



REPORTS OF THE

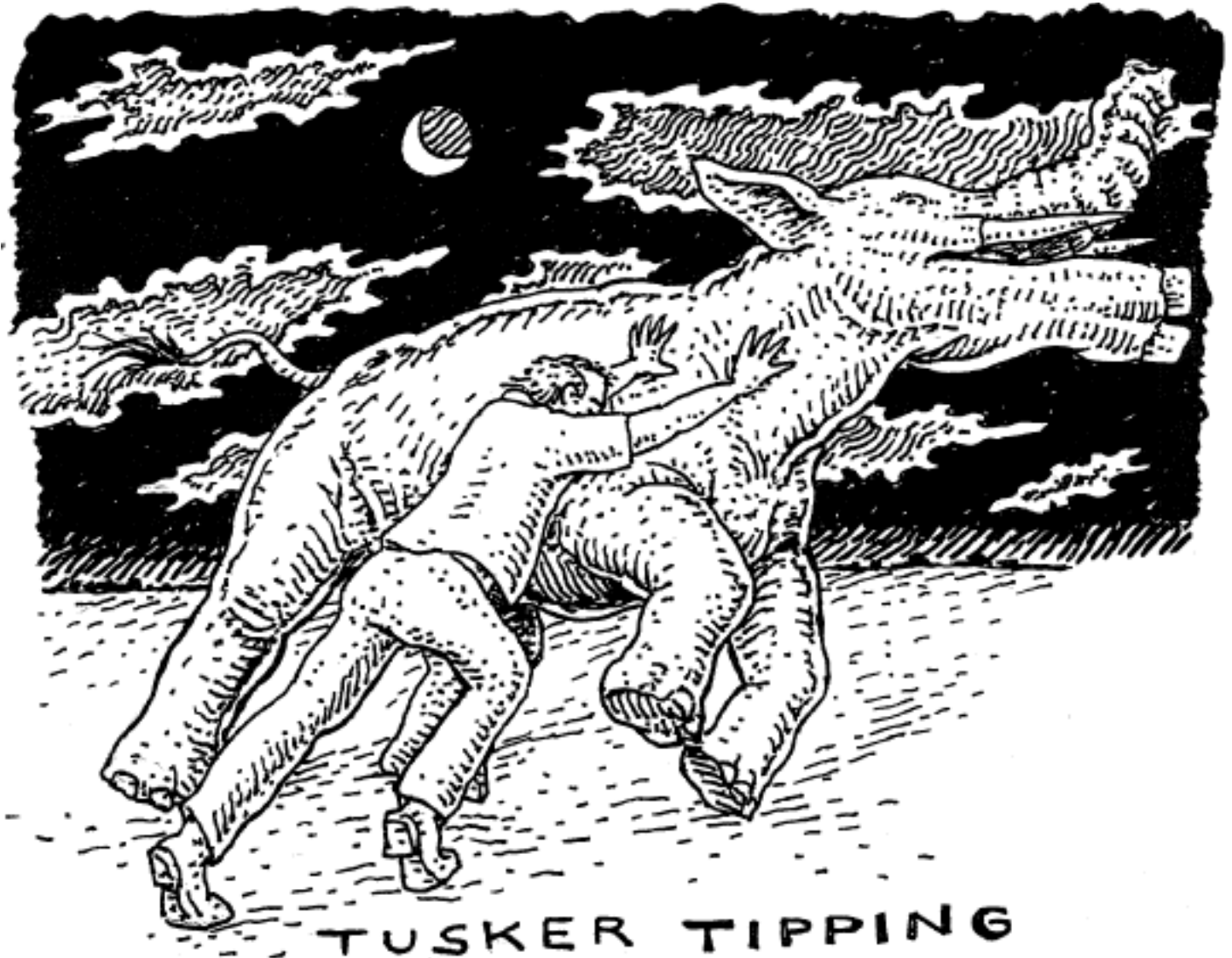
NATIONAL CENTER FOR SCIENCE EDUCATION

DEFENDING THE TEACHING OF EVOLUTION IN THE PUBLIC SCHOOLS

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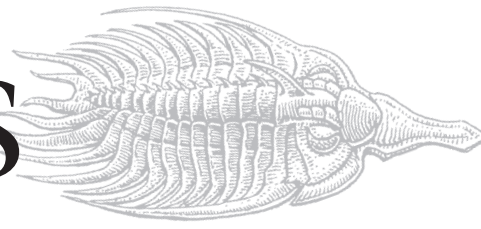
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In 21 US states, local districts must use state-approved texts. In some cases, no other textbooks may be used, and in others, local districts that choose to use alternative texts may forfeit funding for instructional materials. In its report *The Mad, Mad World of Textbook*

Adoption (available on-line at <http://www.edexcellence.net/doc/Mad%20World_Test2.pdf>), the Fordham Foundation argues, "Textbook adoption distorts the market, entices extremist groups to hijack the curriculum, enriches the textbook cartel, and papers the land with mediocre instructional materials that cannot fulfill their important education mission" (<http://www.edexcellence.net/detail/news.cfm?news_id=335>). The irony of textbook adoption, of course, is that it is often exploited by the same people who argue against state and national standards in the name of "local control" when they oppose requirements to teach, say, evolution. *Mad, Mad World* ... also reports that approximately a third of the K-12 textbook market is in three "adoption" states — Florida, California, and Texas.

One of the most prominent textbook adoption states is Texas. Readers of a certain age will remember the textbook "reformers" of the 1970s who supposedly wanted to rid textbooks of "errors" (such as evolution), and Texas featured prominently in these stories because of the efforts of Mel and Norma Gabler. The names and faces may have changed, but the opportunities and dangers are much the same. The standards approved by the Texas state board of education will be required content in textbooks approved by the state when the next round of adoptions for science textbooks takes place in 2011. Moreover, with a budget crisis in California, Texas is poised to exert even more influence over textbook content than ever before. And that is why we are examining the events in Texas in such great detail in this issue.

Our Updates round-up shows that efforts to undermine science education are proceeding apace throughout the country and even overseas. So far, state-wide challenges to evolution education have not prevailed, but experience tells us that their sponsors and supporters will not give up.

From the NCSE office, Glenn Branch reports on another batch of our "Friends of Darwin" — activists who stand out in their support of evolution education. He also provides an update on changes in the NCSE office staff.

Randy Moore takes us to another interesting place in his regular column: Dayton, Tennessee. Historians at Bryan College there have taken pains to mark many of the local landmarks where the important players in the Scopes trial lived and worked. Moore writes that Dayton is a great place for summer or early fall travel.

BOOK REVIEWS

We are using the rest of this issue to catch up with book reviews. There are so many books relating to evolutionary science and its prominence in public discourse that our original draft of this issue ran to almost 100 pages! We will be stepping up the number of reviews in future issues in this volume to be sure to bring them all to our readers.

Most of the reviews that we have chosen to publish in this issue focus on books that explore matters related to the public understanding of science. Some examine what the evolutionary sciences tell us about the history and diversity of life, while others consider the interactions between scientists and members of the general public. In many cases, as NCSE members are well aware, the "controversy" over evolution is more about a clash of "world views" than it is about the nature of scientific theories or evidence that supports them.

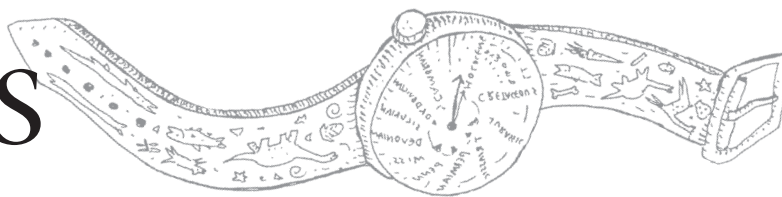
Some of these books are historical, such as those by Contosta, Livingstone, Clark, Burnett, and Rudwick. They show us the cultural and historical context that led to our contemporary view of the importance of evolution (and other scientific ideas) as the foundation of modern science. Books by Miller, Prothero, Coyne, and Lurquin and Stone show us the contemporary state of the public understanding of science with sometimes frank and unflattering discussions of why scientific knowledge meets so much resistance.

Remember to check our centerfold pages, letting you know how to order recommended books and support NCSE financially with every purchase.

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REPORTS



Texas Science Standards and March Madness: Did We Win or Lose?

Steven Schafersman

The revisions of my state's science standards (Texas Essential Knowledge and Skills, TEKS) by the State Board of Education (SBOE) are confusing and controversial. News articles following the March 25–27, 2009 meeting reported that the scientific community had succeeded in turning back proposals by the Discovery Institute (DI) and religious radicals on the SBOE that would have weakened science education. The DI and radical SBOE members, on the other hand, gleefully claimed a great victory in their blogs and reports. Who was right?

The correct answer is neither. The results were mixed: science education both won and lost. Texas Citizens for Science (TCS) worked during the past year with several partners — NCSE, the Texas Freedom Network, and several science and science education professors from Texas universities — to preserve the accuracy and reliability of science education in Texas during the state's science education standards adoption process. In the end, our efforts did not produce the results we wanted and that Texas's students deserved. It is important to examine why.

POLITICAL LANDSCAPES

The political situation in Texas is

Steven Schafersman is the president of Texas Citizens for Science (<<http://www.texscience.org>>). He received NCSE's Friend of Darwin award for 2004 in recognition of his decades of defending the integrity of science in Texas.

such that the religious right is very strong and controls the state Republican Party. The 15-member SBOE has seven members who are religiously conservative Republicans: these individuals are biblical literalists and creationists, including the board's chair Don McLeroy (appointed by a governor who shares his religious views). [Note: see sidebar on the ouster of McLeroy as the chair of the SBOE, p 14.] We have always had some of these on the state board, but right now there are seven of them, and they are well-organized, well-disciplined, and immune to embarrassment despite their frequent public expressions of ignorance, stupidity, and bigotry. If they pick up just a single additional vote — and they did for a variety of reasons — they can do whatever they want.

The science standards writing panels ultimately produced an excellent set of standards that should have been adopted without change, but the SBOE felt the need to modify them. The outcome of the process was that the scientific method standard and many of the standards that concern cosmic and biological evolution in the biology and earth and space science (ESS) standards were compromised. It is true that the very worst language was avoided, but only by very close 8–7 votes for which the majority disappeared when qualifying or debilitating substitute amendments — suggested as “compromises” — were proposed. Getting rid of the *really* antiscientific language was a victory, but it was only a partial victory. When their very worst antiscientific amendments failed, creationist members immediately came back with a new substitutes that were less obviously antiscience. Some of these passed.

The creationist SBOE members voted together as a bloc every time. The eight pro-science members — five Democrats and three Republicans — did not vote as a

pro-science bloc. Most of the pro-science board members are friendly, moderate-to-conservative individuals who believe in collegiality, cooperation, and compromise, so most were willing to accept the weaker but still flawed substitute amendments. I could sense the emotional compulsion in some board members to vote with a colleague for a less egregious amendment and to find some compromise on controversial issues. The anti-science SBOE members exploited this quality again and again.

The pro-science Republican members may have felt more pressure to compromise (they were being politically assaulted by their own party and by thousands of messages, letters, and phone calls from their fundamentalist and creationist constituents). Several had been attacked in their primaries — a political tactic that had increased the number of creationists on the board from four in 2003 to seven in 2008. Sometimes compromise is good, but compromise on science education standards should not result in students' being forced to learn inaccurate and misleading lessons about scientific knowledge.

The antiscience BSOE members were able to manipulate the process by passing a rule that the pro-science members probably thought was inconsequential: requiring votes on amendments without members' being allowed to talk to their science experts first or hearing scientific testimony during board debate. Thus, pro-science BSOE members — who were not scientists themselves — were forced to vote without understanding what they were voting on. Thus, the board approved several anti-science amendments in January and March.

I explained this problem to pro-science SBOE members and recommended that they always vote “no” to any amendment that the antiscience side proposed, but



their plan was to seek a compromise on amendments and standards that were controversial within the board. The antiscience proposals ultimately succeeded because their supporters falsely claimed that their amendments were approved by “science experts” and scholarly publications, and in some cases presented their amendments in a form that did not reveal that vital subject matter was being removed.

Furthermore, the amendments ranged over the map. One SBOE member proposed thirteen bad amendments to ESS in approximately 20 minutes. She talked so fast and so confidently — repeatedly referring to her “scientific experts” who were actually “intelligent design” (ID) creationists — that she managed to convince fellow board members to pass five of them.

By far the worst amendment was to standard (3)(A) (formerly the “strengths and weaknesses” provision), which discusses the scientific method. The original proposal by the science writing panels said simply, “analyze and evaluate scientific explanations using empirical evidence, logical reasoning, and experimental and observation testing.” The SBOE changed this to:

in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student.

The word “critique” was added to suggest that scientific explanations should be *criticized* by students, even though it is redundant and inappropriate, since “critique” correctly used *means* “analyze and evaluate”, not criticize. Even worse, the phrase “all sides of evidence of those scientific explanations” awkwardly and inaccurately suggests that all scientific explanations have “sides” when in fact most do not, especially at the level science is taught in high school. The new words were deliberately added, of course, to attack biology

textbooks in the future if they do not include “critiques” of evolution or present the bogus “evidence” that creationists mistakenly believe undermines or refutes evolution.

CURRICULAR “TIME BOMBS”

SBOE chairman Don McLeroy said he would warn publishers to be sure to cover “all sides” of culturally controversial issues, such as evolution, as specified by these new standards or risk having their textbooks rejected. If SBOE members find “problems” with the books, the publishers could also be told to fix the “errors” to avoid rejection. What will publishers do when faced with this unethical and ugly extortion? If history is a guide, they will make whatever changes are necessary to make sure their textbooks are adopted in Texas or lose many millions of dollars in sales.

Similar time bombs inserted into the proposed biology standards by the SBOE are the requirements to:

analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record;

analyze and evaluate scientific explanations concerning the complexity of the cell; and

analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life.

To many, these new statements may be innocuous, but they were inserted to encourage publishers to include information in biology textbooks that may undermine evolution education and to punish publishers if they do not.

The first one was inserted because SBOE creationists believe that a “sudden appearance” of fossils means they were specially created, rather than reflecting an imperfect fossil record. SBOE members, using misinformation from the DI, will try to force publishers to suggest to students that this pattern in the fossil record is a

weakness of evolution. Ideally, publishers *could* satisfy this standard by including accurate and reliable information about *all* rates and modes of fossil evolution, including gradual fossil evolution and transitional fossils, but the SBOE still can veto these texts.

Two standards were inserted to attempt to force publishers to tell students that the cell and information-carrying molecules are so complex that evolution cannot explain them (implying that some extranatural process is necessary). Cells and information-carrying molecules are complex and their chemical processes are not totally explained, but that gives no license to incorporate extranatural processes into the science curriculum. Again, the standard will try to make publishers include bogus or misleading information about complex processes and molecules that antiscience members believe demonstrates the inadequacy of evolution, and this could pose problems for publishers in the future.

Only one time bomb was inserted in the new ESS standards. This was a requirement to discuss the complexity of life in the origin-of-life standard (we can be relieved that the origin-of-life standard itself was not removed). Antiscience SBOE members did remove requirements that specify that the universe is about 14 billion years old and that discuss the rate and diversity of evolution of fossils. However, since two relevant standards require discussion of the age of the universe and the evolution of fossils, these will not hinder textbook authors and publishers from including this information in ESS textbooks. Furthermore the YECs on the board apparently overlooked standard (7)(C), which mentions “earth’s approximate 4.6-billion-year history”; it remained unchanged. In light of the other compromises they racked up, the creationist members probably could have changed (7)(C) to “a long time ago in a galaxy far, far away” if they had just tried.

Finally, a Democratic SBOE member added a requirement to the Environmental Systems standards to “analyze and evaluate different views on the existence of



global warming", but this time bomb will backfire, too. Textbook authors and publishers of environmental science textbooks now may have to include common arguments against climate change, all of which are easily refuted by scientists (see "How to Talk to a Climate Skeptic"; available on-line at <<http://www.grist.org/article/series/skeptics/>>).

HOLDING OUR OWN ... FOR NOW

Textbook authors and publishers should still be able to use the new standards to write good textbooks. Despite all the problems with the process, the numerous *substandard* standards do not contain explicit requirements to include antiscientific information, so they do not force publishers to put inaccurate or unreliable science textbooks up for adoption — although they allow and even solicit it. For example, the requirement to "analyze, evaluate, and critique scientific explanations" and to examine "all sides of scientific evidence of those scientific explanations" can be easily met by textbook publishers and authors by (1) truthfully stating that there is only one side to most scientific explanations and all that are covered in a high school biology course; (2) pointing out that the standard specifically limits the required examination to "scientific" evidence and explanations, excluding antiscientific information or misrepresentations that some SBOE members and the DI claims should be included; and (3) interpreting the "all sides of...scientific explanations" requirement to mean a much broader discussion of evolution than they normally would present. Perhaps they could include discussions of evolutionary psychology, and the evolution of human intelligence or of religious belief, all of which do indeed have several *scientific* "sides". By following these guidelines, textbook publishers, authors, and teachers can successfully prepare textbooks and perform instruction that are completely scientific.

The first problem we face in Texas is that content in biology and ESS textbooks is no longer controlled by the Texas science education standards, but by the

ability of textbook publishers and authors to stand up to the political whims of members of the SBOE. The second problem is that science textbooks come up for adoption in 2011, so scientists and science advocates will have to return to Austin and the SBOE to resist attempts to weaken science education. The composition of the SBOE may be different then, so attempts to damage science books may fail as in 2003. But if there are no changes, there will be another close fight.

The third and worst problem we face in Texas is that the science TEKS are also the basis for classroom curriculum and statewide end-of-course exams. Science teachers were already operating in a climate of uncertainty, and their situation is now even worse. They may downgrade their emphasis of or even hesitate to teach the topics that the SBOE has made controversial, for fear of being criticized and reprimanded. The Texas Education Agency — the state's Department of Education — is influenced by antiscience activists. Their end-of-course biology exams may contain questions focused on alleged problems with evolution and the history of life, not test whether the students have accurate and reliable knowledge of this field. Teachers and students will be forced to prepare for this pseudo-scientific nonsense if they want to pass the exams.

The very bad situation in Texas will not change until there is a change in political leadership in this state. Science education and many other instructional disciplines have been politicized to an alarming extent in Texas (currently, the social studies standards are being subjected to the same attacks that science and English just endured). Under the new standards, students in Texas will receive a blighted science education and fall further behind their peers in other states and other countries. We science advocates still have much work to do.

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Testimony Before the Texas State Board of Education

Joshua Rosenau

Mr Chairman, members of the board, thank you for the chance to speak with you about the draft science TEKS.

The science TEKS on the books now were given *an F* in a 2005 survey of state science standards by the politically conservative Thomas Fordham Institute, noting that "they produce breadth of assertion instead of depth of understanding."

The TEKS presented by your expert writing committees addressed many of those problems. For instance, they replaced inaccurate and misleading references to "strengths and weaknesses" with a more accurate description of the scientific process.

On behalf of the students, parents, teachers, and scientists represented by the National Center for Science Education, thank you for voting to uphold that decision. You showed the respect this body has for the expertise of Texan scientists and educators.

I am not alone in praising that decision. I am proud to present you with these letters and statements signed by over 60 scientific and educational societies, all thanking you for listening to the experts on your writing committees about leaving "weaknesses" out of the standards. I know of no such society opposing that decision.

I am confident you will show the same respect for these scientists' and teachers' concerns over some amendments which you passed in January.

Fifty-four societies, from the American Institute for Biological Sciences and the National Science Teachers Association to the Biotechnology Institute and the Society of Sedimentary Geology signed a statement drafted by NCSE urging you to remove and reject amendments which single out evolution for scrutiny beyond that applied to other scientific theories,

Joshua Rosenau is Public Information Project Director at NCSE.



or which inaccurately and misleadingly describing these ideas as scientifically controversial (*see sidebar, p 13*). We're especially concerned by references to "sudden appearance," which may sound confusingly similar to creationist rhetoric about "abrupt appearance" to the untrained ears of a student, just as references elsewhere to "arguments against universal common descent" may be taken as a call for creationist claims that go beyond the standards' clear statement about the limits of science.

I'd be happy to go into further details of my concerns about these amendments if you have any questions.

The National Center for Science Education and these many scientific societies urge the board to delay or reject outright any further amendments which have not been reviewed by your writing committees and the community of Texas scientists and educators. Do not be distracted by discredited creationist claims such as that microbes are irreducibly complex or that the Cambrian Explosion is inexplicable. Do not single out evolution or related concepts in geoscience for scrutiny beyond that given to every other scientific topic.

Texas students *deserve* a world-class education, and this revision process could move them toward that goal ... or hold them back. Please, listen to the voices of scientists and educators, listen to the writing committees you chose, and restore and protect honest science in the TEKS.

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[This statement was presented to the Texas state board of education on March 25, 2009.]

Collapse of a Texas Quote Mine

Jeremy Mohn

On January 22, 2009, the Texas State Board of Education met to consider a draft of their state's new science educa-

tion standards (*see RNCSE 2009 Mar/Apr; 29 [2]: 10-4*). At that meeting, the board's chair, Don McLeroy, proposed a new standard for students learning about evolution. The standard concerned the fossil evidence of evolution and would require students to "[a]nalyze and evaluate the sufficiency or insufficiency of common ancestry to explain the sudden appearance, stasis and sequential nature of groups in the fossil record."

In support of this proposal, McLeroy read a long list of quotes into the public record (audio is available on-line at <<http://www.anevolvingcreation.net/collapse/collapse.mp3>>; the list itself is available on-line at <http://www.anevolvingcreation.net/collapse/mcleroy_handout.pdf>). These quotes were from various scientific books and articles that, based on his comments, McLeroy clearly believed presented a compelling case for the existence of a scientific controversy concerning evolution. Apparently, a majority of his fellow board members agreed, and the new student expectation was added to a draft of the science education standards for biology, pending a final vote in March.

The scientists at the meeting, on the other hand, did not agree. They said that McLeroy's amendment was a hopelessly muddled mess that would only serve to confuse students about the evidence for evolution in the fossil record. The sudden appearance, stasis, and sequential nature of groups in the fossil record is due to the fact that species evolve at different rates — sometimes rapidly, sometimes gradually, and sometimes barely at all. Common ancestry is the result of the various processes that have led to the formation of new species over time, but the rate at which these processes occur has nothing to do with whether existing species share common ancestors.

In other words, the new standard would require students to learn that common ancestry may

Jeremy Mohn is a high school biology teacher in Kansas. With Cheryl Shepherd-Adams, he operates the Stand Up for Real Science blog at <<http://www.anevolvingcreation.net/standup/blog.htm>>.

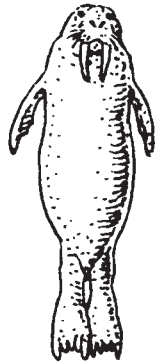
be insufficient to explain something that common ancestry is not used to explain. What initially looked like a gold nugget to the anti-evolutionists on the Texas board of education turned out to be just a big ol' chunk of pyrite. But even though McLeroy's amendment, on examination, was scientific nonsense, it was still a problem because it encouraged Texas teachers to misrepresent the evidence for evolution in the fossil record.

So how exactly did McLeroy manage to convince a majority of his fellow board members to support his attempt to belittle the organizing principle of modern biology? He used a common tactic among those who seek to cast doubt on evolution: the quote mine. A quote mine is a misquotation or a quotation out of context that skews or contorts the meaning of the original source. Such gems are often mined from authoritative literature and presented without the context that explains their intended meaning. Often, the quote miner will use the material that ostensibly bolsters his or her argument while secretly excluding or obscuring further exposition that is at odds with it. That was clearly the case with McLeroy's list of quotations. (For details, see the "Examine the quotes" section of <<http://www.anevolvingcreation.net/collapse/>>.)

WORKING THE MOTHER LODGE

During McLeroy's recitation of his list of quotes, he stated that reading books about evolution is "one of [his] hobbies," saying that he checked out "three books a week" on the topic of evolution from his local public library. However, as the evidence below demonstrates, it appears that McLeroy may not have read all of the sources on his list. In fact, it appears that he may have plagiarized some of his quotes from a creationist website called Genesis Park (<<http://www.genesispark.org/genpark/after/after.htm>>).

The first indication is that the sequence of the quotes is identical. Second, the quotes themselves are nearly identical, with two passages slightly shortened in McLeroy's presentation. Third, the punctuation



used in the quotes is nearly identical, with slight corrections and bracketed glosses apparently made by McLeroy. Finally, the citation style used in each list is identical, and yet different from the style used in the other quotes on McLeroy's handout.

In addition to all of this, the most definitive evidence in support of the "copy and paste" hypothesis is the existence of a citation error in both lists. As indicated in italics below, one of the identical quotes was incorrectly cited as appearing on page 752 when it actually appears on page 750 of Stephen Jay Gould's book *The Structure of Evolutionary Theory* (Cambridge [MA]: Belknap Press, 2002). This citation error appears to have originated in a book review of *The Structure of Evolutionary Theory*

published in 2004 in the young-earth creationist journal *TJ* (18 [1]: 48-51; available on-line at <http://creation.com/images/pdfs/tj/j18_1/j18_1_48-51.pdf>) by Don Moeller. All of the quotes above can also be found within that review, along with the citation error. That means, assuming that the above evidence is not just an amazing coincidence, McLeroy actually copied a list of quotes that were transcribed by someone else who was reading some other guy's review of the book — and passed them off as his own.

TEXAS STUDENTS DESERVE A BETTER EXAMPLE

So why does any of this matter? Why should anyone care about poor scholarship and the apparent lack of academic integrity on the

part of the chair of the Texas SBOE?

When the chair of a state board of education uses inaccurate out-of-context quotes to persuade others to act as he desires, he is undercutting the trust that has been placed in him. When he apparently plagiarizes those quotes from a website and then attempts to pass them off as the result of his own research, he is displaying a disappointing lack of academic integrity.

When the quotes are read in their original contexts, it is clear that the authors' intent was the opposite of McLeroy's. They were not professing doubt concerning the sufficiency of evolutionary processes to account for the patterns observed in the fossil record. On the contrary, modern evolutionary theory and the inference of common ancestry are quite

QUOTES AS PRESENTED ON GENESIS PARK WEBSITE

"...the tale itself illustrates the central fact of the fossil record so well [the] geologically abrupt origin and subsequent extended stasis of most species...Anatomy may fluctuate through time, but the last remnants of a species look pretty much like the first representatives." (p 749)

"...the greatest and most biologically astute paleontologist of the 20th century...acknowledged the literal appearance of stasis and geologically abrupt origin as the outstanding general fact of the fossil record and as a pattern which would 'pose one of the most important theoretical problems in the whole history of life.'" (p 755 quoting George Gaylord Simpson.)

"...the long term stasis following geologically abrupt origin of most fossil morphospecies, has always been recognized by professional paleontologists." (p 752)

"The great majority of species do not show any appreciable evolutionary change at all. These species appear in the section (first occurrence) without obvious ancestors in the underlying beds, are stable once established and disappear higher up without leaving any descendants." (p 753)

"...but stasis is data... Say it ten times before breakfast every day for a week, and the argument will surely seep in by osmosis: 'stasis is data; stasis is data'..." (p 759)

Gould debunks the: "exceedingly few cases that became textbook 'classics' of coiling of Gryphaea and the increasing body size of the horses etc." (p 760)

"Indeed proclamations for the supposed 'truth' of gradualism — asserted against every working paleontologist's knowledge of its rarity — emerged largely from such a restriction of attention to exceedingly rare cases under the false belief that they alone provided a record of evolution at all! The falsification of most 'textbook classics' upon restudy only accentuates the fallacy of the 'case study' method and its root in prior expectation rather than objective reading of the fossil record." (p 773)

QUOTES AS PRESENTED BY MCLEROY

"...Anatomy may fluctuate through time, but the last remnants of a species look pretty much like the first representatives." (p 749) [Stasis]

"...the greatest and most biologically astute paleontologist of the 20th century...acknowledged the literal appearance of stasis and geologically abrupt origin as the outstanding general fact of the fossil record and as a pattern which would 'pose one of the most important theoretical problems in the whole history of life.'" (p 755 quoting George Gaylord Simpson.) [Sudden Appearance [sic], Stasis]

"...the long term stasis following geologically abrupt origin of most fossil morphospecies, has always been recognized by professional paleontologists." (p 752.) [Sudden appearance]

"The great majority of species do not show any appreciable evolutionary change at all. These species appear in the section (first occurrence) without obvious ancestors in the underlying beds, are stable once established and disappear higher up without leaving any descendants." (p 753) [Sudden appearance] [Stasis]

"...but stasis is data... Say it ten times before breakfast every day for a week, and the argument will surely seep in by osmosis: 'stasis is data; stasis is data'..." (p 759) [Stasis]

"Indeed proclamations for the supposed 'truth' of gradualism — asserted against every working paleontologist's knowledge of its rarity — emerged largely from such a restriction of attention to exceedingly rare cases under the false belief that they alone provided a record of evolution at all! The falsification of most 'textbook classics' upon restudy only accentuates the fallacy of the 'case study' method and its root in prior expectation rather than objective reading of the fossil record." (p 773)

powerfully supported by scientific evidence. Texas students should be given the opportunity to learn about this evidence.

POSTSCRIPT

The original version of this exposé attracted media attention, with a columnist for the *Houston Chronicle* (2009 Mar 23) writing, “blogger and Kansas biology teacher, Jeremy Mohn ... discovered McLeroy had lifted much of the research from another creationist blog. McLeroy’s quotes were in virtually the same order, and he repeated a page number error.” She added, “McLeroy acknowledged to me that he had copied some of the research from the creationist site because he liked ‘the format,’ although he said he had indeed read *one* of the books” (emphasis added).

During the board’s next meeting in March, a motion to strike McLeroy’s amendment passed on an 8-7 vote. McLeroy protested, in a now famous phrase, “Somebody’s got to stand up to experts!” Moments later, a similar amendment, requiring students to “analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis and the sequential nature of groups in the fossil records” was proposed and passed on a 13-2 vote.

Although McLeroy’s arguments have clearly evolved, his knowledge of evolution never seems to change. By staunchly refusing to learn anything about the actual theory of evolution, McLeroy and his fellow anti-evolutionists on the SBOE are apparently hoping to serve as a living example of stasis. Will a solution to the problem of entrenched scientific ignorance among those who are in charge of education in Texas suddenly appear? If so, let us hope that it will be in something less than geological time.

ACKNOWLEDGMENTS

Thanks to Cheryl Shepherd-Adams for her help.

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[Adapted and condensed from “Collapse of a Texas quote mine,” available on-line at <<http://www.anevolvingcreation.net/collapse/>>.]

Changes in the Texas State Science Standards

Here are the most significant revisions to the Texas Essential Knowledge and Skills, or TEKS, proposed and adopted, that undermined the scientific integrity of the curriculum standards submitted by the writing team (in italics).

THE NATURE OF SCIENCE

(c)(3)(A): “analyze and evaluate scientific explanations using empirical evidence, logical reasoning, and experimental and observational testing” [final draft of the writing team]

(c)(3)(A): “analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, by examining scientific evidence, supportive or not supportive, of those explanations” [proposed by Cynthia Dunbar at January meeting; failed]

(c)(3)(A): “analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information” [proposed by Ken Mercer at March meeting; amended by Bob Craig]

(c)(3)(A): “analyze and evaluate scientific explanations using empirical evidence, logical reasoning and experimental and observational testing, including discussing what is not fully understood in all fields of science, so as to encourage critical thinking by the student” [amendment to Ken Mercer’s proposal offered by Bob Craig at March meeting; failed]

(c)(3)(A): “in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student” [proposed by Cynthia Dunbar; substituted by Bob Craig; reworded by Barbara Cargill;

approved at March meeting; final draft of TEKS]

[The language of (c)(3)(A) occurs in the beginning of the standards for each area of science covered: aquatic science, astronomy, biology, chemistry, earth and space science, environmental systems, integrated physics and chemistry, and physics.]

BIOLOGY

(c)(7)(A): “identify how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies including anatomical, molecular, and developmental” [final draft of the writing team]

(c)(7)(A): “analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental” [proposed by Terri Leo and adopted at January meeting; final draft of TEKS]

(c)(7)(B): “describe the sufficiency or insufficiency of common ancestry to explain the sudden appearance, stasis, and sequential nature of groups in the fossil record” [proposed insert by Don McLeroy, adopted at January meeting, rejected at March meeting]

(c)(7)(B): “analyze and evaluate the sufficiency or insufficiency of common ancestry to explain the sudden appearance, stasis and sequential nature of groups in the fossil record” [proposed insert by Cynthia Dunbar; substituted by Bob Craig]

(c)(7)(B): “analyze and evaluate scientific explanations concerning any data of sudden appearance, stasis, and sequential nature of groups in the fossil record;” [substitution by Bob Craig; adopted at March meeting; final draft of TEKS; this required renumbering of subsequent sections.]

(c)(7)(B) [original designation before insertion of above]: “recognize that natural selection produces change in populations, not individuals” [final draft of the writing team]



McLEROY UNDER SCRUTINY

As the final vote on the proposed revision of the Texas state science standards approached, the *Austin American-Statesman* (2009 Mar 8) offered a profile of the chair of the Texas state board of education, avowed creationist Don McLeroy. Describing his conversion to fundamentalism as a dental student, the profile explained, “He is now a young-earth creationist, meaning that he believes God created earth between 6 000 and 10 000 years ago,” quoting him as saying, “When I became a Christian, it was whole-hearted ... I was totally convinced the biblical principles were right, and I was totally convinced that it could be accurate scientifically.” Particularly important to McLeroy is the biblical tenet that humans were created in the image of God.

David Hillis of the University of Texas, Austin, told the newspaper, “McLeroy’s amendments are not even intelligible. I wonder if perhaps



Don McLeroy, chair
of the Texas State
Board of Education

he wants the standards to be confusing so that he can open the door to attacking mainstream biology textbooks and arguing for the addition of creationist and other religious literature into the science classroom.” He added, “If Chairman McLeroy is successful in adding his amendments, it will be a huge embarrassment to Texas, a setback for science education and a terrible precedent for the state board’s overriding academic experts in order to further their personal religious or political agendas. The victims will be the schoolchildren of Texas, who represent the future of our state.”

Preparing for the March 25–27 board meeting at which the final vote on the standards was expected, McLeroy armed himself with “a large binder that is adorned on the front with a picture of Albert Einstein” and contains “numerous passages from books — such as [Kenneth R] Miller’s and others on evolutionary theory — and articles that he plans to use as ammunition in the fight this month over what should be in the state’s science standards.” One page from his binder, the *American-Statesman* reported, shows a diagram of the fossil record from a book by Miller, with McLeroy’s gloss, “What do we see?” ‘Sudden appearance’ of species.” Miller replied, “That diagram shows evolution. If he thinks it says evolution does not occur, he is dead wrong. It’s really quite the opposite.”

With Texans still reeling from the *American-Statesman*’s profile of McLeroy, Texas Citizens for Science disclosed that McLeroy endorsed a bizarre creationist screed, Robert Bowie Johnson Jr.’s *Sowing Atheism: The National Academy of Sciences’ Sinister Scheme to Teach Our Children They’re Descended from Reptiles* (Annapolis [MD]: Sowing Light Books, 2008) — aimed, of course, at *Evolution, Creationism, and Science*, issued by the National Academy of Sciences and the Institute of Medicine in February 2008 to general acclaim (see *RNCSE* 2008 Jan/Feb; 28 [1]: 14). McLeroy, however, praised *Sowing Atheism* for showing “how the NAS attempts to seduce the unwitting reader by providing scanty empirical evidence but presented with great intellectual bullying — both secular and religious.”

In a March 18, 2009, post on its blog, the Texas Freedom Network summarized the themes of the book — “Scientists are ‘atheists.’ Parents who want to teach their children about evolution are ‘monsters.’ Pastors who support sound science are ‘morons’” — and pointedly asked, “Is that the sort of message Chairman Don McLeroy and his cohorts on the State Board of Education have in mind for Texas science classrooms if they succeed in their campaign to shoehorn ‘weaknesses’ of evolution back into the science curriculum standards?” Mavis Knight, a member of the Texas State Board of Education who supports the integrity of science education, wryly commented to the *Dallas Observer* (2009 Mar 18), “So much for neutrality in the chairman’s position.”

(c)(7)(C) [as redesignated to allow for the insertion of the new (c)(7)(B)]: “analyze and evaluate how natural selection produces change in populations, not individuals” [proposed by Terri Leo and adopted at January meeting; final draft of TEKS]

(c)(7)(G): “analyze and evaluate the sufficiency or insufficiency of natural selection to explain the complexity of the cell” [proposed by Don McLeroy at March meeting; approved; proposed to strike by Lawrence Allen at March meeting; removed]

(c)(7)(G): “analyze and evaluate scientific explanations concerning the complexity of the cell” [proposed by Bob Craig; approved at March meeting; final draft of TEKS]

(c)(9)(D): “analyze and evaluate the evidence regarding formation of simple organic molecules and their organization into long complex molecules having information such as the DNA molecule for self-replicating life” [proposed by Terri Leo; Lawrence Allen moved to strike, but failed; final draft of TEKS]

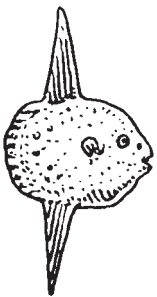
EARTH AND SPACE SYSTEMS

(c)(4)(A): “evaluate the evidence concerning the Big Bang model, such as red shift and cosmic microwave background radiation, and the concept of an expanding universe that originated about 14 billion years ago” [final draft of the writing team]

(c)(4)(A): “evaluate the evidence concerning the Big Bang model such as red shift and cosmic microwave background radiation and current theories of the evolution of the universe, including estimates for the age of the universe” [proposed by Barbara Cargill and approved at January meeting; final draft of TEKS]

(c)(5)(B): “investigate sources of heat, including kinetic heat of impact accretion, gravitational compression, and radioactive decay, which allows protoplanet differentiation into layers” [final draft of the writing team]

(c)(5)(B): “investigate thermal energy sources, including kinetic



heat of impact accretion, gravitational compression, and radioactive decay, which are thought to allow protoplanet differentiation into layers" [proposed by Barbara Cargill at January meeting and approved; final draft of TEKS]

(c)(6)(A): "analyze the changes of Earth's atmosphere through time from the original hydrogen-helium atmosphere, the carbon dioxide-water vapor-methane atmosphere, and the current nitrogen-oxygen atmosphere" [final draft of the writing team]

(c)(6)(A): "evaluate evidence for the changes of Earth's atmosphere that are thought to have occurred" [proposed by Barbara Cargill at January meeting; failed]

(c)(6)(A): "analyze the changes of Earth's atmosphere that could have occurred through time from the original hydrogen-helium atmosphere, the carbon dioxide-water vapor-methane atmosphere, and the current nitrogen-oxygen atmosphere" [proposed by Barbara Cargill at March meeting and approved; final draft of TEKS]

(c)(7)(B): "apply radiometric dating methods that can be used to calculate the ages of igneous rocks from Earth and Moon, and meteorites" [final draft of the writing team]

(c)(7)(B): "evaluate how radiometric dating methods can be used to calculate the ages of igneous rocks from Earth and Moon, and meteorites" [proposed by Barbara Cargill at January meeting; failed]

(c)(7)(B): "calculate the ages of igneous rocks from Earth and the Moon and meteorites using radiometric dating methods" [proposed by Barbara Cargill and approved; final draft of TEKS]

(c)(8)(A): "evaluate a variety of fossil types, transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and rate and diversity of evolution" [final draft of the writing team]

(c)(8)(A): "evaluate a variety of fossil types, proposed transitional fossils, fossil lineages, and significant fossil deposits and assess the arguments for and against universal common

descent in light of this fossil evidence" [proposed by Barbara Cargill at January meeting; failed]

(c)(8)(A): "analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data;" [proposed by Barbara Cargill, amended by Cynthia Dunbar, approved at March meeting; final draft of TEKS]

(c)(13)(F): "discuss scientific hypotheses for the origin of life by abiotic chemical processes in an aqueous environment through complex geochemical cycles" [final draft of the writing team]

(c)(13)(F): "discuss scientific hypotheses for the origin of life by abiotic chemical processes in an aqueous environment through complex geochemical cycles given the complexity of living systems" [proposed by Barbara Cargill at March meeting and approved; final draft of TEKS]

ENVIRONMENTAL SYSTEMS

(c)(9)(H): "Analyze and evaluate different views on the existence of global warming" [insertion proposed by Mavis Knight; passed at March meeting; final draft of TEKS]

The January Amendments

Steven Newton, Joshua Rosenau, and Eugenie C Scott

Here is a brief analysis of Amendments to science TEKS passed in January 2009.

In general, the amendments single out topics touching on evolution (including the age and evolution of earth and the universe as a whole) from other scientific topics included in the TEKS. They uniformly weaken the presentation of these subjects, incorrectly communicating to students that evolution

Steven Newton and Joshua Rosenau are Public Information Project Directors at NCSE; Eugenie C Scott is NCSE's executive director.

FOR FURTHER READING

In addition to the newspaper reports cited here, a variety of on-line sources provided detailed, candid, and often uninhibited running commentary on the proceedings:

Texas Citizens for Science's Steven Schafersman blogged, and posted photographs, on the *Houston Chronicle's* Evo.Sphere blog: <<http://www.chron.com/commons/readerblogs/evosphere.html>>

The Texas Freedom Network was blogging on its TFN Insider blog: <<http://tfnblog.wordpress.com/>>

NCSE's Joshua Rosenau was blogging on his personal blog, Thoughts from Kansas (hosted by ScienceBlogs): <<http://www.scienceblogs.com/tfk/>>

For those wanting to get their information from the horse's mouth, minutes and audio recordings of the board meeting are available on the Texas Education Agency's website via <http://ritter.tea.state.tx.us/sboe/minutes_archived.html> and <http://ritter.tea.state.tx.us/sboe/audio_archived.html> as well as on Tony Whitson's Curricublog <<http://curricublog.wordpress.com/>>. NCSE's previous reports on events in Texas are available on-line at <<http://ncseweb.org/news/texas>>, and of course NCSE will continue to monitor the situation as well as to assist those defending the teaching of evolution in the Lone Star State.

and cosmology are more tentative than the scientific community considers them. Many of the amendments would open the door to the inclusion of creationist ideas.

The amendments should be rejected for reasons of scientific accuracy and pedagogical appropriateness.

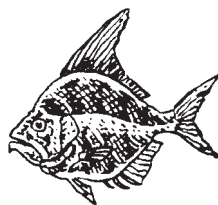
McLEROY'S AMENDMENT TO BIOLOGY SECTION 7

What the amendment does:

Inserts the phrase "analyze and evaluate the sufficiency or insufficiency of common ancestry to explain the sudden appearance, stasis, and sequential nature of groups in the fossil record" between existing standards (7)(A) and (7)(B), relabeling (7)(B-E) to (7)(C-F).

Why this is scientifically and pedagogically wrong:

It contradicts (7)(A), which states that the fossil record provides "evidence of common ancestry," while the



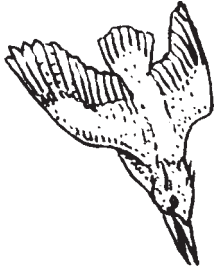
new (7)(B) states that students should “analyze and evaluate the sufficiency and insufficiency of common ancestry.” This will create confusion among teachers, students, textbook authors, and test authors.

“Sufficiency or insufficiency” is similar to “strengths and weaknesses” and is objectionable for the same reasons: it provides an opening for creationist board members to pressure textbook publishers to include creationist-inspired “weaknesses” of evolution, as occurred in 2003.

It requires teachers to present the equivalent of a semester-long college course in paleontology to high school students. To teach this standard would require not only the basics of biology and basic concepts in evolutionary biology, but topics not covered until a capstone Earth and Space Sciences course. Without that background, students are likely to misinterpret discussion of “sudden appearance” as if it were a reference to special creation of living things in their current form, rather than as an evolutionary process which takes place in time-frames measured in the millions of years.

It is unreasonable to ask high school students just beginning to learn about a topic to sit in judgment as to the sufficiency or insufficiency of scientific evidence they do not yet have the mathematical and chemical background to understand in depth.

The “supporting documentation” offered by McLeroy for this amendment reveals that terms of art in evolutionary biology such as “stasis” and “sudden appearance” are interpreted as support for special creationism. This clearly shows that the motivation behind these amendments is to promote an anti-evolution, pro-creationism view.



For more information, consult Jeremy Mohn’s website analyzing McLeroy’s documentation (<<http://www.anevolvingcreation.net/collapse/>>) or the version on p 9.

CARGILL’S AMENDMENTS TO EARTH AND SPACE SCIENCE

(4) Earth and Space Science

What the amendment does:

Inserts the words “differing theories” into the sentence “...observations reveal differing theories about the structure, scale, composition, origin, and history of the universe.”

Why this is scientifically and pedagogically wrong:

Astrophysicists do not have “differing theories” other than the Big Bang model and its extensions; there is no other major theory for the evolution of the universe.

The phrase “differing theories” makes the language weaker and less certain, changes which do not reflect the amassed evidence in favor of the Big Bang model it opens the door for the teaching of creationist “theories”.

(5) Earth and Space Science

What the amendment does:

Changes the sentence “The student knows that Earth’s place in the solar system is explained by the solar nebular accretionary disk model” to “The student understands the solar nebular accretionary disk model.”

Why this is scientifically and pedagogically wrong:

The accretionary disk model is the appropriate explanation for a science class.

It opens the door to the teaching of creationist views of earth’s origin, rather than restricting the discussion of the solar system to natural explanations.

(5)(B) Earth and Space Science

What the amendment does:

Inserts “are thought to allow” into the sentence “...kinetic heat of impact accretion, gravitational compression, and radioactive decay, which are thought to allow proto-planet differentiation...”

Why this is scientifically and pedagogically wrong:

There is no ambiguity or scientific question about the heat sources necessary for the earth’s separating into different zones (mantle, outer core, inner core) during its formation.

The phrase “are thought to” incorrectly and unnecessarily implies doubt.

(6)(D) Earth and Space Science

What the amendment does:

Inserts “the evidence that the” into the phrase “evaluate the evidence that the earth’s cooling led to tectonic activity.”

Why this is scientifically and pedagogically wrong:

The change is unnecessary.

It implies a doubt about these processes that earth scientists do not share

(8)(A) Earth and Space Science

What the amendment does:

Inserts “proposed” before “transitional fossils”.

Removes the phrase about the “appearance, completeness, and rate of diversity of evolution”.

Inserts the phrase “assess the arguments for and against universal common descent in light of the fossil evidence”.

Why this is scientifically and pedagogically wrong:

Transitional fossils are well-recognized in the peer-reviewed literature; “proposed” suggests a false uncertainty.

The removal of the “diversity of evolution” phrase weakens the purpose of the standard and singles out evolution.

The phrase “for and against” is similar to “strengths and weaknesses”.

There are no arguments in modern science against common descent.

A pervasive theme in Cargill’s amendments is casting doubt upon long-settled scientific issues.

Steven Schafersman, a member of the Earth Science writing team, has prepared a detailed analysis of the amendments proposed by Cargill (available on-line at <<http://www.texscience.org/reports/ESS-Report-Final-2009Jan29.htm>>).

LEO’S AMENDMENTS TO BIOLOGY

Terri Leo offered several amendments to High School Biology TEKS in (7)(A–E). These were proposed before McLeroy’s amendment above, and reflect earlier labeling of standards. (7)(B–E) here are (7)(C–F) in the TEKS under consideration later.

What the amendments do:

All of these amendments involved inserting the phrase “analyze and evaluate” in place of verbs such as “identify”, “recognize”, and “describe”.

For example:

(7)(A) identify how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies including anatomical, molecular, and developmental.

(7)(B) recognize that natural selection produces changes in populations, not individuals.

After the amendment, the standards would read:

(7)(A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies including anatomical, molecular, and developmental.

(7)(B) analyze and evaluate how natural selection produces changes in popula-

A MESSAGE TO THE TEXAS STATE BOARD OF EDUCATION

The undersigned scientific and educational societies call on the Texas State Board of Education to support accurate science education for all students by adopting the science standards (Texas Essential Knowledge and Skills or TEKS) as recommended to you by the scientists and educators on your writing committees.

Evolution is the foundation of modern biology, and is also crucial in fields as diverse as agriculture, computer science, engineering, geology, and medicine. We oppose any efforts to undermine the teaching of biological evolution and related topics in the earth and space sciences, whether by misrepresenting those subjects, or by inaccurately and misleadingly describing them as controversial and in need of special scrutiny.

At its January 2009 meeting, the Texas Board of Education rightly rejected attempts to add language to the TEKS about “strengths and weaknesses” — used in past efforts to undermine the teaching of evolution in Texas. We urge the board to stand firm in rejecting any such attempts to compromise the teaching of evolution.

At its January 2009 meeting, the board also adopted a series of amendments to the TEKS that misrepresent biological evolution and related topics in the earth and space sciences. We urge the Board to heed the advice of the scientific community and the experienced scientists and educators who drafted the TEKS: reject these and any other amendments which single out evolution for scrutiny beyond that applied to other scientific theories.

By adopting the TEKS crafted by your expert writing committees, the board will serve the best educational interests of students in Texas’s public schools.

American Anthropological Association
American Association of Physical Anthropologists
American Association of Physicists in Medicine
American Association of Physics Teachers
American Astronomical Society
American Geological Institute
American Institute for Biological Sciences
American Institute of Physics
American Physiological Society
American Society for Biochemistry and Molecular Biology
American Society for Cell Biology
American Society for Investigative Pathology
American Society for Pharmacology and Experimental Therapeutics
American Society of Human Genetics
American Society of Ichthyologists and Herpetologists
American Society of Naturalists
American Society of Plant Biologists
American Society of Plant Taxonomists
Association for Women Geoscientists
Association of American Geographers
Association of Anatomy, Cell Biology, and Neurobiology Chairs
Association of College & University Biology Educators
Association of Earth Science Editors
Association of Environmental & Engineering Geologists
Biological Sciences Curriculum Study
Biotechnology Institute
Botanical Society of America

Clay Minerals Society
Council on Undergraduate Research
Ecological Society of America
Federation for American Societies for Experimental Biology
Federation of American Scientists
Human Biology Association
Institute of Human Origins
National Association of Biology Teachers
National Association of Geoscience Teachers
National Earth Science Teachers Association
National Science Teachers Association
Natural Science Collection Alliance
Paleontological Society
Scientists and Engineers for America
Society for American Archaeology
Society for Developmental Biology
Society for Integrative and Comparative Biology
Society for Sedimentary Geology
Society for the Study of Amphibians and Reptiles
Society for the Study of Evolution
Society of Economic Geologists
Society of Systematic Biologists
Society of Vertebrate Paleontology
Southwestern Association of Naturalists
The Biophysical Society
The Helminthological Society of Washington
The Herpetologists’ League

tions, not individuals.

Why this is scientifically and pedagogically wrong:

It removes specificity needed by teachers, replacing the

different verbs with the same phrase. Teachers, textbook authors, and standardized test authors recognize that different degrees of understanding are implied

by verbs such as “identify”, “recognize”, “describe”, “analyze”, and “evaluate”. These are educational terms of art used to determine how to allocate time and effort; removing that information harms Texas education.

“Analyze and evaluate” is not the appropriate level of detail to require of high school teachers or students with respect to the TEKS’s beginning-level presentation of evolution. High school biology students must know that evolution proceeds via mechanisms other than natural selection, but it is not necessary that students understand, for instance, an ongoing dispute among biologists about the relative importance of natural selection and other mechanisms. Because that is an unresolved question, there is no scientific consensus for teachers to use in planning lessons or in grading students. Specifying “recognize” allows teachers to go into that added detail if they want, but does not require teachers to take time away from other subjects to delve into arcana better suited for a college class. Similarly, it is an empirical fact that natural selection applies to populations, not individuals. There is nothing in that statement to “analyze and evaluate”.

It singles out evolution for special treatment, directly contravening a Texas Attorney General’s opinion that the board of education “not single out ... a single theory of one scientific field”. There is no reason to apply the high-level skills “analyze and evaluate” to every item in the section on evolution and nowhere else in the biology TEKS.

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White House Science Advisor Deplores Texas Standards

John Holdren, the head of the White House Office of Science and Technology, told the ScienceInsider blog (2009 Apr 8; available on-line at <<http://blogs.sciencemag.org/scienceinsider/2009/04/in-full-intervi.html>>) that the recent adoption in Texas of a flawed set of state science standards was “a step backward.” Asked “do you think that the Texas state school board’s recent decision to add a skeptical view of the study of evolution and the fossil record weaken the state’s science standards and weaken national efforts to improve science education?” Holdren replied:

Well, I have not reviewed that decision carefully. But my impression from reading about it is that it was not a

step forward but rather a step backward. Of course, all science needs to be skeptical. It’s hard to be against skepticism. But when you get into the domain of promoting particular views about the basis for skepticism of evolution, and those views are not really valid, then I think we have a problem. I think we need to be giving our kids a modern education in biology, and the underpinning of modern biology is evolution. And countervailing views that are not really science, if they are taught at all, should be taught in some other part of the curriculum.

He added, “I’m not aware of any leverage we have, at OSTP or within the federal government, over the science curriculum in Texas, other than exhortation. We can argue, and we can beg, and we can try to educate. But we have no authority to act.”

TEXAS SBOE TO GET NEW CHAIR

On May 28, 2009, by a final tally of 19–11, the Texas Senate failed to achieve the two-thirds majority necessary to confirm Don McLeroy in his post as chair of the Texas state board of education. The *San Antonio Express-News* (2009 May 28) noted, “The Senate seldom rejects gubernatorial appointments. The Senate’s blocking of McLeroy will force Gov Rick Perry to appoint a new board leader. McLeroy will keep his spot as a board member.”

Earlier, the *Houston Chronicle* (2009 May 25) reported that, “there is speculation in the Capitol and within the Texas Education Agency that Gov Rick Perry might elevate Cynthia Dunbar, R-Richmond, to lead the board” if McLeroy was not confirmed. The newspaper added, “Like McLeroy, Dunbar also holds strong Christian beliefs and recently authored a book that advocates more religion in the public square.”



A SERIOUS PLACERIAS

UPDATES

California: On March 23, 2009, the Supreme Court denied certiorari without comment to *Caldwell v Caldwell*, which challenged the constitutionality of the Understanding Evolution website (<<http://evolution.berkeley.edu/>>) — a joint project of the University of California Museum of Paleontology and the National Center for Science Education. The *San Francisco Chronicle* (2009 Mar 23) reported, “One page on Cal’s 840-page ‘Understanding Evolution’ web site says Darwinism can be compatible with religion. The four-year-old suit by Jeanne Caldwell said the government-funded web site contradicts her religious belief about the incompatibility of religion and Darwinism and amounts to a state position on religious doctrine that violates the Constitutional separation of church and state.”

Caldwell filed suit in the United States District Court for the Northern District of California in 2005. But her suit was dismissed in 2006 because she failed to allege that she had federal taxpayer standing, failed to sufficiently allege state taxpayer standing, and failed to establish that she suffered a concrete “injury in fact” (see *RNCSE* 2006 Jan-Apr; 26 [1-2]: 4-11). When she appealed the decision, the appellate court’s decision concluded, “Accordingly, we believe there is too slight a connection between Caldwell’s generalized grievance, and the government conduct about which she complains, to sustain her standing to proceed” (see *RNCSE* 2009 Jan/Feb; 29 [1]: 8-11). Reacting to the Supreme Court’s decision not to hear the case, a lawyer for the University of California told the *Chronicle*, “We believe the lower court rulings were correct, and we’re glad this ends the matter.”

Jeanne Caldwell was represented by Kevin T Snider of the Pacific Justice Institute and her husband Larry Caldwell. It was a further legal defeat for Larry Caldwell, who previously sued his local

school district, alleging that his civil rights were violated, after it declined to implement his proposals for evolution education; on September 7, 2007, the defendants won a motion for summary judgment (see *RNCSE* 2007 Sep-Dec; 27 [5-6]: 20-4). Understanding Evolution, meanwhile, has been such a success in providing information about evolution to teachers, students, and the general public that the University of California Museum of Paleontology proceeded to develop a similar but broader resource, Understanding Science (<<http://undsci.berkeley.edu/>>), which launched in 2009, just in time for the Year of Science.

California: The appeal of *Association of Christian Schools International et al v Roman Stearns et al* is wending its way through the appeals process, with the University of California system submitting its responsive brief, and a number of organizations submitting *amicus curiae* briefs, in April 2009. The case, originally filed in federal court in Los Angeles on August 25, 2005, centers on the University of California system’s policies and statements relevant to evaluating the qualifications of applicants for admission. The plaintiffs — the Association of Christian Schools International, the Calvary Chapel Christian School in Murrieta, California, and a handful of students at the school — charged that the university system violated the constitutional rights of applicants from Christian schools whose high-school coursework is deemed inadequate preparation for college. The defendants prevailed on August 8, 2008, but the plaintiffs promptly appealed the ruling to the Ninth Circuit Court of Appeals.

Although creationism is not the only issue in the case, it is a prominent part of it. The plaintiffs object, among other things, to the university system’s policy of rejecting high school biology courses that use creationist textbooks — *Biology: God’s Living Creation*, published by A

Beka Books, and *Biology for Christian Schools*, published by Bob Jones University Press — as “inconsistent with the viewpoints and knowledge generally accepted in the scientific community.” Michael Behe, a proponent of “intelligent design” creationism, served as an expert witness for the plaintiffs, although his defense of the creationist biology textbooks was unavailing. Wendell Bird, one of the attorneys for the plaintiffs, is a former employee of the Institute for Creation Research; he defended Louisiana’s 1981 “equal time” act all the way to the Supreme Court, where it was ruled to violate the Establishment Clause in the decision in *Edwards v Aguillard* (1987).

In its appeal of the August 2008 decision, filed on January 26, 2009, the plaintiffs asserted that the University of California system “has rejected a large number of biology courses because, despite their standard content, they added a religious viewpoint” (p 21), which “constitutes viewpoint discrimination, content discrimination, and content-based regulation, which conflict with the First Amendment” (p 24). In their reply, filed on April 10, 2009, the defendants replied that the courses were rejected because they used the creationist textbooks as their primary texts, and a review of those textbooks “concluded they were inappropriate for use as primary texts in college preparatory science courses due to their characterizations of religious doctrine as scientific evidence, scientific inaccuracies, failure to encourage critical thinking, and overall unscientific approach” (p 21) — a judgment with which Donald Kennedy and NCSE Supporter Francisco Ayala, experts for the defendants, concurred.

Two *amicus curiae* briefs — one from the American Center for Law and Justice, the Catholic League for Religious and Civil Rights, the Common Good Foundation, and the Seventh-day Adventist Church State Council; the other from the National Legal Foundation — have been filed on behalf of the plaintiffs; neither discusses creationism. Four *amicus curiae* briefs — from the American Historical Association &

Organization of American Historians, the American Association of University Professors, the California Council of Science and Technology, and the California State University system and the University of Nevada, Las Vegas — have been filed on behalf of the defendants. Of these, only the California Council of Science and Technology's brief discusses creationism, which is perhaps not surprising, since the brief was coauthored by attorneys from Pepper Hamilton LLP who were part of the legal team representing the plaintiffs in *Kitzmiller v. Dover*, the 2005 case over "intelligent design" creationism.

The summary of the argument from the California Council of Science and Technology's *amicus* brief (p 3-4) deserves full quotation:

As a public institution of higher education, UC has the responsibility to produce college graduates who have satisfied its rigorous academic standards in all relevant disciplines, including science. In order to fulfill this responsibility, UC must be allowed to choose among applicants for admission into the UC system based on the applicants' demonstrated understanding of important foundational concepts. In the area of science, two such foundational concepts are the nature of science and the theory of evolution. UC acted appropriately in not giving ... credit to certain high school science courses that used the *Biology for Christian Schools* and *Biology: God's Living Creation* textbooks because these textbooks do not teach either concept in an appropriate manner and in fact advance fundamental misconceptions about both concepts. Students educated with these textbooks will not be adequately prepared for science courses at UC.

The need for high-quality post-secondary science education has never been greater, either in California or the United States as a whole.

Science and technology are recognized as key economic drivers. Unfortunately, both California and the United States are losing ground in these critical areas, in large part because of the inability of colleges and universities to produce enough highly qualified science and technology graduates. The prosperity of the state and nation in the 21st century depends on the reversal of this trend and the production of more university graduates well educated in science and technology. In light of this critical need, UC should be encouraged to take all reasonable measures to ensure that the students admitted into the UC system have a solid grounding in foundational scientific concepts upon matriculation.

The brief, along with all of the documents mentioned here, is available on NCSE's website, in a special section devoted to *ACSI v. Stearns*: <<http://ncseweb.org/creationism/legal/asci-v-stearns>>.

California: A teacher's description of creationism as "superstitious nonsense" was ruled to violate the Establishment Clause of the First Amendment by a federal judge in a decision in *CF et al v. Capistrano Unified School District et al*, issued on May 1, 2009. James Corbett, a twenty-year teacher at Capistrano Valley High School in Mission Viejo, California, was accused by a student, Chad Farnan, of "repeatedly promoting hostility toward Christians in class and advocating 'irreligion over religion' in violation of the First Amendment's establishment clause," according to the *Orange County Register* (2009 May 1). "Farnan's lawsuit had cited more than 20 inflammatory statements attributed to Corbett, including 'Conservatives don't want women to avoid pregnancies — that's interfering with God's work' and 'When you pray for divine intervention, you're hoping that the spaghetti monster will help you get what you want.'"

In his decision in the case, however, Judge James Selna of the United States District Court,

Central District Court of California, identified only one of the statements as constitutionally impermissible, writing:

The Court turns first to Corbett's statement regarding John Peloza ... This statement presents the closest question for the Court in assessing secular purpose. Peloza apparently brought suit against Corbett because Corbett was the advisor to a student newspaper which ran an article suggesting that Peloza was teaching religion rather than science in his classroom. ... Corbett explained to his class that Peloza, a teacher, "was not telling the kids [Peloza's students] the scientific truth about evolution." ... Corbett also told his students that, in response to a request to give Peloza space in the newspaper to present his point of view, Corbett stated, "I will not leave John Peloza alone to propagandize kids with this religious, superstitious nonsense." ... One could argue that Corbett meant that Peloza should not be presenting his religious ideas to students or that Peloza was presenting faulty science to the students. But there is more to the statement: Corbett states an unequivocal belief that creationism is "superstitious nonsense." The Court cannot discern a legitimate secular purpose in this statement, even when considered in context. The statement therefore constitutes improper disapproval of religion in violation of the Establishment Clause.

Selna ended his decision by writing, "The Supreme Court's comments with regard to governmental promotion of religion apply with equal force where the government disapproves of religion ... The ruling today protects Farnan, but also protects teachers like Corbett in carrying out their teaching duties."

Corbett was evidently describing Peloza's lawsuit against the Capistrano Unified School District,



arguing that the district and its trustees and employees were violating his constitutional rights by “pressuring and requiring him to teach evolutionism, a religious belief system, as a valid scientific theory”; Corbett was among the named defendants. The lawsuit failed in the United States District Court, Central District Court of California, and then in the Ninth Circuit Court of Appeals, which specifically endorsed the district court’s statement, “Since the evolutionist theory is not a religion, to require an instructor to teach this theory is not a violation of the Establishment Clause. ... Evolution is a scientific theory based on the gathering and studying of data, and modification of new data. It is an established scientific theory which is used as the basis for many areas of science.”

Opinion was predictably divided about the verdict. Douglas Laycock, a law professor at the University of Michigan, told the *Orange County Register* (2009 May 5), “I’m not sure [Judge Selnal] drew the line in the right place ... The line can be fine sometimes. But here we have a teacher who wasn’t interested in finding the line, and the judge manages to explain away all but one of the teacher’s comments,” while Rachel Moran, a law professor at the University of California, Irvine, said, “What it means is that if you’re a teacher, your liability can turn on a single sentence ... Teachers can avoid this by not talking about these issues at all, but that has a chilling effect,” and John Eastman, a law professor at Chapman University, said, “School districts are routinely sued for making one statement that favors a religion ... The rules apply both ways here.”

Corbett himself told the alternative *OC Weekly* (2009 May 6), “I expected to win. I expected the whole case would be thrown out.” But, the newspaper added, “after rereading it and thinking about it, he says he’s come to different conclusions with regard to the judgments in his favor. I think it’s a victory for the right of teachers to provoke students into thinking,” he says.” He expressed concern, however, about the possible chilling effect of the verdict, commenting,

“You’d almost have to survey the class to find out what their beliefs are so you wouldn’t insult anyone.” Corbett hopes to appeal the decision. In the meantime, fees and damages have yet to be determined; the *Orange County Register* (2009 May 5) reported, “Farnan plans to ask for attorneys’ fees, nominal damages and a court injunction prohibiting Corbett from violating the establishment clause again.”

Documents from the case are available on-line on NCSE’s website at <<http://ncseweb.org/creationism/legal/c-f-v-capistrano-usd>>.

Florida: With the close of the regular legislative session in Florida on May 1, 2009, Senate Bill 2396 apparently died in committee. If enacted, the bill would have amended a section of Florida law to require “[a] thorough presentation and critical analysis of the scientific theory of evolution.” The bill’s sponsor, Stephen R Wise (R-District 5), originally announced his intention to introduce a bill requiring “intelligent design” to be taught in Florida’s public schools, telling the *Jacksonville Times-Union* (2009 Feb 8), “If you’re going to teach evolution, then you have to teach the other side so you can have critical thinking.” (For background on SB 2396, see *RNCSE* 2009 Mar/Apr; 29 [2]: 14–20.)

The phrase “[a] thorough presentation and critical analysis of the scientific theory of evolution” appeared in the previous legislative session in Florida. House Bill 1483, which originally purported to protect the right of teachers to “objectively present scientific information relevant to the full range of scientific views regarding biological and chemical evolution,” was eventually amended — due to concerns about its constitutionality — to require the public schools to provide “[a] thorough presentation and critical analysis of the scientific theory of evolution.” Both that bill and its Senate counterpart died in committee.

After SB 2396 was introduced, Florida Citizens for Science quickly denounced it, writing, in a February 27, 2009, press release, “Wise’s anti-evolution bill is an

insult to citizens who are tired of stomping over the same ground over and over again. The Florida Board of Education and last year’s state legislature have already debated the teaching of evolution *ad nauseam*. To insist on bringing this up again is irresponsible because it will distract our lawmakers from the important tasks at hand, and could burden one of our school districts with a million dollar legal bill” (a reference to the *Kitzmiller* case).

Additionally, the Florida Academy of Sciences denounced the bill in a March 20, 2009, statement (available on-line at <http://www.flascience.org/fas_statement.pdf>), which described it as “a deliberate attempt to undermine the adopted science standards,” adding, “SB 2396, in effect, leaves the door open for the introduction in the public school curriculum of nonscientific and covertly religious doctrines. The proposed bill would be damaging to the quality of science education of Florida’s children and the scientific literacy of our citizens. It would further undermine the reputation of our state and adversely affect our economic future as we try to attract new high-tech and biomedical jobs to Florida.”

David Karlen, a Tampa biologist and a member of the Florida Academy of Sciences, told the *Tampa Tribune* (2009 Mar 28), “‘Critical analysis’ is the latest buzzword in the creationist movement to sneak ‘intelligent design’ or creationism into the curriculum,” and noted that it is typically only evolution for which “critical analysis” is applied. Observing that the bill has yet to receive a hearing in committee — the bill was referred to the Education Pre-K–12 and the Education Pre-K–12 Appropriations committees in the Senate — or a counterpart in the Florida House of Representatives, the *Tribune* correctly predicted that the bill “apparently is going nowhere this year,” especially because the legislature was busy with budgetary issues.

Illinois, Bourbonnais: In January 2009, the American Association of University Professors issued a report on Olivet Nazarene University’s treatment of Richard Colling, a profes-



PEACE IN THE GARDEN

Answers in Genesis and Creation Ministries International have agreed to settle their legal dispute, issuing a joint statement reading, "Each ministry is now focused on its respective mission, having put this dispute behind them." As the *Cincinnati Enquirer* (2009 Apr 27) reported, "The dispute arose more than four years ago as the American ministry, Answers in Genesis, grew more wealthy and influential than the original group in Australia, Creation Ministries International. The one-time allies waged court battles in both countries and accused one another of mishandling donors' money, using 'gutter tactics' to discredit their opponents and threatening the creationist movement with 'ruthless' business decisions."

The Australian (April 30, 2009) quipped, "Ken Ham [of AiG] and Carl Wieland [of CMI] believe the world was created in six days, so the four years it has taken Australia's most prominent creationists to conclude a civil case that began ... in 2005 must seem an eternity." Neither ministry was willing to comment to the press on the terms of the settlement, and CMI, which previously provided a host of documents relevant to the dispute on its website, is now providing only the text of the joint statement. For background on the dispute, see Jim Lippard's report in *RNCSE* 2006 Nov/Dec; 26 (6): 4-7; Lippard's updates on his blog (available on-line at <<http://lippard.blogspot.com/search/label/Answers%20in%20Genesis%20schism>>), and Michael McKenna's report for *The Australian* (2007 Jun 5).

sor of biology who wrote *Random Designer: Creation from Chaos to Connect with the Creator* (Bourbonnais [IL]: Browning Press, 2004), expressing his views about the compatibility of his religious faith with his scientific knowledge. As a result, he was prohibited from teaching the general biology class and professors were barred from assigning his book, which was previously used in both biology and history classes (see *RNCSE* 2007 Sep-Dec; 27 [5-6]: 20-4). The AAUP's report (available on-line at <<http://www.aaup.org/AAUP/protect/academicfreedom/investrep/2009/olivet.htm>>) concluded:

In suspending Professor Richard Colling from teaching general biology for non-majors, which he had taught routinely for sixteen years, the administration of Olivet Nazarene University imposed a severe sanction on him without having demonstrated cause in an adjudicative faculty hearing of record, as called for in Regulation 7a of the Association's Recommended Institutional Regulations on Academic Freedom and Tenure.

The administration of Olivet Nazarene University issued its directives suspending Professor Colling from his responsibility for teaching general biology and prohibiting the curricular use of his book on evolution and religion for the purpose of appeasing off-campus critics, and it insisted on sustaining these directives over the objections of Professor Colling, his department, and the faculty grievance committee. The directives violated Professor Colling's academic freedom as a faculty member, contravening fundamental provisions on academic freedom enunciated in the 1940 Statement of Principles on Academic Freedom and Tenure.

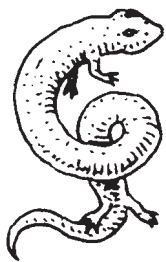
The administration of Olivet Nazarene University curtailed the academic freedom of Professor Colling in order to dampen controversy that had arisen among anti-evolutionist elements of the university's church constituency. In thus acting, the administration placed a higher value on what the president called "constituent rela-

tions" than on the principles of academic freedom to which the university itself claims to subscribe.

"Since the report was issued," *Inside Higher Ed* (2009 Feb 11) reported, "Olivet Nazarene officials have been meeting with Colling to try to resolve their dispute. Colling said Tuesday that he has been assured that the limits on his teaching and the use of his book have both been rescinded. He praised the AAUP report and the university's willingness to work through the issues. As far as he is concerned, he said, the outcome is 'a successful and positive resolution of the academic freedom concerns originally raised.'"

Iowa: House File 183, the so-called Evolution Academic Freedom Act, died in committee in the Iowa House of Representatives on March 13, 2009. The bill purported to protect the right of public-school and state higher-education teachers to "objectively present scientific information relevant to the full range of scientific views regarding biological and chemical evolution in connection with teaching any prescribed curriculum regarding chemical or biological evolution," providing that they "shall not be disciplined, denied tenure, terminated, or otherwise discriminated against" for doing so. The bill added students "shall be evaluated based upon their understanding of course materials through standard testing procedures," and "shall not be penalized for subscribing to a particular position or view regarding biological or chemical evolution." (For background, see *RNCSE* 2009 Mar/Apr; 29 [2]: 14-20.)

The Iowa State Education Association — the state affiliate of the National Education Association, representing over 34 000 education employees in Iowa — opposed HF 183, and over 200 faculty members at Iowa's colleges and universities endorsed a statement calling on Iowa's legislature to reject it, arguing, "It is misleading to claim that there is any controversy or dissent within the vast majority of the scientific community regarding the scientific validity of evolutionary theory." In a March 13, 2009, guest post at The Panda's Thumb blog (available on-



line at <<http://pandasthumb.org/archives/2009/03/iowa-gives-the.html>>), Hector Avalos of Iowa State University, one of the faculty members who drafted the statement, commented, “Although the bill was given little chance of passing from the start, the petition helped to inform legislators and the public of the depth of resistance to such a bill within the academic and scientific community. Iowa faculty wanted to nip this bill in the bud before we had another Louisiana on our hands.”

Avalos was alluding, of course, to the Louisiana Science Education Act, enacted (as Louisiana Revised Statutes 17:285.1) in 2008 over the protests of the state’s scientific and educational communities (see *RNCSE* 2008 Jul/Aug; 28 [4]: 4–10). The LSEA is the only “academic freedom” anti-evolution bill to have been passed, despite attempts to pass such bills elsewhere. So far in 2009, there have been six: Alabama’s House Bill 300, Florida’s Senate Bill 2396, Iowa’s House File 183, Missouri’s House Bill 656, New Mexico’s Senate Bill 433, and Oklahoma’s Senate Bill 320. Such bills are typically based on a policy adopted in Ouachita Parish, Louisiana, in 2006 and/or a model bill promoted by the Discovery Institute’s Center for Science and Culture, the institutional home of “intelligent design” creationism.

Louisiana: “Just in time for the bicentennial observance of Charles Darwin’s birth, a new survey of Louisiana residents shows 40 percent of the respondents believe evolution is not well-supported by evidence or generally accepted within the scientific community,” the Baton Rouge *Advocate* (2009 Apr 14) reports. The Louisiana Survey, sponsored by the Manship School of Mass Communication’s Reilly Center for Media & Public Affairs at Louisiana State University, asked (<http://www.survey.lsu.edu/downloads/2009lasurveyreport_final.pdf>), “Do you think the scientific theory of evolution is well supported by evidence and widely accepted within the scientific community, or that it is not well supported by evidence and many scientists have serious doubts about it?” Of the respondents, only 38.8% preferred

the correct option, with 40.3% thinking that evolution is not well supported and 20.9% listed as saying they don’t know. The survey also asked, “When teaching students about human origins, would you generally favor or oppose teaching creationism along with evolution in public schools?”; 57.5% of the respondents said that they favored teaching creationism, 31% said that they opposed teaching creationism, and 11.4% were listed as saying they don’t know.

The *Advocate* was editorially appalled, commenting, “The level of belief that evolution is not supported by scientific evidence is startling. Equally amazing is the percentage who believe evolution is not generally accepted within the scientific community,” and adding, “Such indifference to basic principles of science doesn’t position Louisiana very well to embrace the knowledge-based economy it needs to advance its future.” (As Barbara Forrest recently observed in a March 22, 2009, post at the Louisiana Coalition for Science’s blog, available on-line at <<http://lasciencecoalition.org/2009/03/22/laissez-bon-temps-router/>>, the state is next-to-last in the nation with respect to student educational success and economic prospects.) In a jab at Gov Bobby Jindal, who signed the so-called Louisiana Science Education Act into law in 2008, opening the door for creationism and scientifically unwarranted critiques of evolution to be taught in public school science classes in Louisiana (see *RNCSE* 2008 Jul/Aug; 28 [4]: 4–10), the *Advocate* also remarked, “How ironic that Jindal’s wife, Supriya, has launched a private foundation to promote math and science education in Louisiana’s classrooms. We encourage the governor to promote science education by working to keep religion out of science classes in public schools — something he’s been unwilling to do so far.”

New Mexico: New Mexico’s Senate Bill 433 died in committee when the legislature adjourned on March 21, 2009. The bill, if enacted, would have required schools to allow teachers to inform students “about relevant scientific information regarding either the scientific

strengths or scientific weaknesses pertaining to biological evolution or chemical evolution,” protecting teachers who choose to do so from “reassignment, termination, discipline or other discrimination.” (For background, see *RNCSE* 2009 Mar/Apr; 29 [2]: 14–20.) SB 433 joins Iowa’s House File 183 and Oklahoma’s Senate Bill 320 as proposed “academic freedom” anti-evolution bills that failed in 2009; Alabama’s House Bill 300 and Missouri’s House Bill 656 are still active.

The bill mentioned only “biological evolution or chemical evolution,” but its sponsor, Kent Cravens (R-District 27), described it as having wider applicability, telling the *Santa Fe New Mexican* (2009 Mar 3), that it “just asks that if there’s a controversial scientific theory being presented, that a teacher can’t be reprimanded or fired or downgraded or any way harmed if the teacher happens to mention that there are other theories of controversial scientific nature, to include biological evolution, human cloning, global warming, you name a dozen different things.” In a March 21, post at The Panda’s Thumb blog (available on-line at <<http://pandasthumb.org/archives/2009/03/another-discove.html>>), Dave Thomas of New Mexicans for Science and Reason suggested that Cravens may have intended to revise his bill accordingly.

Analyses of the bill performed by various state agencies were not enthusiastic. According to the Legislative Education Study Committee’s summary analysis (available on-line at <<http://www.nmlegis.gov/Sessions/09%20Regular/LESCAnalysis/SB0433.pdf>>), the Public Education Department was worried that the bill would allow the teaching of creationism, thereby inviting litigation; the Higher Education Department observed that the New Mexico state science standards already require students to understand the evidential basis for evolution; and the Office of Education Accountability questioned the bill’s premises “that the theory of evolution lacks scientific validity ... and that teachers and students need protection when



HOUSE RESOLUTION 1014 By: THOMSEN

AS INTRODUCED

A Resolution expressing disapproval of the actions of the University of Oklahoma to indoctrinate students in the theory of evolution; opposing the invitation to Richard Dawkins to speak on campus; and directing distribution.

WHEREAS, the University of Oklahoma is a publicly funded institution which should be open to all ideas and should train students in all disciplines of study and research and to use independent thinking and free inquiry, not indoctrinate students in one-sided study and thinking; and

WHEREAS, the Department of Zoology at the University of Oklahoma has, as evidenced on the departmental homepage, been framing the Darwinian theory of evolution as doctrinal dogmatism rather than a hypothetical construction within the disciplines of the sciences; and

WHEREAS, not only has the Department of Zoology at the University of Oklahoma been engaged in one-sided indoctrination of an unproven and unpopular theory but has made an effort to brand all thinking in dissent of this theory as anti-intellectual and backward rather than nurturing such free thinking and allowing a free discussion of all ideas which is the primary purpose of a university; and

WHEREAS, the University of Oklahoma has planned a year-long celebration of the 200th birthday of Charles Darwin and the 150th anniversary of Darwin's controversial theory of evolution, called the "Darwin 2009 Project", which includes a series of lectures, public speakers, and a course on the history of evolution; and

WHEREAS, the University of Oklahoma, as a part of the Darwin 2009 Project, has invited as a public speaker on campus, Richard Dawkins of Oxford University, whose published opinions, as represented in his 2006 book "The God Delusion", and public statements on the theory of evolution demonstrate an intolerance for cultural diversity and diversity of thinking and are views that are not shared and are not representative of the thinking of a majority of the citizens of Oklahoma; and

WHEREAS, the invitation for Richard Dawkins to speak on the campus of the University of Oklahoma on Friday, March 6, 2009, will only serve to further the indoctrination engaged in by the Department of Zoology at the University of Oklahoma by presenting a biased philosophy on the theory of evolution to the exclusion of all other divergent considerations rather than teaching a scientific concept.

NOW, THEREFORE, BE IT RESOLVED BY THE HOUSE OF REPRESENTATIVES OF THE 1ST SESSION OF THE 52ND OKLAHOMA LEGISLATURE:

THAT the Oklahoma House of Representatives hereby expresses its disapproval of the current indoctrination of the Darwinian theory of evolution at the University of Oklahoma and further requests that an open, dignified, and fair discussion of this idea and all other ideas be engaged in on campus which is the approach that a public institution should be engaged in and which represents the desire and interest of the citizens of Oklahoma.

THAT the Oklahoma House of Representative strongly opposes the invitation to speak on the campus of the University of Oklahoma to Richard Dawkins of Oxford University, whose published statements on the theory of evolution and opinion about those who do not believe in the theory are contrary and offensive to the views and opinions of most citizens of Oklahoma.

THAT a copy of this resolution be transmitted to the President of the University of Oklahoma, the Dean of the College of Arts and Science at the University of Oklahoma, and the Chair of the Department of Zoology at the University of Oklahoma.

sponsor of both bills is Todd Thomsen (R-District 25), a member of the House Education Committee and the chair of the House Higher Education and Career Tech Committee. Both measures, if adopted, would express the strong opposition of the Oklahoma House of Representatives to "the invitation to speak on the campus of the University of Oklahoma to Richard Dawkins of Oxford University, whose published statements on the theory of evolution and opinion about those who do not believe in the theory are contrary and offensive to the views and opinions of most citizens of Oklahoma." Dawkins spoke at the University of Oklahoma on March 6, 2009, as part of the university's celebrations of the Darwin anniversaries.

While HR 1015 ends with a plea for civility — "the Oklahoma House of Representatives encourages the University of Oklahoma to engage in an open, dignified, and fair discussion of the Darwinian theory of evolution and all other scientific theories which is the approach that a public institution should be engaged in and which represents the desire and interest of the citizens of Oklahoma" — HR 1014 attacks the University of Oklahoma's Department of Zoology for "framing the Darwinian theory of evolution as doctrinal dogmatism rather than a hypothetical construction within the disciplines of the sciences" and engaging in "one-sided indoctrination of an unproven and unpopular theory" while branding "all thinking in dissent of this theory as anti-intellectual and backward rather than nurturing such free thinking and allowing a free discussion of all ideas which is the primary purpose of a university." (For the text of both bills, see sidebars, p 20, 21).

At the beginning of his talk, which was repeatedly interrupted by cheers and applause, Dawkins opened by saying, "I don't want to blow my own trumpet, but it isn't everybody who's the subject of legislation ..." Quoting HR 1014's complaint of his alleged "intolerance for cultural diversity and diversity of thinking," he presented

addressing 'relevant scientific strengths or scientific weakness pertaining to biological evolution or chemical evolution.'

Oklahoma: Two bills in the Oklahoma House of

Representatives — House Resolution 1014 and House Resolution 1015, introduced on March 3, 2009 — attacked a recent visit by Richard Dawkins to the University of Oklahoma. The sole

the stork theory of human reproduction — illustrated with a parody of the creationist propaganda film *Expelled* — as a view comparable to creationism. “They’ve lost in the courts of law; they’ve long ago lost in the halls of science; and they continue to lose with every new piece of evidence in support of evolution. Taking offense is all they’ve got left. And the one thing you can be sure of is that they don’t actually know anything about what it is that they reject,” he added. He also announced that the Richard Dawkins Foundation for Reason and Science would be donating \$5000 to Oklahomans for Excellence in Science Education, which fights against attempts to undermine evolution education in Oklahoma. (For video of the talk, visit <<http://richarddawkins.net/article,3646,Richard-Dawkins-at-the-University-of-Oklahoma-Introduction,Richard-Dawkins>>.)

Texas: In a March 31, 2009, decision, Chris Comer’s lawsuit against the Texas Education Agency, challenging the agency’s policy of requiring neutrality about evolution and creationism, was dismissed. (For background, see *RNCSE* 2008 Jan/Feb; 28 [1]: 4–7.) The *Austin American-Statesman* (2009 Apr 1) reported, “The state’s attorneys argued in court filings that the agency is allowed to bar its employees from giving the appearance that the agency is taking positions on issues that the State Board of Education must decide, such as the content of the science curriculum.” The newspaper quoted Texas Education Commissioner Robert Scott as saying, “We are sorry that this situation resulted in a lawsuit but we were confident we would prevail,” and John Oberdorfer, one of Comer’s lawyers, as saying of the dismissal, “We’ll look at it and decide what we’ll do next.”

Comer, the former director of science at the Texas Education Agency, was forced to resign in November 2007 after she forwarded a note announcing a talk by Barbara Forrest in Austin. As NCSE’s Glenn Branch — who sent the offending e-mail — explained in *RNCSE* (2008 Jan/Feb; 28 [1]: 9–10), “Less than two hours after sending the e-mail, she was called

HOUSE RESOLUTION 1015 BY: THOMSEN

AS INTRODUCED

A Resolution opposing the invitation to Richard Dawkins to speak on campus; encouraging the University of Oklahoma to engage in a certain discussion of certain scientific theories; and directing distribution.

WHEREAS, the University of Oklahoma is a publicly funded institution which should be open to all ideas and should train students in all disciplines of study and research and to use independent thinking and free inquiry; and

WHEREAS, the University of Oklahoma has planned a year-long celebration of the 200th birthday of Charles Darwin and the 150th anniversary of Darwin’s theory of evolution, called the “Darwin 2009 Project”, which includes a series of lectures, public speakers, and a course on the history of evolution; and

WHEREAS, the University of Oklahoma, as a part of the Darwin 2009 Project, has invited as a public speaker on campus, Richard Dawkins of Oxford University, whose published opinions, as represented in his 2006 book “The God Delusion”, and public statements on the theory of evolution demonstrate an intolerance for cultural diversity and diversity of thinking and are views that are not shared and are not representative of the thinking of a majority of the citizens of Oklahoma; and

WHEREAS, the invitation for Richard Dawkins to speak on the campus of the University of Oklahoma on Friday, March 6, 2009, will only serve to present a biased philosophy on the theory of evolution to the exclusion of all other divergent considerations rather than teaching a scientific concept.

NOW, THEREFORE, BE IT RESOLVED BY THE HOUSE OF REPRESENTATIVES OF THE 1ST SESSION OF THE 52ND OKLAHOMA LEGISLATURE:

THAT the Oklahoma House of Representative strongly opposes the invitation to speak on the campus of the University of Oklahoma to Richard Dawkins of Oxford University, whose published statements on the theory of evolution and opinion about those who do not believe in the theory are contrary and offensive to the views and opinions of most citizens of Oklahoma.

THAT the Oklahoma House of Representatives encourages the University of Oklahoma to engage in an open, dignified, and fair discussion of the Darwinian theory of evolution and all other scientific theories which is the approach that a public institution should be engaged in and which represents the desire and interest of the citizens of Oklahoma.

THAT a copy of this resolution be transmitted to the President of the University of Oklahoma, the Dean of the College of Arts and Science at the University of Oklahoma, and the Chair of the Department of Zoology at the University of Oklahoma.

on the carpet and instructed to send a disclaimer. And then she was forced to resign. Although a memorandum recommending her dismissal referred to various instances of alleged ‘misconduct and insubordination’ on her part, it was clear what her real offense was: ‘the TEA requires, as agency policy, neutrality when talking about evolution and creationism.’” The TEA was widely criticized in editorials and by scientific and educational societies (see *RNCSE* 2008 Jan/Feb; 28 [1]: 15).

In June 2008, Comer filed suit in federal court in the Western District of Texas, arguing, “the

Agency’s firing of its Director of Science for not remaining ‘neutral’ on the subject violates the Establishment Clause, because it employs the symbolic and financial support of the State of Texas to achieve a religious purpose, and so has the purpose or effect of endorsing religion. By professing ‘neutrality,’ the Agency credits creationism as a valid scientific theory. Finally, the Agency fired Director Comer without according her due process as required by the 14th Amendment — a protection especially important here because Director Comer was fired for contravening an unconstitutional poli-

cy.” (See *RNCSE* 2008 Jul/Aug; 28 [4]: 11–4.) The judge ruled, however, that the TEA’s neutrality policy is not a violation of the Establishment Clause. (Legal documentation for the case is archived on NCSE’s website at <<http://ncseweb.org/creationism/legal/chris-comer-docs>>.)

Although Comer’s lawsuit was dismissed, her plight (discussed in a brief video commissioned by NCSE, available on-line at <<http://ncseweb.org/multimedia/chris-comer-expelled-real>>) is still a disquieting indication of the condition of science education in Texas. Shortly after her forced resignation was in the headlines, the *Houston Chronicle* (2007 Dec 4) editorially commented, “With a State Board of Education review of the science portion of the Texas Essential Knowledge and Skills scheduled early next year, Comer’s ouster could portend a renewed effort to establish creationism and intelligent design as science class fare.” In light of the recent adoption of a set of state science standards that encourages the presentation of creationist arguments (see p 9), the TEA’s “neutrality when talking about evolution and creationism” is likely to be under scrutiny again.

Texas: The Institute for Creation Research Graduate School filed suit over the Texas Higher Education Coordinating Board’s decision to deny the ICR’s request for a state certificate of authority to offer a master’s degree in science education. The complaint, filed on April 16, 2009, in the United States District Court for the Northern District of Texas, named Raymund Paredes, the Texas Commissioner of Higher Education, and the Texas Higher Education Coordinating Board and its members as defendants, in both their official and individual capacities, accusing them of imposing “an unconstitutional and prejudicial burden against ICRGS’s academic freedom and religious liberties” (p 63) and asking the court for declarative and injunctive relief.

As recounted in *RNCSE* (2008 Mar/Apr; 28 [2]: 11–5), “When the Institute for Creation Research moved its headquarters from Santee, California, to Dallas, Texas, in June 2007, it expected to be able

to continue offering a master’s degree in science education from its graduate school. ... But the state’s scientific and educational leaders voiced their opposition, and at its April 24, 2008, meeting, the Texas Higher Education Coordination Board unanimously voted to deny the ICR’s request for a state certificate of authority to offer the degree.” Subsequently, the ICR appealed the decision, while also taking its case to the court of public opinion with a series of press releases and advertisements in Texas newspapers.

Although the ICR continues to pursue its appeal, the complaint explains that the ICR deemed it necessary to file the lawsuit now because “(a) waiting a couple months [*sic*] to do so would miss the Statute of Limitations deadline; and (b) SOAH [the State Office of Administrative Hearings] has insufficient jurisdiction to remedy or otherwise resolve all of the serious legal problems involved” (p 14). (Unmentioned in the complaint is Texas’s House Bill 2800, introduced in the Texas House of Representatives on March 9, 2009, which would, if enacted, in effect exempt institutions such as the ICR’s graduate school from Texas’s regulations governing degree-granting institutions. The bill is still in the House Higher Education committee. For background, see below.)

The sixty-seven-page complaint teems with various factual claims and legal arguments, leading a blogger for the *Dallas Observer* (2009 Apr 20) to quip that it “reads kind of like stereo instructions.” It also teems with unabashed creationist rhetoric, citing articles from the ICR’s publication *Acts & Facts* along with case law, explaining that Paredes — born as he was in 1942 — was not a witness to the Big Bang, asserting that discussions about the origin of life and the formation of the earth “do not become ‘empirical science’ simply because those discussions emit from the oral cavities of ‘scientists’” (p. 33), and insisting that the Big Bang “should not be confused with the ‘great noise’ mentioned in 2nd Peter 3:10” (p 21). (Legal documentation for the case is archived on NCSE’s website at <<http://ncseweb.org/creationism/legal/>

[institute-creation-research-graduate-school-v-paredes-et-al](http://ncseweb.org/creationism/legal/institute-creation-research-graduate-school-v-paredes-et-al)>.)

Texas: House Bill 2800, introduced in the Texas House of Representatives on March 9, 2009, would, if enacted, in effect exempt institutions such as the Institute for Creation Research’s graduate school from Texas’s regulations governing degree-granting institutions. The bill’s sole sponsor is Leo Berman (R–District 6), a member of the House Higher Education Committee. A member of NCSE called Berman’s office to ask whether the bill would apply to the ICR’s graduate school; a staffer answered that he thought that it would, adding that he believed that the bill’s objective was to aid institutions that want to teach creation science or “intelligent design”. Berman himself seems not to have offered any public statement about HB 2800 so far.

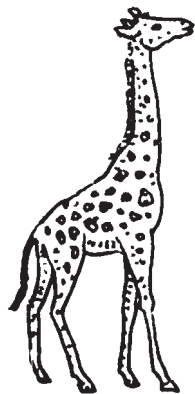
The Texas Higher Education Coordination Board denied certification to ICRGS in April 2008. However, it seems that HB 2800 would take the matter out of the board’s hands altogether. Subchapter G of Chapter 61 of Texas’s Education Code serves to regulate “the use of academic terminology in naming or otherwise designating educational institutions, the advertising, solicitation or representation by educational institutions or their agents, and the maintenance and preservation of essential academic records”; it provides, among other things:

A person may not grant or award a degree or offer to grant or award a degree on behalf of a private postsecondary educational institution unless the institution has been issued a certificate of authority to grant the degree by the board [that is, the Texas Higher Education Coordination Board] in accordance with the provisions of this subchapter.

HB 2800 would amend subchapter G by providing:

The provisions of this subchapter do not apply to a private educational institution, including a separate degree-granting program, unit, or

continued on page 27



Facing Challenges to Evolution Education

In 1983, the National Center for Science Education (NCSE) was incorporated to promote excellence in science education, improve public understanding of evolution, and defend evolution education from sectarian attacks. Four years later the Supreme Court struck down a Louisiana anti-evolution law, and many observers thought the “creation science” controversy had been put to an end. Instead, it roared back onto the scene, first at the local level, where new strategies appeared in countless communities and later at the state and national levels, as well. Some of these strategies are as old as creationism itself; others are merely reworded and relabeled expressions of creationist objections to the idea of common descent.

Here are descriptions of strategies that are commonly used in attempts to force “creation science” or “intelligent design” into public schools, and suggestions on how to respond.

ANTI-EVOLUTION STRATEGY: Uses of euphemisms or code phrases such as “arguments against evolution”, “alternative theories”, “balanced treatment”, “intelligent design theory”, “abrupt appearance theory”, “irreducible complexity”, and so on.

RESPONSE: These phrases are code words for non-scientific, religious views in the science curriculum; no matter what it is called, it is illegal for public schools to advocate religious views of any kind. Districts that do so risk expensive law suits that would divert funds from important educational programs. Because different members of the public will respond to different kinds of information, it is helpful to use many approaches. For example, (a) invite local scientists to explain why “arguments against evolution” (by any name) are not scientific (NCSE can help); (b) call on local clergy to expose the underlying sectarian motivations of this approach; (c) remind boards of education to obtain legal advice when considering such policies; (d) provide board members and administrators with information about the applicable laws.

ANTI-EVOLUTION STRATEGY: Labeling evolution as “theory, not fact,” or claiming that evolution is “only a theory”.

RESPONSE: Point out that proposals like these confuse the ordinary definition of “theory” as “hunch” or “guess” with the scientific meaning of the term. Explain the meaning of scientific theory as used in scientific work — an explanation that is well supported by multiple lines of evidence which scientists can use to understand and guide research about the natural world. The goals are to make sure that the public and policy makers understand the issues and to ensure that correct definitions of “theory” appear in curriculum and policy statements.

ANTI-EVOLUTION STRATEGY: Calls for teaching “both sides” or “all sides” because that’s what’s “fair”.

RESPONSE: The “fairness” strategy can be very effective at first because it appeals to a broadly held value. Point out, however, that a fair science curriculum is one that teaches children the most up-to-date, accurate information that is accepted in the scientific community. It is not fair to harm the education of all of the students because of narrow sectarian objections to evolution. A good curriculum also requires science teachers and students to use scientific standards of evidence and inference in classroom discussions, rather than unsupported opinions.

ANTI-EVOLUTION STRATEGY: Claim that critical thinking skills are enhanced by teaching both evolution and “creation science” (or one of its synonyms).

RESPONSE: Teaching critical thinking does not mean presenting irrelevant and ill-founded “alternatives” to basic knowledge that all students need to understand. In the context of science education, it would be appropriate to discuss genuine disagreements within the scientific community — for example, scientific discussions about the pace at which evolution occurred.

Another problem is that teachers discussing “evidence against evolution” would logically be expected to discuss evidence against “scientific creationism”. Yet it is impossible to do so without criticizing religious beliefs, which they should not do.

ANTI-EVOLUTION STRATEGY: Calls to treat evolution as a “controversial issue” by using disclaimers or other methods.

RESPONSE: Point out that evolution is not scientifically controversial, but, rather, the guiding theoretical framework for the modern biomedical and life sciences. Evolution should not be treated differently from other theories in the mainstream sciences. The social and political controversies that sometimes arise around the teaching of evolution should be recognized for what they are, social and political controversies, not scientific ones. Of course, there are unresolved questions and open issues within the field of evolution. In this respect, evolution is typical of other scientific fields.

ANTI-EVOLUTION STRATEGY: Call for “academic freedom” to use “supplementary materials”.

RESPONSE: Attempts to bring in anti-evolution material is almost always behind calls of this kind. When proposals like these are made, examine the supplementary materials and determine if they are legitimate scientific materials or whether they consist of inaccurate, misleading, or false claims about evolution that circulate in creationist sources. Ensure that local policies were followed in adopting them. References to “academic freedom” are inappropriate in this context. The American Association of University Professors, the chief watchdog for academic freedom, has stated that efforts to teach “intelligent design” “run counter to the overwhelming scientific consensus regarding evolution and are inconsistent with a proper understanding of the meaning of academic freedom.” By the AAUP’s widely accepted definition, academic freedom is principally the right of college-level scholars to conduct, publish and discuss research. Furthermore, as the AAUP observes, academic freedom does not carry with it the freedom to misinform students, and that is exactly what happens when ID arguments are taught. Academic freedom, as normally understood, does not apply to teachers in K-12, because they are not researchers. Teachers at that level set the foundation for students to work with active researchers in college.

Adapted from “Facing challenges to evolution education” by Molleen Matsumura, available on-line at <<http://ncseweb.org/taking-action/facing-challenges-to-evolution-education>>.

FROM NCSE'S SUPPORTERS

The three dozen or so Supporters of NCSE — listed on our letterhead and on the back of every issue of *RNCSE* — are a group of distinguished scientists, scholars, and educators whose prestige we respect, whose support we value, and whose insight we cherish. They differ among themselves on a number of issues, of course, as any such group would, but they all agree on the importance of evolution education and the need to defend it, as their official support of NCSE testifies. Featured here, therefore, are books by our Supporters on a variety of topics: various aspects of science in general, evolution, and, of course, the creationism/evolution controversy. (Obviously it is only a sampling: our Supporters are prolific authors!) To see what our Supporters have to say, consult the following books, now available through the NCSE web site: <<http://ncseweb.org/store>> — 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.

ABOUT SCIENCE...

Essential Cell Biology,
third edition

by Bruce Alberts and others

A brand-new and thoroughly up-to-date edition of a classic textbook widely used in introductory classes in cell and molecular biology, supplemented with a DVD-ROM including over 130 animations and videos, all of the figures from the book, and a self-testing feature for students. “This book fills a critical niche in the pedagogical process of introducing cell biology and does an excellent job in reaching its objective,” wrote a reviewer of *The Quarterly Review of Biology*. NCSE Supporter Bruce Alberts, a former president of the National Academy of Sciences, is Professor of Biochemistry and Biophysics at the University of California, San Francisco, and editor-in-chief of the journal *Science*.

Present at the Flood
by Richard E Dickerson

Present at the Flood chronicles a scientific revolution — the rise of structural molecular biology — by providing forty-two key scientific papers together with informed commentary to place their accomplishments in context. The reviewer for the *Journal of Structural Biology* wrote, “The book will clearly serve its intended purpose as an

outline for a graduate course on the origins and methods of structural molecular biology, but it is also highly recommended for its insights into the lives and thought processes of those who laid the foundations of the field.” Richard E Dickerson is Professor Emeritus in the Molecular Biology Institute of the University of California, Los Angeles.

Physics, the Human Adventure
by Gerald Holton and
Stephen G Brush

The third edition of a classic text, *Physics, the Human Adventure* presents the content and nature of physical science while emphasizing its history as well. As the authors explain, “Our purpose in this book is to tell the story of the major ideas that have led to our current understanding of how the physical universe functions. At the same time we also aim to show that the growth of science was part of the general development of our civilization, as it is to this day.” NCSE Supporter Stephen G Brush is Distinguished University Professor Emeritus of the History of Science at the University of Maryland.

*Origins: Fourteen Billion Years of
Cosmic Evolution*

by Neil deGrasse Tyson and
Donald Goldsmith

The companion volume to the NOVA special, *Origins* astonishingly compresses the fourteen-billion-

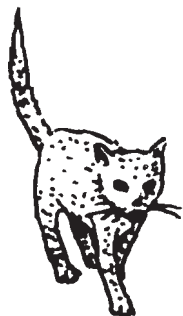
year history of the universe, from the Big Bang to the search for extraterrestrial intelligence, in 288 fascinating pages. Michio Kaku describes it as “a remarkable text which is bound to set the gold standard for cosmology book for years to come. Clear, lucid, and up-to-date, this delightful book takes us on a grand tour of the mysteries of the universe.” NCSE Supporter Neil deGrasse Tyson is the director of the Hayden Planetarium at the American Museum of Natural History and author of *The Pluto Files* (New York: WW Norton, 2009).

ON EVOLUTION...

*Remarkable Creatures: Epic
Adventures in the Search for the
Origin of Species*

by Sean B Carroll

In *Remarkable Creatures*, Sean B Carroll — one of the principal architects of evolutionary developmental biology (“evo devo”) — turns his attention to the history of evolutionary theory, offering vignettes of the explorers, from Darwin’s day to ours, whose discoveries provided the evidential basis for modern biology. Neil Shubin writes, “In addition to being one of our most distinguished scientists, Sean Carroll is a gifted storyteller. Blending the suspense of a page-turning detective story with the powerful insights of some of



the best science writing, he tells the story of natural history as it needs to be told — as an adventure into the unknown.”

Evolution, second edition

by Douglas J Futuyma

Now in its second edition, *Evolution* is described by its publisher as “a comprehensive treatment of contemporary evolutionary biology that is directed toward an undergraduate audience. It addresses major themes — including the history of evolution, evolutionary processes, adaptation, and evolution as an explanatory framework — at levels of biological organization ranging from genomes to ecological communities. Throughout, the text emphasizes the interplay between theory and empirical tests of hypotheses, thus acquainting students with the process of science. Teachers and students will find the list of important concepts and terms in each chapter a helpful guide, and will appreciate the dynamic figures and lively photographs.”

Evidence and Evolution

by Elliott Sober

The publisher writes, “How should the concept of evidence be understood? And how does the concept of evidence apply to the controversy about creationism and also to work in evolutionary biology about natural selection and common ancestry? In this rich and wide-ranging book, Elliott Sober investigates general questions about probability and evidence and shows how the answers he develops to those questions apply to the specifics of evolutionary biology. ... His book will interest all readers who want to understand philosophical questions about evidence and evolution, as they arise both in Darwin’s work and contemporary biological research.”

Developmental Plasticity and Evolution

by Mary Jane West-Eberhard

A major contribution to a synthesis of development and evolution, *Developmental Plasticity and Evolution*, in the words of the reviewer for *Evolution & Development*, “comprehensively explores the mechanisms and

implications of developmental plasticity to numerous aspects of both micro- and macroevolution ... West-Eberhard seamlessly shifts between a broad mastery of the classical literature and up-to-date modern science. ... Every reader will find their own ideas altered and expanded by at least some of the examples and arguments representing the lifetime gestalt of this exemplary scientist.” Mary Jane West-Eberhard is a staff scientist at the Smithsonian Tropical Research Institute.

AND AGAINST CREATIONISM...

Darwin’s Gift to Science and Religion

by Francisco Ayala

“Darwin’s theory of evolution is a gift to science,” Francisco Ayala argues, “and to religion as well.” He explains why in *Darwin’s Gift to Science and Religion*, hailed by John F Haught as “a crisp summary and development of positions he has long held regarding the explanatory scope and limitations of the idea of natural selection” and by Michael Zimmerman as “a clear and concise précis of the current battleground between evolution and its creationist attackers.” Ayala is University Professor and the Donald Bren Professor of Biological Sciences at the University of California, Irvine; he received the National Medal of Sciences in 2002.

Scientists Confront Creationism: Intelligent Design and Beyond

edited by Andrew J Petto and Laurie R Godfrey

A spectacular new anthology featuring essays about creationism — and its latest incarnation, “intelligent design” — by Ronald L Numbers, NCSE’s Eugenie C Scott, John R Cole, Victor J Stenger, Antonio Lazcano, Kevin Padian and Kenneth D Angielczyk, Robert Dorit, NCSE’s Wesley R Elsberry, C Loring Brace, Robert T Pennock, Norman A Johnson, J Michael Plavcan, Alice Beck Kehoe, and the editors, Andrew J Petto and NCSE Supporter Laurie R Godfrey; Cole, Padian, and Petto are all members of NCSE’s board of directors. *Scientists Confront Creationism and Intelligent Design* is a worthy

successor to Godfrey’s previous collection, *Scientists Confront Creationism*, published in 1984.

Living With Darwin

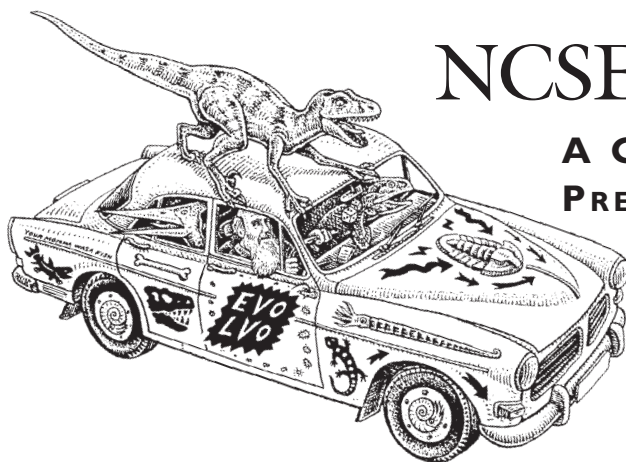
by Philip Kitcher

As NCSE deputy director Glenn Branch wrote in *BioScience*, “Kitcher discusses the evidence for, and the creationist resistance to, deep time, common ancestry, and natural selection, in vivid and fluent prose, and always with accuracy and insight. Recognizing the historical respectability and the current bankruptcy of ‘intelligent design’, he describes it as ‘dead science’ — although, in light of its shambling tenacity, ‘zombie science’ is perhaps a preferable label. Kitcher concludes by offering a historically detailed and sociologically acute diagnosis of creationism as a reaction to what is understood — and not unreasonably so, he suggests — as the vanguard of the Enlightenment’s critique of supernaturalist and providentialist forms of religion.”

But Is It Science? updated edition edited by Robert T Pennock and Michael Ruse

Part of the controversy over the *Origin of Species* was whether Darwin’s theory was properly scientific, and part of the ongoing controversies over creation science and “intelligent design” is whether these views are properly scientific. *But Is It Science?* thus tackles the philosophical question in the creation/evolution controversy. The editors, NCSE Supporter Michael Ruse and NCSE member Robert T Pennock, testified on the nature of science in *McLean v Arkansas* and *Kitzmiller v Dover*, respectively. Not to be missed is Nick Matzke’s article, written especially for the volume, detailing the genesis of “intelligent design” in preparation for *Edwards v Aguillard*.





NCSE on the Road

A CALENDAR OF SPECIAL EVENTS, PRESENTATIONS, AND LECTURES

DATE August 14, 2009
CITY Berkeley CA
PRESENTER Eugenie C Scott
TITLE Why Evolution "Makes Sense" of the Human Skeleton
EVENT "Think Evolution" symposium
TIME 9:30 AM
LOCATION Valley Life Sciences Building, University of California at Berkeley
CONTACT Louise Mead, mead@ncseweb.org

DATE August 17, 2009
CITY San Francisco CA
PRESENTER Eugenie C Scott
TITLE Constructive Debates When Science and Politics Mix
EVENT Pacific AAAS Symposium
 Good Science is only Part of the Job:
 Communicating Science to the Public
TIME 9:00 AM
LOCATION San Francisco State University
CONTACT Henry J Campbell, hank@scientificblogging.com

DATE September 8, 2009
CITY South Bend IN
PRESENTER Eugenie C Scott
TITLE How to Teach Evolution Better
EVENT Talk to biology graduate students
TIME 4:00 PM
LOCATION 105 Jordan Hall, University of Notre Dame
CONTACT Peter Levi, plevi@nd.edu

DATE September 8, 2009
CITY South Bend IN
PRESENTER Eugenie C Scott
TITLE The Evolution of Creationism
EVENT Public lecture
TIME 7:00 PM
LOCATION McKenna Auditorium,
 University of Notre Dame
CONTACT Peter Levi, plevi@nd.edu

DATE September 17, 2009
CITY Provo UT
PRESENTER Eugenie C Scott
TITLE What Will the Creationists Do Next?
EVENT Duane E Jeffery Lecture Series in Evolution Education
TIME 11:00 AM
LOCATION Brigham Young University
CONTACT Jerald B Johnson, jerry.johnson@byu.edu

Check the NCSE web site for updates and details — <<http://www.ncseweb.org/meeting.asp>>.

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school operated by the institution, that: (1) does not accept state funding of any kind to support its educational programs; (2) does not accept state-administered federal funding to support its educational programs; (3) was formed as or is affiliated with or controlled by a non-profit corporation or non-profit unincorporated organization; and (4) offers bona fide degree programs that require students to complete substantive course work in order to receive a degree from the institution."

Presumably the ICR would argue that its graduate school satisfies all four requirements.

Fox News (2009 Mar 18) offered a detailed story about House Bill 2800. Although the ICR is not specifically named in the text of the bill, "[the bill's sponsor Leo] Berman says ICR was the inspiration for the bill because he feels creationism is as scientific as evolution and should be granted equal weight in the educational community." Berman was also quoted as saying, "I don't believe I came from a salamander that crawled out of a swamp millions of years ago." NCSE's executive director Eugenie C Scott responded, "Their science education degrees are greatly inferior to those at, say, the University of Texas or Baylor University or even a good community college, frankly," adding, "Teaching that the earth is only 10 000 years old is a little irregular in modern science."

Concern about HB 2800 was not confined to the ICR's program. A spokesperson for the Texas Higher Education Coordinating Board, which denied state certification to the ICR's graduate school in 2007, argued that "HB 2800 appears to open the doors of Texas to predatory institutions ... Were the bill to become law, it could have the effect of leaving students defenseless against exploitation by diploma mills and other substandard institutions." Steven Schafersman of Texas Citizens for Science warned, "This would open the door to other fly-by-night organizations that come in and want to award degrees in our state, because the bill is highly general-

ized," and NCSE's Scott added, "It would certainly open the door to all kinds of chicanery ... I mean, all you have to do, it looks to me from the bill, is start a non-profit organization, don't take any federal or state money, and then offer degrees in any fool subject you want."

Texas: House Bill 4224, introduced in the Texas House of Representatives on March 13, 2009, would require the Texas state board of education to restore the "strengths and weaknesses" language in the Texas state science standards. The current standards for high school biology include a requirement that reads, "The student is expected to analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information." As NCSE previously reported, in 2003 the "strengths and weaknesses" language in the standards was selectively applied by members of the board attempting to dilute the treatment of evolution in the biology textbooks then under consideration. When a panel of scientific and educational experts revised the standards, the "strengths and weaknesses" requirement was replaced with "The student is expected to analyze and evaluate scientific explanations using empirical evidence, logical reasoning, and experimental and observational testing." In a close vote on January 23, 2009, the board gave its preliminary approval to a version of the standards without the "strengths and weaknesses" language; at the board's March 25-27, 2009, meeting, however, creationists on the board eventually managed to insert a requirement that students examine "all sides of scientific evidence" (see p 9).

Introduced by Wayne Christian (R-District 9), House Bill 4224 would add a section to the Texas Education Code providing:

- (a) As part of the essential knowledge and skills of the science curriculum under Section 28.002(a)(1)(C), the State Board of Education by rule shall establish elements relating to instruction on the scientific hypotheses and theories for grades 6-12.
- (b) Instructional elements for

scientific processes: the student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(c) Students may be evaluated based upon their understanding of course materials, but no student in any public school or institution shall be penalized in any way because he or she subscribes to a particular position on scientific theories or hypotheses;

(d) No governmental entity shall prohibit any teacher in a public school system of this state from helping students to understand, analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.

The state's scientific and educational communities are firmly opposed to the inclusion of the "strengths and weaknesses" language in the science standards. According to a survey (available on-line at <<http://www.tfn.org/site/DocServer/FinalWebPost.pdf?docID=861>>; see *RNCSE* 2009 Jan/Feb; 29 [1]: 7) conducted by the TFN Education Fund in conjunction with Raymond Eve, a sociology professor at the University of Texas, Arlington, professors of biology at Texas's colleges and universities overwhelmingly reject the notion of teaching the "weaknesses" of evolution, with almost 80% regarding it as likely to hinder student readiness for college and 72% regarding it as likely to hinder student ability to compete for 21st-century jobs. Additionally, over 1400 Texas scientists have endorsed the 21st Century Science Coalition's call on the state board of education to approve science standards that "encourage valid critical thinking and scientific reasoning by leaving out all references to 'strengths and weaknesses,' which politicians have used to introduce supernatural explana-



tions into science courses.” And in a newsletter published by the Science Teachers Association of Texas (available on-line <<http://www.statweb.org/STATellite/Dec08.pdf>>), the organization’s president described the “strengths and weaknesses” language as “vague and misleading,” noting that it provides a pretext for the problematic insertion of religious beliefs into the science curriculum.

Discussing House Bill 4224, which would require the Texas state board of education to restore the “strengths and weaknesses” language to the Texas state science standards, the *Fort Worth Star-Telegram* (2009 Mar 19) reported, “The bill does not address evolution specifically, but that seems to be its target. ... [The bill’s sponsor Wayne] Christian said he filed the bill to allow teachers to continue to teach the strengths and weaknesses of the theory of evolution.” Steven Schafersman of Texas Citizens for Science told the newspaper that the language was removed from the proposed new standards because it is not scientifically based, and warned that HB 4224 was likely to encourage teachers to teach creationism in violation of the constitutional strictures against doing so. He also said that for Texas to compete nationally and globally, the education standards must be based on “good science and not get bogged down with these religious interventions into our secular schools.”

A further concern about HB 4224 discussed in the *Star-Telegram*’s article was the bill’s provision that “Students may be evaluated based upon their understanding of course materials, but no student in any public school or institution shall be penalized in any way because he or she subscribes to a particular position on scientific theories or hypotheses.” (The article reported, incorrectly, that the bill would afford the same protection to teachers; it is in fact silent about the beliefs of teachers, although it explicitly allows them to present “strengths and weaknesses” — a creationist catchphrase — to their students.) Schafersman commented, “Students could claim they believe anything they wanted in anything

in science and if that’s what they say, the teacher would be forced to give that student an A,” but Christian countered that students would still be responsible for learning the material presented in the curriculum: “They can be lazy if they want to ... but teachers are still in charge of the grading.”

Vermont, Burlington: Controversy erupted at the University of Vermont after it was announced that Ben Stein, the actor, pundit, and lead for the creationist propaganda film *Expelled* (see *RNCSE* 2008 Sep-Dec; 28 [5-6]) was invited to give the commencement address at, and receive an honorary degree from, the university. The *Burlington Free Press* (2009 Feb 2) reported that the university’s president Dan Fogel selected Stein “largely on the basis of the enthusiastic response Stein received from students for a lecture at UVM last spring.” Reaction to the announcement was swift. Particularly noteworthy was Richard Dawkins’s letter to Fogel (available on-line at <<http://richarddawkins.net/articleComments,3564,University-of-Vermont-makes-an-embarrassing-decision,PZ-Myers-Pharyngula,page1#330930>>), in which he wrote, “I can only presume that neither you, nor anybody else responsible for this lamentable decision, has seen the film ‘Expelled’. Was anybody in the Biology Department consulted before you issued an invitation to a notoriously mendacious propagandist for creationism? Was anyone in the History Department consulted before you issued this invitation to somebody who seriously tries to blame Darwin for the Holocaust?”

The *Free Press* quoted a spokesperson for the university as saying, “profound concerns have been expressed to President Fogel by persons both internal and external to the university about his selection. After Fogel apprised Mr Stein of these communications, he immediately and most graciously declined his commencement invitation.” According to a subsequent report in the *Free Press* (2009 Feb 3), Stein called the university’s response to the furor “chicken sh**,” and you can quote me on that.” He added, by e-mail, “I am far more pro-science than

the Darwinists ... I want all scientific inquiry to happen — not just what the ruling clique calls science.” Fogel was quoted as describing Stein’s views on “evolutionary theory, intelligent design, and the role of science in the Holocaust” as “highly controversial, to say the least.” Replacing Stein as the commencement speaker was former Vermont governor Howard Dean. Stein, for his part, seems to have found a friendlier academic environment in which to be honored: on April 7, 2009, Liberty University — founded by Jerry Falwell — announced that Stein would speak at its commencement on May 9, 2009, citing in particular his “exposing the evils and dangers of Darwinism through the documentary *Expelled: No Intelligence Allowed*.”

Washington: Kimberly Struiksma, a teacher’s aide from Blaine, Washington, filed two proposed state initiatives with the aim of blocking the teaching of evolution and encouraging the teaching of “creation science” in public schools. Proposed initiatives 1040 and 1047 would “prohibit state use of public money or lands for anything that denies or attempts to refute the existence of a supreme ruler of the universe, including textbooks, instruction or research.” This prohibition would also apply to the funding of any “scientific endeavor,” which is defined as “any act, idea, theory, intervention, conference, organization or individual having to do with science.” The phrase “supreme ruler of the universe,” denoting God, is taken from the preamble to the Washington state constitution.

Struiksma filed Initiative 1040 on January 15, 2009; she filed 1047 on February 9, citing improvements in the language, and withdrew 1040 on March 3. While 1040 contained disclaimers to the effect that it did not “warrant a government sponsored witch hunt,” and that individuals could not be “held in contempt” or “questioned, interrogated, harassed, bullied, discriminated against, discharged from employment, or punished” for their belief or disbelief in God, these disclaimers were removed from 1047.

Neither initiative mentions evolution or creationism explicitly. However, Struiksma told the



Bellingham Herald (2009 Feb 19) that she was motivated by opposition to the teaching of evolution. She added, “I think probably at least that more creation science is overlooked as not belonging in the public school system because of the religion [aspect].” Struiksma credited creationist presenter Tom Hoyle of Tacoma’s Bible and Science Ministries for inspiration. However, Hoyle disagrees that evolution should be banned, arguing instead for a “strengths and weaknesses”-style approach in science classes which does not mention God. If 1047 receives 241 153 signatures by July 3, 2009, it will be added to the statewide ballot for the November 2009 general election.

Canada: Gary Goodyear, the Minister of State for Science and Technology, was embroiled in a controversy after declining to say whether he accepts evolution. “I’m not going to answer that question,” he told the *Toronto Globe and Mail* (2009 Mar 17). “I am a Christian, and I don’t think anybody asking a question about my religion is appropriate.” Brian Alters, a professor of education at McGill University and a member of NCSE’s board of directors, was aghast, telling the newspaper, “It is the same as asking the gentleman, ‘Do you believe the world is flat?’ and he doesn’t answer on religious grounds.” Goodyear hastened to declare his belief in evolution in a television interview on the show *Power Play*, but did not allay concern about his understanding or acceptance of evolution: according to the *Globe and Mail* (2009 Mar 18), he described evolution as “a fact, whether it’s to the intensity of the sun, whether it’s to ... walking on cement versus anything else, whether it’s running shoes or high heels, of course we are evolving to our environment.” Peter McKnight of the *Vancouver Sun* (2009 Mar 28) commented, “whatever Goodyear meant by this word salad, he clearly wasn’t talking about evolution.” A chiropractor and a member of the Conservative Party, Goodyear was elected to the House of Commons from Cambridge, Ontario, in 2004, and was appointed to his present post on October 30, 2008.

Canada, Alberta: Proposed changes to Alberta’s Human Rights Act are alarming educators. The

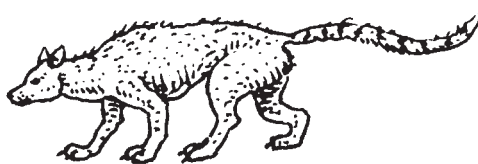
Edmonton Journal (2009 Apr 30) reported, “Under Bill 44, school boards must provide parents and guardians with advance notice any time instructional materials or courses of study that deal explicitly with religion, sexuality or sexual orientation are going to be taught. Parents will have the right to pull children from such classes.” Ed Stelmach, the premier of Alberta, was reported in the *Journal* (2009 Apr 28) as confirming that evolution would be included, although according to the later article, he “tried to back away from that point” on the following day. Alberta’s minister of culture Lindsay Blackett, who introduced the bill, told the *Journal* that evolution was indeed included. The *Journal* (2009 May 6) subsequently reported that the Alberta School Councils’ Association, the Alberta School Boards Association, the Alberta Teachers’ Association, and the College of Alberta School Superintendents have called for the opt-out provision to be abandoned. For a discussion of the problems posed by opt-out policies for the teaching of evolution, see Eugenie C Scott and Glenn Branch’s article “The OOPSIE compromise — A big mistake” (*Evolution: Education and Outreach* 2008; 1 [2]: 45–7).

Turkey: Allegations of censorship at the government-backed science magazine *Bilim ve Teknik* (*Science and Technology*) were swirling after a portrait of Charles Darwin was removed from the cover of the March 2009 issue before the magazine went to press, and the editor, Çidem Atakuman, was fired. According to *Nature* (2009; 488: 259), “TÜBTAK [the Scientific and Technological Research Council of Turkey] vice-president Ömer Cebeci, who sits on the magazine’s editorial board, pulled the plug on Darwin. He denied censorship, charging that Atakuman had secretly changed an issue intended to cover global warming. Not true, says Atakuman, who says Cebeci told her that the Darwin cover was a ‘provo-

cation’ at a time of imminent local elections. One editorial-board member of *Bilim ve Teknik* has resigned in protest...”

Critics of the current Turkish administration took the incident as confirmation that the ruling party is seeking to promote the role of religion in Turkish society, in part by promoting Islamic creationism; a group of academics at the Middle East Technical University in Ankara issued a statement describing that the incident as “proof that a dogmatic world view that is opposed to science dominates” the Turkish administration, according to *Times Higher Education* (2009 Mar 26). The government, for its part, tended to take the line that the incident was a regrettable misunderstanding blown out of proportion — although there were still hints of anti-evolutionary sentiment in its statements. For instance, Topkan Koksa, the speaker of the Turkish parliament and a member of the ruling party, told the Associated Press (2009 Mar 11), “Whether you like Darwin’s theory or not, whether you believe in it or not, this is another matter.”

The incident was a black eye for Turkey, with headlines about censorship and creationism throughout the world press. Taner Edis (author of *An Illusion of Harmony: Science and Religion in Islam* [Amherst (NY): Prometheus, 2007] and RNCSE’s associate editor for physics and astronomy) told the *Irish Times* (2009 Mar 13), “If you are at all interested in countries like Turkey making progress in natural science then this Tubitak affair is deeply worrying.” *Times Higher Education* (2009 Mar 26) later reported that Atakuman was reinstated as editor — although apparently with misgivings on her part, saying that she would “see how it goes.” She added, “This incident has hurt the reputation of Turkish science and scientists in the international arena.”



NCSE NEWS

News from the Membership

Glenn Branch

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

Philip Appleman's book of poetry *Darwin's Ark*, with illustrations by Rudy Pozzatti (Bloomington [IN]: Indiana University Press, 2008), was reissued in time for the Darwin anniversaries. When it first appeared, **Stephen Jay Gould** wrote, "Philip Appleman has captured the elusive themes of Darwin's worldview and translated them into items of beauty that also provoke thought." A review will appear in a future issue of *RNCSE*. Additionally, a new book of Appleman's poetry, *Karma, Dharma, Pudding & Pie*, with illustrations by Arnold Roth, was just published (New York: The Quantuck Lane Press, 2009); included is a section entitled "Darwin 101," which, according to the copy on the flap, shows "the ludicrous (and potentially tragic) misunderstandings of those who cling to fundamentalist 'creationism' or 'intelligent design' while rejecting the well-established facts of biological evolution." Emeritus Professor of English at Indiana University, Appleman is also the editor of the Norton Critical Edition of *Darwin* (New York: WW Norton, 2000), now in its third edition.

Among the fifty people to be named Early Career Scientists by the Howard Hughes Medical Institute was **Daniel Bolnick** of the University of Texas, Austin. According to a March 26, 2009, press release, "Each HHMI Early Career Scientist will receive a six-year appointment to the Institute and, along with it, the freedom to explore his or her best ideas without worrying about where to find the money to fund those experiments. HHMI's investment of approximately \$200 million will allow these researchers to concen-

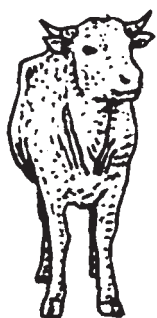
trate on making discoveries in the laboratory and training the next generation of scientists. HHMI will provide each Early Career Scientist with his or her full salary, benefits, and a research budget of \$1.5 million over the six-year appointment. The Institute will also cover other expenses, including research space and the purchase of critical equipment." In addition to studying threespine stickleback fish around Vancouver Island in British Columbia, Bolnick is also active in fighting creationism in Texas, as one of the leaders of the 21st-Century Science Coalition (<<http://www.texasscientists.org>>). He also contributed "ANOPA: 'Statistical' systematics for young-earth creationists" to *RNCSE* (2006 Jul/Aug; 26 [4]: 22–3, 27–30).

NCSE Supporter **Stephen G Brush** was selected by the American Physical Society and the American Institute of Physics to receive the 2009 Abraham Pais Prize for the History of Physics "for his pioneering, in-depth studies in the history of nineteenth and twentieth-century physics," according to a story in the spring 2009 *History of Physics Newsletter*. Beginning his career as a physicist, Brush turned to the history of physics, publishing a number of historical monographs, including *The Kind of Motion We Call Heat: A History of the Kinetic Theory of Gases in the 19th Century* (New York: North-Holland, 1976), which won the History of Science Society's Pfizer Award. He also coauthored the popular textbook *Physics, the Human Adventure: From Copernicus to Einstein and Beyond* (New Brunswick [NJ]: Rutgers University Press, 2001) with Gerald Holton. On retiring from the University of Maryland in 2006, he was named Distinguished University Professor Emeritus of the History of Science. Among his writings relevant to the creationism/evolution controversy are

"Creationism versus physical science" (*APS News* 2000 Nov; 9 [10]: 8; available on-line at <<http://www.aps.org/publications/apsnews/200011/backpage.cfm>>) and two refutations of creationist misuse of the history of science — "Kelvin was not a creationist" (*Creation/Evolution* 1982; 3 [2]: 11–4; available on-line at <<http://ncseweb.org/cej/3/2/kelvin-was-not-creationist>>) and "Popper and evolution" (*NCSE Reports* 1994; 13 [4]/14 [1]: 29) — for NCSE's journals. He is also Steve #71 in NCSE's Project Steve (now with over 1090 Steves).

NCSE Supporter **Sean B Carroll** of the University of Wisconsin, Madison, **Ursula W Goodenough** of Washington University in St Louis, and **Gary B Ruvkun** of Harvard Medical School and Massachusetts General Hospital were among the 231 newly elected members of the American Academy of Arts and Sciences announced in April 2009. Founded in 1780, the American Academy of Arts and Sciences is an independent policy research center that conducts multidisciplinary studies of complex and emerging problems. The Academy's elected members are leaders in the academic disciplines, the arts, business, and public affairs.

Alex Glass contributed "Why the conflict? A scientist's take on Christianity and evolution" to *Religio: An Undergraduate Journal of Christian Thought at Duke* (2009 Apr; 3 [1]: 16–8; available on-line at <<http://www.duke.edu/~asc16/ReligioSpring09.pdf>>). "Despite a worldwide scientific consensus about evolution's validity, and its embrace by many mainline denominations, evolution remains a controversial subject for many Christians," he wrote. "Whereas evolutionary biologists have countless reasons to celebrate the cutting edge of their highly successful science, American science educators remain puzzled as to why so many of their fellow citizens remain so skeptical. More important to the focus here, American Christians find themselves as divided as ever on the place of evolution in Christian thinking." Glass teaches in the Nicholas School of the



Environment in the division of Earth and Ocean Sciences at Duke University.

William McComas was featured in the Spring 2009 issue of *University of Arkansas Research Frontiers*, which devoted its cover story (p 14-9) to Darwin. "In more than 25 years of teaching science in high schools and science education in universities, William F McComas, the Parks Family Professor of Science Education at the University of Arkansas, has introduced hundreds of students to Darwin and evolution," the story explained. "He has prepared university students to become science educators, confident and able to teach a subject that has had a history of controversy." The story was accompanied by samples of McComas's photography from the Galápagos. In the same issue were sidebars presenting the evolutionary work of various professors at the University of Arkansas, including **William J Etges**, who works on cactophilic *Drosophila*: "Eventually we want to know about the larger-scale patterns that explain how species are formed," he explained.

Randy Moore and Sehoya Cotner published "The creationist down the hall: Does it matter when teachers teach creationism?" in *BioScience* (2009; 59 [5]: 429-35). In the abstract, they wrote, "The responses of biology majors in their first year of college differed significantly from those of first-year non-biology majors on only 3 of the 20 items on the Measure of Acceptance of the Theory of Evolution survey instrument. Despite these differences, and regardless of whether students were or were not biology majors, several findings from the survey stand out: (a) surprisingly high percentages of students accepted creationism-based claims, (b) students' views of evolution and creationism when they entered college were strongly associated with the treatment of evolution and creationism in the students' high-school biology classes, and (c) on average, incoming biology majors' views of evolution and creationism were similar to those of nonmajors. In this article, these results are discussed relative to the ongoing popularity of

creationism among biology majors and biology teachers." A long-time member of NCSE who received its Friend of Darwin award in 2004, Moore is Professor of Biology at the University of Minnesota, Twin Cities. His latest book, coauthored with **Mark Decker**, is *More than Darwin: An Encyclopedia of the People and Places of the Evolution-Creationism Controversy* (Westport [CT]: Greenwood Press, 2008; reviewed in *RNCSE* 2009 Jan/Feb; 29 [1]: 27-8).

Clay Farris Naff contributed "Down with the origin of speciousness" to the on-line magazine *The Global Spiral* (2009 Apr 2; available on-line at <<http://www.metanexus.net/magazine/tabid/68/id/10745/Default.aspx>>). Suggesting that Darwin "made it all too easy to accept 'nature red in tooth and claw' as the emblem of evolution," Naff argued, "we should not be too hard on Darwin. Evil events at Down House contributed to this grim interpretation — one that misses the larger majesty of evolution altogether and moreover obscures a path to reconciliation with faith." A science writer and executive director of the Lincoln (Nebraska) Literary Council, Naff is vice president of Nebraska Citizens for Science.

Michael Ruse's *Monad to Man: The Concept of Progress in Evolutionary Biology* (Cambridge [MA]: Harvard University Press, 1996) was reissued in paperback by Harvard University Press. Reviewing the book for the *British Journal for the Philosophy of Science*, Ron Amundson commented, "*Monad to Man* combines the sweeping history of the science of evolution with intricate details about individual scientists' researches, prejudices, and personal lives ... a rich and compelling narrative of the personalities and ideas that shaped the history of evolutionary biology." A Supporter of NCSE, Ruse is the Lucyle T Werkmeister Professor of Philosophy and Director of the Program in the History and Philosophy of Science at Florida State University.

The late **Robert J Schadewald's** *Worlds of Their Own* was reviewed by Glenn R

Morton in *Perspectives in Science and Christian Faith* (2007 Mar; 59 [1]: 75-6; available on-line at <<http://www.asa3.org/ASA/PSCF/2007/PSCF3-07BookReviews.pdf>>). "Schadewald, who passed away in March 2000, was a science writer and former president of the National Center for Science Education. Bob was also my friend. He spent his career writing about various offbeat views. His articles span the range from perpetual motion machines to creationism, the flat-earth theory, and Velikovskisms. This book is his first and is posthumously published," Morton wrote, concluding, "The book is entertaining, well written, and full of anecdotes useful for the dinnertime raconteur." Favorably reviewed in the same issue of the journal were *Perspectives on an Evolving Creation* (Grand Rapids [MI]: Eerdmans, 2003), edited by NCSE Supporter **Keith B Miller**; **Daryl P Domning** and Monika K Hellwig's *Original Selfishness: Original Sin and Evil in the Light of Evolution* (Burlington [VT]: Ashgate, 2006), and **Mark Isaak's** *The Counter-Creationism Handbook* (Westport [CT]: Greenwood Press, 2005).

NCSE's executive director **Eugenie C Scott** contributed a few thoughts to *What Do I Do Next: Leading Skeptics Discuss 105 Practical Ways to Promote Science and Advance Skepticism*, offering advice about donating to and volunteering for skeptical organizations, following the literature, learning from the successes and failures of other organizations, exploring new frontiers for skepticism, forming coalitions and employing sound organizational practices, running booths at community events, and so forth. The publication, edited by Daniel Loxton of *Skeptic* magazine, is available on-line at <<http://www.skeptic.com/downloads/WhatDoIDoNext.pdf>>.

NCSE's executive director **Eugenie C Scott** appeared as a guest on the first hour of NPR's Science Friday show on April 10, 2009. Science Friday's description of the segment:

In late March, the Texas State Board of Education held several days of debate over new



curriculum requirements scheduled to take effect in 2010. The school board eventually decided to accept evolution as accepted, mainstream science — but the standards were modified to instruct that students examine “all sides of scientific evidence” on a range of topics. Critics of the school board say that phrases such as “all sides” and “examine the strengths and weaknesses” (a phrase rejected by the board after debate) are code words that would allow the teaching

of creationism in the science classroom. The large state of Texas is considered a crucial battleground in the fight over teaching evolution, as its purchasing power gives the state’s curriculum standards a good deal of influence over the content of textbooks sold around the country. We’ll find out how the topic of evolution will be taught under the new standards.

To listen to the recorded show, visit <http://www.sciencefriday.com/program/archives/200904101>.

Elliott Sober’s new book

Evidence and Evolution: The Logic Behind the Science (Cambridge: Cambridge University Press, 2008) was reviewed by David Hull in *BioScience* (2009; 59 [4]: 348–9), who wrote, “For readers who want a better understanding of evidence and how it bears on evolutionary theory, Sober’s book is the best place to begin. In fact, it is the best place to end, as well. The likelihood that anyone else will be able to do a better job is slim to nonexistent.” A Supporter of NCSE, Sober is Professor of Philosophy at the University of Wisconsin, Madison.

New Faces at NCSE *Glenn Branch*

It is early May 2009 as I am writing, and there has been quite a turnover in the office in the last year or so: two staff members departed, one staff member took a sabbatical, three new staff members came on board, and one staff member is not returning from a sabbatical. I hope that you’ll join me and the rest of the staff in welcoming the newcomers and bidding farewell to the departing staffers.

Steven Newton joined NCSE as a Public Information Project Director in August 2008. He



Steven Newton

received a BA in history from the University of California, Berkeley, with an emphasis in modern German history and early 20th-century pseudoscientific movements (such as eugenics). Switching gears completely, he then completed an MS in geology from California State University, Hayward, with an emphasis in paleoclimatology. Following graduation, Newton taught geology and oceanography as an adjunct faculty member at a number of Bay Area colleges, where he developed courses in the history of science and the geology of the national parks. His e-mail address here is newton@ncseweb.org.

Robert Luhn joined NCSE in November 2008 as NCSE’s Director of Communications — a



Robert Luhn

new position, responsible for piloting NCSE’s communication strategies and increasing NCSE’s public visibility. A journalist with extensive experience in the media, the science and technology sector, and the non-profit world, Luhn hit the ground running, doing a marvelous job of learning the lay of the land and then getting NCSE’s message out to journalists and bloggers, especially in the fight over the state science standards in Texas. He is also working on extending NCSE’s web outreach and enhancing the organization’s presence on FaceBook and YouTube. His e-mail address is luhn@ncseweb.org.

Public Information Project Director **Susan Spath** went on sabbatical in the beginning of 2008 to pursue her scholarly interests in the history of biology, and was replaced by **Anton Mates**. Mates received BA degrees in mathematics and physics from the University of California, Berkeley, and then received a MS in mathematics from the Ohio State University, with an emphasis in numerical analysis and



Anton Mates

mathematical biology. While in Ohio he worked with Ohio Citizens for Science during the dispute about evolution in the state science standards (see *RNCSE*

2006 May/June; 26 [3]: 7–11 for background). In the fall of 2009, he will enter the University of Washington’s doctoral program in psychology, continuing his work on crow behavior. His e-mail address is mates@ncseweb.org. **Wesley Elsberry**, who was on sabbatical, will be taking a position at the Florida Wildlife Research Institute in St Petersburg, Florida, instead of returning.

Anne Holden, who was a post-doctoral scholar at NCSE from the summer of 2007 to the spring of 2008, joined 23andMe, a web-based service that helps customers read and understand their DNA. While at NCSE, she worked extensively on *Expelled Exposed*, NCSE’s comprehensive rebuttal to the creationist propaganda movie *Expelled* (see *RNCSE* 2008 Sep–Dec; 28 [5–6]), writing and editing a lot of the material and coordinating the production of four short videos available at <http://www.expelledexposed.com>. She also provided efficient

NCSE Honors “Friends of Darwin” for 2005

Glenn Branch

Every year, NCSE honors a few exceptional people for their support of evolution education and/or their service to NCSE. The “Friend of Darwin” awards are proposed by the staff and approved by the board at its annual meeting; the recipients for the award for a given year are thus selected in the spring of the following year. NCSE usually arranges

and effective advice to people facing challenges to evolution education in a number of communities around the country, and reviewed Frans de Waal’s *Our Inner Ape* for *RNCSE* (2007 Sep-Dec; 27 [5-6]: 45-6).

Finally, **Carrie Sager** left NCSE in March 2009. A temporary employee off and on over the years, she began to work full-time at NCSE in April 2006, assisting archivist **Charles Hargrove** in the effort to organize NCSE’s holdings of books, periodicals, and ephemera relevant to the creationism/evolution controversy. She additionally assisted with the redesign of NCSE’s website and the design of the *Expelled Exposed* website, the content of which she helped to write and edit. She was also responsible for the editing and production of the third edition of *Voices for Evolution*, NCSE’s collection of statements from scientific, educational, religious, and civil rights organizations in support of teaching evolution. She is now living in Ottawa, Canada, where she plans to work in the non-profit sector.

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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 2005.

Ed Barber served as the director of the college and trade department for the publisher WW Norton and Company, where he is now a senior editor. NCSE Supporter Laurie R Godfrey writes that Barber “took great pleasure in working with me on the first edition of *Scientists Confront Creationism*. Ed is a kind-hearted and knowledgeable editor; he has a sophisticated knowledge of evolutionary biology, having worked so closely and for so many years with one of my own mentors from Harvard, Stephen Jay Gould, among others. He was especially proud, I think, to have published a series of popular Gould books, including compilations of the articles that he wrote for *Natural History* magazine. Most of all, he knows how to help authors connect with the general public.”

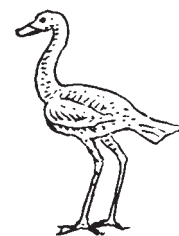
Fred Edwards is currently the leader of the United Coalition of Reason. He previously served as director of communications for the American Humanist Association, after having served as its executive director from 1984 to 1999 and as editor of its journal *The Humanist* from 1994 to 2006. Back in the heyday of creationism/evolution debates, Edwards was on the front lines, debating such creationist luminaries as Duane Gish and Henry M Morris of the Institute for Creation Research. As a result of his debate experiences, he cofounded and edited the journal *Creation/Evolution* from 1980 to 1991, originally published by the AHA but acquired by NCSE in 1991. He also served on NCSE’s board of directors from 1982 to 1992. “Fred’s knowledge, experience, and plain horse sense com-

bined to make him a formidable ally in the evolution wars,” commented NCSE’s executive director Eugenie C Scott.

Jack Krebs, a high school teacher in Lawrence, Kansas, is a former president and current board member of Kansas Citizens for Science (<<http://www.kcfs.org>>), the grassroots organization that fought effectively for the integrity of science education in Kansas when the state board of education rewrote the state science standards to disparage the scientific status of evolution in 1999 and again in 2005. Always civil, always cogent, Krebs was tireless in his speaking and writing on behalf of the uncompromised teaching of evolution in the Sunflower State; thanks to his and KCFS’s work, a scientifically appropriate and pedagogically responsible treatment of evolution was restored to the state science standards when moderates regained power on the board in 2001 and again in 2007.

Steve Rissing is professor of evolution, ecology, and organismal biology at the Ohio State University, and a member of the board of Ohio Citizens for Science (<<http://www.ohioscience.org>>), the grassroots organization that fought effectively for the integrity of science education in Ohio when the state board of education adopted “critical analysis” language in its state science standards in 2002 and then adopted a corresponding model lesson plan derived from creationist sources in 2004. Always concerned with the public understanding of science in general, he also played a major role in revamping the way introductory-level biology courses are taught at Ohio State, coauthored a debunking treatment of creationist myths about Haeckel for *The American Biology Teacher*, and contributed a bimonthly column about science to the *Columbus Dispatch*.

Carl Zimmer is the author of such popular books about evolution and related topics as *Evolution: The Triumph of an*



Glenn Branch is deputy director of NCSE.

The Kilosteve

Glenn Branch

With the addition of Steve #1000 on February 12, 2009, NCSE's Project Steve attained the kilosteve mark. A tongue-in-cheek parody of the long-standing creationist tradition of amassing lists of "scientists who doubt evolution" or "scientists who dissent from Darwinism," Project Steve mocks such lists by restricting its signatories to scientists whose first name is Steve. (Cognates are also accepted, such as Stephanie, Esteban, Istvan, Stefano, or even Tapani — the Finnish equivalent.) About 1% of the United States population possesses such a first name, so each signatory represents about 100 potential signatories. ("Steve" was selected in honor of the late Stephen Jay Gould, a supporter of NCSE and a dauntless defender of evolution education.)



NCSE executive director Eugenie C. Scott and Steven P. Darwin

Steve #1000 was announced at the Improbable Research press conference and crowned at the Improbable Research show, both held on February 13, 2009, as part of the annual meeting of the American

Association for the Advancement of Science. NCSE's executive director Eugenie C. Scott and Steve Mirsky, long-time writer, columnist, and podcaster for *Scientific American*, presented a commemorative plaque

Idea, revised edition (New York: Harper Perennial, 2006), which *Scientific American's* reviewer described as "as fine a book as one will find on the subject"; *The Smithsonian Intimate Guide to Human Origins* (New York: HarperCollins, 2005); *Microcosm: E coli and the New Science of Life* (New York: Pantheon, 2008), and the forthcoming textbook *The Tangled Bank: An Introduction to Evolution* (Greenwood Village [CO]: Roberts and Company, 2009). His honors include the American Association for the Advancement of Sciences Science Journalism Award in 2004 and the National Academies Science Communication Award in 2007 for "his diverse and consistently interesting coverage of evolution and unexpected biology."

Michael Zimmerman is Dean of the College of Liberal Arts and Sciences and Professor of Biology at Butler University. In 2004, concerned about attempt to undermine the teaching of evolution in

Grantsburg, Wisconsin, he recruited local members of the Christian clergy to endorse a statement affirming the compatibility of evolutionary science with their faith. So successful was the Clergy Letter Project that Zimmerman took it national; today, there are almost 12 000 signatories from Christian denominations, with hundreds in parallel projects for Unitarian Universalist clergy and rabbis. Zimmerman also organized the Evolution Weekend project, in which members of the clergy conduct events centering on evolution and faith on or around Darwin's birthday; over 1000 churches participated in 2009. He is also helping to connect scientists with members of the clergy who have questions about science.

Finally, special Friend of Darwin awards were conveyed to the eleven plaintiffs in *Kitzmiller v. Dover*, the seminal 2005 case establishing the unconstitutionality of teaching "intelligent design" creationism in the public schools

— **Tammy Kitzmiller, Bryan Rehm, Christy Rehm, Deborah Fenimore, Joel Lieb, Steven Stough, Beth Eveland, Cynthia Sneath, Julie Smith, Aralene "Barrie" D Callahan, and Frederick B Callahan** — in recognition of their bravery in challenging the Dover Area School Board's policy of requiring a disclaimer about evolution to be read to students in Dover's high school. The awards were presented in 2007 by Kevin Padian, the president of NCSE's board of directors, at a gathering of the plaintiffs and their friends and supporters to watch *Judgment Day: Intelligent Design on Trial*, the NOVA documentary about the case.

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

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to — of all people — Steven P Darwin, a professor of ecology and evolutionary biology and director of the herbarium at Tulane University. In a February 14, 2009, press release (available on-line at <<http://ncseweb.org/news/2009/02/steve-darwin-is-steve-1000-004308>>), Darwin commented, “This is the first time that being a Darwin — or a Steve — has paid off!” Videos of the press conference and the award ceremony are available on-line at NCSE’s YouTube channel (<<http://www.youtube.com/NatCen4ScienceEd>>), and a *Scientific American* podcast is available on-line at <<http://www.sciam.com/podcast/episode.cfm?id=count-on-steves-to-defend-darwin-09-02-20>>.

The fact that Steve #1000 hails from Louisiana is particularly ironic, since the state recently enacted a law that threatens to open the door for creationism and scientifically unwarranted critiques of evolution to be taught in public school science classes. When a policy implementing the law was drafted, a provision that prohibited the use of materials that teach creationism in the public schools was deleted. Recently, the Society of Integrative and Comparative Biology announced that, due to the anti-evolution law, it would not hold its 2011 conference in New Orleans; a spokesperson for the New Orleans Metropolitan Convention and Visitors Bureau told the weekly *New Orleans City Business* (2009 Feb 23) that the city would lose about \$2.7 million as a result of SICB’s decision. (For background, see *RNCSE* 2008 Mar/Apr; 28 [2]: 8-11; 2008 July/Aug; 28 [4]: 4-10; 2009 Mar/Apr; 29 [2]: 5-7.)

Although the idea of Project Steve is frivolous, the statement is serious. It reads

Evolution is a vital, well-supported, unifying principle of the biological sciences, and the scientific evidence is overwhelmingly in favor of the idea that all living things share a common ancestry. Although there are legitimate debates about the patterns and processes of evolu-

tion, there is no serious scientific doubt that evolution occurred or that natural selection is a major mechanism in its occurrence. It is scientifically inappropriate and pedagogically irresponsible for creationist pseudo-science, including but not limited to ‘intelligent design,’ to be introduced into the science curricula of our nation’s public schools.”

Currently, there are 1088 signatories to Project Steve, including 100% of eligible Nobel laureates (Steven Weinberg and Steven Chu), 100% of eligible members of President Obama’s Cabinet (Steven Chu, the Secretary of Energy), at least ten members of the National Academy of Sciences, the authors of widely used textbooks such as *Molecular Biology of the Gene*, *Psychology: An Evolutionary Approach*, and *Introduction to Organic Geochemistry*, and the authors of popular science books such as *A Brief History of Time*, *Why We Age*, and *Darwin’s Ghost*. When last surveyed in February 2006, 54% of the signatories work

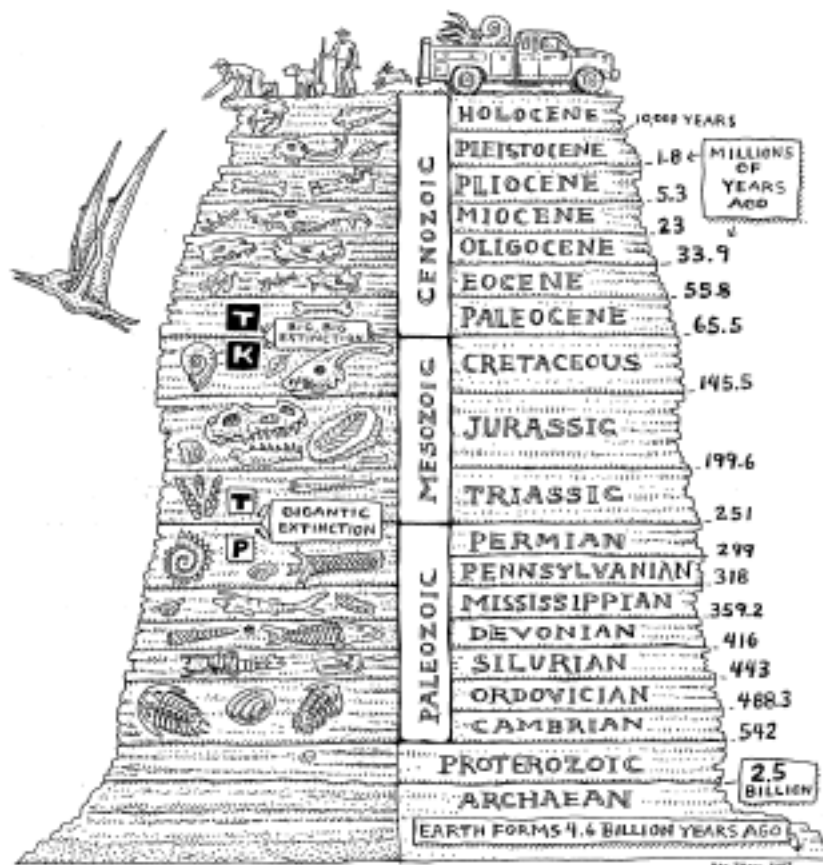
in the biological sciences proper; 61% work in related fields in the life sciences.

Additionally, Project Steve appeared in Steven Pinker’s recent book, *The Stuff of Thought: Language as a Window into Human Nature* (New York: Viking, 2007). Pinker, himself a single-digit Steve, described it as “the most formidable weapon in the fight against neo-creationism today,” adding, “Part satire, part memorial to Stephen Jay Gould, the project maintains a Steve-O-Meter (now pointing past 800) and has spun off a T-shirt, a song, a mascot (Professor Steve Steve, a panda puppet), and a paper in the respected scientific journal *Annals of Improbable Research* called ‘The Morphology of Steve’ (based on the T-shirt sizes ordered by the signatories).”

For further information about Project Steve, visit <<http://ncseweb.org/taking-action/project-steve>>.

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Dayton, Tennessee

Every July, throngs of tourists descend on tiny Dayton, Tennessee, to celebrate the Scopes Trial Play and Festival. This festival, which is sponsored by the Dayton Chamber of Commerce, includes a re-enactment of John Scopes's famous trial in 1925 for allegedly teaching evolution in the local public school. Although Scopes's trial accomplished nothing from a legal perspective (his conviction was set aside two years later by the Tennessee Supreme Court), it nevertheless remains the most famous event in the history of the evolution-creationism controversy.

John Scopes's famous trial was instigated by Dayton businessmen as a publicity stunt to attract investors to the area. As Congressman Foster Brown of Chattanooga noted, the trial was "not a fight for evolution or against evolution, but a fight against obscurity." Scopes's trial brought hundreds of visitors to Dayton, but within a week after the trial, virtually all of the spectators, street preachers, circus performers, and hucksters had left town, and Dayton returned to normal. Some people profited from the trial, but the long-term economic stimulus that the trial's instigators had sought never materialized. Several years after the trial, Bryan College opened in Dayton to honor the ideals of William Jennings Bryan, one of Scopes's prosecutors.

John Scopes's trial was held in the Rhea County Courthouse (Figure 1). The courthouse, an Italian villa-style building built in 1891, was designated a National Historic Landmark in 1976, and was restored with the completion of the Scopes Trial Museum in the courthouse basement in 1978. At the front of the famous courtroom is posted a page from the *Congressional Record* listing the Ten Commandments. In 2005, a Cessna Decosimo statue of William

Jennings Bryan was unveiled outside the courthouse; this statue depicts Bryan in 1891, when he began his Congressional career, and when the courthouse was built.

SCOPES TRIAL LANDMARKS

Visitors to Dayton will find a number of sites that played important roles during the Scopes Trial. Thanks largely to the efforts of Bryan College Professor Emeritus Richard Cornelius, many of these sites have been preserved and marked with "Scopes Trial Trail" plaques (designated with an asterisk in the list below). A map of Scopes Trial sites with a complete legend can be found at <http://www.bryan.edu/1990.html>.

The Rhea County Courthouse and Scopes Trial Museum (Figure 1) is in the center of Dayton. Scopes's trial was held in the second-floor courtroom, which still contains several items from the famous trial (for example, the judge's desk and dais rail).*

FE Robinson's home on the corner of 3rd and Market Streets was the home of "The Hustling Druggist," who helped initiate the Scopes Trial. It was occupied by photographers during the proceedings.*

Darwin Cunnynggham home on Market Street housed journalists during the Scopes Trial.

McKenzie Law Office, which is adjacent to the Robinson home, was formerly used by Jim McKenzie, the nephew of JG McKenzie and grandson of Ben McKenzie. In 2007, Jim McKenzie was a judge in the Rhea Family Court.*

WC Bailey's boardinghouse on the northeastern corner of 4th and Market Streets was where John Scopes lived when he worked in Dayton. Scopes's father, journalist Bugs Baer, and briefly the chim-

panzee Joe Mendi also stayed at the house during Scopes's trial.*

AM Morgan home at the southwest corner of 7th and the alley was where journalist HL Mencken lived during the Scopes Trial. After Scopes's trial, Morgan was a founder of Bryan College.

Rhea County High School (southwest of Dayton) was where John Scopes taught and coached in 1924-1925. Bryan College used the building from 1930-1935.*

Ballard/Bailey house at the northwest corner of 3rd and Church Streets was where chimpanzee Joe Mendi stayed during the Scopes Trial after being evicted from Bailey's boardinghouse.

Luke Morgan home, located at the southwest corner of 2nd and Walnut Streets, is where Clarence Darrow and his wife Ruby stayed during the Scopes Trial. Luke Morgan, a former student of John Scopes, testified during the trial.

Morgan Furniture Company on Market Street housed reporters during the Scopes Trial. The business has been open since 1909.*

Bailey Hardware housed more than 100 reporters during the Scopes Trial. Until recently the building — on Market Street between 1st and Main — housed an antique store.*

Thomison Hospital, Wilkey Barbershop, and Richard Rogers Pharmacy were all in this area. Rogers worked at Robinson's Drug Store during the Scopes Trial, and later opened a pharmacy here. West of Rogers Pharmacy was the Wilkey Barbershop. On May 19, 1925, barbers Virgil Wilkey and Thurlow Reed staged a fake fight at the courthouse with George Rappleyea to promote the upcoming Scopes Trial. Above Rogers Pharmacy was a hospital operated by Walter Agnew Thomison, whose



FIGURE 1. *John Scopes's famous trial for teaching evolution occurred in the second-floor courtroom of the Rhea County Courthouse in Dayton, Tennessee.*

father, Walter F Thomison, was the attending physician at William Jennings Bryan's death. A sign for Thomison's office remains on the wall of the building near the intersection of Main and Market Streets.

Hicks Law Office, located in the second lot from the southeast corner of Main and Market Streets, was used by Scopes prosecutors Herbert and Sue Hicks.

Robinson's Drug Store was where several of Dayton's businessmen devised the Scopes Trial. Adjacent to the drug store was the three-story Aqua Hotel, where John Neal, John Raulston, Arthur Hays, Dudley Malone, and Clarence Darrow stayed, met, or ate during the trial.*

Cumberland Presbyterian Church was built two years after the Scopes Trial; FE Robinson was a member of that church. When Clarence Darrow returned to Dayton after the Scopes Trial and saw this church, he commented, "I guess I didn't do much good here after all." The church no longer is affiliated with the Cumberland Presbyterian denomination.

First United Methodist Church was where William Jennings Bryan made his last public appearance. During Scopes's trial, the church at this site — the northwest corner of California Avenue and Market Street — was a Southern Methodist church.*

Richard Rogers home was where William Jennings Bryan and his entourage stayed during and after the Scopes Trial. Bryan died in his sleep in the Rogers' home on July 26, 1925. Only the retaining wall of the property is as it was in 1925.*

AP Haggard, the father of Scopes prosecutor Wallace Haggard, built his home across the street from the Richard Rogers home.*

Walter F Thomison built this home for Ella Darwin, his 16-year-old wife. Thomison's house is now called Magnolia House.*

Broyles-Darwin home is on the National Historic Register and housed reporters during the Scopes Trial. SD Broyles, who built the house in 1861, was the first resident of the village in 1820.*

Cedar Hill, the first hospital in Dayton, was built in 1929 by Walter Agnew Thomison. The building was used by Bryan College from 1932-1938 and 1967-1984.*

Bryan College was opened in 1930 as a memorial to Scopes prosecutor William Jennings Bryan. The campus includes several exhibits related to the Scopes Trial, and several of the college's founders were involved in the trial.*

Dayton Coal & Iron Company is a former mining operation that was managed by George Rappleyea, an instigator of the Scopes Trial. The land is now a recreational area, but coke ovens remain visible. Blast furnaces of the Dayton Coal and Iron Company were at this site, which now is covered by sports fields.

St Genevieve's Academy at 449 Delaware Road was where some children of Dayton Coal and Iron Company employees were educated before the Scopes Trial. Today the school building — which was built in 1891 — houses Fehn's 1891 Restaurant.

The Mansion was an 18-room house renovated by George Rappleyea to house several members of the defense team during the Scopes Trial. The house, which was atop a knoll overlooking the furnaces and company store of the Dayton Coal and Iron Company, had been vacant for more than a decade. Before he moved into the Morgans' home, Clarence Darrow stayed at the Mansion, and it was at the Mansion that Darrow and Kirtley Mather prepared for Darrow's questioning of William Jennings Bryan. In *Inherit the Wind*, several of the participants stayed at a hotel named "The Mansion".

Buttram Cemetery just outside Dayton is where many of the participants in the Scopes Trial are buried.

Dayton Drive-In Theater, which was 2.5 miles north of Dayton, was the site of the US premiere of *Inherit the Wind*.

BOOKREVIEWS

EVOLUTION AND RELIGIOUS CREATION MYTHS: HOW SCIENTISTS RESPOND

by Paul F Lurquin and Linda Stone
New York: Oxford University Press,
2007. 240 pages

Reviewed by Randy Moore

E*volution and Religious Creation Myths: How Scientists Respond* is meant to arm “the public with facts about the differences between myth and science, fiction and theory.” The book is intended as a college textbook; it contains a glossary, sections titled “Things to think about” at the end of each chapter, and an appendix of experiments for readers to perform.

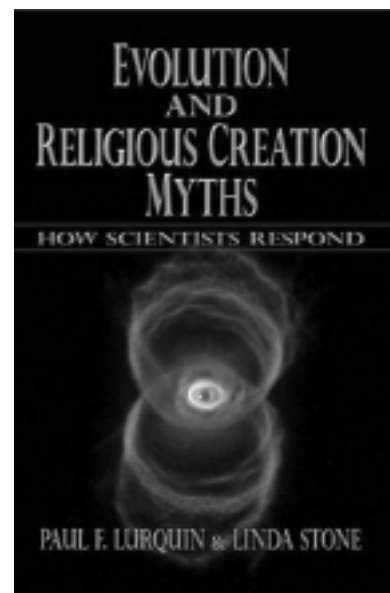
Evolution and Religious Creation Myths is generally well-written and addresses many of the topics that are integral to the evolution/creationism controversy. The book is laid out as follows.

Chapter 1 (“Creationism and intelligent design: The evolution of an idea”) covers familiar ground — for example, that there are many different creation myths, that “intelligent design” (ID) is neither science nor a new idea, and that many creationists selectively claim that evolution is “just a theory” (that is, they do not make such claims about the germ theory of disease). This section of the chapter concludes with “... God as creator is right as a matter of religious faith, and evolution by natural

selection is right as a matter of science” (p 14). Many readers will question this claim because it is often impossible to separate creation myths from the value systems they support. For example, conservative Christians often defend their values by defending their conception of how God created the universe; Answers in Genesis’s \$27-million Creation Museum is a monument to how many people link their value systems to a creation myth. That museum, which blames the teaching of evolution for societal ills such as divorce, school violence, and pornography, was visited by more than 360 000 patrons during its first year of operation.

Chapter 2 (“What is evolutionary biology and where is it coming from?”) discusses some of the history of evolutionary thought while focusing on Buffon, Lamarck, Lyell, Darwin, and Wallace. The stories in this chapter will be familiar to *RNCSE*’s readers. Although there is a considerable discussion of finches, the authors do not make clear that “Darwin’s finches” were not mentioned in the first edition of *On the Origin of Species*, and became an icon of biology only after David Lack published *Darwin’s Finches* (Cambridge: Cambridge University Press, 1947). I was disappointed that there was no mention of Lyell’s struggles with science and faith.

Chapter 3 (“Creationist purpose and irreducible complexity rebutted”) discusses several topics challenged by creationists, including radiometric dating, molecular biology and biochemistry, and the evolution of antibiotic resistance, the eye, bacterial flagella, and the immune system. The chapter concludes with discussions of whether ID and “creation science”



are sciences, and whether ID-based research has been published in scientific journals. Again, the stories in this chapter will be familiar to most readers of *RNCSE*. There is no discussion of any of the court decisions that have addressed “creation science” and ID.

Chapter 4 (“The origins and evolution of *Homo sapiens*”) discusses human evolution, a topic that frightens many creationists. The authors concisely discuss drift, the migration out of Africa, cultural evolution, and the abundance of fossil evidence supporting current views of human evolution. The authors also raise intriguing questions about our ancestors (for example, what caused the demise of Neanderthals?).

Chapters 5 (“The origins of life and the cosmos as evolutionary themes”) and 6 (“Evolution of the DNA world and the chance events that accompanied it”) are the most interesting parts of the book. The authors do an excellent job of discussing — among other things — abiogenesis (including the difficulties with the experiments of Stanley Miller), the RNA world, the appearance of genetic information, the DNA world, and the evolution of eukaryotes. The authors also contrast probabilistic arguments with teleological ones, noting that the teleology that underlies ID and other types of creationism places these beliefs at odds with all of science, not just evolution.

Randy Moore is the HT Morse-Alumni Distinguished Teaching Professor of Biology at the University of Minnesota. A former editor of *The American Biology Teacher*, he received NCSE’s Friend of Darwin award in 2004. His latest book, coauthored with Mark D Decker, is *More than Darwin: An Encyclopedia of the People and Places of the Evolution-Creationism Controversy* (Westport [CT]: Greenwood Press, 2008).

Chapter 7 (“The dangers of creationism”) completes the book with discussions of the political ramifications of evolution and creationism (for example, how conservatives often appeal to the anti-intellectualism of their constituents), the business of creationism, and the importance of a scientifically literate public. Again, the examples and stories will be familiar to readers of *RNCSE*. The authors note that the Discovery Institute had revenues of \$4.1 million in 2003, but do not mention any of the other anti-evolution organizations (such as Answers in Genesis, the revenues of which far exceed those of the Discovery Institute).

Evolution and Religious Creation Myths has many strengths. However, some topics are tantalizingly incomplete. For example, despite the book’s title, only about 10 pages are devoted to religious myths that are outside of biblical literalism.

The authors write, “back in those days, the State of Tennessee had banned evolution from its science curriculum ...” (p ix). In fact, Tennessee made it a crime for teachers in public schools (including universities) “to teach any theory that denies the Story of the Divine Creation of man as taught in the Bible, and to teach instead that man has descended from a lower order of animal.” That is, Tennessee (and, subsequently two other states — Arkansas and Mississippi) banned only the teaching of *human* evolution (it would have presumably been acceptable to discuss the evolution of cockroaches or turnips). Noting the legislative sensitivity to human evolution would have helped to place the chapter on human evolution into better context.

The authors correctly note, “Most professional scientists, even though they are deeply irritated by all the attacks against evolution, have remained largely silent in public forms, at least in forums that involve the general public” (p x). It would have been helpful to remind readers that it has usually been high school teachers (for example, John Scopes, Susan Epperson, and Don Aguillard) who have resisted creationists in courts, the most public of forums. The primary battlefield of the creation-

ism/evolution wars in the US educational system is the high school biology classroom, where surprisingly high percentages of teachers continue to include creationism in their courses.

Almost half of the adults in the United States believe that humans were created by a deity approximately 10 000 years ago and that evolution — the foundation of biology — is a myth. *Evolution and Religious Creation Myths* will help readers to respond to such nonsense.

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EVOLUTION: WHAT THE FOSSILS SAY AND WHY IT MATTERS

by Donald R Prothero
New York: Columbia University Press, 2007. 381 pages

Reviewed by Peter Dodson

Arch-creationist Duane Gish proclaimed that fossils say “no!” to evolution. Creationists perennially make bizarre claims about the supposed deficiencies of the fossil record. This book is motivated by the challenge of “intelligent design” (ID) and the recent *Kitzmiller v. Dover Area School Board* case decided in federal court in Harrisburg, Pennsylvania. Don Prothero of Occidental College is a very good vertebrate paleontologist. He has written a book to provide definitive resources on exactly what the fossil record shows.

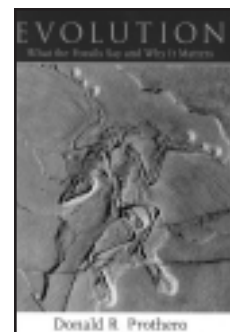
Prothero is equal to his task. He is unusually broad in his background and experiences. Although he is an expert on Late Cenozoic ungulate mammals, he has also published on planktonic microfossils. He is a wily veteran of successful debates with

Gish. Like Stephen Jay Gould, he demonstrates familiarity with the Bible, and quotes it frequently to advantage. I am in awe of his ability to read the New Testament in Greek. He is well versed in the history of science and religion and makes it clear that he sees no necessary conflict between science and religion.

The book is divided into two parts. Part I (141 pages) examines exactly what we understand by evolution. Prothero considers the nature of science itself, and the relationship of evolution to biology. The biological material brims with up-to-date content, including a nice discussion of the significance of *evo-devo* and of *box* genes. Very useful is the section aptly titled “Evolution happens all the time!” (p 113–8). He reviews contemporary examples of evolutionary change such as sock-eye salmon in Washington state, three-spine sticklebacks in Alaska and Norway, codfishes in the Western Atlantic, and pesticide resistance in insects. He ends this section with a lovely quote from entomologist Martin Taylor, lamenting of farmers in the southern United States: “These people are trying to ban the teaching of evolution while their own cotton crops are failing because of evolution” (p 118).

In the chapter on systematics and evolution, Prothero hammers the point that the course of evolution is not progressive as conceptualized in such outmoded historical concepts as the scale of nature or the great chain of being but rather takes the form of a bush. Creationist insistence on missing links depends on a metaphor scientists (but not necessarily journalists) have long since discarded. He fully develops concepts of cladistics that systematists universally rely upon today.

Part II (215 pages) is the heart of the matter, a survey of the major features of the fossil record from the origins of life to the appearance of humans. I found chapter 7 (“Cambrian ‘explosion’ — or ‘slow fuse?’”) quite useful. To Darwin and his contemporaries it appeared that the geological record showed no evidence of life for an immense interval of Precambrian time, and then all of a sudden life appeared in profusion



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during the Cambrian Period. Since the 1940s there has been a steady increase in discoveries of soft-bodied fossils and microfossils from the Precambrian, including the famous metazoan radiation of the late Precambrian, with its now world-wide Ediacaran faunas. It is also clear that the profusion of hard-bodied fossils such as trilobites, brachiopods, and sponge-like archaeocyathids that are so apparent in rocks came about 25 million years after the beginning of the Cambrian, and was preceded by a reasonably diverse fauna of small shelly fossils that had long been ignored. Thus the Cambrian explosion turns out to be more apparent than real, and another creationist canard bites the dust!

At one time the finest example of an early tetrapod that we could use was *Ichthyostega*, an unequivocal amphibian. *Tiktaalik roseae*, described only in 2006, is as sweet an intermediate fossil as can be imagined. Although just on the fish side of the transition, this “fishapod” from the Canadian Arctic has the flattened skull of a tetrapod and a neck, unheard of in a fish. The forefins show a humerus, radius, and ulna, but bear fin-rays, not fingers. Early tetrapods such as *Acanthostega* and *Tulerpeton* show that seven or eight fingers preceded the familiar tetrapod pattern of five fingers.

The book proceeds *seriatim* through seminal recent discoveries in tetrapods, amniotes, dinosaurs to birds and then to mammals. Prothero points out that the evolution of horses, elucidated since the 1870s, remains one of the finest demonstrations of evolutionary change over time. Horse evolution traced over 50 million years exhibits bushiness and lack of directedness. Similar cases can be made for rhinoceros, camels, tapirs, artiodactyls, and elephants. Whale evolution has been clarified by the recent discovery of important fossils from Pakistan, especially *Ambulocetus*, the Eocene “walking whale”, and *Rodhocetus*, the proto-whale with the ankle of an artiodactyl. Finally, the book documents the richness of the hominin fossil record, which has been substantially enhanced by new finds of the past decade. Prothero demonstrates atavisms in humans

(including several arresting photographs of fleshy tails) that make no sense in terms of “intelligent design”, but which are easily understandable as developmental anomalies revealing our evolutionary antecedents.

The book is beautifully illustrated with photos and drawings of fossils, and phylogenetic diagrams. It is enlivened with topical cartoons skewering creationists. The book is very valuable as a demonstration of the quality of the fossil record, which has improved dramatically in the past decade. It is a fine resource for those whose knowledge of either paleontology or evolutionary biology can use a little dusting off and polishing. We often accuse creationists of using outdated arguments. Reading a book such as Prothero's will ensure that we do not do the same.

I do have a complaint, however. The book preaches to the converted. Its polemical tone can become wearying and may produce the unintended effect of nudging undecided readers in the wrong direction. Poorly disguising his contempt, Prothero's rhetoric is sometimes over the top, as when he refers to “hard working, dedicated, self-sacrificing biologists who spend years enduring harsh conditions in the field” in contrast to “creationists who sit in their comfortable homes and write drivel” (p 113). Please! The facts of paleontology stand on their own. They do not need to be undermined by rhetorical shenanigans.

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ONLY A THEORY: EVOLUTION AND THE BATTLE FOR AMERICA'S SOUL

by Kenneth R Miller
New York: Viking, 2008. 256 pages

Reviewed by Andrea Bottaro

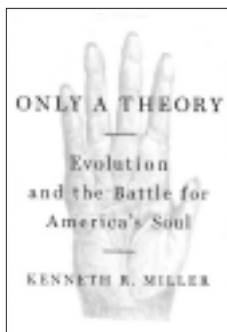
The thesis of Ken Miller's succinct and very readable book *Only a Theory* is that the evolution/creationism controversy that has been

playing out in schools, school boards, legislatures, and courts across the United States is more than a heated but circumscribed skirmish between scientists and religious fundamentalists over the veracity of evolutionary theory versus divine creation, but actually part of a broader and more widespread battle over “nothing less than America's scientific soul”. Since few people in the past decade have been more often and more prominently involved at the front lines of this controversy than Miller, this is an alarm call we ought to listen to.

The book begins with taking stock of the scientific prominence of the United States. According to Miller, this success reflects a deep commonality between the scientific spirit and America's key national virtues, namely individual independence and imaginative enterprise, and the value ascribed to the challenging of authorities. American scientific institutions, Miller argues, have thus tended to reward originality and innovation as opposed to loyalty and adherence to established paradigms, which are part of the Old World's academic structure. This is an interesting observation and, to the extent that such a generalization can do so, it probably reflects a true insight.

The next step in Miller's argument, namely that this same independent spirit leads the American public more freely to doubt and openly to challenge the scientific consensus, allowing grassroots movements such as creationism to prosper and score occasional political victories, is far less convincing. By all published surveys, in fact, Americans are far less skeptical of science and more likely to trust the scientific establishment than the supposedly less independent-minded Europeans (see, for instance, NSB 2004: Fig 7-4). For instance, a stunning statistic is that since 1973 a very large fraction (about 40%) of Americans have consistently expressed “a great deal of confidence” (as opposed to

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“some” or “no confidence at all”) in the leadership of the scientific community, more than any other professional group but medicine (which science actually passed in 2002) and, in brief wartime periods, the military (NSB 2004: Fig 7-13). European skepticism of science, however, expresses itself in ways that are not common among Americans, such as the widespread rejection of genetically modified organisms and biotechnology. To me, these data suggest that evolution is more likely to be a sticking point in the United States because of the country’s widespread religiousness and the success of fundamentalist denominations, rather than any innate contrarian spirit.

Regardless, Miller’s remark that the creationist attack focuses not only on some of the results of science but even on its very methods, and is therefore a real threat to American scientific success, is sensible and important. Yet, the book continues, if we abide by the spirit of challenge that is intrinsic to science, we owe it to ourselves not to reject the creationist critiques of evolution on principle, but to counter them factually. This is where Miller’s broad biological knowledge and science writing skills really shine: in a few central chapters, the major tenets of modern creationism and its objections to evolutionary science, such as “irreducible complexity” and the misuse of information theory, are first fairly outlined and then convincingly dismantled. Ranging from pseudogenes to eye evolution, from the immune system to evo-devo, Miller gives a comprehensive view of the scope of modern biology and the interlocking evidence for evolution. Much of this evidence, and the linked account of the *Kitzmiller v Dover Area School District* trial over the teaching of “intelligent design” in a Pennsylvania high school, will not be new to those who follow the

evolution/creationism controversy, but will certainly be a key attraction to readers who want to find a easily digestible and yet factually accurate — well, *almost* fully accurate: on page 149, Miller classifies the Australian feral dog, the dingo, with the indigenous marsupials — and thorough condensate of the topic.

The factual evidence having been presented, the book goes back to its core argument on the nature of science and how “intelligent design” aims to undermine its very foundations. Miller draws a parallel to a famous book by Allan Bloom (1987), *The Closing of the American Mind: How Higher Education Has Impoverished America’s Young and Failed Its Students*, which was among the first to highlight the problems associated with the academically dominant post-modernist/multiculturalist paradigm of the time. The striking parallels between the antiscientific arguments of (generally conservative) religious anti-evolutionists and those of (generally leftist) post-modernists have been noted before, most notably by Paul R Gross, who has spent the better part of two decades countering both (Gross and Levitt 1998; Forrest and Gross 2007). Here Miller quotes extensively from Bloom to point out that “intelligent design”’s very own “Wedge strategy” to turn society first against evolution and then against empirically based science altogether very closely matches the rhetoric and goals of some post-modernist philosophy, with similarly pernicious effects. Both attempts, Miller warns, have the potential severely to undermine America’s scientific and technological primacy at a critical time in world history. (I dare say that the juncture has become even more critical since the book’s publishing, because of the current global economic recession.)

Ultimately, Miller is optimistic about the final success of the pro-science side in this battle, and offers suggestions on how to achieve it by expanding the civic engagement of scientists, renewing our efforts in education, and becoming more savvy in the use of tactics and arguments that appeal to the general public. I suspect that some of these latter pro-

posals will encounter some skepticism, but as usual with Miller’s writing, his arguments are thoughtful, his tone engaging, and his enthusiasm infectious. This book is no different, and will make for stimulating reading regardless of a reader’s own positions on specific issues and their knowledge of the field.

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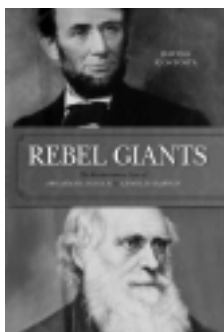
REBEL GIANTS

by David R Contosta
Amherst (NY): Prometheus Books,
2008. 263 pages

Reviewed by Sherrie Lyons

February 12, 2009, was the 200th birthday of two truly remarkable men: Abraham Lincoln and Charles Darwin. And we have already witnessed an onslaught of celebrations, conferences, articles, and books reflecting the latest scholarship on them. In this biography of the two men, David Contosta suggests that in spite of obvious differences in their lives, they share a lot more than just their birthdays, and that

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his comparative approach provides more insight into their character than studying each man separately. Contosta

chronicles the lives of the two men from their childhood, through their rise to prominence, Darwin in the scientific sphere and Lincoln in the political. The last two chapters provide an overview of the legacies of the two men. In addition, Contosta discusses how views of the two men have changed as a result of different waves of scholarship.

Each chapter has a particular theme, and Contosta continually switches back and forth between the two men's lives, comparing and contrasting. For readers somewhat familiar with their lives, the book covers well-known ground. Contosta has made some use of the Darwin Correspondence Project as well as Darwin's autobiography, and he does a good job of describing Darwin's family life and interweaving it with the development of his scientific ideas. Both men are often portrayed as very humble, and much is made of Darwin's continual bouts of sickness and Lincoln's long periods of depression. Yet Contosta rightly points out how ambitious both these men were. While many comparisons are made, this reader did not find them particularly illuminating. For example, both experienced lulls in their careers: Lincoln only had limited success in being elected to public office and Darwin delayed publishing his theory. "In the long run these lulls turned out to be beneficial, since the time had not yet come for either of these men to launch their main efforts" (p 255).

Contosta emphasizes that both men were not religious, doing a better job of showing the factors that led to Darwin's loss of faith. Lincoln appears to have been influenced by enlightenment thinkers, particularly Thomas Paine. Both men were also deeply opposed to slavery, yet clearly

thought that the Negro was inferior. Although Darwin believed his theory showed that all races belonged to the same human family, Contosta does not show how Darwin's racism influenced the development of his theory. Darwin thought that present-day primitive races provided a window into the past, exhibiting behavior that was undoubtedly quite similar to that of ancestral primitive races. This would suggest a chain of continuity from ape-like ancestors to primitive human ancestors to present-day humans. Did Lincoln share a similar view? Even many of the most militant abolitionists also thought the Negro were inferior. In the next hundred years, findings in biology from evolution to genetics were used to promote racism, and not just by uninformed people, but scientists themselves. How did such views shape the struggle for true equality? It is not accurate just to say that non-scientists have misconstrued scientific findings. Today, two hundred years later in the United States, religion masquerading as science in the form of "intelligent design" is threatening the teaching of evolution and racism is still rampant. Contosta claims that the two men's "rebellions were challenging others ... to join them with wide-ranging applications for human equality and human rights and the interconnectedness of all living things" (p 215). Since the supposed strength of this book is its comparative approach, a deeper exploration of these issues is warranted.

In a book of this length that is targeted for a general audience, it is somewhat surprising that Contosta devotes an entire chapter to essentially a review of the secondary literature. This is useful for someone who wants to do further reading. Although Contosta cites Janet Browne's major two-volume biography of Darwin, he does not appear to have made much use of it, instead relying on older material. He provides an overview of the developments in the twentieth century that finally vindicated nat-

ural selection but also points out the challenges evolution still faced from the religious community. He presents a good synopsis of the pertinent aspects of the Scopes trial, less so for the recent case in Dover, Pennsylvania (probably because it was still going on when the book was already in production). Contosta is a historian whose specialty is American history and may have not felt qualified to comment on the Darwin scholarship. However, I was hoping that he would render his professional opinion about the different treatments of Lincoln. He claims that the early work on Lincoln was hagiographic, but he does not answer the questions later scholarship raised. Was Lincoln really a racist and Southern sympathizer? Had he been a pawn of the radical Republicans and led the country into an unnecessary war or did he save the Union and at the same time emancipate the slaves? Instead Contosta closes the chapter with a rather noncommittal statement: "Debates over what they accomplished and what those accomplishments mean for each succeeding generation seem destined to go on for as long as anyone can imagine" (p 330).

For those who are well versed in the scholarship on Lincoln and/or Darwin, there is nothing that cannot be found in earlier works. However, for readers who do not know much about these men, this is a very readable account of their lives and the many important and struggles they faced, both professionally and personally. One comes away with a good basic understanding of the controversies surrounding evolution as well as the tension between Lincoln's desire to prevent a civil war and at the same time bring an end to slavery. It is definitely a worthwhile read in this regard.

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ADAM'S ANCESTORS: RACE, RELIGION, AND THE POLITICS OF HUMAN ORIGINS

by David N Livingstone
Baltimore: The Johns Hopkins
University Press, 2008. 301 pages

Reviewed by J David Pleins

Some trips down memory lane in the creationism/evolution debate can be enlightening, others disturbing.

In a previous volume, Livingstone enlightened us by uncovering the early conservative Christian backers of Darwin, those he dubbed *Darwin's Forgotten Defenders* (Grand Rapids [MI]: Eerdmans, 1987). In his current exploration, Livingstone takes us into the heterodox and racially-charged world of Adam's preadamite ancestors. If we thought we understood the history of the creationism/evolution debate, Livingstone once again upends the standard categories to reveal new fault lines in the bitter battles over the Bible, theology, and science.

Livingstone begins by turning the clock back to the age of heresy to highlight the provocative views of Isaac La Peyrère. Peyrère met the rising tide of the expanding European knowledge of ancient civilizations and the increasing encounters with non-European populations by suggesting that there were men before Adam. If the Chinese and Egyptians were right to say civilization is far older than Adam and if the bewildering array of races on earth suggest colors and customs unknown to Noah's sons, then logically the Bible's story is limited in time and scope. By suggesting there were men before Adam, Peyrère managed to reconcile the Bible and modern knowledge while earning the disdain of many a high churchman.

Thus, the preadamite heresy

was born. Ironically, Peyrère's heresy would go on to become an orthodox leitmotif in the 19th and 20th centuries. Livingstone's story is designed to tell us how this topsy-turvy state of affairs came to dominate the discussion of human origins before and after Darwin.

The debates that unfolded in the 18th and 19th centuries hinged on how, scripturally-speaking, to account for the world's diverse races. Some said the climate was the shaping force. Others said God created different races for different places. Some suggested there were multiple Adams, while others claimed there were two creations — the creation of the preadamites in Genesis 1 and the creation of the Adamites in Genesis 2. Whether the preadamites died off before Adam or coexisted became a theological concern. Matters of Original Sin and the dangers of race mingling were at stake. In each case, the effort was made to reconcile Genesis with the new knowledge of world geography and global cultures. Peyrère's heresy was seed cast on fertile soil.

Behind the clever theological schemes, Livingstone reminds us, there was a hellish reality. In many cases, theological gamesmanship went hand-in-hand with the global slave trade and imperial adventures. Defenders of the faith fell rather easily into ranking the races, with white Europeans always coming out on top of the divine pecking order. Whether the theologians spoke in terms of climate, diverse centers of creation, or even common descent from Adam, invariably blacks and other groups trailed behind white Europeans in spiritual worth.

Against this backdrop, the major players of the day can be seen in a new light. Louis Agassiz's distinct zones of God's creation appear awfully racist, whereas the Darwinian view of the common descent of humans and apes looks far less racist and much more egalitarian.

By this point, Peyrère's heresy was here to stay.

After Darwin, some who wished to link the Bible and science would speculate about whether Adam evolved from his preadamite

ancestors.

Eventually, many Catholics would say that the human body did evolve, but that the human soul takes up residence in a fetus during the gestation period. In other post-Darwinian theological circles, the racist angle would reassert itself as writers worried over whether Adam's white heirs should intermarry with the brutish preadamite blacks, thereby diluting Caucasian spiritual purity.

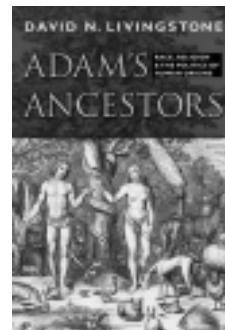
It is hard to conceive of all the useless theological ink spilled in the name of preadamite racism. Yet, lest the secular evolutionist begin to gloat over Darwin's triumph, Livingstone reminds us that the secularists of the period could play the multiple centers of origin game with similar racist intent. The schools of anthropology of the 19th century are replete with racial invective that parallels the odiousness of preadamite religious rhetoric. Theological references to Adam and preadamite are replaced by talk of races as "varieties" and "species." Somehow, in all the secularist charts, portraits, and cranial measurements, primitive blacks stood several notches below the superior white.

One need not have been religious to be racist in the 19th and 20th centuries. True, there were voices, like some abolitionists, who rose above the devilish din, but Livingstone's tawdry tale (well-told) airs the dirty laundry that wafted on both sides of the creation-evolution divide.

Livingstone's richly detailed, amply illustrated work stands as a warning to a religion that loses its ethical moorings and a science that betrays basic human dignity. This is an unsettling book. The skeletons are out of the scientific and theological closet. Will we heed the lessons Livingstone has set out for us?

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GOD OR GORILLA: IMAGES OF EVOLUTION IN THE JAZZ AGE

by Constance Areson Clark
Baltimore: The Johns Hopkins University Press,
2008. 312 pages

Reviewed by Marcel Chotkowski LaFollette

Images matter. Whether through a political campaign's choice of symbols, a news headline's metaphors, or a cartoonist's deft exaggeration of a famous face, visual images persist in popular culture and influence public reaction to ideas, people, and, yes, science. Animals have long been used to embody subtle messages — automobile brands chosen to imply speed, or nicknames that capture essential elements of personality — but few animals carry such rich cultural baggage as non-human primates. Don't "monkey" around with or make a "monkey" of me! As historian Constance Areson Clark demonstrates in her engaging comparison of cultural and scientific images of evolution, the image choices made by scientists, anti-evolutionists, cartoonists, museum curators, and the press all helped to shape public debate during the 1920s and 1930s and not always in the direction intended.

The book's title might, at first glance, seem just another sensational use of such images, but, in fact, it simultaneously references both a central tract of the anti-evolution debate and the ambiguous personal attitudes of one of evolution's most visible defenders. Alfred Watterson McCann's 1922 book *God — or Gorilla* attacked paleontologist Henry Fairfield Osborn and challenged the accuracy of the "Hall of the Age of Man" in the American Museum of Natural History that Osborn headed.

Marcel Chotkowski LaFollette is a historian of science communication. Her most recent books include Science on the Air: Popularizers and Personalities on Radio and Early Television (Chicago: University of Chicago Press, 2008) and Reframing Scopes: Journalists, Scientists, and Lost Photographs from the Trial of the Century (Lawrence [KS]: University Press of Kansas, 2008).

McCann's publication — one of many salvos in a publicity battle which, Clark points out, raged long before the trial of John T. Scopes — targeted a staid and admired museum (a veritable castle of scientific prominence and prestige) and the wealthy and socially connected Osborn, who had been active in the debate against fundamentalists such as McCann, John Roach Straton, and William Jennings Bryan. Osborn was, however, a religious man, an elitist, and a supporter of eugenics. He publicly argued that evolution supported "Christian values" and demonstrated that humankind had always struggled for improvement, physically as well as spiritually, yet he privately expressed distaste for the "image of a simian ancestry." Such ambiguity, Clark points out, characterized the attitudes of many scientists at the time.

Clark skillfully analyzes the technical aspects of the debates (as science's understanding of human evolution was being refined and challenged), but her book holds interest outside the history of science because she also dissects the era's popular culture images of monkeys, chimpanzees, gorillas, and "cavemen" and analyzes strategies chosen or ignored by scientists in their efforts to defend evolution. A "contest among images" played out in the pages of newspapers and magazines, in radio talks, and in museum halls. Everyone — scientists and theologians, evolutionists and anti-evolutionists — had an agenda; all sought cultural supremacy of *their* ideas, sought to have *their* interpretation of life's origins, and of the appropriate delineation of the territory of science and religion, prevail in the public mind. The weapons in that battle continue to be exploited today — satire, ridicule, lampoonery, and photographic comparisons of "man" and "ape." As Clark notes, "the evolution debate was about so much more than the substance of science."

One complicating factor was the increasing complexity of the relevant biology, geology, paleontology, and anthropology. Even though institutions like the non-profit news agency Science Service were being created to

improve public communication, the scientific community's longstanding resistance to popularization for the masses hobbled these efforts. To reach large audiences required using the latest communications techniques like radio, while most scientists remained more comfortable with formats like formal lectures or museum exhibitions. Osborn himself could be dismissive of the very public he claimed to be addressing (he told his publisher that, in writing a popular book, he had "stooped to conquer"). Scientists mindful of the nuances in the evidentiary record would also carefully qualify their statements, while some opponents of evolution simply reduced the choice to one stark question — "God or gorilla?"

Clark offers perceptive analysis of the metaphors, cartoons, and illustrations (including human "pedigrees" and "trees" used in 1920s school biology texts) which peppered the evolution debate, but her book also poses a deeper question. Why did this particular scientific debate capture so much public attention? Certainly, the breakneck speed of technological and social change during the 1920s — automobiles, movies, radio, flappers, jazz — lent credibility to conservatives' anxiety that science disturbed the status quo but, as Clark emphasizes, the two sides also effectively constructed starkly different images of the past. Either human beings stood erect and dignified in the great chain of being, forged in God's image, or else they hunkered on the muddy ground alongside their simian cousins. Neither fundamentalists nor evolutionists seemed willing to compromise in the images they employed in their writings and lectures.

Popular culture then worked its own magic, conflating cute chimpanzees with powerful gorillas and eventually fashioning a satirical version of a brutish, stoop-shouldered, slack-jawed "caveman" (the comic strip *Alley Oop*, still carried in hundreds of newspapers today, was created in 1932). In her chapter on "Redeeming the Caveman, and the Irreverent Funny Pages," Clark shows how anti-evolutionists exploited science's own visualizations to advantage. Osborn and

other scientists may have imagined that they could determine how evolution would be presented to the public, but even powerful institutions like a New York museum could not control how anti-evolutionists would interpret the images in public exhibit halls. McCann frequently turned Osborn's own displays against him. Osborn had worked with curators and designers to "create a vision of cavemen ennobled, rather than degraded," and yet, Clark points out, they added elements (for example, facial and body hair, or rough wooden clubs) which had little scientific basis, and the murals, busts, and dioramas seemingly celebrated a vision of brutal creatures capable of violence. Critics like McCann then easily pointed to such artistic license as proof that the exhibits "represented speculation, not science." Interpretation (and misinterpretation) of images and evidence thus helped, Clark explains, to raise potent questions "about the very definitions of science and its boundaries," a result that served neither science nor the public well. This history offers an important lesson for popularization and public communication of science today.

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WHY EVOLUTION IS TRUE

by Jerry A Coyne
New York: Viking Press, 2009.
282 pages

Reviewed by
Donald R Prothero

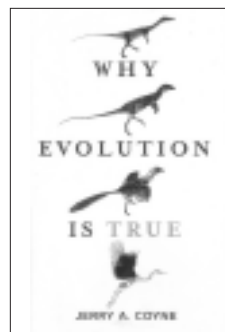
In recent years, the battles over creationism, "intelligent design", and evolution have produced a glut of new books on the topic.

Donald R Prothero is Professor of Geology at Occidental College, and Lecturer in Geobiology at the California Institute of Technology. He is the author of twenty-four books, including Evolution: What the Fossils Say and Why it Matters (New York: Columbia University Press, 2007).

Most of the books focus on the purely biological side of evolution; a few (including mine) focus on the fossil evidence. Jerry Coyne's new book, *Why Evolution is True*, does a beautiful job of covering nearly all the bases in a succinct but enjoyable and gently persuasive fashion.

In the first chapter, Coyne discusses the basic conceptual framework of evolution, and clarifies the common misconceptions about how the science works, and the creationist misuse of the word "theory". The second chapter is a brief but compelling overview of the fossil evidence of evolution, drawing from the most familiar recent examples (*Tiktaalik* and the origin of tetrapods, the origin of birds from dinosaurs, and the origin of whales) as well as some that are more obscure. Even though Coyne is a neontologist, he does a good job of showing the difficulties that paleontologists endure while finding fossils, the strengths and limitations of the fossil record, and how important the fossil evidence has become for establishing the actual course of evolution. Given the limited, outdated, and inaccurate coverage of the fossil record in most college-level evolutionary biology textbooks, it is a pleasure to see paleontology given a seat at the "high table" of evolutionary biology, even before any of the neontological evidence has been mentioned. I have some small quibbles about outdated taxonomy and Coyne's insistence on gradualism (which most paleontologists would dispute), but overall this is one of the best summaries of the fossil evidence for evolution that I've ever seen by a non-paleontologist.

The third chapter outlines the "mute witnesses" of evolution in the form of vestigial organs and suboptimal or bad design — the best possible antidote to the foolishness of the "intelligent design" argument. More than anything else, pointing to these strange examples of useless or poorly designed features is a powerful argument for evolution, and quickly disarms those who might be seduced by the phony "design argument". Coyne covers most of the classics and many lesser-



known examples, from whale hips and legs, human tails, and many other features of the human body that are poorly designed, to

"dead genes" and other junk in our DNA. Most impressive of all is the bizarre course of the left recurrent laryngeal nerve, which takes an unnecessarily long course down from the throat to the aorta and back again, since it was once attached to a gill arch in the developing embryo. In the fourth chapter, Coyne reviews all the overwhelming evidence from biogeography, from islands and their peculiar biotas to the odd patterns left over from the breakup of Pangaea.

Chapters 5, 6, and 7 cover the classic neontological arguments from genetics, speciation theory, and the evidence that modern biologists have been documenting for the past century. This is the strength of the book, since Coyne's specialty is in these areas, and here his familiarity with the field truly shows. Among these topics is a provocative discussion of "how sex drives evolution", updating the classic sexual selection arguments that Darwin first presented, which were amplified when genetics discovered how important sexual recombination was to genetic variability and speciation.

The penultimate chapter deals with the issue most driving the creationist movement: human evolution. Many creationists would probably ignore evolution (along with the rest of biology) completely were it not for the claim that humans are related to the rest of the animal kingdom, and evolved from non-human ancestors. Coyne presents a brief but clear summary of all the evidence from human anatomy, paleontology, and genetics that make our connection to the animal kingdom (and especially the great apes) indisputable.

In his final chapter, "Evolution Redux," Coyne muses on some of the major implications of evolution, from the philosophical rea-

sons why a scientist can say “evolution is true,” to the new field of evolutionary psychology, to the implications of evolution for our worldview. He never spends much time engaging the creationists directly or debunking most of their arguments, but instead gently convinces the reader by clearly and simply describing and explaining the overwhelming evidence that evolution occurred — much as Darwin did 150 years ago. In this way, Coyne’s book is a wonderfully balanced approach that is gently persuasive without being combative, and works well for anyone who is sitting on the fence about the fact of evolution. Of course, creationists will hate a book like this (judging from the Amazon.com reviews, many have already tried to trash it), but it should convince anyone with doubts about the issue, or whose mind is not already clouded by religious dogma.

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TRYING LEVIATHAN

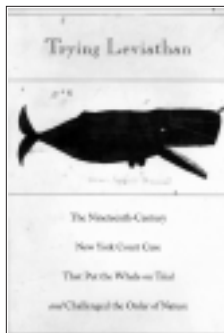
by D Graham Burnett
Princeton (NJ): Princeton
University Press, 2007. 266 pages

Reviewed by Arthur M Shapiro

Strictly speaking, *Trying Leviathan* is not about evolution. It is about a remarkable legal clash between “common sense” and “expert opinion” — a theme all too familiar in the ongoing creationism/evolution wars. As such it has valuable lessons for us. It is also a terrific read.

The case, *Maurice v Judd*, played out in the Mayor’s Court in New York City in 1818. Because of alleged adulteration of fish liver oil, then an important commodity, the New York state legislature had mandated government inspection thereof — with an inspection fee, and a hefty fine for those failing to comply. At issue was

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Distinguished zoologist and all-around savant Samuel L Mitchill was the star witness, presenting all the latest arguments from comparative anatomy to demonstrate that whales were mammals, not fishes.

One might expect such erudition to carry the day, but it did not. The lead attorney for the other side, William Sampson, played cleverly on anti-intellectualism to discredit Mitchill as a dilettante and out of touch with reality. Nor did the rhetorical manipulation stop at mere anti-intellectualism. Sampson exploited resentment of what was perceived as New England snobbery, portraying the notion that cetaceans were mammals as a Yankee insult to good old New York common sense: “a mere provincial usage” his co-counsel, John Anthon, called it. And Mitchill had testified that “a whale is no more a fish than a man.” Anthon exploited this to tie scientific taxonomy to the slavery question and racial anxiety. He posited a scenario in which Mitchill, using all the same arguments he had adduced in claiming a whale was a mammal, now claimed that an orangutan was a man, and indeed “entitled to vote in our public elections.” Sampson cautioned the jury that the distinctness of man from the lower orders would be cast into doubt if this newfangled comparative anatomy were to be recognized in a court of law: “Yes, gentlemen of the jury, in the same order with man, they place the monkey, ape and baboon; all equally related, and differing from the lord of the creation only as they differ from each other” (p 84–5). It is hard to tell which of these ploys was most effective, but something worked, since the jury took only fifteen minutes to rule that a whale was a fish.

The court recommended that the legislature revisit the statute and decide for itself whether it wanted whale oil included. It did not, and

whether whale oil was “fish oil” for the purpose of the statute. The argument boiled down to whether or not whales were fishes.

amended the statute forthwith.

As we all know, evolutionary biologists are prone to lose debates to creationists if they assume that scientific “knowledge” by its very nature must vanquish creationist “ignorance”. *Maurice v Judd* shows that the same sociological forces and the same rhetorical ploys can maintain their vigor for nearly two centuries, and warns us that when elite culture gets too far ahead of popular culture, it loses its relevance. I think about this every time I explain to students why cladistic reasoning tells us that the “Class Reptilia” does not exist, and that birds are a subset of dinosaurs. It sounds just as “airy-fairy” as the whale-as-mammal theory did in New York in 1818 and is received with appropriate incredulity.

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WORLDS BEFORE ADAM: THE RECONSTRUCTION OF GEOHISTORY IN THE AGE OF REFORM

by Martin JS Rudwick
Chicago: University of Chicago
Press, 2008. 800 pages

Reviewed by Paul D Brinkman

Martin Rudwick’s latest work, *Worlds before Adam* (hereafter *WBA*), is a mighty sequel to his massive volume *Bursting the Limits of Time* (hereafter *BLT*; Chicago: University of Chicago Press, 2005; reviewed in *RNCSE* 2006 Nov/Dec; 26 [6]: 35–6). Together they constitute a *magnum opus* from one of the world’s foremost historians of geology and paleontology. Like its predecessor volume, *WBA* is a weighty book that details the efforts of 19th-century geologists to reconstruct an immensely long and eventful earth

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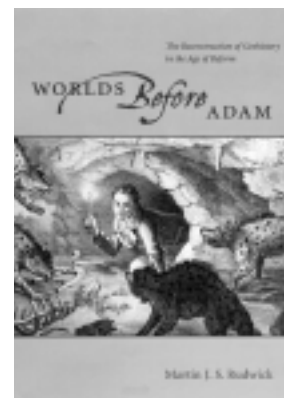
history, or “geohistory,” as Rudwick puts it in his title. This book begins where the previous one leaves off, in the years following the end of the Napoleonic era (circa 1817), when the French comparative anatomist Georges Cuvier still wielded considerable influence in geology, and ends in the early 1840s, when Louis Agassiz’s glacial theory “forced geologists to recognize the contingent character of geohistory as a whole” (p 7). Rudwick divides his book into thirty-six well-written and lavishly illustrated chapters arranged chronologically and grouped into four parts. Part I begins in Paris with Cuvier, vertebrate paleontology, and earth’s natural “revolutions,” then moves to Great Britain, where important contributions to stratigraphy and paleontology were often interpreted in Biblical terms, and ends with a lengthy discussion of the debates about the adequacy of “actual” causes in explaining geological events of the distant past. Could small, observable changes in elevation during earthquakes, for example, account for crustal movements on a more massive, mountainous scale? Part II deals with the late 1820s and earliest 1830s, when French and English geologists such as Alexandre Brongniart, Louis-Constant Prevost, and William Buckland grappled with questions of a cooling earth, fossil faunas, glaciers, extinction and much more.

Part II ends with Chapter 17, “The specter of transmutation (1825–1829),” which deals briefly (in twelve pages) with the subject of evolution, which is only “loosely linked” (p 237) to the central issues of *WBA*. As Rudwick argues, Cuvier had already established the reality of extinction by the 1820s, when almost all naturalists agreed that many of the strange fossil remains turning up in all quarters of the globe represented species long gone. Whether it was brought about by gradual, local changes of climate, or through massive catastrophes, the fact of extinction was no longer a question. Explanations for the origins of new species remained steeped in controversy, however, especially as evidence accumulated for the successive appearance of new organisms in the fossil record.

Jean-Baptiste de Lamarck had all but ignored the fossil evidence in his general theory of transmutation published in 1809. Fossils were Cuvier’s bailiwick, and he abhorred transmutation. In 1825, however, Cuvier’s colleague Etienne Geoffroy Saint-Hillaire published a paper in which he argued that living gavials might be the direct descendants of the fossil crocodiles found in the Secondary formations of Normandy, and he tied his argument explicitly to Lamarckian transmutationism. Geoffroy used a widely approved actualistic approach to make his case, arguing that analogous “monstrosities,” which could be directly observed in the present world, represented more significant morphological variability than that which was required to explain the cumulative transformation of vertebrate animals over the course of geohistory. But he badly mishandled the fossil record, suggesting that a “progressive series” of fossil vertebrates could be traced from “the ichthyosaur ... and pterodactyl, then passed by way of the ... mosasaur and the Caen crocodile to the American megatherium ... and ended with the Parisian palaeotherium and anoplotherium” (p 242). Geoffroy’s hopelessly confused series did not win converts. Moreover, according to Cuvier, there was as yet a conspicuous absence of intermediate forms between fossil and living species.

The important point, though, is that theories of transmutation were still kicking around, at least in France, and they played a role in the continuing debate over how paleontologists were to interpret the history of life. Indeed, Lamarck’s *Zoological Philosophy* inspired a book-length repudiation by the English barrister and geologist Charles Lyell, who felt compelled to “defend his own species from the indignity of being assigned a merely animal origin” (p 246).

Ultimately, the theoretical background did not matter. What mattered most to the practicing geologist of 1830 was to determine when species went extinct, when new ones appeared, and whether they did so suddenly, gradually, in bunches, or one at a time. In short, geologists could reconstruct the history of life on earth without the necessity



of appealing to any causal explanation. Debates about the transmutation of species, Rudwick argues, developed “in parallel with the reconstruction of geohistory, with only a loose linkage between them” (p 249). This explains the relatively marginal position that evolution occupies in his book.

Part III is devoted largely to Lyell and his contemporaries and critics, as they debated the merits of his influential *Principles of Geology* and its uniformitarian approach in the 1830s. Finally, Part IV takes the story of geologists and geohistory into the early 1840s, by which time reconstructing geological events and deducing their causal explanations had become standard practice.

In spite of their intimidating mass, *WBA* and *BLT* together are not a comprehensive history of geology, nor are they intended to be. Whole subfields of geology, including mineralogy, petrology, and structural and economic geology, are largely ignored in favor of the more obviously historical fields of stratigraphy and paleontology. This makes perfect sense in light of Rudwick’s goal of chronicling the ever-expanding geohistorical approach of earth scientists in the early 19th century. Rudwick claims, with excessive modesty, that he hopes his work will serve as a starting point for further research. But with so grand a beginning, the prospect of writing a worthy contribution in history of geology seems daunting indeed. *WBA* is a work of such excellence as to recommend it to anybody.

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