determine their own science curriculum content." Unimpressed with Meyer's attempt at spin, McCulloch told *The Missoulian* that Hickok's letter would have little or no effect on Montana's science instruction.

Meanwhile, back in Darby, the prospect of a lawsuit was raising eyebrows. In a March 11 op-ed in the *Ravalli Republic*, Kathleen Duggan — founder of Darby Taxpayers Against Court Costs — explained that the cost of a trial would be incurred by property owners, whether they supported the "objective origins" policy or not. "While most of us don't mind paying for what is necessary for our schools, or voting on what we think is not," she wrote, "we should be outraged to pay for something so completely irrelevant to our kids and the good of our school." Before the board meeting on April 5, a group of protesters led by Duggan chanted, "We can't afford this Darby board!" "We've been giving the board the benefit of the doubt," Duggan told the *Ravalli Republic* (2004 Apr 7), "and unfortunately, we've been stepped on along the way."

Attracting attention

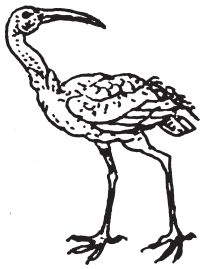
Probably because of the unprecedented publicity due to Glanz's story in *The New York Times*, the controversy in Darby continued to attract national attention. Americans United for Separation of Church and State filed a freedom-of-information request with education officials in Montana to obtain "all documents referring to or relating to any potential decision of the Darby School Board to teach theories of the origins of human life, including evolution, creationism, 'intelligent design' or other 'objective origins' theories", according to its press release issued on April 6 (available on-line at <http://www.au.org/site/News2?page=NewsArticle&id=6564&news_iv_ctrl=0&abbr=pr>. The request was covered in several Montana newspapers, including *The Missoulian* (2004 Apr 7).

In Montana, all eyes were on Darby. The Speaker of the Montana House of Representatives, Doug Mood, expressed his support for the "objective origins" policy, writing, "Darby School Board's proposed 'objective origins' policy is encouraging exactly the kind of critical discipline that should be a part of any teaching of science" (*Ravalli Republic* 2004 Apr 14). But at its April meeting in Missoula, the MEA–MFT, the organization representing Montana's teachers, unanimously passed a motion urging Darby to "cease all efforts to incorporate objective origins in Darby schools' science curriculum" (*Ravalli Republic* 2004 Apr 21). Evolution was suddenly a hot issue throughout the state — in Hamilton, Havre, and Helena, as well as in the preliminaries to the gubernatorial primary election (see Updates, p 16).

In the meantime, the Darby School Board was becoming embroiled in a different controversy. Throughout March, the board held several meetings to discuss candidates for the position of superintendent. These meetings were closed to the public, which the *Ravalli Republic* regarded as a violation of Montana's open meeting law. The newspaper asked the board to release the minutes of the closed meetings and to undertake not to violate the law in the future (*Ravalli Republic* 2004 Mar 26). After the board refused, the newspaper sued, asking for the minutes and any recordings of the closed meetings, as well as all documentation relating to the superintendent search (*Ravalli Republic* 2004 Apr 12). In a subsequent board meeting, the board altered the minutes of meetings, impelling the newspaper to obtain a restraining order to prevent the original minutes from being destroyed (*Ravalli Republic* 2004 Apr 21, Apr 27).

There were hints in the press that the meetings were closed because the majority of the board who supported the "objective origins" policy sought to ensure that the new superintendent would favor it as well. According to the weekly *Missoula Independent* (2004 Apr 15), "The meetings stem from a superintendent search that went awry when the same three members of the school board who are pushing for 'intelligent design' also became interested in recruiting a superintendent candidate with faith, though the board had already offered the job to someone else. Current superintendent, 13-year Darby veteran Jack Eggensperger, is leaving because he has 'a different philosophy' on 'intelligent design' than the board."

Between the "objective origins" policy and the closed meetings, there was plenty of fuel for the campaign before the May 4 election. Favoring the policy were incumbent Gina Schallenberger and hopeful Robert House; opposing it were incumbent Bob Wetzsteon and hopeful Erik Abrahamsen. The candidates teamed up in pairs, with Schallenberger and House running under the banners of "Local control" and "Fair and balanced" while Wetzsteon and Abrahamsen exhorted the electorate to "Fix this mess!" The *Ravalli Republic* (2004 Apr 27) reported, "Of the six school board trustee elections in Ravalli County, Darby's is the most heated, with candidates and their supporters spending more dollars to sway votes than in any other district." Campaign signs, political mail, and newspaper advertisements were rife. In a notable gaffe, signs supporting Schallenberger and House violated campaign regulations by not indicating their source, the newly formed political action committee Montana Advocates for True Science; the signs were quickly amended.



A further campaign irregularity surfaced just before the election. From April 29 to May 1, visitors to the Darby School District's web

site were greeted by a pop-up window with the text of 5 advertisements published in the *Ravalli Republic* that defended the "objective origins" policy and urged citizens to vote for Schallenberger and House (*Ravalli Republic* 2004 May 3). It also contained Ohio's controversial "Critical analysis of evolution" lesson plan (see *RNCSE* 2004 Jan/Feb; 24 [1]: 5–6). The window was placed without authorization by the Darby High School computer teacher. Superintendent Jack Eggensperger said that he expected a complaint to be filed with the Montana Commission for Political Practices, which forbids school districts to be involved in political campaigns.

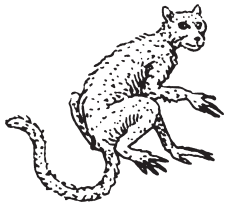
On April 29, the *Ravalli Republic* expressed its editorial opinion: "We believe the Darby School Board's passage of their 'objective origins' policy is an unnecessary solution to a non-existent problem," adding, "We have serious concerns when the Darby School Board steps away from their supervisory role and begins dictating what scientific theories are presented in the classroom." Although the newspaper stopped short of endorsing any candidates, it remarked, "Voters in Darby have a unique opportunity May 4 to make their feelings known on objective origins. Gina Schallenberger and Robert House are on record sup-

SHALL WE LET OUR CHILDREN THINK?

Victoria Clark

This was the message posted on the marquee at the Lewis and Clark Trading Post for over two weeks as the Darby school board conducted public hearings concerning the adoption of an "objective origins" policy *(see p 4)*.

The uninitiated might assume that the question was posed as a rallying point for those against the policy, but to illustrate the complexity and divisiveness surrounding this issue, the author of the marquee script proved to be a most vocal supporter for the policy. To complicate matters further, the author was none other than Larry Rose, our town marshal, a prominent and visible local personage.



What has happened to Darby, Montana, since Curtis Brickley, an ordained minister, gave a polished presentation to a packed gymnasium expounding on the scientific virtues of "intelligent design" and the need for an "objective origins" policy in our schools to combat the "one-sided" teaching of evolutionary theory? What was Brickley's intent when he equated evolution with atheism to the assembled crowd? Whom was Brickley trying to awaken and alarm with his spurious scientific and religious rhetoric? Why would someone bring a nationally controversial agenda to our small, rural community? Was Brickley acting alone? Or was Darby considered potentially easy prey by someone beyond the local boundaries, someone willing to sponsor, or at least, encourage Brickley's meeting? If so, how would our town deal with such possible machinations?

For whatever small part that Darby plays in the anti-evolutionists' place to "wedge" "intelligent design" into the curriculum, the local impact has been huge. Some of the comments I heard in the last month show this.

> "I don't grocery shop in Darby anymore."
>
> "The florist didn't deliver when she saw my name on the bill."
>
> "My daughter stormed out of the classroom to avoid more trouble."

I even had a friend stop by the house and tell me that a fellow parishioner had asked her why I was leading up the religious education program at our church "if I didn't believe in God."

Darby is not a big place. The main north–south thoroughfare for far-western Montana, two-lane US Highway 93, runs straight through town and comprises our commercial district, less than a mile of businesses: several gift/gallery shops, a few restaurants, a few bars, a few auto repair places, a few hair salons, a few realtors, a couple of spots to pump gas, 2 banks, a grocery store, a gym, a post office, a volunteer fire hall, a community clubhouse, a one-doctor clinic, a one-room public library, 3 modest motels, and, oh yes, 6 churches. There is no strip mall architecture. There are no fast food franchises. Some of the older buildings are fixed up, but not all. Darby has a sleepy, old-West look, inviting to some who stop for lunch and a stroll down Main Street. The next town north is Hamilton, nearly 20 miles down river. The next town south is Gibbonsville, Idaho, about 45 miles up river and over the pass. The surrounding communities refer to us as Darbarians. You get the picture.

What has the "objective origins" debate brought to our town? Externally, a bit of publicity (or perhaps notoriety) as various Montana — and even national — media organizations pick up and run with the story, allowing folks across the country either to applaud us or to laugh at us. Internally, however, the proposed "objective origins" policy has brought Darby nothing but grief and discord. Although events to date (to my knowledge) have been generally civil — no punches thrown, no bodily threats — and while participants in the public meetings have been noted for their composed demeanor, engaging in minimal heckling and hissing, underneath this controlled veneer there is a palpable sense of unease.

A person is known as either "for" or "against". The fence sitters are now few. The blissfully ignorant can no longer hide. One local summarized with a grimace, "apathy won't be an issue in the next election." Everyone has a heightened sense of awareness of the issue.

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porting the controversial theory; Bob Wetzsteon and Erik Abrahamsen are opposed. It's a clear choice voters can make."

The controversy in Darby appeared again on the national stage, with a story on "intelligent design" aired on National Public Radio's Weekend Edition on May 2. Opening with a discussion of Brickley and his initial attempt to have "intelligent design" added to the science curriculum, it segued to a discussion of the "objective origins" policy and the RCCS's resistance to it. Darby teacher Karen Hedges said that the lack of a curriculum was particularly troublesome: "When I try to do research on it, everything takes me to 'intelligent design'. All the Web sites take me back to the Discovery Institute, which has some scary goals in mind — to do away with science. And it scares me to think that we might be headed in that direction." The story then turned to the Discovery Institute, defended by John West and criticized by Barbara Forrest (the coauthor of *Creationism's Trojan Horse: The Wedge of Intelligent Design* [New York: Oxford University Press, 2004] and a member of NCSE's board of directors).

Then, on May 3, the night before the election, the board voted 3–2 to hire James McLaughlin as the

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There is an awkwardness when encountering an unfamiliar person whose position on the policy is unknown. Should one say something? Should one engage in idle pleasantries? What are others thinking? Can one escape before questions are asked? As to encounters with people one knows to be on the opposing side, there is a strangeness and bristling up the back, sometimes mixed with hostility, sometimes tempered by weariness. Judgments are passed on both sides, even among residents who have been acquainted for years. There is a tendency to avoid public conversation.

Why do feelings run so deep and so strong? Those favoring "objective origins" in Darby have centered their arguments on two tenets: first, that there exists valid scientific criticism of evolution, and second, that evolution and God are mutually exclusive. The proponents have furthered their cause by claiming that their children have been "persecuted" and "ridiculed" in school for their stance against evolution. One individual testified that evolution was being "shoved down the throats" of the children. (Notably, these accusations remain unsubstantiated and have been fervently denied by all school staff.) The proponents present themselves as defenders of critical thinking, freedom of speech, and freedom of religion. They see the schools as preaching a gospel of godlessness. They worry about the government's proselytizing in our science classes in support of the "Church of Darwin". Also in this camp are those that reject the current interpretation of the Establishment Clause. Some explicitly testified that they wanted to see "religion put back in the schools." This group includes a number of homeschooled families whose interest in the debate implies that if things were otherwise they would enroll their children in our public schools, adding to needy school coffers. Perhaps the most unnerving commonality among the proponents of the policy is that they present themselves as the guardians and holders of the moral high ground, making them particularly impervious to (and intolerant of) the reasoning and considerations of the opposing side.

The group against the policy has a more diverse and, consequently, less cohesive following. There are the scientists who worry about the quality and veracity of the science curriculum. There are the First Amendment defenders who recognize that, in the United States, religion and science instruction are not to be intertwined in the public schools. There are the parents who fear the loss of accreditation and funding as implementation of the policy strays from state curriculum standards. There are the property owners who fear lawsuits and subsequent tax hikes as constitutionality is challenged in the legal arena. Others are simply insulted by the religious presumptions of their opponents and assert that "religion should be taught at home." Finally, there appears to be a growing body that is plainly tired of the whole debacle and just wants to table the policy and get on with their lives. This group includes business owners who appreciate that strife is not good for capitalism and that not all publicity is good publicity. Regardless of specific motive, it was rumored that at least 30 families petitioned to remove their children from the Darby public schools if the policy is adopted. This would have been a significant blow to the school's finances.

Where has all this controversy taken us? In a protracted and heated school trustee election this past spring, the two candidates opposing the "objective origins" won. Public awareness of the issues was at an all time high. Voter turnout was record-breaking. Moreover, the two victorious candidates both won by nearly a 2-to-1 margin. There can be no doubt that the people have spoken. Given such an outcome, many of us thought the tensions of the past six months would quickly and quietly dissipate into the background, with life in Darby returning to its usual pattern of petty ups and downs. Unfortunately, this appears not to be the case. The "objective origins" supporters continue to submit agitating editorials to the local newspaper. They attended the latest school board meeting in force. They seem undaunted and undeterred by the mandate of the voters. For the foreseeable future, those of us against the policy will have to remain vigilant. One victory at the polls does not translate into an end to the hostilities.

Advice to others: pay attention to local trustee elections, follow school board proceedings carefully, be aware of underlying agendas. Save your community from this malignancy.

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new superintendent; the three in favor of the offer were Schallenberger, Banks, and Bender, the supporters of the "objective origins" policy. Although the policy was not discussed during McLaughlin's interview, according to members of the board, some teachers said that he expressed support for it while touring their schools, and one teacher reported that "McLaughlin didn't believe in the scientific measurement of carbon dating" (*Ravalli Republic* 2004 May 5). There were other concerns expressed about McLaughlin's qualifications and background, leading one parent to question the timing of the decision to hire him just before the election. At the same meeting, the board decided to develop a policy governing the content of the district's web site; no disciplinary action was taken at the time against the teacher who placed the pop-up window there.

Finally, in the May 4 election, Bob Wetzsteon won re-election and Erik Abrahamsen won election (defeating Gina Schallenberger); both men won by almost a 2-to-1 margin, the weekly *Missoula Independent* (2004 May 13) reported: "Wetzsteon received 757 votes and Abrahamsen (whose daughter took part in the February 25 student protest against the 'objective origins' policy) received 737; Schallenberger and House received 352 and 351 votes, respectively. Turnout in the election was unprecedentedly high, at over 50%". Both Wetzsteon and Abrahamsen oppose the "objective origins" policy, meaning that it is unlikely that the newly constituted board will adopt it after all. It was unclear whether the board would consider the policy a second time and reject it — as Abrahamsen hopes, according to the *Independent* — or simply let it drop. (In the event, the board considered it and rejected it; details in the next issue of *RNCSE*.)

Rod Miner of RCCS was thrilled by the results of the election: "I am delighted and it will be really nice to see a spirit of team playing return to the Darby school board," Miner said. "We worked so hard to stop this thing short of a lawsuit. I am just very, very pleased" (*The Missoulian* 2004 May 5). And the people at the educational frontlines — the teachers in Darby's schools — were pleased, too: "The school is glowing," a school employee told the *Ravalli Republic* (2004 May 7). "Everybody is just psyched."

Acknowledgments

We wish to thank Victoria Clark, Kathleen Duggan, Eric Meikle, and John Schneeberger for their comments and assistance.

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Evolution Back in Italian Schools ... Maybe

Carla Castellacci

[*A recently proposed revision to the Italian middle-school science curriculum omitted any mention of evolutionary theory. The reaction of the research and education communities, both in Italy and abroad, caused a reversal of that proposal in May 2004. See Updates, p 17, for a news brief on the situation. The following report from Carla Castellacci provides an insider's perspective on the proposal, the reactions of the academic community, and the current state of affairs in Italian science education.*]

Italian Education Minister Letizia Moratti assures us that the teaching of evolution will not be removed from Italian middle schools. She never meant to keep Darwin out of science classes. A commission chaired by Nobel laureate Rita Levi-Montalcini will provide detailed guidance and roadmaps on the subject. And the brief attention given to the subject of education by the Italian scientific community seems to be over.

The press release from the Ministry of Education issued on April 28, 2004 (<http://www.istruzione.it/prehome/comunicati/2004/280404.shtml>), followed a wave of criticism uniting scientists and citizens in opposition to the removal of biological and human evolution from the curriculum for middle schools (ages 11–14 years). The Minister had already maintained that the theory of evolution would be included in science classes at appropriate stages in the complete curriculum (from ages 6 to 18), but not until the formation of the advisory commission did such claims gain credibility (*La Repubblica* 2004 Apr 24; available on-line at <http://www.repubblica.it/2004/d/sezioni/cronaca/darwin/morarepli/morarepli.html>). When members of the Senate questioned the Minister, her response set the script for the rest of the story: the curriculum is not a prescription; it leaves schools and teachers ample freedom of choice by adopting a pedagogical stance in which the scientific method is introduced gradually, starting from observation and experience. However, this nonspecific response did not reassure the academic community. (For the exchange, see <http://www.scuolaoggi.org/index.php?action=detail&artid=1382>.)

The controversy over the removal of evolution from the curriculum had been mounting slowly but steadily. The National Association of Natural Science Teachers (ANISN) and UIL Scuola, the teachers' branch of the third largest trade union, were the first

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to voice their dissent even before the final release of the new curriculum on March 2. The issue reached the general public when articles started to appear in the press. Stanford geneticist Luigi Luca Cavalli-Sforza, historian of medicine Gilberto Corbellini, and oncologist Umberto Veronesi engaged the Minister and her experts in unequal exchanges — unequal, in light of the absence on the Minister's side of a qualified representative of the natural sciences. In one such exchange, Professor Giuseppe Bertagna, member of the Minister's staff and leading advocate of the reformed curriculum, expressed his conviction that at younger ages "it is important to leave room for myths and tales of origins," bringing as an example that "children are fond of cartoons showing men fighting against dinosaurs … [though] … this never happened in reality" (*La Repubblica* 2004 April 23; available on-line at <http://www.cgilscuola.it/forum/rassegna/topic.asp?MsgView=1&forum_id=20&topic_id=14832>). This sort of thinking at high levels in the Ministry suggests a serious lack of understanding of modern scientific and educational practice and exposes the need for more input from professionals in both these fields.

Two petitions protesting the exclusion of evolution from the curriculum were circulated, one promoted by the leading newspaper *La Repubblica*, the other by the Natural History Museum of Milan. In a few days, the *La Repubblica* web site was able to collect about 47 000 on-line signatures, while the Museum's petition was relayed through the internet to distant places, receiving support from members of the scientific community worldwide, including helpful members of NCSE. The prestigious Accademia dei Lincei announced that it would also prepare a letter of protest. And finally the Minister declared, "Darwin will be taught from elementary school." Or did she?

As one of those who started the petition for the Natural History Museum, I was keen to inform my correspondents of the success of the campaign, emphasizing the high profile of the commission in charge of establishing new directives in science teaching. Attempts to trace the source of the declaration attributed to the Minister, however, were dead ends, leaving the impression that the quote was an oversimplified "feel-good" synthesis of the Minister's position, which took on life as one media source quoted another. The February 19 decree has not been retracted so far, and its conversion into law is still a possibility that would have immediate effects on the textbooks under preparation for the upcoming year.

Our hopes rest with the commission's members, biologists Rita Levi-Montalcini, Vittorio Sgaramella, and Roberto Colombo, and physicist and Nobel laureate Carlo Rubbia. In light of statements from officials at the Ministry, however, one may wonder whether such a commission will act as a much-needed panel of experts, or as a prestigious but vacuous scientific imprimatur such as the recent Commission on Bioethics that earlier introduced into Italian law the "rights of the human embryo", based on sectarian rather than biological principles.

This commission will also have to face the fact that the curriculum is just part of the implementation of a reform of the educational system wherein specific normative content standards are replaced by formative goals and guidelines, leaving to individual schools and teachers the final say on the articulation of subject matter. The latitude in these guidelines does leave open the possibility, following Bertagna's perspective, that teachers might include material on "Paluxy man" in the science curriculum; the new curriculum is short on detailed content and long on general concepts.

With few exceptions, the Italian scientific community appears convinced that its pressure has changed the Minister's mind and is crediting her for her courage in making her supposed U-turn. Sadly, despite all the signs we had of more frequent attacks against evolution education in recent years, such as the "anti-evolution campaigns" promoted by politically motivated student unions, attention to the effects of these on science education and a scientifically literate citizenry remains episodic. And given the short supply of politicians who support science, such confidence in the ability to resist these attacks seems to rest on the influence of the Catholic Church in Italian cultural life.

As is well known, Pope John Paul II issued a statement to the fact that the theory of evolution "is more than a hypothesis" — a statement that does seem to undermine attacks to evolution based on religion (*see "Who is fooling Pope John Paul II?",* RNCSE *1998 Jan/Feb; 18 [1]: 23–4; "Roman Catholic Church accepts biological evolution — again!"* NCSE Reports *1996 Fall; 16 [3]: 7–8*). The major risk, however, is not in misreading the Pope's position but in underestimating the potential strength of political attacks on evolution education.

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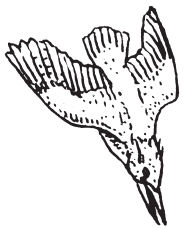
When his grandparents returned with a commemorative shirt from their visit to Valley Forge, Editor Jr decided that some revisions were in order.

UPDATES



Alabama: On May 17, 2004, the final day of the 2004 legislative session, the Alabama state House adjourned without voting on SB 336. The bill, entitled the "Academic Freedom Act", aimed to give public school teachers "the affirmative right and freedom to present scientific, historical, theoretical, or evidentiary information pertaining to alternative theories or points of view on the subject of origins." One of the sponsors of the House version of the bill, Representative Jim Carns, was quoted in March as saying with reference to the bill, "Evolution is one theory; creation is an alternative theory." SB 336 was passed out of the House Education Committee on April 29 by a vote of 9–1; for the prior history of the bill, see *RNCSE* 2004 Jan/Feb; 24 (1): 10–15.

Arizona: On May 24, 2004, the State Board of Education approved a final version of state science standards. A previous draft, released on January 26, 2004, omitted content relating to evolution that was present in earlier versions. Moreover, in the Life Sciences strand of the January draft, the Biological Evolution section concluded with PO 6: "Describe how scientists continue to investigate and critically analyze aspects of evolutionary theory." The same language was included in the Ohio science standards in 2002 due to pressure from proponents of "intelligent design" and despite opposition of scientific and educational groups, and subsequently spawned Ohio's error-filled "Critical analysis of evolution" lesson plan (see *RNCSE* 2004 Jan/Feb; 24 [1]: 5–6). Arizona's scientific community reacted: Arizona State University President Michael Crow protested, "Strong, rigorous life-science standards are particularly critical in light of Arizona's efforts to build strength in the biosciences and related industries," and NCSE member Jane Maienschein, who directs ASU's Center for Biology and Society, warned that by singling evolution out for special treatment, PO 6 was "sneaking creationism in by stealth and effectively dumbing down the standards" (*Arizona Republic* 2004 May 2; available on-line at <http://www.azcentral.com/arizonarepublic/local/articles/0502edscience02.html>). The treatment of evolution was improved, and the language of PO 6 was removed, during a final round of revisions in May.

California, Roseville: The Roseville Joint Union High School District continues to be pressed about its policies on evolution education. (For background, see *RNCSE* 2003 May–Aug; [3–4]: 5–10, 2003 Sep–Dec; 23 [5–6]: 13–7, and 2004 Jan/Feb; 24 [1]: 10–15.) The *Sacramento Bee* (2004 Apr 25; available on-line at <http://www.sacbee.com/content/community_news/roseville/story/9034648p-9960542c.html>) reports that local parent Larry Caldwell filed two complaints against the district: "In one complaint, Caldwell alleges that the school district violated his rights by not placing on the board's agenda his proposed policy that says teachers are expected to include arguments against evolution when they present evidence in its favor. In the other, Caldwell alleges that the school district violated state law when it selected a biology textbook without ensuring that the text was 'accurate, objective and current.'" In a 26-page response, the district denied any wrongdoing; presumably responding to a call to "teach the controversy," the district's attorney wrote, "Biology class is not debate class, no matter how fascinating a particular 'controversy' in science may be." In its meeting on April 27, the board decided to uphold the district's response to the complaints, although it also agreed to consider Caldwell's "Quality Science Education Policy" at a meeting on May 4. Caldwell agreed to drop his complaint about his policy's not being considered, but has not decided whether to pursue his complaint about the textbook adoption process. At the May 4 meeting, the *Bee* reports (2004 May 6; available on-line at <http://www.sacbee.com/content/news/education/story/9195255p-10120592c.html>), Caldwell's policy was considered, but not brought to a vote; a modified version of it was proposed by Dean Forman, the president of the board. Forman's policy would permit teachers to decide for themselves whether to teach "arguments against evolution"; it would also require "a note to be sent to parents explaining that evolution would be taught in a non-dogmatic fashion and for school libraries to devote a section to materials arguing for and against evolution." The policy reportedly met with Caldwell's approval; 28 of the district's 32 science teachers, however, signed a petition expressing their opposition to it. During the meeting, members of the audience eventually expressed their displeasure by shouting "Recall the board!" and "You've already wasted enough time and money on this." At a subsequent meeting on June 2, Forman's version of the policy was rejected by a 3–2 vote, a decision that was greeted with "screaming and cheering for the board's decision" (*The* [Roseville] *Press-Tribune* 2004 Jun 2; available on-line at <http://www.rosevillept.com/main.asp?SectionID=1&SubSectionID=1&ArticleID=4680>).

Florida, Pensacola: Kent Hovind and his Creation Science Evangelism ministry are in trouble with the Internal Revenue Service, according to the *Pensacola News-Journal* (2004 Apr 17). On April 14, IRS agents raided Hovind's home and business offices, confiscating all records of financial activity since January 1997. In a sworn statement submitted in order to obtain a search warrant, IRS agent Scott Schneider wrote, "Since 1997, Hovind has engaged in financial transactions indicating sources of income and has made deposits to bank accounts well in excess of $1 million per year during some of these years, which would require the filing of federal income taxes." Hovind responded by denying any wrongdoing, questioning the timing of the raid (which occurred one day before the deadline for fil-

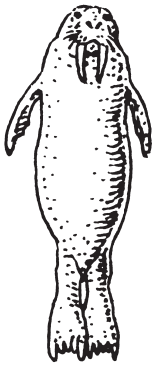
ing federal tax returns), and referring questions about his business practices to Remedies at Law, a firm based in Edmonds, Washington, that seeks "to offer remedies at law and provide an impenetrable means of defense against any attack on traditional church and family relationships." Glen Stoll, the director of Remedies at Law, said, "They don't understand how the church is created and registered, how it operates under church law, which is entirely separate from secular authorities." Stoll is apparently not a member of the Washington bar; he is associated with the Embassy of Heaven Church, whose members consider themselves not subject to local, state, or federal laws, including those concerning taxation.

Minnesota: When the Minnesota legislature adjourned on May 16, 2004, two bills based on the so-called Santorum amendment to the federal No Child Left Behind education act finally died. House File 2003 and Senate File 1714 were companion bills, identical in language, introduced early in the year. Each was referred to the appropriate education committee, but neither made any further progress through the legislature during the remainder of the 2004 session. Closely following the Santorum language, the bills singled out evolution as controversial and implied that there are scientific alternatives to evolution. In the last few years, opponents of evolution education have cited the original Santorum amendment and proposals derived from it as justification for weakening or questioning coverage of evolution in public school science curricula. For background, see *RNCSE* 2002 May/Jun; 22 (3): 4–5 or Glenn Branch and Eugenie C Scott's "The antievolution law that wasn't" (*The American Biology Teacher* 2003 March; 65 [30]: 165–6).

Minnesota: On May 16, 2004, the Minnesota legislature adopted new state science standards. Both houses voted to adopt the standards as forwarded to them by the Department of Education in December 2003, thus approving the standards as written and submitted by a committee of educators and citizens. The place of evolution in the science standards attracted only a moderate amount of public attention; the social science standards, in contrast, were so controversial that the legislature was actively and directly involved in their revision. One ultimately unsuccessful attempt to amend the science standards was viewed as motivated by anti-evolutionism. The section of the standards on the nature of science includes the directive that "[t]he student will be able to explain how scientific and technological innovations as well as new evidence can challenge portions of or entire accepted theories and models." The amendment would have repeated the directive, along with specific examples — "atomic theory", "plate tectonic theory", "big bang theory", "cell theory", "theory of evolution", and "germ theory of disease" — in several specific portions of the standards (*St Paul Pioneer Press* 2004 May 19). Since evolution is the only one of the examples that is routinely challenged, the amendment was regarded as providing a pretext for those wishing to claim that the state or the standards themselves implied that there are scientific questions about the status of evolution, and thus was opposed by a majority of the original writing committee. Although the House of Representatives voted for the amendment, it was dropped in the compromise between House and Senate versions of the bill enacting the standards. According to the *Minneapolis Star-Tribune* (2004 May 18; available on-line at <http://www.startribune.com/stories/462/4781669.html>), members of the Democratic–Farmer–Labor party, which dominates the Senate, challenged the amendment as "an effort to discredit evolution and open the door to the teaching of religious creationism." In related news, Cheri Pierson Yecke, the state's Education Commissioner, was not confirmed, and thus immediately removed from office, by the Senate in a 35–31 vote. Yecke was quoted earlier in her term in office as asserting that while state science standards should not include creationism, "every local district should have the freedom to teach creationism if that is what they choose"; she also cited the so-called Santorum amendment as reason to include reference to "a higher power creating life alongside evolution" (see *RNCSE* 2003 May–Aug; 23 [3–4]: 5–10).

Minnesota, Faribault: Rodney LeVake's attempt to argue that he enjoys free exercise, free speech, and due process rights to teach "evidence against evolution" ended decisively in January 2002, when the Supreme Court unanimously voted to refuse his appeal in *LeVake v Independent School District 656*. (See *RNCSE* 2001 Sep–Dec; 21 [5–6]: 20–1.) Randy Moore, the editor of *The American Biology Teacher*, interviewed LeVake in December 2003, and a transcript of their conversation appears in the April 2004 issue (66 [4]: 246–50). "Rod wanted to include his 'criticisms' of evolution in the school's biology course", Moore writes. "However, Rod also admitted that he didn't know of any non-religious schools that teach 'criticisms' of evolution, and acknowledged that the references that he used to support his 'criticisms' of evolution were meant to support the Bible. To paraphrase the US Supreme Court's majority opinion in *Edwards v Aguillard*, religious concepts do not shed their religiosity merely because they are presented as criticisms of evolution." Moore also interviewed LeVake's colleague Ken Hubert, whose concern about LeVake's refusing to teach evolution prompted the school to reassign LeVake, which in turn prompted LeVake to sue; a transcript of their conversation appears in the May 2004 issue (66 [5]: 325–7).

Missouri: On April 7, 2004, House Bill 1722 was introduced in the Missouri General Assembly by Representative Wayne Cooper, who introduced a similar bill, HB 911, late in 2003 (see *RNCSE* 2004 Jan/Feb; 24 [1]: 10–15). Like HB 911, HB 1722, if enacted, would require "the equal treatment of science instruction regarding evolution and intelligent design" in Missouri's public schools. But where its predecessor specified that "Willful neglect of any elementary or secondary school superintendent, principal, or teacher to observe and carry out the requirements of this section shall be cause



for termination of his or her contract" and that "Each public school classroom in this state from grades eight through twelve in which science is taught exclusively shall post a copy of this section in a conspicuous manner", HB 1722 is silent. Neither HB 911 nor HB 1722 was ever assigned to committee, and both bills died when the legislative session of the Missouri House of Representatives ended on May 14.

Montana: Two of Montana's 6 gubernatorial candidates support teaching creationism in Montana's public schools, according to a report in the *Billings Gazette* (2004 Apr 21; available on-line at <http://www.billingsgazette.com/index.php?id=1&display=rednews/2004/04/21/build/state/35-ask-candidates.inc>). Responding to a questionnaire from the *Gazette*, candidate Ken Miller wrote,"Creationism should have an equal place with the theory of evolution in our school curriculum. If God is taken totally out of our schools, than so should Darwin's theory of evolution. If both are presented and accepted as differing opinions, then students can seek out the truth that they and their parents are comfortable with", and Tom Keating wrote, "This country was founded on the premise that all things, including you and me, were created. Certainly the theory of creation should be studied in the public schools in comparison to the theory of evolution. The Declaration of Independence defines the essence of our country and the source of life, liberty and just pursuits. Yes, there should be serious study of creationism in the public schools as it relates to America." Both men were vying for the Republican nomination for governor; both are former state senators. Republican hopefuls Bob Brown (the current secretary of state for Montana) and Pat Davison and Democratic hopefuls Brian Schweitzer and John Vincent indicated that they oppose teaching creationism. Creationism is in the news in Montana due to recent incidents in Darby, Helena, and elsewhere (see p 4 and *RNCSE* 2004 Jan/Feb; 24 [1]: 10–5). In the primary election on June 8, Schweitzer and Brown won their parties' nominations, and will face each other in the November election.

Montana: The two men seeking the Republican nomination for the post of Superintendent of Public Instruction, John Fuller of Kalispell and Bob Anderson of Fort Benton, expressed support for the right of local school districts to set their own curricula, even if it results in the inclusion of "alternatives" to evolution in science classrooms, according to the *Bozeman Daily Chronicle* (2004 May 29; available on-line at <http://www.bozemandailychronicle.com/articles/2004/05/29/news/candidates.txt>). The issue was in the news due to the controversy in Darby, Montana, during which the incumbent Superintendent, Democrat Linda McCulloch, publicly criticized the proposed "objective origins" policy as a way to smuggle creationism into the science curriculum (see p 4). In the primary election on June 8, Anderson won his party's nomination; he will face McCulloch in the November election.

Montana, Hamilton: Evolution education was a controversial topic in the school board elections in Hamilton, a town in the Bitterroot Valley near Darby (see p 4). Of the 5 candidates participating in a forum sponsored by the League of Women Voters on April 20, three — Lori Holley, Bill LaCroix, and Ingrid Sutherland — indicated that they opposed teaching "intelligent design" in the science classroom; Cary Monaco, a Baptist minister, said that he, like the majority of the community, supported teaching "intelligent design" (*Ravalli Republic* 2004 Apr 22; available on-line at <http://www.ravallinews.com/articles/2004/04/22/news/news02.txt>). The remaining candidate, Harris Himes, was not quoted as expressing a view on "intelligent design", but he reportedly offered to help proponents of the "objective origins policy" in Darby to find free legal representation. In the following week, LaCroix withdrew his candidacy in order not to split the votes of those opposed to Himes and Monaco, whom he described as "conservative ministers who have a history of trying to force a narrowly focused religious and social agenda on our kids through school boards," and warned of the prospect of a repetition of the Darby situation in Hamilton: "Creationism, whether it's called 'objective origins' or 'intelligent design', is neither peer-reviewed nor scientific. It's religious and political in nature, which is why Darby taxpayers are being exposed to three possible lawsuits" (*Ravalli Republic* 2004 Apr 27; available on-line at <http://www.ravallinews.com/articles/2004/04/28/opinion/viewpoint/valley.txt>). In the May 4 election, Holley and Sutherland won decisively.

Montana, Havre: In a forum sponsored by the Havre Education Association on April 22, the 4 candidates for 2 seats on the Havre school board were questioned about their views on evolution education. Havre is a town of about 10 000 in northern Montana, 40 miles south of the Canadian border. According to the *Havre Daily News* (2004 Apr 23; available on-line at < http://www.havredailynews.com/articles/2004/04/23/local_headlines/candidates.txt>), incumbent Kathie Newell said that she believes in presenting both sides of the issue and allowing students to decide for themselves, and candidate Bonnie Benson said,"I think creationism should be taught." Mike Ley (a former Catholic priest) and Norman Proctor, however, opposed teaching creationism. A spokesman for the Havre Public Schools told the *Daily News* that the system has no specific written policy on the teaching of creationism; teachers are expected to use their own discretion in answering students' questions about the topic. In the May 4 election, Newell and Proctor won.

Oklahoma: On April 28, 2004, the Oklahoma House of Representatives passed House Bill 2194 — a bill governing textbook purchase contracts — by a vote of 96–0. Conspicuously absent from the bill as passed was the disclaimer provision added to the bill on February 23. (See *RNCSE* 2004 Jan/Feb; 24 [1]: 10–15.) The disclaimer provision would have required textbooks that discuss

evolution to include a long disclaimer virtually identical to one previously proposed in Oklahoma in 2001 and 2003, and in use in Alabama from 1996 to 2001. The proposed disclaimer describes evolution as "a controversial theory which some scientists present as scientific explanation for the origin of living things" and "the unproven belief that random, undirected forces produced a world of living things." It also states, "No one was present when life first appeared on earth. Therefore, any statement about life's origins should be considered as theory, not fact." As amended, HB 2194 was passed by the House by a vote of 96–0 and referred to the Senate's Education Committee, which removed the section containing the disclaimer; the amended bill was passed by the Senate on April 13 by a vote of 44–0. When HB 2194 returned to the House, the Senate's modifications were accepted by a vote of 55–41. According to the Associated Press, the vote was primarily along party lines; Bill Graves (R–Oklahoma City), who proposed the disclaimer amendment to HB 2194, urged his colleagues to vote against accepting the Senate's modifications. "I'm angry ... that this evolution disclaimer won't get a hearing out here," Graves said. "We have the government taking away the rights of these children to know they were created by a God, and I think that's wrong." He added, "If you tell kids that they're not any different than animals, pretty soon they're going to start acting like that, and that's what we're having in our society today." Opio Toure (D–Oklahoma City), the chairman of the House Judiciary Committee, opined that the adoption of Graves's disclaimer would have resulted in litigation; Victor Hutchison, George Lynn Cross Research Professor Emeritus of Zoology at the University of Oklahoma, explained, "All the major professional scientific societies in this country have issued official statements explicitly supporting the teaching of evolution," adding, "The fossil record is just tremendous. We've got DNA that totally supports what we see in the fossil records. It's overwhelming evidence, and the creationists just say there isn't any or they just ignore it." HB 2194 was not Graves's first attempt to require a textbook disclaimer, but it may be his last: due to term limits, he is not eligible for re-election.

Texas, Fort Bend: Three candidates for a vacant position on the Board of Trustees of the Fort Bend Independent School District discussed their views on teaching evolution during a forum in early May 2004. According to the *Fort-Bend/Southwest Sun* (2004 May 10; available on-line at <http://www.zwire.com/site/news.cfm?newsid=11620688&BRD=1914&PAG=461&dept_id=183407&rfi=6>), Ken Chen expressed skepticism about evolution, saying that "I believe in God," but adding that he was uncertain how much influence trustees wield over the curriculum. Larry Danna and Lisa Rickert both said that evolution should be taught, although they both expressed personal skepticism about it: "Though I believe in the Bible, we can't hide the theory of evolution from our children," Danna said. In the May 15 election, Rickert won.

National: During an on-line colloquy about science policy in the Bush administration conducted by *The Chronicle of Higher Education* on March 5, 2004, John H Marburger III, director of the White House's Office of Science and Technology Policy, was asked (by NCSE member Russell K Durbin) about the Bush administration's scientific credibility in light of the president's reported skepticism about evolution. He replied, "Evolution is a cornerstone of modern biology," adding, "Much of the work supported by the National Institutes of Health depends heavily on the concepts of evolution. President Bush has supported the largest increases in the NIH budget in history." For a complete transcript, see *The Chronicle of Higher Education*'s web site: <http://chronicle.com/colloquylive/2004/03/science/>.

Italy: Controversy erupted in Italy after a revised national middle school curriculum, released on February 19, 2004, was found to make no mention of evolutionary theory. (Italian students attend middle school for three years, while they are between 11 and 14 years old, after which they enter either high school or a vocational school; middle schools thus provide the last education shared by all students.) A campaign to restore evolution to the curriculum was quickly mounted: leading Italian scientists, including Luigi Luca Cavalli-Sforza (head of the Human Population Genetics Laboratory at Stanford University and member of NCSE), drafted and signed a public petition urging the Ministry of Education to reverse its decision. The on-line version of the petition (<http://www.repubblica.it/speciale/2004/appelli/scuola2/index_eng.html>) was endorsed by over 44 000 signatories by April 28. And a spokesman for the Italian National Association of Natural Science Teachers was quoted as saying that evolution "is the structure on which the entire teaching of natural sciences is based. We cannot talk of plants and animals without talking of evolution as well" (*The Scientist* 2004 Apr 28; available on-line at <http://www.biomedcentral.com/news/20040428/04>). On April 28, *La Repubblica* reported that the decision to omit evolution was reversed. Minister of Education Letizia Moratti named a commission, to be chaired by Nobel laureate Rita Levi-Montalcini, who helped to launch the petition drive, to provide specific guidance on the subject of evolution in the science curriculum (*The Scientist* 2004 Apr 29; available on-line at <http://www.biomedcentral.com/news/20040429/01/>). Readers should also refer to a related article by Carla Castellacci beginning on page 12.

[*NCSE thanks Victoria Clark, Chet Dickson, Victor Hutchison, and Michael McIlwrath for information used in this article.*]

NCSE NEWS_


Robert T Pennock


Patricia Princehouse


Howard Van Till

NCSE Honors "Friends of Darwin" for 2002

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 "Friends 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 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 2002.

Wesley R Elsberry is a veteran opponent of anti-evolutionism, both on the internet (where he contributes to a variety of forums) and in real life. He is also known for his scholarly investigations of the "intelligent design" movement, having delivered papers at several conferences, and having published (with John Wilkins) a detailed critique of William Dembski's "explanatory filter" as well as reviews of Dembski's *The Design Inference* and Robert T Pennock's *Tower of Babel*. After receiving the Friend of Darwin award from NCSE and his PhD in Fisheries and Wildlife Science from Texas A&M University, he came to work for NCSE (see *RNCSE* 2004 Jan/Feb; 24 [1]: 16).

Robert T Pennock, who teaches philosophy at Michigan State University, is a nationally recognized critic of the "intelligent design" movement. He wrote the first definitive critique of "intelligent design" creationism, *Tower of Babel: The Evidence Against the New Creationism* (Cambridge [MA]: MIT Press, 1999), which was nominated for the Pulitzer Prize, and compiled the anthology *Intelligent Design Creationism and its Critics* (Cambridge [MA]: MIT Press, 2001), which a reviewer for *Science* described as "an invaluable compilation for anyone who wants to learn about the scientific and philosophical failures of intelligent design and the long-term political and social strategies of its advocates."

Patricia Princehouse, who teaches philosophy at Case Western Reserve University in Cleveland, Ohio, is the co-founder of Ohio Citizens for Science. Her advocacy for quality science education during the battle over the place of evolution in Ohio's new science standards (see her article in *RNCSE* 2002 Sep/Oct; 22 [5]: 4–6) can only be described as indefatigable. With the state board of education's adoption of the anti-evolutionist "Critical Analysis of Evolution" lesson plan (see her article in *RNCSE* 2004 Jan/Feb; 24 [1]: 5–7), the battle is continuing; NCSE is confident that, with Patricia and her colleagues on the job, the defenders of evolution in Ohio will ultimately prevail.

Howard Van Till is Professor Emeritus of Physics and Astronomy at Calvin College. As NCSE Executive Director Eugenie C Scott told the *Newsletter of the American Scientific Affiliation & Canadian Scientific & Christian Affiliation* (2003 Sep/Oct 45 [5]: 4; available on-line at <http://www.asa3.org/ASA/newsletter/sepoct03.pdf>), "For decades, Howard has been working to help the public understand evolution as a science, and science as a way of knowing. … His thoughtful reflections on the complex, and often contentious, relationship between evolution and Christian theology have been nothing short of inspirational to those who hope for a rapprochement between the two."

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

Farewell, Skip

Glenn Branch
NCSE Deputy Director

Skip Evans, NCSE's Network Project Director, resigned on April 15, 2004.

Even before Skip came to work for NCSE in August 2001, he was already a stalwart defender of teaching evolution in the public schools. His web site devoted to debunking the flamboyant young-earth creationist Kent Hovind was a valuable resource — sadly, it is no longer active. Among his publications in *RNCSE* were a report of his visit to a "seminar" run by Answers in Genesis (*RNCSE* 1998 Mar/Apr; 18 [2]: 22–3) and a review of a bizarre creationist novel, Warren LeRoi Johns's *Ride to Glory* (*RNCSE* 2000 May/Jun; 20 [3]: 36–7).

During his nearly-three-year stay at NCSE, Skip worked closely with activists in Georgia, Montana, Ohio, and Texas, who found his level of commitment impressive and his trademark sense of humor infectious. He produced effective critiques of the "intelligent design" movement's propaganda, such as "Doubting Darwinism through creative license" (*RNCSE* 2001 Sep–Dec; 21 [5–6]: 22–3) and "The Discovery Institute pioneers the misinfomercial" (*RNCSE* 2002 Jul/Aug; 22 [4]: 9–10). His delight in NCSE's Project Steve was heightened by the fact that his given name, which he rarely uses, is Stephen. And as a self-described "refugee from the dot-coms", Skip also brought his expertise with information tech-

continued on page 23

Statement on Evolution and Creationism
American Anthropological Association

Adopted by the AAA Executive Board
April 2000

Affirmation

The Executive Board of the American Anthropological Association affirms that:

Evolution is a basic component
of many aspects of anthropology (including physical anthropology, archaeology, cultural anthropology, and linguistics) and is a cornerstone of modern science, being central to biology, geology, and astronomy;

The principles of evolution have been tested
repeatedly and found to be valid according to scientific criteria. Evolution should be part of the pre-college curriculum; it is the best scientific explanation of human and nonhuman biology and the key to understanding the origin and development of life;

Religious views are an important part of human cultures,
and deserve a place in the pre-college curriculum, provided that they are not presented dogmatically or in a proselytizing context. A comparative, anthropological study of religion would not violate the Constitutional requirement of religious neutrality in the classroom. An anthropological understanding of religion would be helpful in resolving some of the perceived conflict between creationism and evolution;

The Association respects the right of people
to hold diverse religious beliefs, including those who reject evolution as matters of theology or faith. Such beliefs should not be presented as science, however;

Teachers, administrators, school board members and others involved
in pre-college education are under pressure to teach creationism as science and/or eliminate or downgrade evolution, to the detriment of public scientific literacy. Many succumb to this pressure, for lack of expressed support from scientists and other community members;

Therefore anthropologists are encouraged to use their knowledge
both of evolution and of human social and cultural systems to assist communities in which evolution and creationism have become contentious. Anthropologists should help the public and public officials understand that good science education requires that evolution be presented in the same manner as other well-supported scientific theories, without special qualifications or disclaimers, and that an understanding of religion and other cultural systems should be part of the education of each child.

Stones, bones, and groans

In his entertaining *Lost Tribes and Sunken Continents* (Chicago, University of Chicago Press, 1962 — sadly now out of print), a critique of popular pseudoanthropological beliefs about Native Americans, Robert Wauchope lamented, "The average professional anthropologist cannot or will not write the kind of book that people in any great numbers will want to read. For the most part he has surrendered this function, usually somewhat condescendingly, to the journalist, the travel-book writer, the sensationalist, and the devoted mystic ..." No longer is that so! Although works of archaeological and paleoanthropological pseudoscience continue to abound, there is no shortage of popular scientific introductions to human prehistory and human evolution in print, and there is at least a handful of excellent volumes devoted to debunking pseudoscientific alternatives. Consult the following books, now available through the NCSE web site: <http://www.ncseweb.org/bookstore.asp> — look in the "In the latest *RNCSE*" section. And remember, every purchase benefits NCSE!

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

Investigating human prehistory

The Great Human Diasporas
by Luigi Luca Cavalli-Sforza and Francesco Cavalli-Sforza
The lifework of Luigi Luca Cavalli-Sforza has been to investigate the history of humanity through its genetic makeup. *The Great Human Diasporas*, written in collaboration with his filmmaker son and translated from the Italian, distills his prodigious scientific knowledge into a form accessible to the general reader. A central chapter explains how Cavalli-Sforza used archaeological and genetic data to reconstruct the human population movements of the last 10 000 years (especially in Europe). *The Great Human Diasporas* also touches on the fundamentals of evolutionary theory as well as issues of eugenics, linguistics, racism, and genetic engineering.

Guns, Germs, and Steel: The Fates of Human Societies
by Jared Diamond
Guns, Germs, and Steel takes on the ambitious task of explaining the development of human civilization since the Ice Age, and succeeds marvelously. Arguing that "[h]istory followed different courses for different peoples because of differences among peoples' environments, not because of biological differences among peoples themselves," Diamond explains the rise of the West in terms of geography and environment, debunking racially based theories. Winner of the 1998 Pulitzer Prize for General Non-Fiction, *Guns, Germs, and Steel* was praised by EO Wilson for showing "how history and biology can enrich one another to produce a deeper understanding of the human condition."

America before the European Invasions
by Alice Beck Kehoe
Drawing on the methods of anthropology, archaeology, and history, Kehoe's magisterial account of the 15 000 years of pre-Columbian American history is a must for anyone interested in the development of human cultures in North America north of Mexico. Reviewing *America before the European Invasions* in *The New York Review of Books*, Tim Flannery wrote, "Its strength lies in the author's deep empathy with the people who lived their lives in vanished and barely imaginable civilizations, as well as with contemporary indigenous cultures. ... Kehoe's book does a great service to Americans."

Mapping Human History
by Steve Olson
From the publisher: "In this sweeping narrative of the past 150 000 years of human history, Olson draws on new understandings in genetics to reveal how the people of the world came to be. ... He shows how groups of people differ and yet are the same, exploding the myth that human races are a biological reality while demonstrating how the accidents of history have resulted in the rich diversity of people today. Celebrating both our commonality and our variety, *Mapping Human History* is a masterful synthesis of the human past and present that will forever change how we think about ourselves and our relations with others."

Introducing human evolution

From Lucy to Language
by Donald Johanson and Blake Edgar
Paleoanthropologist (and NCSE Supporter) Donald Johanson, Director of the Institute of Human Origins, and science writer Blake Edgar team up to discuss human history — from the appearance of bipedal walking to the origin of language — in a volume lavishly

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

illustrated with original (and often life-size) photographs of fossils and artifacts. Part 1, "Central issues of paleoanthropology", concentrates on interpretation of the evidence, considering such topics as migration, diversity, anatomy, society, bipedalism, tools, customs, and "imponderables" (such as clothing and the problem of consciousness). Part 2, "Encountering the evidence", comprehensively summarizes the evidence on which our knowledge of human prehistory is based.

The Human Career,
second edition
by Richard G Klein
Simply the single best reference and advanced introduction to paleoanthropology (the subject of human biological and cultural evolution, the area where physical anthropology and prehistoric archaeology overlap). Writing in *Evolution*, Henry McHenry praised it as "by far the best book of its kind"; writing in *Antiquity*, RA Foley described it as "the best introduction to the problems and data of modern palaeoanthropology yet published". And no wonder: unmatched for breadth, range, and reliability, with more than 2500 references cited in 800 pages, *The Human Career* is indispensable for any serious student of human evolution.

Human Evolution:
An Illustrated Introduction,
fourth edition
by Roger Lewin
Kenneth Kennedy writes, Lewin is "one of the very few scientific journalists I know who has been successful in relating, with accuracy and an exciting writing style, the principles of paleoanthropology to a broad reading audience of scholars and laymen." Unsurprisingly, then, his *Human Evolution* is a good introduction to its subject. Containing brief but accurate accounts of contemporary research and results, as well as copious references and illustrations, it is eminently useful both as a general source of information and as a supplementary textbook. Lewin's other books include *Bones of Contention* and (with Richard Leakey) *Origins Reconsidered*.

The Human Evolution Coloring Book, second edition
by Adrienne L Zihlman
In preparing her book — now in a revised and expanded second edition — Zihlman realized that "many of the human characteristics I would be writing about are perfectly adapted for this kind of book — namely, color vision, hand-eye coordination, manual dexterity, and a brain especially evolved for tool-using!" Where else would you get the opportunity to use all of these abilities at once? The plates to be colored illustrate evolution in general, genetics, the living primates, primate evolution, and fossil evidence for human evolution. The author/illustrator is Professor of Anthropology at the University of California, Santa Cruz.

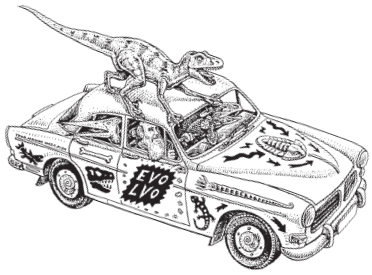
A SKEPTICAL EYE

Frauds, Myths, and Mysteries: Science and Pseudoscience in Archaeology, fourth edition
by Kenneth L Feder
Updated, expanded, and improved for its fourth edition, *Frauds, Myths, and Mysteries* is a classic, comprehensive, and invaluable treatment of pseudoscience in archaeology. Among the topics discussed are the Cardiff Giant, the Piltdown Hoax, controversies over who settled the Americas, the myth of the Moundbuilders, Atlantis, ancient astronauts, psychic archaeology, creationism, the Shroud of Turin, and what Feder refers to as "real mysteries of a veritable past" — the Paleolithic cave paintings of Europe, the fall of the Maya, Stonehenge, and Kennewick Man. The author is Professor of Anthropology at Central Connecticut State University.

Cult Archaeology & Creationism, expanded edition
edited by Francis B Harrold and Raymond A Eve
In the preface to *Cult Archaeology & Creationism*, the editors explain "[t]he articles in this book are concerned with pseudoscientific beliefs about the human past. They are *not* primarily concerned with showing how and why these beliefs are wrong. ... Instead, this book is concerned primarily with two tasks relatively neglected by the scientific community: *understanding* these beliefs and *dealing* with them." Contributors include Kenneth L Feder, Alice B Kehoe, Laurie Godfrey and John Cole, and Bernard Ortiz de Montellano. The reviewer for *American Antiquity* described the first edition as "Now needed more than ever. ... A very useful book."

Strange Creations
by Donna Kossy
As the subtitle "Aberrant ideas of human origins from ancient astronauts to aquatic apes" suggests, *Strange Creations* takes a look at a wide variety of pseudoanthropological views, from the "de-evolution" theory of Oscar Kiss Maerth (which inspired the band Devo) to the theosophical views of the Heaven's Gate cult. Unsurprisingly, a chapter is devoted to creationism, describing not only the stalwarts of the ICR but also colorful characters such as Emil Gaverluk, the author of *Did Genesis Man Conquer Space?* Wolf Roder praises *Strange Creations* as "a very useful source on a wide variety of pseudoscientific ideas, oddball groups, and their writings."

Ancient Astronauts, Cosmic Collisions and Other Popular Theories About Man's Past
by William H Stiebing Jr
From the publisher: "This book critically evaluates many of these popular hypotheses about man's early history. It presents the most important evidence and arguments for and against theories of a universal flood, the lost continent of Atlantis, mysterious pyramid powers, pre-Columbian voyages to America by ancient Egyptians and Phoenicians, and Velikovsky's cosmic catastrophism. ...The book discusses radio-carbon dating, archaeological stratigraphy, textual interpretation, and epigraphy as well as emphasis on the proper use of data provided by geology, astronomy and other sciences. It is written in non-technical language and will appeal to a wide audience." Stiebing is Professor of History at the University of New Orleans.



NCSE on the Road

A Calendar of Special Events, Presentations, and Lectures

Date September 27, 2004
City San Francisco CA
Presenter Eugenie C Scott
Title International Creationism: The Export of American Creationism
Event Commonwealth Club of California
Time 5:30 PM
Location 595 Market St, 2nd Floor
Contact John O Sutter, wfnca@wfnca.org

Date October 15, 2004
City San Jose CA
Presenter Eugenie C Scott
Title Body Plans and Adaptive Radiation
Event California Science Education Conference
Time 8:00 AM
Location Marriott Hotel
Contact Judy Scotchmoor, jscotch@berkeley.edu

Date October 23, 2004
City Gainesville FL
Presenter Eugenie C Scott
Title Anti-evolutionism and Museums
Event Enhancing Natural History Museum Visitors Understanding of Evolution Conference — Keynote Address
Time TBA
Location TBA
Contact Bruce J McFadden, bmacfadd@flmnh.ufl.edu

Date November 6, 2004
City Denver CO
Presenter Eugenie C Scott
Title They're Getting More Clever All the Time
Event Society for Vertebrate Paleontology
Time 12:30 PM
Location Adam's Mark Hotel
Contact Judy Scotchmoor, jscotch@berkeley.edu

Date November 12, 2004
City Chicago IL
Presenter Eugenie C Scott
Title Teaching the Scientific and Philosophical Foundation of Evolution
Event American Institute of Biological Sciences Panel
Time 9:45 AM
Location Hyatt Regency Chicago
Contact Susan Musante, smusante@aibs.org

Date December 2, 2004
City Richmond VA
Presenter Eugenie C Scott
Title Creationism as Voodoo Science
Event National Science Teachers Association
Time 1:00 PM
Location Richmond Marriott
Contact Randy Moore, rmoore@umn.edu

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nology to bear, materially improving NCSE's ability to communicate with, and to facilitate communication among, activists.

In his spare time, Skip — a glutton for punishment — frequently went to hear anti-evolutionists speaking locally, including Phillip Johnson, Jonathan Wells, and his old adversary Kent Hovind. He was fond of expressing his surprise that the Berkeley area abounded in such opportunities. He also continued to learn about evolution and to share his knowledge — a running joke in the office was that after reading two books on a topic, he was *ipso facto* an expert.

All of us at NCSE wish him well in his future endeavors.

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Philip Spieth, NCSE Director of Operations

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Stretching the Limits of Evolutionary Biology: A Profile of George Williams

Carl Zimmer

On a recent sunny Saturday, scientists from the United States, Canada, and Europe gathered at the State University of New York (SUNY), Stony Brook, to talk about their research. A geneticist from Harvard University spoke about pre-eclampsia, a potentially fatal condition during pregnancy. An ichthyologist described the loyalty — or lack thereof — that male fish show to the mothers of their offspring. Psychologists discussed economic decision-making. A psychiatrist reviewed some of the genes associated with clinical depression.

This lineup might seem like a random trawl through the sciences. But the researchers who assembled in the auditorium were there for a common purpose: to honor the lanky, white-bearded man who sat quietly in the fourth row, George C Williams. He may not be as familiar as his peers Richard Dawkins or the late Stephen Jay Gould. But Williams, who spent 25 years at Stony Brook, is generally considered one of the major architects of the study of evolutionary biology, and the meeting's far-ranging talks reflected the scope of his influence.

"George Williams was instrumental in making natural selection an intellectually rigorous theory," says Stephen Pinker of Harvard University, one admirer who was not at the meeting. "He forced people to think about how selection actually works and how we can see its fingerprints in the natural world."

In the 1950s, when Williams was doing his graduate work at the University of California, Los Angeles, the science of evolutionary biology had just gone through two decades of spectacular advances. Ronald Fisher and Theodosius Dobzhansky, among others, had used the new science of genetics to work out some of the molecular underpinnings of evolution. Natural selection was now recognized as a change in the frequency of genes in a population. Yet one important part still had not been nailed down: the nature of adaptations. It was clear that adaptations evolved, but few biologists had given serious

Carl Zimmer is a science journalist whose books include Evolution: The Triumph of an Idea *(New York: HarperCollins, 2001), the companion volume to the PBS series Evolution. His latest book,* Soul Made Flesh *(New York: The Free Press, 2004), is about the dawn of neurology in the 1600s.*

thought to the rules that govern the process.

Williams was struck by the *ad hoc* way that even prominent biologists would explain an adaptation. They would claim that it had evolved because it provided some benefit; often, an entire population or species supposedly benefited. Williams recalls a lecture he heard by Alfred Emerson, a zoologist at the University of Chicago, about why people age and die. "He said growing old and dying is a good thing," Williams says. "We've evolved to do it so we get out of the way, so the young people can go on maintaining the species."

"I thought it was absolute nonsense," says Williams. Whenever people like Emerson claimed that an adaptation was for the good of a species, they never offered an explanation of how, from one generation to another, that potential benefit produced real evolutionary change. Williams suspected that in most cases, no such explanation existed. For him, the primary engine of evolutionary change was the one Darwin had written about in the *Origin of Species*: competition among individuals of the same species. Most biologists in the 1950s simply failed to think seriously enough about how natural selection could produce adaptations, he says.

Williams wrote a series of papers critiquing the notion that adaptations were generally good for a group or a species, rather than an individual. Ultimately, his work led to his classic 1966 book *Adaptation and Natural Selection*. In it, Williams explained that almost every aspect of biology, no matter how puzzling, was the result of strict natural selection working on individuals.

Take a school of fish, for example. It seems as if every individual cooperates for the good of the group, working with others to avoid predators, even if it means that individual gets devoured in the process. Williams argued that the schooling behavior could instead be the product of individual fish trying to boost their personal chances of survival — by trying to get in the middle of the school and by watching other fish for signs of approaching predators.

Williams's book had an immediate, profound effect. "It fundamentally changed how biologists think about how natural selection works," says Randall Nesse, a psychiatrist at the University of Michigan, Ann Arbor, whose own studies of depression and other disorders are influenced by Williams.

One reason that the book was so effective was that Williams demonstrated how natural selection could influence the full course of a species' life history. It was not necessary to think of growing old as being for the good of the species, for example. Instead, Williams argued that the decline of old age could be caused by pleiotropy — in other words, the harmful side effects of genes selected for advantages they offered during youth. Just as long as the advantages of these genes outweighed the disadvantages, they would become widespread. Ironically, cancer, declining stamina, deteriorating vision, and various diseases of old age could all be the result of natural selection, says Williams: "Pleiotropy is the ultimate reason for all these things."

Williams argued that an organism faces these sorts of evolutionary tradeoffs throughout its lifetime: how much energy to invest in maturing before starting to reproduce, for example, or how much to invest in raising offspring before searching for another mate. Natural selection should find a balance between an animal's current investment in itself and its offspring and in potential future benefits. Williams speculated that animals could also keep track of how these factors change and adjust their behavior accordingly — like an investor deciding which stocks to keep or sell.

Researchers have now amassed a wealth of evidence showing that animals do alter their strategies in the face of changing conditions, as Williams proposed, investing more or less care in raising their young. Williams also suggested that his argument could apply to humans as well as animals, helping lay the groundwork for a Darwinian approach to human behavior (frequently referred to as evolutionary psychology).

"George was a supportive figure from the get-go," said Martin Daly of McMaster University in Ontario, a leading evolutionary psychologist. At the meeting, Daly and his wife, psychologist Margo Wilson, illustrated Williams's influence by describing an experiment they published in the 7 May issue of *Biology Letters* ("Do pretty women inspire men to discount the future?" 2004 May 7; 271 [S4]: 177–9).

The experiments grew out of a well-known economic phenomenon called "future discounting". People typically choose a small amount of money they can get today over a larger amount they will get in the distant future. Daly and Wilson proposed that the value people put on resources in the present and the future is influenced by natural selection: The better one's prospects for reproductive success look in the near term, the more one will discount the future.

"We wanted to see if we could do an experiment that would manipulate people's discount rate," said Wilson. First, they ran a simple discounting experiment on a group of male subjects who, as expected, tended to choose small money now over bigger sums far in the future. Then they ran the experiment again, but after showing the men a picture of an attractive woman. (They gave their subjects no explanation about the picture.) Daly and Wilson found that seeing that picture made the men even more likely to choose money in the short term. (Pictures of cars, by comparison, did not affect future discounting.)

Although Williams has convinced many people of the value of his ideas, the notion that human behavior can be broken down into such finely tuned reproduction-boosting adaptations is, to say the least, controversial. The late Stephen Jay Gould liked to call this approach "Darwinian fundamentalism," and he credited Williams's *Adaptation and Natural Selection* as "the founding document for this ultimate version of Darwinian reductionism."

Likewise, Gould and others — such as Elliott Sober of the University of Wisconsin, Madison, and David Sloan Wilson of SUNY Stony Brook — have accused Williams's followers of focusing obsessively on individuals and reflexively dismissing the possibility of group selection or species

selection. Sober and Wilson, for example, argue that cooperative behavior may have evolved in our own species because cooperative groups outcompeted uncooperative ones. It is a testament to Williams's stature that Sober is careful to distinguish between Williams and Williams's followers. "Williams is less hostile to group selection than his followers are. It's ironic that he's become the icon for the anti–group-selectionists."

Although speakers at the meeting did not directly address these controversies, they did confront a major disappointment: the failure of Williams's adaptationism to influence medicine. Since the early 1990s, Williams has argued that because medicine compensates for the shortcomings of our adaptations, doctors should get a sound grounding in evolutionary biology. Exploring the evolutionary forces that have shaped our bodies could produce new hypotheses about the causes of diseases, he maintains, and point the way to more effective treatments.

At the meeting, evolutionary biologist David Haig of Harvard University offered an example of the insights that the Williams approach can offer to pregnancy. Haig pointed out that during a pregnancy, the evolutionary interests of mother and child overlap in some ways but conflict in others. The investment a mother puts into the child can potentially reduce the amount of energy she could put into future children. The child, on the other hand, benefits if its mother focuses all her attention on it.

Haig showed how this perspective on pregnancy can shed light on pre-eclampsia, a mysterious condition that causes dangerously high blood pressure in pregnant women. Haig suggested that pre-eclampsia might be the result of a fetus trying to draw nutrients to the placenta. He proposed that, when in need, a fetus might release factors into the maternal bloodstream that damage the walls of the mother's blood vessels, thereby raising the resistance of her circulatory system. Because the resistance in the vessels feeding the placenta would be lower, more blood would flow to the fetus.

At the Stony Brook meeting, Haig reported on recent research by Ananth Karumanchi of Harvard Medical School in Boston and his colleagues, who studied a curious protein released by the fetal placenta that blocks the repair of damaged blood vessels. Karumanchi and his co-workers found that levels of this substance — known as placental soluble Fms-like tyrosine kinase 1 (sFlt1) — rose significantly in women with pre-eclampsia just before the symptoms emerged, a finding that Haig cites as "evidence of the antagonistic relationship of fetal and maternal factors."

"It's an outstanding hypothesis," Karumanchi says of Haig's research. "It makes a lot of sense in my mind." He points out that even in normal woman who do not experience pre-eclampsia, levels of sFlt1 rise toward the end of pregnancy. "As the fetus is growing, it needs to get more blood to itself, and so it secretes more of the protein," he speculates.

Yet at the meeting, Haig readily admitted that this evolutionary approach has not yet penetrated the medical community. "Darwinian ideas are not making a big impact" on the way doctors think, said Haig, pointing out that at his own Harvard Medical School, students still get no training in evolutionary biology.

Karumanchi admits that he learned about Darwinian medicine only when Haig approached him recently. "I'd never thought that evolutionary biology was important before now," he says. "There's a big barrier between people like me who are physicians and people who are in biology departments. Those barriers need to be broken."

Mart Gross, a biologist at the University of Toronto, agreed that Williams's ideas have yet to produce as much impact outside of evolutionary biology as he and other followers believe they deserve. He, for one, puts an optimistic stamp on the situation. "It's still very early on," says Gross. "After all, think how long it took for Darwin's ideas about natural selection to really take hold. I think Williams is at the same stage." It is clear that just as Darwin remained controversial long after his death, the legacy of George Williams's work will stimulate research for decades to come.

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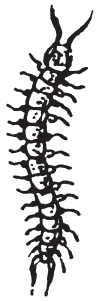

BBC Reports HMS Beagle Found

According to a BBC news report published on February 27, 2004, the remains of the ship that carried Charles Darwin and Captain FitzRoy around the world has been located at the bottom of a marsh in Essex, England. The fate of the *Beagle* and its final resting place have been a mystery for some time. The BBC reports: "A team led by Dr Robert Prescott of the University of St Andrews has located what they believe are the remains of *HMS Beagle* beneath an Essex marsh." The team used advanced radar equipment to detect signs of wood and metal that may belong to the bottom of a ship like the *Beagle*.

Prescott and his team inferred the possible location of the ship after studying historical documents about the *Beagle's* service after its return from its most famous voyage. It performed mostly coastal and estuarine duties. When it was decommissioned in 1870, it was sold and most of the usable materials above the waterline were removed.

Exploring the site, Prescott and his team have recovered pottery described as "mid-Victorian" and an anchor that matched the type used during the *Beagle*'s coast-guard service. Whether it will be feasible to recover what remains of the ship, and whether there will be funding to do so, is not yet clear.

[The complete news report can be found at <http://news.bbc.co.uk/go/2/hi/science/nature/3490564.stm>.]

The Coso Artifact: Mystery from the Depths of Time?

Pierre Stromberg and Paul V Heinrich

Introduction

Creationists have often been criticized for failing to present original research and evidence that would overthrow our contemporary scientific view of human origins. However, this is not entirely fair. The creation "science" field known as OOPARTS, or "Out Of Place ARTifactS", is a lively area of study that relies on "anomalous" finds in the archaeological record to challenge scientific chronologies and models of human evolution. In this paper, we will examine one of the most popular and least understood OOPARTS specimen, the Coso Artifact.

The story of the Coso Artifact has been embellished over the years, but nearly all accounts of the actual discovery are basically the same. On February 13, 1961, Wallace Lane, Virginia Maxey, and Mike Mikesell were seeking interesting mineral specimens, particularly geodes, for their LM&V Rockhounds Gem and Gift Shop in Olancha, California. The trio was about 6 miles northeast of Olancha, near the top of a peak about 4300 feet in elevation and about 340 feet above the dry bed of Owens Lake. At lunchtime, after collecting rocks most of the morning, all three placed their specimens in the rock sack Mikesell was carrying (Steiger 1974: 49).

The next day in the gift shop's workroom, Mikesell ruined a nearly new diamond saw blade while cutting what he thought was a geode. Inside the cut nodule, Mikesell did not find the cavity that is typical of geodes, but a perfectly circular section of very hard, white material that appeared to be porcelain. In the center of the porcelain cylinder was a 2-millimeter shaft of bright metal. The metal shaft responded to a magnet. There were other odd qualities about the specimen. The outer layer of the specimen was encrusted with fossil shells and their fragments. In addition to shells, the discoverers noticed two nonmagnetic metallic objects in the crust, resembling a nail and a washer. Stranger still, the inner layer was hexagonal and seemed to form a casing around the hard porcelain cylinder. Within the inner layer, a layer of decomposing copper surrounded the porcelain cylinder.

The Initial Investigations

Very little is known about the initial physical inspections of the artifact. According to Maxey, a geologist she consulted who examined the fossil shells encrusting the specimen said that the nodule had taken at least 500 000 years to attain its present form. However, the identity of the first geologist is still a mystery, and his findings were never published.

Another investigation was conducted by creationist Ron Calais. Calais is the only other individual known to have physically inspected the artifact, and he was allowed to record images of the nodule using both X-ray and natural-light photography. Calais's X-rays brought interest in the artifact to a new level. The X-ray of the upper end of the object seemed to reveal some sort of tiny spring or helix. *INFO Journal* editor Ronald J Willis (1969) speculated that it could actually be "the remains of a corroded piece of metal with threads." The other half of the artifact revealed a sheath of metal, presumably copper, covering the porcelain cylinder.

The last individual known to possess the Coso Artifact was one of the original discoverers, Wallace Lane. Lane had the object on display in his home, but he adamantly

---

Pierre Stromberg is the founder of Pacific Northwest Skeptics and has been fascinated by origins research after he saw PBS Nova's destructive exposé of Erich vön Daniken's Chariots of the Gods. *Since then, he has encouraged a grassroots movement to combat creationism in the Pacific Northwest. When he is not battling creationists, he enjoys hearing stories about local hauntings, alien abductions, and UFO sightings. He has a BS in computer science and is currently employed as a software quality assurance manager in Redmond, Washington.*

Paul V Heinrich is a geologist and Research Associate at Louisiana State University. He has an MS in geology and over 13 years' experience as a geologist. His work experience includes years of research in Quaternary geology, geologic mapping, and archaeological geology. He is a registered professional geologist and has been interested in the "wild side of geoarchaeology" since watching the "Mysterious Origins of Man" in 1996.

refused to allow anyone to examine it (Willis 1969). However, he had a standing offer to sell it for $25 000. In September 1999, a national search to locate any of the original discoverers proved fruitless. We suspect that Lane is dead. Maxey is alive, but is avoiding any public comment, and the whereabouts of Mikesell remain unknown. The location and disposition of the artifact are also unknown. Willis's 1969 article is the primary source for information on this object to date.

Fantastic Speculations

Ever since the artifact was first discovered, numerous individuals have speculated about its mysterious origin and possible use. Maxey speculated that the specimen may have been no more than 100 years old after being deposited in a mud bed and sun-baked. However, she also apparently claimed that the artifact could be at least 500 000 years old, "an instrument as old as Mu or Atlantis. Perhaps it is a communications device or some sort of directional finder or some sort of instrument made to utilize power principles we know nothing about" (Steiger 1974).

INFO Journal editor Willis speculated that the artifact was some sort of spark plug. His brother found the suggestion extraordinary: "I was thunderstruck," he wrote, "for suddenly all the parts seemed to fit. The object sliced in two shows a hexagonal part, a porcelain or ceramic insulator with a central metallic shaft — the basic components of any spark plug" (Willis 1969). However, they could not reconcile the upper end featuring a "spring", "helix", or "metal threads" with any contemporary spark plug. So the mystery continued. The artifact even appeared briefly at the end of an *In Search Of ...* episode hosted by Leonard Nimoy.

The internet offers a plethora of other opinions on the subject. While most writers simply report the mystery as described earlier, some have taken to speculating on the purpose and origin of such a device. Brian Wood, describing himself as "Co-Producer, ParaNet UFO Continuum [and] International Director of MICAP [Multinational Investigations Cooperative on Aerial Phenomena]", suggested that if it is not simply a spark plug, "My guess would be some sort of antenna. The construction reminds me of modern attempts at superconductors" (Wood 1999).

Joe Held of "Joe's UFOs and Space Mysteries" thinks that the device "looks similar to a small capacitor with several different materials. The object is roughly the size of an auto spark plug. Since the formation of geodes can take millions of years this was a very curious find indeed" (Held 1999).

The Creationists and the Artifact

With such outrageous speculation, individuals familiar with the creationism/evolution controversy might assume that fundamentalist Christians would stay far away from such artifacts and stories. But this is far from the case. Numerous creationists have been involved with this artifact since its discovery. Calais, who was involved with the Coso Artifact since its initial discovery, is an active contributor to creationist literature (see, for example, Calais and Mehlert 1996). He brought the artifact to the attention of the Charles Fort Society, publisher of *INFO Journal*. Creation Outreach, a Spokane, Washington-based creationism ministry promotes the artifact on its website by reprinting an article by JR Jochmans which concludes:

> As a whole, the "Coso artifact" is now believed to be something more than a piece of machinery: The carefully shaped ceramic, metallic shaft and copper components hint at some form of electrical instrument. The closest modern apparatus that researchers have been able to equate it with is a spark plug. However, there are certain features — particularly the spring or helix terminal — that does [*sic*] not correspond to any known spark plug today (Jochmans 1979).

It should also be noted that according to a letter printed in *Atlantis Rising*, Jochmans claims to have ghost-written three-quarters of the book *Secrets of the Lost Races* by Rene Noorbergen (1977), which has often been cited as a reference for the Coso Artifact by young-earth creationists (Jochmans 1999). For example, Carl Baugh, a young-earth creationist whose claim to fame is the promotion of the Paluxy River tracks, relies on Noorbergen (1977) in his discussion of the Coso Artifact in his dissertation (Baugh 1989).

Elsewhere in the Pacific Northwest, Institute for Creation Research (ICR) adjunct faculty member Donald Chittick has been heavily promoting the Coso Artifact. In *The Puzzle of Ancient Man,* Chittick (1997) presents the Coso Artifact as evidence that ancient civilizations were extremely advanced. Presuming that it *is* an ancient spark plug, Chittick explains his inference that this find indicates technological sophistication. He admits that reliable dates are unlikely, but then goes on to argue that the plug is old because geodes take too long to form. Chittick's discussion assumes that the plug was found inside a naturally occurring geode, which would indicate great age and therefore an "out-of-place" artifact. This, he argues, refutes evolution, since evolutionary models fail to explain the existence of such sophisticated technology so long ago.

The Geologic Evidence: Is the Coso Artifact Encased in a Geode?

When it comes to the geologic evidence, the most stunning claim is that the artifact was discovered in a geode. As Chittick has noted, formation of a geode requires significant amounts of time. But what is often overlooked is that the Coso Artifact possesses no characteristics that would classify it as a geode. The fact that the original discoverers were looking for geodes on the day the artifact was found is not sufficient evidence that the artifact *is* a geode.

Geodes consist of a thin outer shell composed of dense chalcedonic silica and filled with a layer of quartz crystals. The Coso Artifact does not possess either feature. Maxey referred to the material covering the artifact as

"hardened clay" and noted that it had picked up a miscellaneous collection of pebbles, including a "nail and washer". Analysis of the surface material using the standard Mohs scale suggests a hardness of Mohs 3, which is much softer than chalcedony.

Other arguments regarding the ancient source of the Coso Artifact focus on the alleged fossil shells encrusted on the surface. If, as noted earlier, a nail and washer were also found on the same surface as the fossil shells, then the power of the inference of an ancient age for the artifact is seriously diminished. Even creationist literature notes how transport, erosion, or other geological changes in surface materials can lead to mistaken assumptions about the true age of individual objects. For example, *Creation Ex Nihilo*'s June–August 1998 issue features fence wire that had become encased by surface materials including "fossil" seashells ([Anonymous] 1998b, quotation marks in the original; see also [Anonymous] 1991, 1998a, 1999).

The Willis brothers seriously suspected the object was a contemporary spark plug.

The Artifact Itself: What Is It?

As noted earlier, numerous individuals have speculated about the identity of the Coso Artifact. The most common suggestion is that it is some sort of spark plug, designed and manufactured by an advanced civilization eons ago for technological devices equal to or surpassing our own. But there is no reason to conclude that the artifact was manufactured thousands of years ago. Some have half-heartedly suggested that the device could have been a contemporary spark plug circa 1961. But ancient artifact proponents point to the X-ray of the top half, which indicates some type of tiny spring or helix mechanism. The content of this X-ray, they argue, runs contrary to what we know about contemporary spark plugs.

A clue to what is revealed in the X-ray lies in one of the earliest articles about the artifact. Willis (1969) suggested that the upper end of the object "is actually the remains of a corroded piece of metal with threads." The Willis brothers seriously suspected the object was a contemporary spark plug, but were still unable to explain what was in the X-ray. Spark plugs of the 1960s typically terminated with no visible threading and tapered to a dull point. Though many of the interested parties agreed that the artifact bore a striking resemblance to a 20th-century spark plug, no one seems to have considered the idea of evolution — specifically, spark plug evolution.

Investigating the origins of the Coso Artifact revealed that mining operations were conducted in the area of discovery early in the 20th century. If internal combustion engines were used in these operations in the Coso mountain range, they would have been a very new technology at the time. So we extrapolated that spark plug technology would also have been in its infancy. To help us to learn more about spark-plug technology of a century ago, we enlisted the help of the Spark Plug Collectors of America (SPCA). We sent letters to four different spark plug collectors describing the Coso Artifact, including Calais's X-rays of the object in question. We expected the SPCA to provide some vague hints or no information at all about the artifact. The actual answers were stunning.

On September 9, 1999, Chad Windham, President of the SPCA, called Pierre Stromberg. Windham initially suspected that Stromberg was a fellow spark plug collector, writing incognito, with the motive of hoaxing him. His fears were compounded by the fact that there is an actual line of spark plugs named "Stromberg". Though Stromberg repeatedly assured Windham that his intentions were purely for research, he was puzzled why Windham was so suspicious and asked him to explain. Windham replied that it was so obvious to him that the artifact was a contemporary spark plug, the letter had to be a hoax. "I knew what it was the moment I saw the X-rays," Windham wrote.

Stromberg asked Windham if he could identify the particular make of the spark plug. Windham replied he was certain that it was a 1920s-era Champion spark plug. Later, Windham sent 2 identical spark plugs for comparison. Ten days after Windham's telephone call, Bill Bond, founder of the SPCA and curator of a private museum of spark plugs containing more than 2000 specimens, called Stromberg. Bond said he thought he knew the identity of the Coso Artifact: "A 1920s Champion spark plug." Spark plug collectors Mike Healy and Jeff Bartheld (Vice President of the SPCA) also concurred with Bond's and Windham's assessment about the spark plug. To date, there has been no dissent among the spark plug collectors as to the identity of the Coso Artifact.

Since Windham mentioned that spark plug collectors enjoy pulling pranks on one another, the question of deliberate fraud inevitably crops up in relation to the Coso Artifact. However, there is little hard evidence that the original discoverers intended to deceive anyone from the start. Furthermore, the Spark Plug Collectors of America was formed in 1975, well after the discovery of the artifact, and none of the 3 discoverers was ever affiliated with the organization.

Comparisons and Analysis

On September 14, 1999, Stromberg received a package from Windham containing 2 spark plugs and an analysis of the specimens. Windham wrote:

> I am enclosing two spark plugs made by Champion Spark Plug company circa 1920s. Plug #1 is 7/8" #18 thread. I have loosely assembled the plug, and chipped the "brass hat" off to show the configuration of it and the porcelain under it. Plug #2 is ½" NPT of same design.
>
> The diameter of the porcelain on Plug #1 is slightly less than ¾" — close to the dimension in your letter. As you can see[,] the base and packing nut[,] which hold the porcelain, are sealed with a copper and asbestos gasket. This corresponds with the article. The center electrode of plugs were made of

special alloys which were "... cut in two in 1961 but five years afterwards had no tarnishing visible."

The sketches included clearly show one rib on the upper end of the porcelain, although Champion used two ribs in this era — probably just an artist's error. The "top hat["] matches those of "plug 1 and 2".

As for the outer shell, it obviously decayed — probably from salt water (or other corrosive substance) [—] and the outer crust is merely some sort of deposit like sea shells or other deposits collected on the deteriorating surfaces of the spark plug base.

There is *no* doubt that this is merely an old spark plug. Most probably, it is a Champion spark plug, similar to the two enclosed.

The most striking aspect of Windham's description is the brass "top hat" that has so vexed previous attempts to provide a rational explanation for the artifact. But other similarities are even more significant. Because Windham had chipped the brass top hat off specimen #1, the spark plug revealed a metal shaft terminating in a flared end, presumably to help to secure the top hat to the plug's porcelain cylinder. The same sort of flared end also appears in the metal shaft of the Coso Artifact. The shaft in the X-ray, just below the flare, also reveals deterioration where it was exposed to the elements above where it meets the porcelain cylinder. This, too, is exactly what we would expect from a 1920s-era Champion spark plug. An X-ray of the specimen that Windham sent us reveals a picture very similar to the original X-ray of the Coso Artifact. As with the original artifact, the central metal shaft of both specimens responds to a magnet.

Proponents of fantastic stories regarding the artifact have made mention of mysterious copper rings that encase the porcelain. But this too can be easily explained. Windham provided one completely disassembled plug (specimen #1). It revealed a pair of copper rings sandwiching an asbestos lining. According to Windham, this design was necessary because porcelain and steel have vastly differing expansion rates, so the copper was used to compensate for some of the problems this difference caused.

Specimen #2 was not disassembled by Windham, but also presented a feature that could explain why the artifact had not been identified decades ago. Specimen #2, though suffering from severe tarnish, came with a top nut screwed into its top hat. Almost all Champion spark plug advertisements of the first half of the 20th century showed pictures of their spark plugs including the top nut already screwed into place. In some cases, the top nut comes in two forms, one of which closely mimics the tip of today's contemporary spark plugs, which have no threading whatsoever. So it becomes rather easy to understand why the appearance of threads in the Coso Artifact seemed so puzzling to the original investigators.

It should be noted that the corrosion of the Coso Artifact almost completely destroyed any of the iron-alloy-based components, with the exception of the metal shaft encased in the porcelain cylinder. The samples received from Windham also revealed corrosion of the iron-based components, but the brass top hats were unscathed, except for some tarnishing. If the Coso Artifact is indeed a 1920s-era Champion spark plug, the X-ray of an almost perfectly preserved top hat is exactly what one would expect. Brass, a copper–zinc alloy, is commonly engineered to resist corrosion far better than iron-based alloys. In harsh environments, copper tends to outlast iron, but still succumbs fairly quickly. The rates of decay in the Coso Artifact match the rates of decay one would see in a 1920s-era Champion spark plug. An excellent review (Cronyn 1990) of how ferrous and non-ferrous alloys decay over time includes numerous photographs, including X-rays, of contemporary objects that have completely decayed into oxide nodules. Like the Coso Artifact, these examples also feature empty cavities where the original materials once resided.

The formation of the iron oxide nodule probably was hastened by the fact that corrosive "mineral dust" is blown off the dry lake bed of Lake Owen and onto the surrounding uplands where the artifact was discovered. This dust contains salts created by the evaporation of the lake water that are regularly blown off the lake bed by local windstorms. The US Geological Survey has conducted extensive investigations of this phenomena (Reheis 1997).

Reaction from the Paranormal Community

The embrace of the Coso Artifact by young-earth creationists is truly puzzling. We asked the ICR's Donald Chittick why he felt the Coso Artifact was an object worthy of presentation to the public, and specifically how he reconciled a previous age estimate of 500 000 years with his young-earth creationist beliefs. On September 29, 1999, Chittick responded:

> The article's speculation that it had taken at least 500 000 years to attain the present form is just that: speculation. Actual petrifaction of such objects proceeds normally quite rapidly, as is illustrated by several other similar formations. See for instance, the note about the petrified miner's hat on the back cover of *Creation Ex Nihilo* (Vol 17, Nr 3) for June–August, 1995. See also an article about another "fossil" spark plug in *Creation Ex Nihilo* (Vol 21, Nr 4) for September–November, 1999 on page 6.
>
> You asked what I thought about its age. My best guess is that it is probably early post-Flood. I have not yet been able to obtain sufficient documentation, so I don't say much publicly. However, there is evidence that they did in fact perhaps have internal combustion engines or even jet engines way back then.

The embrace of the Coso Artifact by young-earth creationists is truly puzzling. ... Creation Outreach continues to promote the spark plug.

Chittick's revelation that he was

already aware of "fossil" spark plugs was startling. We asked in a follow-up letter how he can positively date the Coso Artifact to the Great Flood since he was already aware of contemporary spark plugs that appear to be fossilized. In his response on October 23, 1999, he commented:

> It has not been my privilege to personally examine the Coso Artifact or location and strata where it was found. There are two reasons I considered the Artifact significant.
>
> 1. It obviously is a man-made item.
> 2. Those who evaluated the strata said that it appeared to be old, not modern strata. Those two items are the principle basis for my conclusion that it was worth study. Certainly it does merit further study in my judgment. Numerous items like that abound, but I haven't been able to document them as thoroughly as I would like, and so I don't say too much about them.

As noted earlier, the alleged stratum where the Coso Artifact was found is unknown since all 3 discoverers had separately searched for geodes all morning before consolidating their collections in a single sack. Even if the exact location were discovered, the artifact was an oxide nodule freely lying on the surface, so the stratum where the item was discovered is irrelevant, because surface deposits are an inconsistent mix of eroded, transported, and generally jumbled-up materials that are out of any meaningful geologic or archaeologic contexts.

Once the investigation revealed beyond a reasonable doubt the true nature of the artifact, Stromberg notified Chittick via postal mail, warning him about the publication of this paper and urging him to issue a retraction and to paste a disclaimer in his book that the Coso Artifact story is fallacious. Chittick never responded, and the second edition of *The Puzzle of Ancient Man* promotes the Artifact with no disclaimer, but Chittick seems to have stopped mentioning the artifact in his public lectures. When Ken Clark of Spokane's Creation Outreach learned that the Artifact was a 1920s-era Champion spark plug and was offered detailed proof, he ceased to communicate with us. Although Creation Outreach continues to promote the spark plug on its web site by reproducing Jochmans (1979), it adds the editorial note: "Several readers have stated the artifact is indeed a sparkplug from the 1920s" (see <http://home.att.net/~creationoutreach/pages/strange.htm>).

Conclusion

The Coso Artifact is a remarkable example of how pseudosciences such as "creation science" fail when their analyses and conclusions are investigated in a real-life archaeological situation. Perhaps the most surprising revelation is the stunningly poor research Chittick conducted regarding the Artifact. He persisted in portraying of the Artifact as "ancient" evidence for advanced technology. (*RNCSE* readers may recall an earlier incident in which Chittick was confronted about his erroneous statements regarding Lucy's knee joint [Stromberg 1998]; his reaction was similar, ignoring warnings and continuing to mislead his audiences.)

The Coso Artifact was indeed a remarkable device. It was a 1920s-era Champion spark plug that probably powered a Ford engine, possibly modified to serve mining operations in the Coso mountain range of California. To suggest that it was a device belonging to an advanced civilization of the ancient past could be interpreted as true, but only if we redefine "ancient" to mean "the early 20th century".

Acknowledgments

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The Antiquity of Man: Reviewing Hindu Creationism

Michael Brass

Introduction

What convinced me to take up the task of refuting Michael Cremo and Richard Thompson's Hindu-inspired creationism was twofold. First, their books have been phenomenally successful, selling briskly around the world. They have a simplistic yet expressive writing style that is highly effective. Their Hindu-inspired creationist views are presented in such a way as to appear scientific when they are in fact being pseudoscientific, using scientific terminology in order to expropriate scientific authority. Second, considering their widespread commercial success, it is clear that their books have reached many readers who possess neither the background knowledge and training nor the easy access to university facilities and the technical journals necessary in order to formulate their own critiques. Furthermore, the literature of human evolution is vast and extremely complex, and I felt it needed to be synthesized within an accessible framework so that a general readership can apply it to the evaluation of Cremo and Thompson's work.

Cremo is a prominent staff member of the Bhaktivedanta Institute — the research branch of the International Society for Krishna Consciousness (currently with branches in Florida, Los Angeles, Berkeley, and Mumbai). Cremo and Thompson used the Institute's religious concepts based on Vedic literature from India, and expressed them in the best-seller *Forbidden Archaeology* (1994) and its shortened version for the general public, *The Hidden History of the Human Race* (1999). On his web site (<http://www.mcremo.com/cremo>), Cremo argues that the mainstream scientific community not only ignores and suppresses evidence, but also prevents the attainment of the higher consciousness that that the Bhaktivedanta Institute promotes:

> With Dr Richard L Thompson, a founding member of the Bhaktivedanta Institute, I began a series of books aimed at both scholarly and popular audiences. The first to be published was *Forbidden Archaeology*. ... This book shows that archaeologists and anthropologists, over the past one hundred and fifty years, have accumulated vast amounts of evidence showing that humans like ourselves have existed on this planet for tens of millions of years. We show how this evidence has been suppressed, ignored, and forgotten because it contradicts generally-held ideas about human evolution. In lecture presentations on *Forbidden Archaeology* to scientific and lay audiences around the world I see a new consciousness emerging that integrates science and religion into a cohesive paradigm of reality.

In light of the book's foundation in the Hindu creationist narrative, it may be somewhat surprising to encounter the ringing endorsement given to their book by one of the most prominent Christian creationists, Phillip Johnson, on the back cover of *The Hidden History of the Human Race*: "A stunning description of some of the evidence that was once known to science, but which has disappeared from view due to the 'knowledge filter' that protects the ruling paradigm."

In fact, the "knowledge filter" in use is that of Cremo and Thompson. Only by filtering or even ignoring the vast array of evidence from archaeology and paleoanthropology could the authors arrive at their conclusion that humans have existed on the planet for tens of millions of years. This evidence shows that early australopithecines diverged from a population of ancestors shared with modern African apes some time around 5–8 million years ago (MYA) and that anatomically modern humans first appear only about 250 000 years ago. In this essay, I will review both the evidence that Cremo and Thompson misuse and that which they ignore.

The Anatomical Evidence

The anatomical evidence — both fossil and contemporary — demonstrates that australopithecines and chimpanzees share a geologically recent common ancestor and that *Homo sapiens* are descendants of the evolutionary lineage that began with the divergence of the australopithecines from that ancestral population.

There are several anatomical features that distinguish humans from our closest biological relative, the African apes. In australop-

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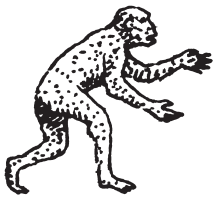
ithecines, many of these features either resemble the form seen in modern humans or else show a form intermediate between humans and African apes. Australopithecines show changes in these features that are intermediate between the condition in modern chimpanzees and humans:

- The canines of the australopithecines do not project much further forward in relation to the other teeth than they do in *Homo*;
- Australopithecine canines show a decrease in sexual size differences over time — the more recent forms are more like those of modern humans;
- The thickness of australopithecine tooth enamel increased over time to a thickness more like that of *Homo* tooth enamel;
- Wear patterns on australopithecine cheek teeth suggest a "crushing" action, similar to that of *Homo*;
- The cranial capacity of australopithecines increased over time to a capacity range approaching that of early *Homo*;
- The australopithecine foramen magnum, which allows the spinal cord to connect with the base of the brain, is located more toward the base of the skull than in apes, yet not completely under the skull, as in *Homo*, except in the robust australopithecines (also known as *Paranthropus*), where it was just as in *Homo*; and
- The australopithecine tibiae share features (orientation angle, thickness, and internal structure) with those of *Homo*, reflecting the common demands placed on their bodies by bipedalism.



The anatomical *similarities* between chimpanzees and anatomically modern humans (*Homo sapiens*) indicate recent common ancestry because they represent traits that are shared by all apes and humans, but in a modified form that differs consistently in this group compared to other nonhuman primates:

- In both species, the rib cage is broad from side to side and shallow from front to back, extending back beyond the vertebral column;
- Both species have a dorsally-placed scapula and shoulder joints facing outward to the side;
- The positioning and angle of the humeral shaft and humeral head and other joints in the forelimb are the same in both species.

The examples in Table 1 clearly show that australopithecines possessed anatomical features that were intermediate between modern humans and our nearest ape relatives. So, how do we know that they are really in the hominin clade — a branch set off from the one leading to modern African apes? There answer lies in those anatomical features that are found in humans and no other primate species, for example the anatomical features associated with our particular form of locomotion. Upright walking appears to have evolved early in the hominin clade, so anatomical modifications related to this behavior go back as far as hominin fossils do — in fact it is one of the ways that we diagnose hominin fossils. However, despite the antiquity of these modifications, earlier hominins can be distinguished from modern humans, and genus *Australopithecus* from genus *Homo*, based on uniquely derived traits that emerged only after the emergence of the latter — if the diagnostic features are preserved in the specimens under study.

However, because of the overall similarity among these genera due to the biomechanical demands of upright locomotion, preliminary studies can cause confusion when the diagnostic features are not well preserved (or if they were identified later). For example, in 1965, Patterson and Howells (1967) discovered a humerus at Kanapoi that is now attributed to *Australopithecus anamensis*. Although Cremo and Thompson do not mention *A anamensis* by name, they discuss this find and attribute it to *Homo sapiens* by stating:

Table 1. Anatomical similarities and differences among modern chimpanzees, australopithecines, and modern humans

Modern Chimpanzees	Australopithecines	Modern Humans
Canines larger and project out from tooth row	Canines slightly larger, but non-projecting	Canines of similar size to other teeth and non-projecting
Extensive canine size dimorphism by sex	Moderate canine size dimorphism by sex	Minimal canine size dimorphism by sex
Tooth enamel thin	Tooth enamel intermediate	Tooth enamel thick
Dental wear pattern shows grinding action	Dental wear pattern shows crushing action	Dental wear pattern shows crushing action
Cranial capacity around 400 cc	Cranial capacity 350–540 cc	Cranial Capacity ≥ 1000 cc
Foramen magnum opens toward rear of skull	Foramen magnum opens between rear and base of skull	Foramen magnum opens at base of skull
Tibiae thin and angled	Tibiae thicker and straighter	Tibiae thick and straight
Rib cage broad and extends past vertebral column	Rib cage broad and extends past vertebral column	Rib cage broad and extends past vertebral column
Scapulae on the back, shoulder joints oriented to the sides	Scapulae on the back, shoulder joints oriented to the sides	Scapulae on the back, shoulder joints oriented to the sides

Patterson and Howells found that the Kanapoi humerus was different from the humeri of gorillas, chimpanzees, and australopithecines but similar to those of humans. They noted that "there are individuals in our sample of man on whom measurements … of Kanapoi Hominoid I can be duplicated almost exactly." Patterson and Howells would not have dreamed of suggesting that the Kanapoi humerus belonged to an anatomically modern human. Nevertheless, if an anatomically modern human had died at Kanapoi 4.0–4.5 million years ago, he or she might have left a humerus exactly like the one they found. Further confirmation of the humanlike morphology of the Kanapoi humerus came from anthropologists Henry M McHenry and Robert S Corruccini of the University of California. They concluded that "the Kanapoi humerus is barely distinguishable from modern Homo" and "shows the early emergence of a *Homo*-like elbow in every subtle detail." In a 1975 study, physical anthropologist CE Oxnard agreed with this analysis. He stated: "we can confirm clearly that the fossil from Kanapoi is very humanlike." This led Oxnard to suggest, as did Louis Leakey, that the australopithecines were not in the main line of human evolution. Keeping *Australopithecus* as a human ancestor would result in a very unlikely progression from the humanlike Kanapoi humerus, to the markedly less humanlike humerus of *Australopithecus*, and then to one more humanlike again (Cremo and Thompson 1999: 251–2).

It should be made clear that it is Cremo and Thompson's claim — not Patterson and Howells's — that modern humans might have left behind a "humerus exactly like the one they found." The important question for paleoanthropologists is whether the Kanapoi humerus is different from the humeri of other australopithecines. If Kranapoi is both a "typical" australopithecine humerus and is *also* nearly indistinguishable from humeri of modern humans, then Cremo and Thomspon's claim fails; the similarities do not prove that *Homo sapiens* was present 4.2 MYA, but only that anatomical changes in the human humerus are some of the earliest evolutionary changes associated with human divergence from the most recent common ancestor with apes.

To begin to answer this question, we should look for more recent examinations on the Kanapoi humerus than McHenry and Corruccini's 1975 study. When the humerus was first uncovered, its date could not be established with any degree of certainty. However, by the early 1980s, the discovery of *Australopithecus afarensis* at Hadar, Ethiopia, and further *A anamensis* finds at Kanapoi allowed a more careful analysis. These new investigations — which include more material, better dating, and new techniques for quantitative analysis — should bear more weight than the earliest reports on these specimens in determining the place of these specimens in human history. In other words, Cremo and Thompson appear to have selectively ignored the most recently scientific research and analyses — work that would have resolved many of the issues and questions their book raises by relying on 25–year-old publications that can only be regarded as preliminary.

For example, recent studies show great similarities between the Kanapoi humerus and those of *A afarensis* discovered at Hadar (discussed in Wolpoff 1999). As might be expected for an *intermediate* form, the Kanapoi humerus shares a number of features in common with all later hominins, but lacks an important derived trait of the genus *Homo*. Modern human distal humeri contain an internal cavity of spongy bone near the elbow; it is one of the features that can unquestionably identify a humerus as belonging to an anatomically modern human. However, this derived trait is absent from the Kanapoi find, indicating that, however much the rest of the humerus resembles that of a modern human, it was not a member of *H sapiens* but a representative of an earlier form. The error committed by Cremo and Thompson — in common with anti-evolutionists of all stripes — is to fail to recognize that not all anatomical traits are of equal importance in resolving the phylogenetic status of a particular fossil specimen. In this case, the overall number of similarities does not override the importance of the derived anatomical features present in *H sapiens* but absent in other members of the hominin lineage.

Cremo and Thompson appear to have selectively ignored the most recent scientific research and analyses.

Ancestors and Intermediates

No creationist story would be complete without disputing that the australopithecines are a part of our ancestral lineage. It is an essential part of the myth, which creationists try to bolster by citing two paleoanthropologists in particular: Sir Solly Zuckerman and Charles Oxnard — two scientists who in decades past disputed some of the specific findings and interpretations of mainstream paleoanthropologists on the position of various australopithecine specimens in the evolving hominin lineage. Standard creationist procedure also dictates that direct rebuttals to Zuckerman and Oxnard's articles or subsequent re-evaluations of their earlier work be overlooked. *The Hidden History of the Human Race* follows the procedure to the letter. An extra innovation is the claim that "Louis Leakey held that *Australopithecus* was an early and very apelike offshoot from the main line of human evolution. Later, his son Richard Leakey took much the same stance" (Cremo and Thompson 1999: 257). What Cremo and Thompson do not mention is that Richard Leakey subsequently abandoned this stance (Leakey and Lewin 1993: 141).

After giving the impression that

Richard Leakey still supports his father's idea, thereby lending an additional "air of authority" to their claims, Cremo and Thompson head back on the normal creationist track, insisting that Zuckerman and Oxnard have disproven any ancestral relationship between *Homo* and the australopithecines. This approach is mandatory, for if one of the australopithecine species were ancestral to *Homo*, their religious view that humans are a separate creation and that there are no intermediates between humans and other primates would be effectively destroyed. Zuckerman and Oxnard lost the debate in the 1950s and 1970s respectively; paleoanthropologists do consider *Homo* to have emerged from australopithecine ancestral stock. It should also be noted that while Oxnard removed the australopithecines from our line of *direct* ancestry, he agreed that *Homo* and the australopithecines shared a common ancestor — an agreement that Cremo and Thompson conspicuously fail to note.

Cremo and Thompson can reach their conclusions only with a selective use of scientific data.

Out of the muddle that Cremo and Thompson make of the hominin fossil record, it is fair to ask what they expect intermediary ancestors, along the path from the time of the chimpanzee–hominin split to the advent of *Homo sapiens*, to look like. The further back in time we go, the greater the anatomical similarities between the 2 lineages leading to modern chimpanzees and humans become. Cremo and Thompson share the view of other anti-evolutionists that the ape-like anatomical features that distinguish australopithecines from modern humans is supposedly proof that they do not belong in our lineage. However, the fact that the form of these features is intermediate between the condition in modern humans and modern apes (and more human-like than any of the remains of fossil apes up to the estimated time of divergence) is instead proof positive of the transition from the more ape-like ancestors to the more modern human forms that appear in the fossil record over the past 5 million years. But how do Cremo and Thompson evaluate this evidence?

In 1913 the German geologist Hans Reck was searching at Olduvai Gorge when his helpers came across an anatomically modern skeleton in Bed II, the second oldest of five beds (Morell 1995). Bed II is dated at 1.2 MYA. Louis Leakey visited the site in 1931 with Reck and agreed that the skeleton was in the bed where it was originally preserved and not an intrusive burial dug down into the older bed from a younger level. Later, however, after soil samples were tested from Bed II and the skeleton, they published their revised conclusions in the prestigious journal *Nature*: the skeleton was indeed an intrusive grave filling from Bed V — the stratum where modern human skeletons ought to be found. Leakey also stated, in *Stone Age Races of Kenya* (1935), that although this specimen appeared at first to be of great antiquity, subsequent scientific investigations revealed its age to match its recent modern morphology.

Cremo and Thompson (1999: 236) reject the revised conclusion on the speculative basis that "perhaps Reck was simply tired of fighting an old battle against odds that seemed more and more overwhelming." Further details are given by Louis Leakey's biographer, Virginia Morell (1995), which go unmentioned by Cremo and Thompson (1999):

> Meanwhile, in England the death knell was sounding for Olduvai Man. Several independent geological tests had been run on the skeleton and soil samples. These showed that the body had been buried in Bed II in comparatively recent times, when a fault exposed that horizon. Sometime after the burial, Beds III and IV eroded away; then Bed II had been covered over by the deposits of Bed V. Reck had mistaken the soil of Bed V for that of Bed III — an easy enough error to make as both are a deep red in color (Morell 1995: 66).

Cremo and Thompson (1999: 237) point out that Bed V has an age of 400 000 years before the present (BP), so the skeleton "still gives a potentially anomalous age for the fully human skeleton." However, Bed V is divided up into a number of component beds. While the lower Ndutu Bed began accumulating around 400 000 BP and ended about 75 000 BP, the most recent Naisiusiu Beds are dated 22 000 – 15 000 BP. Anatomically modern humans appeared before the end of the time period encompassed by the Ndutu Bed.

Protsch (1974) published the results of radiocarbon tests in 1974, which dated the skeleton to 16 920 years ago — well within the upper limits of the most recent age of the Naisiusiu Bed and much *younger* than the original estimates based on the burial horizon. Cremo and Thompson (1999: 237–8) challenge these results, claiming:

- It is uncertain whether the sample tested came from the original skeleton;
- The sample (224 grams) was a third smaller than the normal test size;
- The sample could have been contaminated by more recent carbon through exposure to bacteria and preservation with Sapon — an organic preservative — which may not have been taken into account during the testing process;
- Protsch did not use modern protein purification techniques in extracting collagen from the bone; and
- The amino acids were not dated individually (the technique called "Accelerator Mass Spectrometry", AMS, had not been used).

These arguments fail on several counts, many related to the technological and methodological advances in carbon isotope dating in the past 30 years.

In the 1970s, the typical sample required by many laboratories was 1 gram of carbon. Fresh bone contains 20% collagen. The carbon content of collagen is 40%, which means that 224 grams of bone could potentially give 18 grams of

carbon. Even if the bone were poorly preserved so that much of the organic content had been destroyed and had as little as 6% of the original carbon remaining in it, the tests could still have been carried out reliably because there would be about 1 gram of carbon to use in the analysis.

The requirement for dating each individual amino acid is a peculiarity of AMS dating procedures; it is not necessary in other radiocarbon analyses except when using extremely small samples, which can confound the age estimates in the presence of even very small amounts of contaminants. In the case of the skeleton Reck studied, individual dates for constituent amino acids are unnecessary.

Cremo and Thompson's critique of the validity of the procedures followed by Reck's laboratory therefore fails. However, they make an additional, more elementary mistake. In the extremely unlikely event that there were errors with the dating, they would be in exactly the opposite direction from what Cremo and Thompson predict. An intrusive burial — the interment of a recent skeleton into a deeper, geologically older stratum — would only have contamination from material much older than the skeleton. This contamination would make the age estimates based on the context of the burial falsely older, not younger, than the true age of the skeleton.

The Tool Man

The spread of stone tools is another line of evidence that supports the conventional views of human evolution, the rise of *Homo sapiens* (Foley and Lahr 1997), and the rise of modern behavior (Kaufman 1999; McBrearty and Brooks 2000). Cremo and Thompson contend that some eoliths (literally, "ancient stones") resemble Upper Pleistocene and Holocene (Late Stone Age) tools, despite the fact that none of the "tools" they cite exist today except as drawings whose accuracy cannot be determined. Furthermore, none is available for modern analyses with more powerful tools and techniques that have been developed in the last several decades.

According to Cremo and Thompson, anatomically modern humans manufactured Holocene-type tools tens of millions of years ago, side-by-side with Middle Stone Age, Acheulian-, and Oldowan-type industries. In that case it is very revealing that *H heidelbergensis*, whose anatomical features retain ancestral characteristics compared to modern *Homo sapiens*, is found with the Acheulian (1.6 MYA – 250 KYA) and Middle Stone Age (250 KYA – 20 KYA) industries; the first clear *Homo sapiens* fossils are in context with Middle Stone Age industries. Cremo and Thompson's hypothesis would require an association between hominin species and ancient tools that simply does not exist.

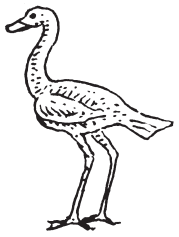
Cremo and Thompson do little better with New World tool technologies. Even taking into account the fierce debate raging within New World paleoanthropology regarding the age of the first populations in the Americas (Fiedel 2000), the date can be fixed in a broad range between about 14 000 and 40 000 BP. Seeking to extend the time of New World tool technology back beyond 200 000 BP, Cremo and Thompson focus upon the Calico site in California.

Their use of the specimens from Calico is a good example of their brand of "scientific scholarship". Calico is a prime example of a setting for eoliths, some dated to 200 000 BP by uranium isotope methods (Morell 1995). The site is in an alluvial fan — the geological signature of an active transport system. Rocks and boulders from the site have been removed, redeposited, and modified by erosion, abrasion, and impact. These stone cobbles — often also used for the most primitive stone tools — were broken as a consequence of this movement. The geological processes that most likely created the Calico eoliths are detailed by Haynes (1973). Thus, Cremo and Thompson's deduction that these fractured pebbles were stone tools is a haphazard guess, at best.

Conclusions

Cremo and Thompson can reach their conclusions only with a selective use of scientific data and ignoring the progress that paleoanthropology has made both in the number of specimens and the techniques available for analysis. Their conclusions regarding the nature of the hominin fossil and stone-tool record are internally contradictory — often failing to provide any support for their "alternative" model of human history. As with other creationist models, this inconsistent and contradictory use of the scientific evidence is caused by a prior commitment to a pre-scientific religious model. They commit the very sins of which they accuse the scientific establishment: In their book, "evidence has been suppressed, ignored, and forgotten because it contradicts" their prior commitment to a different view of human history.

Both the hominin artifactual and fossil remains supports current models of human evolution: Hominins diverged from a common ancestor with chimpanzees between 5–8 million years ago, first mastering upright walking and basic tool making in a succession of australopithecine species, later dramatically increasing geographic range, brain size, and cultural complexity — including tool technologies. Despite the variety of hominin species to precede us and pioneer a number of evolutionary innovations, we — modern *Homo sapiens* — are very recent survivors of the hominin evolutionary tree. This tree clearly shows a common ancestry of hominins with the nonhuman primates *and* a geologically recent emergence of hominins from a common ancestor with the African apes.



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BOOKREVIEWS

Human Paleobiology

by Robert B Eckhardt
Cambridge: Cambridge University Press, 2000. 368 pages.

**Reviewed by Richard J Sherwood,
Wright State University**

As an anthropology professor, I have taught a variety of classes, including one entitled Hominid Paleobiology. I was, therefore, very pleased and interested when asked to read and review Robert Eckhardt's book *Human Paleobiology*. It is common for books on human evolution to follow a certain formula: Begin by establishing historical background, follow up with tales of new fossil discoveries (usually by the author and often including humorous or harrowing stories of field work in desolate places), reiterate the importance of those fossils to interpretations of human evolution, and, finally, advocate the conclusion that more fossils need to be found and more work needs to be done. I, like many people, love that kind of book and have read many over the years. I must admit, though, that I do not need to read another account of Dart's discovery of the Taung child, or to learn again the lyrical etymology of a certain petite Ethiopian fossil, any time soon.

Upon reading the introductory chapter of *Human Paleobiology*, I realized that Eckhardt has loftier ambitions than *describing* a specific set of fossil finds; his intention is to discuss an approach to *analyzing* the fossil record. As defined in the book, "[t]he objective of paleobiology is to reconstruct the lifeways of past hominid populations — their biological characteristics, the environments in which they lived, their behavioral interfaces with environmental opportunities and constraints — and overall to gain as much insight into their ecological niches as possible" (p 18). To achieve this goal, data from a wide variety of evolutionary sciences, including developmental biology, morphology, behavior, and genetics, are blended to provide a paleobiological synthesis. Chapters deal with key evolutionary ideas such as adaptability, diversity, systematics, and demography. Throughout the book, Eckhardt provides a strong emphasis on the historical background for each topic.

It is clear from the start that Eckhardt is unhappy with what he identifies as the current focus of paleoanthropological research, namely phylogenetic reconstruction and taxonomy. Although it is true that anthropologists often receive tremendous press over disagreements regarding assigning specimens to specific taxa, Eckhardt simply does not want to weigh in on those discussions. The important issue for Eckhardt is not which names are applied to which fossils, but rather the concept of taxonomy that underlies the production of such names. Portraying the genus-and-species binomen typical of Linnaean taxonomy as restrictive, Eckhardt suggests examination of possible alternatives. This idea is certainly worthy of discussion and is just one of the topics covered that makes *Human Paleobiology* interesting.

I must say, though, that I was a bit surprised, given the above definition of paleobiology, that the book dedicates so much discussion to taxonomic issues, both theoretical and practical. For instance, there are lengthy passages discussing the features that may or may not define the taxon *Homo habilis* and whether the specimens KNM-ER 1470 and OH 62 can be accommodated within this single species. This is exactly this type of discussion that Eckhardt defined as unproductive within and contrary to the basic premise of paleobiology. The distortion of the field of paleobiology caused by this overemphasis on taxonomic issues is a recurrent theme throughout the book, and Eckhardt argues that links between taxonomic issues and paleobiology are tenuous at best. So the considerable attention that Eckhardt devotes to these issues detracts from achieving the stated goals of his book.

While the wide array of interesting topics promised are eventually covered in the book, the text is dense and often difficult to read. Certain passages are so replete with etymological derivations, superficial historical references, and trivial facts that the biological relevance is frequently lost. I found myself rereading paragraphs several times in an attempt simply to identify the topic sentence. I firmly believe that historical references are interesting and important, but this

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information would have often been better presented in footnotes.

For instance, I was particularly interested in the section labeled "Taxonomy encounters fossils". The section begins by describing what a fossil is, which is hardly necessary given the intended audience for the book (see below).The subsequent discussion in the first paragraph quickly turns to the etymology of the word "fossil". I must admit that I did not know the word originally came from the Latin *fossa*, meaning trench, or that it was first used by Georg Bauer, whose literary name was Agricola. I do know that none of that has much to do with taxonomy. The next paragraph descends into a discussion of a partial poem by Xenophanes and the similarities to an earlier work by Anaximander (of whom Xenophanes was a student). Later in that same paragraph,Aristotle is mentioned, followed by da Vinci, Fracastoro, and Niels Stensen (Steno; *see Kevin Padian's review of Alan Cutler's biography of Steno in* RNCSE *2004 Jan/Feb; 24 [1]: 37*).What is the common theme uniting these great minds across the centuries? We are told that they accepted fossils as the "remains of ordinary organisms that had lived and died in earlier times" (p 34). An important idea, to be sure, but it is almost lost among the layers of trivia. Fortunately, most of these diversions occur early in the book and the later chapters are more cohesive.

An important consideration when writing, or reviewing, a scientific book is to identify the intended audience. There are generally three possible alternatives: the lay audience with a general interest in the subject, an educated audience familiar with the terminology and some of the basic arguments in the field, or a professional audience familiar with the history, approaches, arguments, and data. *Human Paleobiology* is aimed somewhere between the second and third audiences but suffers from shifts throughout. Discussion of fossils often involves long lists of museum accession numbers (too often incorrectly reported). As noted in the text, this is the appropriate way to reference specimens (as opposed to nicknames such as "Lucy") within the discipline, but for those not well-acquainted with these fossils, these passages will be very difficult. On the other hand, several passages are surprisingly rudimentary, such as the description of chimpanzees on p 135.

Human Paleobiology covers a large number of topics, which ultimately makes the book useful. Rarely does a work try to incorporate such detailed discussions of the vast morphological, molecular, evolutionary, and behavioral literature with a single overarching purpose — to try to understand human evolution. In light of this breadth, it is not surprising that the bibliography is extensive and may itself be worth the purchase price. It is clearly not an easy book to read (and I was faced, yet again, with the story of Dart and Taung), but having done so, I can say there is much inside to stimulate the mind of anyone interested in human evolution.

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Origin of the Human Species

by Dennis Bonnette
Amsterdam/Atlanta (GA):
Rodopi BV, 2001. 202 pages.

Reviewed by Colin P Groves, Australian National University

Though it still has an enormous following in the Western world, especially in the US, orthodox creationism has taken a back seat as far as its scientific wannabes are concerned. Instead, educators and legislators are faced with something called "intelligent design" (ID), which pretends to an odd neutrality on the subject of evolution, insisting merely that there is a place for "an intelligent agency" in scientific research — a euphemism even its most ardent promoters regularly admit to their supporters (though seldom to the press or general public) is entirely consistent with the God of the Bible. A moment's reflection should remind legislators that a scientific hypothesis ought to be falsifiable and to lead on to a research program. "God did it, and there's an end to it" immediately chokes off all further research, and there can be no hope of falsifying it — in this life, at least (and afterward it is too late anyway) — and most scientists are appalled that ID could be presented as science. And it took very little digging for the mask of neutrality to be torn off, and there, underneath, was the old creationism.

If it cuts no ice with scientists, ID is fertile ground for philosophers with an axe to grind, and here is one such. Bonnette's book comes with a rave endorsement from none other than Michael Behe (ID's equivalent to young-earth creationists' Duane Gish: the pseudoscientific front-man with the biochemistry PhD): "His demonstration that the standard human evolution story is compatible with Christianity makes his conclusion that the story itself may be shaky all the more impressive." Yes, that's the ID technique: some of our best friends are evolutionists, but ... .

Fourteen chapters and an epilogue lay down this argument: evolution (particularly human evolution) *could* be true without ruffling a hair of the Christian's head, but actually it isn't. There are copious notes at the end, giving sources. This, however, is one of those annoying books in which the running head is the chapter *title* but the notes are grouped under chapter *number*; I had to keep a special bookmark in the notes section, until I began to realize that there was no need: the references are mostly to the same few sources.

And such sources! Aristotle is cited as bang-up-to-date, and so is Aquinas. Bonnette's leading source for the argument that evolution is all right is a 1963 book by Raymond J Nogar (*The Wisdom of Evolution* [New York: Doubleday]); his main source for the argument that evolution is *not* all right is, if you please, an unpublished manuscript written by one Austin M Woodbury of the Aquinas Academy in Sydney in — one hardly likes to say this — in 1945.

We have become used to the creationist tactic whereby yesterday's cutting-edge paleontological research is triumphantly negated by an out-of-context quote written by a famous chemist a quarter of a century ago, but this book appears to me to break new ground. The trump card is not

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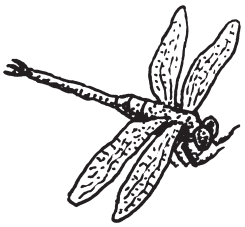
from a scientist of any kind, but from a philosopher and theologian; it was written well over half a century ago; and it was not even published, so even if we wanted to, we could not check it. Not that I would think it worth doing.

Here is Woodbury's argument against the argument for evolution from homology, as relayed to us by Bonnette (p 9–10):

> (1) ... it is possible that God simply created organisms according to an "archetypal plan" whose unity in the ideal order would naturally give rise to morphological similarities;
>
> (2) since higher forms "virtually contain" lower ones, one should expect production of similar formal effects such as similar organization and appearance;
>
> (3) ...



— no, I will not bother to go on. Suffice it to say that this is about as close as Bonnette ever gets to biology.

Time and again, Bonnette seems on the verge of coming to grips with science, then backs off in favor of philosophy — and not just any old philosophy, but theology. After being disappointed with the vapidity of chapters 2 through 4, in which Bonnette purports to discuss the concept of species (a particular interest of mine), I looked forward eagerly to chapter 5, "Significance of recent ape-language studies". I should have looked at the notes at the end: he does not even mention current studies; his most recent reference is 1983!

As far as Bonnette is concerned, these studies are stuck at the point when the Sebeoks discovered the "Clever Hans" effect and used it to explain the entire corpus of ape-language research. The vast research effort since then, and its surrounding context of cognitive studies, is lost on him. Even were he aware of it, I doubt if it would move him, because he has a position: "impressive experiments done by Savage-Rumbaugh and others manifest sophisticated ape-communicative skills," he writes on page 55, but then he seems to remember the task he has set himself — to prove a discontinuity between humans and all other animals — and writes, "Claims that apes understand the meaning of signs, create new word complexes, deceive, lie, reason, and so forth, still need not prove they have intellective powers" (p 59). In other words, whatever research may be produced in the future, he for one is not going to be swayed by mere facts. And we do not have to take his word for it: "Woodbury's positive demonstrations prove the non-existence of intellect in lower animals" (p 68).

And so we go on through chapters on the human soul, extraterrestrial life, and the truths of revelation (which are not argued, but taken for granted), to, at long last, paleoanthropology. His chief — no, in effect his only — source for paleoanthropology is Michael A Cremo and Richard L Thompson's blockbuster *Forbidden Archaeology* (San Diego: Govardhan Hill, 1994; reviewed in *Creation/Evolution* 1994; 34: 13–25), Hare Krishna's contribution to the creationist literature. In case readers have forgotten, this was an enormous book in which the authors described in great detail every single claim ever made for a human fossil, and concluded that a jawbone found by a mid-19th-century workman and sold to an amateur fossil-hunter for the price of a pint of beer was as authentic as one discovered and documented by a late-20th-century professional team with full stratigraphic context accompanied by radiometric dating. This led them to conclude in turn that the world is billions of years old, and human beings were present from the very beginning. Bonnette in fact thanks Cremo for his help with chapter 14. And that, dear reader, takes care of human evolution.

Philosophers have their place in human origins studies. When biologists and geologists — and perhaps cognitive psychologists — have elucidated the context, and paleoanthropologists have fleshed out the detailed scenario, then we can turn to philosophers to ask us what it all means for our place in the world. Philosophers are not equipped to take the place of the biologists, geologists, and paleoanthropologists, nor even of the psychologists. When they try to do so, they risk making idiots of themselves; and, when they not only do so but also have a barely hidden agenda that they are trying to fulfill, they lose every shred of credibility. It is an unfortunate fact that, if paraded as the last word, even Aristotle, the emperor of philosophers, has no clothes; Bonnette certainly has none, and he is not even an emperor.

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A Devil's Chaplain: Reflections on Hope, Lies, Science, and Love

by Richard Dawkins
New York: Houghton Mifflin, 2003.
viii + 263 pages.

Reviewed by Michael Ruse, Florida State University

Richard Dawkins once called me a "creep". He did so very publicly but meant no personal offense, and I took none: We were, and still are, friends. The cause of his ire — his anguish, even — was that, in the course of a public discussion, I was defending a position I did not truly hold. We philosophers are always doing this; it is a version of the *reductio ad absurdum* argument. We do so partly to stimulate debate (especially in the classroom), partly to see how far a position can be pushed before it collapses (and why), and partly (let us be frank) out of sheer bloody-mindedness, because we like to rile the opposition.

Dawkins, however, has the moral purity — some would say the moral rigidity — of the evangelical Christian or the committed feminist. Not even for the sake of argument can he endorse something that he thinks false. To do so is not just mistaken, he feels; in some deep sense, it is wrong. Life is serious, and there are evils to be fought. There must be no compromise or equivocation, even for pedagogical reasons. As the Quakers say, "Let your yea be yea, and your nay, nay."

All of this comes through very strongly in Dawkins's new book, *A Devil's Chaplain: Reflections on Hope, Lies, Science, and Love*. At one level, to be candid, it is not much of a book. It is a collection of what one might charitably call literary ephemera: not real articles, or chapters, but bits and pieces — reviews, introductions to the books of others, eulogies, items in the popular press, and so forth. The pieces were written that way and read that way. They are good for the moment, but hardly worth laying down for the future. How often has one had a wonderful, local wine in a little restaurant in Spain or Italy, and on bringing a bottle home been amazed at how thin and sour it tastes when served up proudly to one's friends? It is much this way with the contents of *A Devil's Chaplain*.

Michael Ruse is Lucyle T Werkmeister Professor of Philosophy at Florida State University.

On another level, however, Dawkins's collection is really interesting and does raise absolutely crucial issues. In recent years, his attention has swung from writing about science for a popular audience to waging an all-out attack on Christianity. In the name of Darwinism, he has become the scourge of the religious, the atheist's answer to Billy Graham. At every opportunity, he preaches the hard truth — there is no God, religion is superstition, and Darwin proves just this. Essentially, what ties this volume together is the crusade of nonbelief, for just about every piece carries this same message.

The collection has 7 sections. The first, *Science and Sensibility*, ranges from an open letter to Tony Blair about science, genetics, and ethics to a savage attack on cultural studies and postmodernism. The second, *Light Will Be Thrown,* takes its title from Charles Darwin's comment in *On the Origin of Species* about the pertinence of his theory to our species, and the section is anchored by an introduction written for a new edition of Darwin's *Descent of Man*. The third, *The Infected Mind,* offers no prizes for discerning whose mind is infected (too many are) and with what (religion). The fourth, *They Told Me, Heraclitus,* contains eulogies for the science-fiction writer Douglas Adams and the evolutionist William D Hamilton. Dawkins also puts the boot into purveyors of alternative medicines. In the fifth, *Even the Ranks of Tuscany,* Dawkins spends a lot of time quarreling with the late Stephen Jay Gould, who was unwise enough to suggest that there is a place for both science and religion. The sixth, *There Is All Africa and Her Progenies in Us,* tells of Africa, the birthplace of Richard Dawkins. Finally, in the seventh, *A Prayer for my Daughter,* the author instructs his child not to believe in the Assumption of the Virgin Mary.

I find myself of two minds about all of this. I welcome that the world of nonbelief has such a vigorous champion. These days, in the United States particularly, atheism does not have a very good press. As the philosopher Daniel Dennett pointed out recently, a politician today could never be publicly rude about blacks or Jews or women or the handicapped, but nonbelievers are fair game. The fact that Thomas Jefferson, who used to scoff at the Trinity, could never become president today is considered of no importance. Jesus is our favorite philosopher, and that is that.

Also, I myself share just about every bit of Dawkins's nonbelief. I too think that the Assumption of the Virgin is fiction. More than this, I too feel that religion can be a force for positive evil. The happenings in the Catholic Archdiocese of Boston prove that. One of Dawkins's pieces tells of a televised discussion of cloning he took part in, which included prominent religious leaders, one of whom refused to shake hands with the women in the studio in case they were menstruating. His behavior was disgusting.

However, I worry about the political consequences of Dawkins's message. If Darwinism is a major contributor to nonbelief, then should Darwinism be taught in publicly funded US schools? The creationists say not. They argue that if the separation of church and state keeps belief out of the schools, then it should likewise keep nonbelief out of the schools. There are issues to be grappled with here, and Dawkins does nothing to address them. Does Darwinism as such lead to nonbelief? It is true that Darwinism conflicts with the Book of Genesis taken literally, but at least since the time of Saint Augustine (AD 400) Christians have been interpreting the 7 days of creation metaphorically.

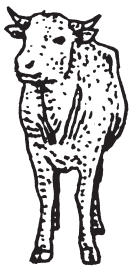
I would like to see Dawkins take Christianity as seriously as he undoubtedly expects Christianity to take Darwinism. I would also like to see him spell out fully the arguments as to the incompatibility of science (Darwinism especially) and religion (Christianity especially). So long as his understanding of Christianity remains at the sophomoric level, Dawkins does not deserve full attention. It is all very well to sneer at Catholic beliefs about the Virgin Mary, but what reply does Dawkins have to the many theologians (like Jonathan Edwards) who have devoted huge amounts of effort to distinguishing between false beliefs and true ones? What reply does Dawkins have to the contemporary philosopher Alvin Plantinga, who argues that the belief that there are other minds and that others are not just unthinking robots requires a leap of faith akin to the Christian belief in the Deity? Edwards and Plantinga may be wrong, but Dawkins owes them some reply before he gives his cocky negative conclusions. Moreover, once he has proved the incompatibility of science and religion, I would like him to address the classroom issue. Would he keep evolution out of US schools, and if not, what argument would he use? In one of these pieces, he complains that British A-level examination requirements necessitate coverage of so much other material that they exclude the proper teaching of evolution. What about the US Constitution?

Finally, I do not want to sound paranoid or insecure, but I do wish that he and other science writers would cease assuming that philosophical issues can be solved by talking in a brisk, confident voice. I have no more liking of cultural studies than Dawkins, and I loved his talk of "the low-grade intellectual poodling of pseudo-philosophical poseurs". But this rhetoric is no substitute for hard analysis. Postmodernists claim that science, no less than religion and literature and philosophy, is infiltrated with culture. How does Dawkins respond to this charge, given the undoubted significance in science of metaphors that are based on the culture of the day? One would have thought that the author of *The Selfish Gene* would be sensitive to questions like these.

There is more. I agree fully with Dawkins when he writes that "modern physics teaches us that there is more to truth than meets the eye; or than meets the all too limited human mind, evolved as it was to cope with medium-sized objects moving at medium speeds through medium distances in Africa."

But how then does Dawkins respond to the obvious retort of the religious, who have always stressed mystery? Some of the fundamental problems of philosophy are no closer to being solved today than they were at the time of the Greeks: Why is there something rather than nothing? Why is this something not something else? What is mind, and are we unique? Perhaps one agrees that traditional religions — Christianity specifically — do not offer the full answers. But what is to stop a nonbeliever like myself from saying that the Christians are asking important questions and that they are right to have a little humility before the unknown? As Saint Paul said: "Now we see through a glass, darkly." That apparently includes Richard Dawkins.

I love Dawkins's books. They always make me mad and make me want to respond. What more could an author ask?



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