

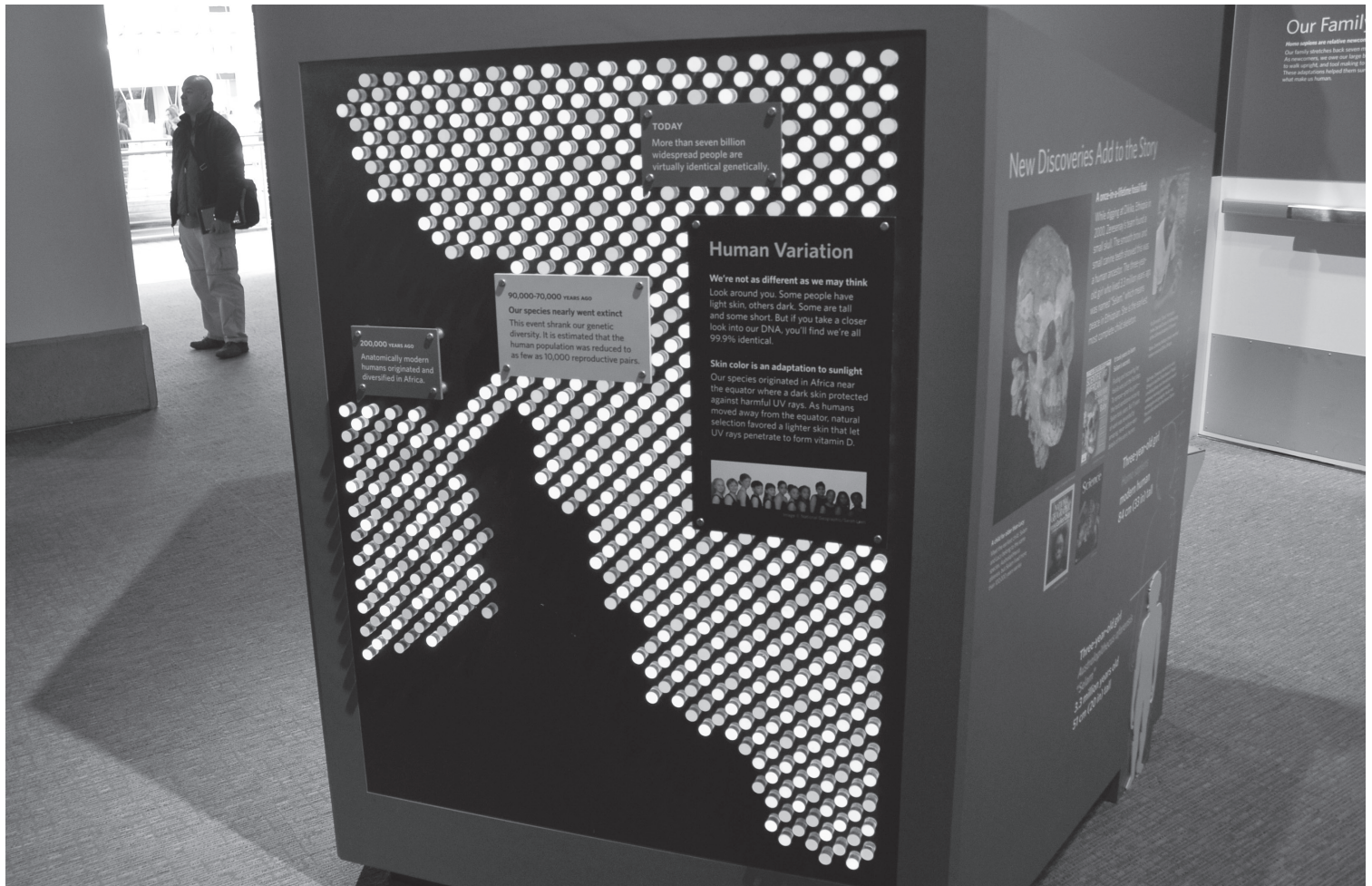


REPORTS OF THE NATIONAL CENTER FOR SCIENCE EDUCATION

DEFENDING THE TEACHING OF EVOLUTION AND CLIMATE SCIENCE

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A display on the genetic bottleneck in human evolution at Human Odyssey, California Academy of Sciences.

Photograph: Steven Newton.

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UPDATES

Kentucky, Hyden: “The ACLU of Kentucky learned recently that Stinnett Elementary School in Hyden, Kentucky, took second graders on a field trip to the Creation Museum as part of its science curriculum,” according to the ACLU’s Heather L Weaver in a June 26, 2013, blog post (available from <http://www.aclu.org/blog/religion-belief/creationism-follies-2012-2013-edition>). In a June 6, 2013, letter to the superintendent of the Leslie County Schools (available from http://www.aclu.org/files/assets/aclu_letter_to_leslie_county_schools.pdf), the ACLU of Kentucky wrote:

While the ACLU of Kentucky fully supports the rights of individuals to exercise their chosen religion, including the right to believe in a literal interpretation of the Bible, public school officials are prohibited from teaching, as part of a science curriculum, religion-based creation stories because doing so amounts to an impermissible endorsement of religion in violation of the United States and Kentucky constitutions. Creation Science is not a scientific theory, and every court that has considered whether creationism or Intelligent Design may be incorporated into a public school’s science curriculum has found that they cannot. ... Because the ACLU of Kentucky is committed to ensuring that public school officials do not impermissibly promote religious belief as scientific theory in violation of the Establishment Clause, we think it is clear that Stinnett Elementary School must immediately cease conducting field trips to the Creation Museum as part of its science curriculum.

The letter closed by requesting written confirmation that the school would discontinue field trips to the Creation “Museum,” warning that if it was not received, the ACLU of Kentucky would “evaluate alternative avenues” to ensure that the school would comply.

Kansas, Hugoton: The Creation Truth Foundation, a young-earth creationist ministry headquartered in Noble, Oklahoma, was scheduled to present a “dinosaur lyceum” at the Hugoton, Kansas, High School; the assembly was mandatory for all high school and middle school teachers and students. The ACLU of Kansas & Western Missouri protested in an April 19, 2013, letter (available from http://www.aclu.org/files/assets/2013_04_19_letter_to_sup_crawford_re_creation_truth_assemblies.pdf) to the superintendent of the Hugoton Public Schools, noting that the Creation Truth Foundation “is seeking to help school administrators teach or promote ‘a sound science curriculum based in Biblical Creation,’” reviewing the statutes and case law prohibiting the teaching of creationism in the public schools, and requesting the immediate cancellation of the event.

The superintendent, Mark Crawford, told the *Topeka Capital-Journal* (2013 Apr 19) that the letter was based on a misunderstanding, claiming that the speakers (who included a Hugoton native) were going to be presenting non-religious events as the Foundation for the Advancement of Childhood Education during school hours and religious events as the Creation Truth Foundation during non-school hours, adding that the school and district staff were not promoting the religious events. Doug Bonney of the ACLU of Kansas & Western Missouri was still suspicious, acknowledging that it would be acceptable for creationism to be promoted at a non-school event but doubting the claim that the school events and the non-school events were not going to be linked; he sent a further letter (available from http://www.aclu.org/files/assets/2013-04-20_kora_request_re_creation_truth_assemblies.pdf) urging the cancellation of the school events and requesting records relevant to their planning.

Subsequently, after the school events (of which there were three; none mandatory) took place, Crawford told the *Capital-Journal* (2013 Apr 23) that it was not about creationism: the speaker “helped the kids to think like a paleontologist.” The speaker, Matt Miles, is described by the Creation Truth Foundation as “Student Worldview Director” and a previous youth pastor; there is no indication that he has any training or credentials in paleontology, science, or science education. Crawford conceded, “On paper he’s not going to stand out to the scientific community. I understand that,” but praised Miles for his excellent communication skills. Complaining that the ACLU of Kansas & Western Missouri was acting like a bully and attempting to intimidate the school, Crawford nevertheless said that the district had nothing to hide and would comply with the public information request.

Maryland, Salisbury: A sentence about evolution in a high school history textbook elicited concern from the president of the Wicomico County, Maryland, School Board. On page 3 of *Ways of the World: A Global History with Sources* appears the sentence, “Ever since Charles Darwin, most scholars have come to view human beginnings in the context of biological change on the planet.” At a board meeting on June 11, 2013, according to the Salisbury, Maryland, *Daily Times* (2013 Jul 6), Ron Willey told the board, “I have a problem with the statement on [p]age 3. ... It is a matter of fact versus theory. That one statement does continue to give me real pain.”

Nevertheless, according to the *Daily Times* (2013 Jul 10), on July 9, 2013, the board voted unanimously to approve the book, over four competitors, for use in the district’s Advanced Placement world history courses. Willey reiterated his concern with the sentence, saying that he was uncertain that it is true and suggesting that it would lead to a confusion of theory and fact. His

concern was assuaged by the fact that the first chapter, including page 3, would not be taught. Asked why, the district superintendent “said it is not uncommon to select certain pages”; the book is over a thousand pages long, he noted, adding, “World history is not universe history.”

Pennsylvania: A Pennsylvania legislator is seeking cosponsors for a bill that would allow public school students to assess “the scientific strengths and weaknesses of existing scientific theories,” the *Philadelphia Inquirer* (2013 Aug 4) reports. As NCSE previously reported, there were calls for such legislation in April 2013, following a series of presentations from young-earth and “intelligent design” creationists in a Murrysville, Pennsylvania, church. But there was no apparent reaction until August 1, 2013, when Stephen Bloom (R–District 199) circulated a memo seeking cosponsors for a proposed “academic freedom” bill closely resembling the bill enacted in Tennessee in 2012.

In its draft form, Bloom’s bill claims that “[t]he teaching of some scientific subjects, including, but not limited to, biological evolution, the chemical origins of life, global warming and human cloning, can cause controversy” and that “[s]ome teachers may be unsure of the expectations concerning how they should present information on such subjects.” It thus directs state and local educational administrators to permit teachers to “help students understand, analyze, critique and review in an objective manner the scientific strengths and scientific weaknesses of existing scientific theories covered in the course being taught” and forbids them from prohibiting teachers from doing so.

Andy Hoover of the American Civil Liberties Union of Pennsylvania—which helped to litigate *Kitzmiller v Dover*, the 2005 case in Pennsylvania in which teaching “intelligent design” in the public schools was ruled to be unconstitutional—told the *Inquirer*, “[T]his is the code people use when they want to inject religion into public-school science classrooms.” NCSE’s executive director Eugenie C Scott agreed, “Because of the various court decisions, they can’t overtly promote creationism, so they’ve found a backdoor way of promoting creationism.”

Turkey: A funding application for a summer workshop on evolutionary biology in Turkey was denied because “evolution is a controversial subject”, according to *Science Insider* (2013 Jul 5). A group of Turkish ecologists and evolutionary biologists working in Turkey and abroad had sought 35 000 Turkish lira (about \$18 000) from the Science and Technological Research Council of Turkey (TÜBİTAK), the main funder of scientific research in Turkey.

TÜBİTAK rejected the application on the grounds that evolution is both nationally and universally a controversial subject. ... It is difficult to regard it as an activity on which a consensus can be reached. ... Since evolution is still a debated issue, the degree to which the organizers represent the community/country is very questionable.

However, the letter also described evolution as “the glue of all biological sciences”.

Erol Akçay, a Turkish evolutionary biologist at Princeton University involved in organizing the workshop, told *Science Insider*, “It sets a very dangerous precedent ... Today it might be a summer school that is fairly cheap ... but tomorrow it could be a young researcher coming up for tenure.” The workshop will proceed without TÜBİTAK’s funding; Akçay commented, “We have raised a little above 3000 Turkish Lira, and donations are still coming in.”

A representative of TÜBİTAK denied that the agency had any reservations about supporting evolutionary biology per se, and cited its recent funding of a workshop on human evolution in Ankara. But the organizer of that workshop observed that a proposal for a further workshop was denied in part because of doubts about the “universality” of evolution, and was confident in attributing “anti-evolutionist motives” to TÜBİTAK.

As NCSE previously reported, there is a long-standing concern about the state of evolution education in Turkey at both the pre-college and the university level. A useful review by Zehra Sayers and Zuhul Özcan, writing in *APS News* (June 2013), concluded, “Turkey is raising a generation of biologists/scientists whose grasp of scientific thinking is flawed and whose ability to participate in modern biology is correspondingly compromised.”

United Kingdom: Michael Gove, the Secretary of State for Education in the United Kingdom, “has abandoned plans to drop climate change from the geography national curriculum,” reported the *Guardian* (2013 Jul 5). As NCSE previously explained, the existing national curriculum discusses sustainable development and “its impact on environmental interaction and climate change” in the section on geography.

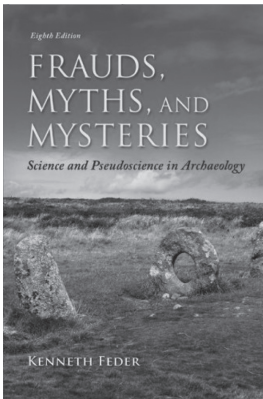
The silence about climate change in the new draft prompted speculations about political interference in the revision process and worries about the effect on students: Doug Bourn, director of the Development Education Research Center at the Institute of Education, told the *Guardian* (2013 Mar 18) that with the omission of any mention of climate change in the curriculum, “The danger is that it will now not be taught at all or that the vacuum could be filled by people who are not positive about it, like deniers.”

Now, however, the *Guardian* reports, “Those familiar with the final version say it will be clear about the role of humans in climate change. It will refer to how human and physical processes interact to influence and change landscapes, environments and the climate, and how humans depend on the effective functioning of natural systems.” The newspaper credited Ed Davey, the Secretary of State for Energy and Climate Change, for his efforts to convince Gove to restore climate change.

Writing on the *Guardian’s* Environment blog (2013 Jul 8), Leo Hickman welcomed the change, but warned that it “might be a little premature ... to claim total victory”. ■

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!

Kenneth L. Feder's classic textbook *Frauds, Myths, and Mysteries: Science and Pseudoscience in Archaeology* was published in its 8th edition (Boston: McGraw-Hill, 2013). According to the publisher, the eighth edition features:



- An updated discussion of scientific creationism and intelligent design, and the impacts these are having on science education in the US
- An updated and reworked section on the Maya apocalypse
- An updated discussion of the evidence for human evolution
- A revised focus on how historians and archaeologists assess specific claims
- Placing archaeological frauds in a broad context, using examples from the 17th through the 21st century
- The treatment of the paleoanthropology of human evolution. The story of the Piltdown Man hoax and the misrepresentations of Intelligent Design advocates are presented
- New information on the molecular archaeology of the first Americans

Feder is Professor of Anthropology at Central Connecticut State University.

Barbara Forrest's "Rejecting the founders' legacy: Democracy as a weapon against science" was published as part of a symposium on Democracy and Science that appeared in the journal *Logos* (2013;12[2]), available from <http://logosjournal.com/2013-vol-12-no-2/>. In her article, Forrest compared "the Founders' enthusiasm for science with Republicans' current animosity toward it," concentrating on her home state of Louisiana. She wrote:

Jindal's Religious Right allies began promoting anti-science legislation immediately after his January 2008 inauguration. Among the first bills he signed was the Louisiana Science Education Act (LSEA), which disguises creationism as "critical thinking" and was promoted as a safeguard of "academic freedom". Written by the Discovery Institute (DI), an intelligent design (ID) creationist think tank, and the Louisiana Family Forum (LFF), a Focus on the Family affiliate, the LSEA permits public

school science teachers to use pseudoscientific supplementary materials concerning "evolution, the origins of life, global warming, and human cloning". Five years later, Jindal has admitted the law's true intent: "[T]he Science Education Act ... says ... if the [local] school board's okay with that, [and] if the state school board's okay with that, [teachers] can supplement those materials. ... I've got no problem if ... a local school board says, 'We want to teach our kids about creationism, that some people have these beliefs as well, let's teach them about intelligent design.' ... What are we scared of?" Moreover, in 2012, Jindal successfully pushed a school voucher law under which \$11 million in public funding is going to almost two dozen Christian schools that teach young-earth creationism.

A member of NCSE's board of directors, Forrest is Professor of Philosophy at Southeastern Louisiana University. Two members of NCSE's Advisory Council also contributed to the symposium. In "Plato's revenge: An undemocratic report from an overheated planet," **Philip Kitcher**, Professor of Philosophy at Columbia University, argued that "our current misconceptions about democracy, and about what a commitment to democracy requires of us, interfere with the global political discussions we so urgently need" in the face of global climate change. And in "Democracy and pseudo-science," **Michael Ruse**, Professor of Philosophy at Florida State University, urged tolerance for pseudoscience—but emphasized that "tolerance about people's beliefs does not extend to letting this sort of stuff [creation science] be taught in science classrooms in state-supported schools."

Nick Matzke completed his dissertation—entitled "Probabilistic historical biogeography: New models for founder-event speciation, imperfect detection, and fossils allow improved accuracy and model-testing"—under the supervision of John Huelsenbeck in the Department of Integrative Biology at the University of California, Berkeley, in August 2013. In September 2013, he started a Postdoctoral Fellowship at the National Institute of Mathematical and Biological Synthesis (NIMBioS) at the University of Tennessee, Knoxville, to work on the unification of phylogenetic historical biogeography and species distribution modeling. He also plans to visit Dayton, Tennessee, the site of the Scopes trial in 1925, which is only eighty miles away from Knoxville. Matzke worked for NCSE from 2004 to 2007 and was the lead NCSE staffer working on the *Kitzmiller v Dover* case, providing a wealth of scientific expertise and practical advice to the legal team representing the ultimately victorious plaintiffs.

Glenn Branch is NCSE's deputy director.

NCSE offers its belated congratulations to **Bill McKibben** on winning the Sophie Prize, “established to inspire people working towards a sustainable future,” for 2013, in recognition of his efforts to combat climate change. According to a press release dated May 27, 2013,

“This planet desperately needs a global mobilizer for change. Fighting immensely powerful interests[,] McKibben has shown that mobilizing for change is possible. This brings hope,” the Sophie Prize jury writes in the jury statement. In the past few years McKibben has been animating and mobilizing a global movement based on the conviction that if we are to stay below [2 degrees Celsius; 3.6 degrees Fahrenheit] of warming, we can emit [no more] than 565 more gigatons of carbon dioxide. Fossil fuel corporations have more than five times that amount in coal, oil[,] and gas reserves.

McKibben received the award, along with \$100 000, in Oslo, Norway, on October 28, 2013. The founder and chair of the board of the international climate change campaign 350.org, McKibben is a member of NCSE’s Advisory Council.

Kevin Padian contributed “Correcting some common misrepresentations of evolution in textbooks and the media” to *Evolution: Education and Outreach* (2013;6[11]; available from: <http://www.evolution-outreach.com/content/6/1/11>). The abstract:

Topics related to evolution tend to generate a disproportionate amount of misunderstanding in traditional textbooks, other educational materials, and the media. This is not necessarily the fault of textbook and popular writers: many of these concepts are confusingly discussed in the scientific literature. However, faults can be corrected, and doing so makes it easier to explain related concepts. Three general areas are treated here: ideas and language about evolution, historical and philosophical aspects of evolution, and natural selection and related concepts. The aim of this paper is to produce a template for a more logical, historically and scientifically correct treatment of evolutionary terms and concepts.

A member of NCSE’s Advisory Council and a past president of its board of directors, Padian is Professor of Integrative Biology at the University of California, Berkeley.

From May 30 to June 2, 2013, Oklahomans for Excellence in Science Education (OESE) sponsored the first annual Oklahoma Evolution Road Trip. The trip, led by **Stanley Rice**, a biology professor at Southeastern Oklahoma State University and president-elect of OESE, and Gordon Eggleton, a retired physical sciences professor at the same institution, had ten participants,

including retired and current high school teachers, retired and current professors, and other interested parties. Rice reports:

The trip was based at the University of Oklahoma Biological Station on the shore of Lake Texoma. It was a wonderful group and everyone had something interesting to contribute. Somehow the tornadoes, which were monitored on weather radio, missed the station.” On May 30 and 31, the participants visited geological sites in south central Oklahoma, which included sites with abundant fossils of bivalves, crinoids, and even some stromatolites. Although Oklahoma is now in the middle of the relatively tranquil North American plate, the participants observed direct evidence of a dramatic geological history that included grabens that collapsed during the Pennsylvanian period. On June 1, participants traveled to Glen Rose, Texas, not only to see the Paluxy River dinosaur footprints but also to visit Carl Baugh’s creationist museum, which is extreme even by creationist standards.

A fuller account, with photographs, can be found at Rice’s blog, <http://www.honest-ab.blogspot.com>.

William Rogers contributed a column to the Rock Hill, South Carolina, *Herald*, continuing his debate with a local creationist. Responding to a claim that science is founded in Christianity, he responded

modern science actually arose out of the recognition by Bacon and other Renaissance/ Enlightenment thinkers of the need to separate explanations of *how* the universe operates from the *why*. That did not require scientists to abandon religious perspectives but to recognize the limits to the questions science can answer.

Answering the charge that textbooks don’t offer “critical analysis” of scientific ideas, he observed that “in practice, it is only evolution that gets called out for such attention, and those demands come almost exclusively from creationists.” And responding to the idea that a cabal of scientists prevents the publication of evidence refuting evolution, he wrote,

The reality is there’s no good-old-boys club and no fatal flaw with evolutionary biology, despite some people’s attempts to manufacture such issues. Those individuals overwhelmingly approach evolution from a personal perspective and, as I pointed out in my previous submission, they typically wish to impose their religious views on science.

Rogers is Professor of Biology at Winthrop University; his letter appeared on June 21, 2013. ■

from THE STAFF

CHARLES HARGROVE writes: As NCSE's archivist, I'm pleased to announce the addition to NCSE's archives of the papers of Karl D Fezer. Now Professor Emeritus of Biology at Concord University, Fezer served as editor of *Creation/Evolution Newsletter* from 1984 to 1988. He explains:

In 1983, NCSE's founder, Stanley Weinberg, passed on responsibility for various functions to the members of NCSE's first board of directors. Jack Friedman became president; Catherine Callaghan, vice president; Duane Jeffery, secretary; Ken Saladin, treasurer. Fred Edwards's presence on the board was critically important since he was editor of *Creation/Evolution*, the only journal devoted entirely to substantive critiques of "creation science." *Creation/Evolution* was owned at that time by the American Humanist Association, with its headquarters in Amherst, New York, and with Edwards as its national administrator and later executive director. I became editor of NCSE's own newsletter. Weinberg's memoranda from 1981 to 1983 are considered to be its volumes 1 to 3. I produced volumes 4 to 8 on a bimonthly basis, which has been continued ever since. It was called *Creation/Evolution Newsletter* during my editorship from 1984 to 1988; it became *NCSE Reports* in 1989, and then was merged with *Creation/Evolution* in 1997 to become *Reports of the NCSE*.

From 1984 to 1986, NCSE's closest approximation to a national office was Friedman's home address in Syosset, New York, or my faculty mail box at Concord College (as it then was) in Athens, West Virginia.

Subscribers had the option of ordering *Creation/Evolution* only, *Creation/Evolution Newsletter* only, or both, with a reduced rate for members of a Committee of Correspondence (as the local organizations of evolution activists were then known, after the Revolutionary War-era organizations of independence activists). And they could send their order to Amherst, New York or to Athens, West Virginia. Both offices reported to Treasurer Saladin at Georgia College in Milledgeville, Georgia, who had to track the allocation of income to AHA and to NCSE, and to worry about the tax code and other legal constraints.

In Athens, almost all aspects of circulation, production, and mailing were handled by me,

with massive assistance from a secretary who also had to serve the three departments and seventeen other faculty members of the Division of Natural Sciences at Concord College.

From the beginning, I received a wealth of potential material for the newsletter, much of which was never published for reasons of both time and space. Under these circumstances, submitters of possible newsletter materials usually received no response to their submissions, which either were, or were not, published or excerpted, with minimal editing. There was no peer review beyond the editor's judgment. Challenges to that judgment usually were also printed.

In the May–June issue of 1986, I explained these practices and offered to respond to inquiries about the fate of particular submissions. Furthermore, I wrote, "We are grateful for everything we receive, whether we can use it in the Newsletter or not. Even items that do not get used are placed in a file that will eventually become available to scholars of the creation/evolution controversy." Well, "eventually" turned out to be about a quarter century later, but the file alluded to is now part of the Karl D Fezer Papers special collection in NCSE's archives.

Weinberg meanwhile focused his efforts on seeking foundation grants that would allow NCSE to hire an executive director, to establish a national office, and to address certain problems. The July–August 1986 issue of *Creation/Evolution Newsletter* announced that he had finally succeeded in persuading the Carnegie Corporation of New York to make a two-year grant of \$150 000 to facilitate these goals. NCSE's board met with the promising applicants on November 15, 1986, and chose Eugenie C Scott to be executive director. She started work the very next day. Needless to say, Scott has a well-known record of achievement as leader of NCSE, spokesperson, and expert on science education and its interactions with the social, religious, and political worlds.

I may say that I derived considerable satisfaction from being told by Weinberg that *Creation/Evolution Newsletter* was "essential" to winning those initial grants. And, of course, I have been delighted by the subsequent success of NCSE, under Scott's leadership, in fulfilling its initial goal of defending the teaching of evolution. And now, with its new additional focus on climate change education, NCSE may also do its bit to help to save the planet!

The Fezer papers consist of materials concerning Fezer's editorship of *Creation/Evolution Newsletter*, correspondence with many people involved in the creationism/evolution fight, records of creationism controversies in the United States, subject files related to various creationism/evolution topics, and materials and correspondence relating to the early days of NCSE

and the Committees of Correspondence. They, along with the other special collections in NCSE's archives—the *Creation/Evolution Journal Records*, the *McLean v Arkansas Collection*, the Frank Awbrey Papers, the G Brent Dalrymple Papers, the William V Mayer Papers, the Wayne Moyer Papers, the Robert Schadewald Creationism/Evolution Rare Book Collection and the NCSE Creationism/Evolution Audio and Video Collection—are available for research at NCSE's office by appointment.

MARK MCCAFFREY writes: Picking our daughter up at the Denver Airport at midnight the other week, the clichéd response “it seems like just yesterday she was on her scooter, nervous about starting school” flashed through my mind. There she was, exhausted, relieved that her summer internship at a hotel in France was over, looking forward to her final semester at college. The work was hard—a gritty taste of the so-called “real world” where she experienced hard work for low, almost no wages—but her French is now fluent and she's more seriously contemplating what comes next after she graduates, whether that is graduate school or attempting to enter the work force.

Her mother and I are super proud of her. She can procrastinate like the best of us, but is a true scholar, able to ask tough questions, collect data, analyze spreadsheets, write coherent research papers with citations from peer-reviewed literature. We worry about her—that's part of our job description as parents—but we know that, given the opportunity, she can do well whatever she puts her mind to. She's done well in public schools, taking advantage of an International Baccalaureate program at a local high school that gave her a leg up on college, and she's now finishing up at the University of Colorado with a degree in International Affairs.

She's one of the reasons I get up in the morning to go to work at the National Center for Science Education, but there are 76 million more reasons: the 56 million students in K–12 and the 20 million more in higher

education in the United States—nearly one in four people in the nation—who need to learn the essentials of science in school so they'll be better able to make informed decisions about issues like climate change themselves rather than rely on the often uninformed opinions of others.

By the time you are reading this, gentle reader, it will be well into the 2013–2014 school year, and we at NCSE will be once again immersed in our efforts to defend the teaching of evolution and climate change in particular and science education in general. Over the summer we've been planning our new blog, mapping out strategies to help teachers, parents and others concerned about quality science education, building partnerships, and identifying events and conferences to share our insights and tools at. We're working with groups like CLEAN (the Climate Literacy & Energy Awareness Network) and ACE (the Alliance for Climate Education), and we've established an education affiliate group with the National Climate Assessment. The Understanding Global Change website we're developing with the University of California at Berkeley's Museum of Paleontology is well underway, though it won't be finalized until 2015, and I'm working on a book for Corwin Press with the working title *Climate Smart—Energy Wise: A Guide for Teaching and Learning* that is scheduled for a fall 2014 release.

Nationally, the big news in science education is the release of the Next Generation Science Standards (NGSS), which were developed “by the states, for the states,” with twenty-six states taking the lead in developing the standards. NCSE was involved with this process, and we feel that their coverage of evolution and climate change is an improvement over the existing hodgepodge of state science standards. But adoption and implementation will take some time, and the pushback from elements of both the right and the left against the deployment of the widely adopted Common Core mathematics and language arts standards may further complicate adoption and implementation of NGSS.

We also anticipate in the coming year more “Academic Freedom” bills, which are carefully designed to provide cover for teaching phony controversy in classrooms around topics like evolution, human origins, and global warming. And we're also on the lookout for curricular materials from groups like the Heartland Institute which are meant to foster confusion rather than clarity around issues relating to human impacts on the climate system.

So we have our work cut out for us. We're still following up on the recommendations from the Climate and Energy Literacy Summit we held in December 2012 (see <http://ncse.com/news/2013/03/toward-climate-energy-literate-society-0014744> for details), including exploring with our partners how to make the case that science education matters more than ever, and that we need to do everything we can to provide young people with the knowledge and knowhow to make effective decisions and choices in order to be prepared for and respond to global changes that are already well underway. ■



NCSE & me

It's the new installment of "NCSE and me," the occasional feature in which we interview our favorite people—members of NCSE's board of directors, Supporters of NCSE, recipients of NCSE's Friend of Darwin award, and the like—about their experiences with and thoughts about NCSE and its work defending the integrity of science education.

Lawrence S Lerner is Professor Emeritus of Physics and Astronomy at California State University, Long Beach, where he was Founding President of the Phi Beta Kappa chapter. He is the recipient of numerous teaching excellence awards. Born in New York City, he earned his bachelor's, master's, and doctoral degrees at the University of Chicago. In addition to publishing over a hundred scientific papers, he wrote *Modern Physics for Scientists and Engineers* (Sudbury [MA]: Jones and Bartlett, 1996) and (with Edward A Gosselin) edited and translated Giordano Bruno's *The Ash Wednesday Supper* (Hamden [CT]: The Shoe String Press, 1977). He also is a recognized expert on state science standards, having participated in multiple evaluations of standards sponsored by the Thomas B Fordham Institute. He is a proud recipient of NCSE's Friend of Darwin award.

How did you first become interested in creationism?

I've been intrigued by the mental gymnastics of all kinds of screwballs ever since I can remember. In high school, I read the Astounding Science Fiction serializations of Velikovsky's *Worlds in Collision* and L Ron Hubbard's *Dianetics*, and I was amazed that many of my friends took the stuff seriously. I chuckled over the speculations of Charles Fort, as recounted by the comic writer H Allen Smith. In my high-school biology class, I learned of the backward folk "down South" who had passed laws against the teaching of evolution, but in New York City there was systematic teaching of the subject as the core of the life sciences, and I never expected to meet a creationist.

In college, not much later, I read Martin Gardner's *Fads and Fallacies in the Name of Science*, and came to realize how widespread sloppy thinking was, both in science and in the closely allied field of medicine.

But all this was mainly a matter of amusement—a source of chuckles—until I joined the Physics Department at Cal State Long Beach. I found to my great surprise that some of my colleagues—even a few in physics—were creationists. The matter did not come up often in the course of teaching physics. But as my interests expanded into interdisciplinary studies and I served a term as Director of the General Honors Program, I saw more and more that concerned me as a person responsible for the development not only of scientists



Lawrence S Lerner
Photograph: Dan Dry

and engineers, but of educated citizens in general.

Having recognized creationism as a threat, what did you do to combat it?

All of these concerns took on a concrete aspect when, about 1980, I met William

Bennetta, the editor and publisher of the small review *The Textbook Letter*. The overall state of K–12 textbooks in a variety of fields (including the sciences) was such as to provide ample scope for the mordancy of Bennetta's reviews. He invited me to review some textbooks, mainly in the physical sciences, and it was through this work that I came into direct contact with NCSE. My first direct connection was taking part in a trip to Sacramento with a group of scientists. We testified to the California Board of Education in opposition to the adoption of textbooks that did a bad job on presenting evolution and at least hinted at creationist "alternatives".

One thing led to another, and I soon found myself on the committee that wrote the 1990 California State Science Framework. As things turned out, three of us did most of the writing. And some months later, when the page-proof version was presented to a large group of science educators, I was outraged and raised hell about the watering down that had mysteriously happened after the committee disbanded. I yelled enough so that at least some changes were made, to the extent possible in page proofs.

About the same time, I was a member of the committee that visited the Institute for Creation Research on behalf of the California Department of Education. The details were messy, but our mission was to report on ICR's application to confer MS degrees in several sciences. It turned out to be a visit to a madhouse. Not surprisingly, we found ICR's programs grossly lacking and recommended against the approval of the application. For complicated legal reasons, ICR eventually got its way; there is a bit of irony in the fact that when it moved to Texas a few years ago, the state department of education there denied it the very same privileges, and as a result the degrees it confers now are in biblical apologetics.

After your experience helping to draft the California state science standards, you became a recognized expert on state science standards in general. What trends have there been in their treatment of evolution?

Over many years, I have been involved in the writing, editing, and critical evaluation of state K–12 science standards, working mostly with many state departments of education and with several foundations dedicated to educational policy matters. The teaching of evolution has, of course, always been a significant issue. In 2000 I wrote a detailed analysis of the way science standards dealt with evolution (*Good Science, Bad Science: Teaching Evolution in the States*, Washington DC: The Thomas B Fordham Foundation, 2000). At the time, a few states did a good job, many did a pretty poor job, and quite a few simply ignored the dreaded E-word completely. In the years following, there has seemed to be a trend toward more and better treatment of evolution in state science standards, but it is impossible to tell how much is due to the influence of that report. I did get lots of flak, though, from such ideologues as Warren Nord, Alvin Plantinga, and Jonathan Sarfati. And I took special satisfaction in a rousing denunciation by the Discovery Institute’s resident Moonie, Jonathan Wells.

What’s the most significant development on the science standards front?

Currently, the fifty-one sets of standards (every state plus the District of Columbia) constitute a chaotic hodgepodge of a few good, a lot of mediocre, and too many poor or worthless documents. But a years-long national effort to develop science standards that can be adopted by most states has now reached fruition, and I have just finished participating in a working group that has critiqued and evaluated the Next Generation Science Standards. (Released in June 2013, our evaluation is available on-line at <http://www.edexcellence.net/publications/final-evaluation-of-NGSS.html>.)

For all its shortcomings, NGSS treats evolution fairly and well, though some critics, including myself, argue that the entire document is superficial and deficient in content, especially in the physical sciences. Certainly the approach to evolution is open, honest, and accurate, and there is no attempt to sneak pseudoscience in through the back door. The same is true of NGSS’s approach to climate change.

But even the best standards still need to be implemented to be effective, right?

How will NGSS affect what actually happens in the classroom? As I have often pointed out, it’s a long way from the department of education offices in the state capital to the small-town classroom. Even the best standards are not by themselves the magic key to excellent science education, but they are surely a sine qua non. Unfortunately, about fifteen states that have

really good standards will find the adoption of NGSS a step down in quality; California is one of these.

The current vogue for standards-based testing has as one of its goals a tightening of the links between standards and the classroom. To some extent, this is bound to be effective, since teachers will teach the specific items in the standard if they know their students will encounter them on the next test. But that tells us nothing about depth. For instance, consider the high-school level NGSS standard, “Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on macroscopic objects, their mass, and acceleration.” What will the test require? Is the teacher to do some simple hand waving, or go through the extensive development of kinematics and dynamics that are really required to make sense of this statement?

Which of NCSE’s accomplishments have you been the most proud of, and which have you helped with yourself?

I have been mightily impressed by the way a small, dedicated staff keeps tabs on the many, varied, and continuing assaults on science teaching at every level from the individual classroom to the state legislature. The highly visible, sweeping *Kitzmiller v Dover* decision of 2005 is perhaps the most dramatic achievement of NCSE in recent years, but we should not overlook the painstaking day-by-day work that has been mostly successful in keeping pseudoscience and religious dogma out of public school classrooms.

My own contribution to this work has been quite modest. I have written from time to time for *RNCSE*, and have recently undertaken editorial duties in the area of history of science. I hope to solicit a series of articles showing how attacks on evolution have varied over the past century and a half, and how the sources of these attacks have varied as well. My own article which touched on the views of the French philosopher Henri Bergson (“Whither ‘intelligent design’ creationism?” *Reports of the National Center for Science Education* 2009;29[4]:18,23–24) will give an idea of what I hope to present.

The need for NCSE is not going to fade away any time soon. Well-financed attacks on good science, for reasons having to do with everything from religion to politics to plain screwiness, will continue. NCSE’s work will therefore continue to be as important and necessary as it has been to date, and I will do what I can to help in the future. ■

WILLIAM J GUSTE JR DIES

William J. “Billy” Guste Jr, who served for twenty years as the attorney general of Louisiana and who assiduously defended the state’s Balanced Treatment for Creation-Science and Evolution-Science in Public School Instruction Act, died on July 24, 2013, at the age of 91, according to the obituary in the New Orleans *Times-Picayune* (2013 Jul 25).

The Louisiana Balanced Treatment Act was signed into law on July 20, 1981, and preparations were immediately underway to challenge it as unconstitutional. Consequently, “many of the biggest names in creationist legal circles came to the aid of the embattled bill,” writes Amy J Binder in *Contentious Curricula* (Princeton [NJ]: Princeton University Press, 2002, p 142). “Joining Guste as legal counsel on the case were Wendell Bird, creationism’s top legal mind, and John Whitehead of the Rutherford Institute.” Guste and his comrades stole a march on the opponents of the act by filing suit to force the state’s educational system—whose superintendent had adopted a wait-and-see attitude—to comply with its provisions. When the American Civil Liberties Union filed its suit, *Aguillard v Treen*, a day later, Guste asked for it to be delayed pending the resolution of the prior *Keith v Louisiana*. After the *Keith* suit was dismissed, the *Aguillard* suit resumed. After a complicated detour through the Louisiana Supreme Court, a federal judge in New

Orleans issued a summary judgment ruling that the act was unconstitutional, which was upheld by a panel of the Fifth US Circuit Court of Appeals, and then, narrowly, by the whole court sitting en banc. Guste and his comrades then decided to take the case to the Supreme Court. In a letter to the editor of the New Orleans *Times-Picayune* published on August 11, 1985, Guste defended the decision to appeal, emphasizing his central argument that the act’s purpose was to ensure “academic freedom.” When Bird argued the case before the Supreme Court, Guste was at his side. On June 19, 1987, on a 7–2 vote, the Supreme Court ruled, in what was by then *Edwards v Aguillard*, that the act was unconstitutional, holding that it “impermissibly endorses religion by advancing the religious belief that a supernatural being created humankind.” Although Bird was indisputably the foremost legal defender of the act, Binder writes, “Creationists had been wise to put their faith in the Louisiana Attorney General as a committed ally to the Bird and Whitehead team” (p 144).

Guste was born on May 26, 1922, in New Orleans. He earned his AB and LLB degrees at Loyola University in New Orleans in 1942 and 1943 and was granted a honorary LLD degree by the same university in 1974. In addition to practicing law from 1943 to 1972, he served in the Louisiana Senate from 1968 to 1972 and as the attorney general of Louisiana from 1972 to 1992.

ELAINE MORGAN DIES

The writer Elaine Morgan, known for her advocacy of the “aquatic ape” hypothesis of human evolution, died on July 12, 2013, at the age of 92, according to the BBC (2013 Jul 12). Morgan wrote a series of books advancing and defending her idiosyncratic views on human evolution, including *The Descent of Woman* (Souvenir Press, 1972), *The Aquatic Ape* (Stein & Day, 1982), *The Scars of Evolution* (Souvenir Press, 1990), *The Descent of the Child* (Oxford University Press, 1995), *The Aquatic Ape Hypothesis* (Souvenir Press, 1997), and *The Naked Darwinist* (Eildon Press, 2008).

The aquatic ape hypothesis, promoted by the marine biologist Alister Hardy, holds that human evolution included a phase in which humans were adapted to a marine environment, citing as evidence such distinctive human features as the reduction of body hair, the unusual amount of subcutaneous fat, and the diving reflex. Morgan contrasted the hypothesis with what she called “the savannah theory,” as exemplified in popular books such as Desmond Morris’s *The Naked Ape*, which she faulted as not only empirically lacking but also relying on sexist assumptions. Despite their high profile among the general public, Morgan’s ideas attracted little sustained attention from the scientific community, the main exceptions being a 1987

symposium, the proceedings of which were published as *Aquatic Ape: Fact or Fiction?* (Souvenir Press, 1987), and a paper by John H Langdon in the *Journal of Human Evolution* (1997;33[4]:479–494). Langdon described the aquatic ape hypothesis as “troubled by inconsistencies” and unlikely to be reconcilable with the fossil record, adding, with respect to Morgan’s proclivity to argue from uncertainty or disagreement among paleoanthropologists, “This aspect of the argument for the aquatic hypothesis greatly resembles the approach that ‘creation science’ takes to evolutionary biology. In comparing a single model to an entire academic field, there is an illusion of contrasting order with chaos.”

Morgan was born as Elaine Floyd on November 7, 1920, in Pontypridd, Wales, and received a BA from Lady Margaret Hall at Oxford University in 1942 and her MA in 1948. She began a professional writing career in the 1950s, writing plays for the stage and television scripts for the BBC, and winning a number of prizes for her writing for television. She received an honorary DLitt from Glamorgan University in 2006; in 2009 she was appointed an Officer of the Order of the British Empire for services to literature and to education and elected a Fellow of the Royal Society of Literature.

Reflections on Human Odyssey: The California Academy of Science's New Human Evolution Exhibit

Steve Newton

Human Odyssey, an exhibit about human migration and evolution, opened in February 2013 at San Francisco's California Academy of Sciences. But the Human Odyssey exhibit suffers from having too little space, too few specimens, and too little hands-on interaction for its intended target audience of middle-school children. This is an example of how not to design a public science exhibit.

In light of the foundational importance of evolution in biology and the lack of emphasis on human evolution in public schools, one would think that an exhibit on human evolution would merit far more—and more prominent—space, and many more specimens than the Academy of Sciences has allotted. This is an opportunity missed.

Human Odyssey occupies a surprisingly austere space in the Tusher African Hall. Rather than being given a proper display space, the exhibit fills part of one wall (exit doors cut through the middle of the exhibit) and a bit of space in the middle of a walkway. Human Odyssey's space is so small, one could easily miss the entire exhibit. But for those who do locate the Human Odyssey exhibit, the problems are just beginning.

PLEASE TOUCH!

The Human Odyssey exhibit has skeletal material, but most of it is behind behind glass. This sends clear messages to students: No touching allowed, no interaction; we will show you what you need to see. Many of the skulls in this exhibit are placed so high that many children cannot even see them, much less interact with them.

It didn't have to be this way. Imagine a low bench with dozens of reproductions of skulls, attached with flexible cords, fully touchable and accessible. Imagine these skulls arranged in a long phylogenetic tree printed on the bench so that students can see how they connect with common ancestors. That's the kind of interactive, hands-on exhibit that can inspire children to learn more about science.

This Cal Academy exhibit relies too heavily on video screens at which children are expected to watch passively

as abstract information is displayed. Kids spend far too much time in front of screens already, and a science museum should be one place for them to interact with something other than an implacable, stultifying screen.

Electronics are also involved in the most confusing aspect of the Human Odyssey exhibit. One of the panels contains a patch of multi-colored lights connected by a thin stream of orange and yellow lights, which then expand into a ochreous blossom. This is meant to show the genetic bottleneck that occurred after the eruption of the "supervolcano" Mt Toba in Indonesia, 74 000 years ago. . But Mt Toba is not mentioned; nor does this exhibit describe the fascinating idea that a giant volcano nearly snuffed out the human species not very long ago—the kind of dramatic information that might interest children in science.

It should be emphasized that the accuracy of the science content in Human Odyssey is not the problem; the problem is how information is displayed. The issue is how younger children interact with the exhibit.

In the year 2013, during one of the most fruitful periods of scientific discovery, it should be critical to communicate the wonder of science to the public, and especially to children who may be inspired to choose scientific careers. It is therefore disappointing to see one of the most vital and fascinating scientific topics—human evolution—presented with less than a full effort by the California Academy of Sciences. The Human Odyssey exhibit does no harm, but it could have been so much more.

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Summary of *RNCSE* 2013;33(4):2.1–2.4; the full text is available from <http://reports.ncse.com/index.php/rncse/article/view/222/359>



Creation and Earth History Museum

Randy Moore



Figure 1: The Creation and Earth History Museum in Santee, California, which was originally owned by the Institute for Creation Research (ICR), uses dinosaurs to attract visitors. Photograph: Randy Moore

The Creation and Earth History Museum (Figure 1) was founded in 1992 by the Institute for Creation Research (ICR), and since then has been in its current location in suburban San Diego, California. The museum presents “the biblical account of science and history” and argues that its creation model for life’s diversity and earth’s history is scientifically superior to evolution because “true science supports the biblical worldview. There are many facts of science revealed in the Bible and no proven scientific errors.”

After moving to Dallas in 2008, ICR sold the 4000-square-foot museum (and its contents) to Tom Cantor, the founder and owner of Scantibodies Laboratory, Inc, a biotechnology company. Today, the expanded Creation and Earth Museum is owned and operated by Life and Light Foundation, which is Tom and Cheryl Cantor’s non-profit ministry. (Cantor is also a supporter of Answers in Genesis, a prominent anti-evolution organization that operates the Creation Museum near Cincinnati.)

Like similar creation museums throughout the United States, the Creation and Earth History Museum promotes young-earth creationism and uses roadside dinosaurs to lure visitors (Figure 1). Its “A Journey Through Time” includes a tribute to Henry Morris, “the founder of the modern creation science movement” (and ICR’s founder), and begins with questions such as “What happens after I die?”, “Where did I come from?”, and “What is the meaning of life?” A nearby exhibit laments how “the National Academy [of Sciences] opposes the scientific teaching of creation.”

Visitors then encounter displays numbered according to the days described in Genesis. Following the “Day 7” display, “The Fall of Man” (bathed in red light) describes how the “entrance of sin into the world” ruined everything. Subsequent displays describe human evolution (“we are all descended from Noah and Adam”) and promote the standard claims of young-earth creationists. They’re all here: radiometric dating (unreliable), earth’s age (young), evidence for the Genesis flood (lots of it), compatibility of the Bible with evolution (no, it’s not compatible), the compatibility of the Bible with the Big Bang theory (the Big Bang theory is unscientific and unscriptural), and fossils (they were deposited by the Genesis flood). How should we determine the age of a fossil? Instead of using stratigraphy or radiometric dating, we should trust “the word of God, which indicates that most fossils were buried in one year.” Earth’s young age is a recurrent theme of the museum (Figure 2), and visitors are reassured that “even those who reject the Genesis record of six-day Creation inadvertently acknowledge it by taking off one day each week.”

Visitors then learn about other icons of young-earth creationism, including Noah’s ark (it really happened), dinosaurs (created on Day 6 and possibly still alive in Africa), Mount St Helens, fossils (“all fossils were formed after Adam’s sins”), and the Grand Canyon (it was created by the Flood). An exhibit of famous creationists features clean-shaven scientists such as Pasteur, Babbage, and Faraday, whereas the opposing wall shows bearded

and disheveled evolutionary biologists such as Darwin, Wallace, Lyell, and Haeckel.

Exhibits are supplemented by handouts that attack other types of creationism (day-age creationism “is not permitted by Scripture and is therefore false”) and evolution (macroevolution can “no longer be rationally defended”). Exhibits link evolution with the “consequences of evolutionary thinking,” which include Hitler (“a fanatical evolutionist”), racism (“the concept of race is an evolutionary idea”), entropy, abortion, and death (the punishment for sin), while noting that “much evil has entered the world under the tutelage of Darwin’s theory.” The Noah’s ark exhibit includes a photo-op for visitors to place themselves in the ark; one of the pens in the background houses stegosaurus. Visitors then go through a long exhibit titled “Human Cell” which explains cell biology with creationism. The walk-through museum empties visitors into a bookstore, gift shop, and information center, which promotes events such as a creationism-based tour of the Grand Canyon and “Creation Fellowship” lectures about “Facts versus Darwinism in the Textbooks”, “The 3-Day Formation of Grand Canyon”, “An Old Earth or a Global Flood?”, and “Noah’s Ark and Dinosaurs”.

Throughout the museum, visitors learn that evolution “bears only corrupt fruits,” whereas “creationism bears good fruits,” and are commanded to “obey the biblical teaching of Creation” because evolution is a “false religion” and because “God, Himself, said that the creation took only six days.”

The Creation and Earth History Museum is located at 10946 Woodside Avenue North in Santee, CA. The museum is open Monday–Saturday. Admission is free.

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Summary of RNCSE 33(5):1.1–1.3; the full text is available from <http://reports.ncse.com/index.php/rncse/article/view/253/361>



Figure 2: The Creation and Earth History Museum promotes young-earth creationism while claiming that radiometric dating is unreliable.
 Photograph: Randy Moore



Need a speaker?

As the only national organization that is wholly dedicated to defending the teaching of evolution and climate change in the public schools, NCSE is the perfect place to find someone to

speak to your organization or university about issues relevant to evolution and climate education and attacks on either or both. Available speakers include NCSE’s executive director Eugenie C Scott, Minda Berbeco, Glenn Branch, Peter MJ Hess, Mark McCaffrey, Eric Meikle, Steven Newton, and Joshua Rosenau, as well as four (past or present) members of our board of directors, Barbara Forrest, Kevin Padian, Andrew J Petto, and Benjamin D Santer. So if you need a speaker, please feel free to visit the speakers information page on the NCSE website (<http://ncse.com/about/speakers>) or get in touch with the NCSE office (info@ncse.com or 1-800-290-6006). If nobody from NCSE is available or suitable, we’ll try to find you someone who is!



Scott



Branch



Hess



McCaffrey



Meikle



Newton



Rosenau



Forrest



Padian

Searching for Sasquatch: A Class Project in Critical Thinking

Tim Sullivan

One measure of student learning is how they respond to extraordinary claims related to human evolution. Such claims can be entertaining, offer a way to assess learning goals, and also instill a sense of student confidence in their ability to apply course content to the world in which they are connected. Students are often the best source of such opportunities, and this was the case with a relatively recent news story about the “discovery” of Sasquatch DNA.

In November 2012, a student sent me a link to an article in the Huffington Post, about an east Texas veterinarian/geneticist who claimed to have DNA evidence of a “Bigfoot” or “Sasquatch” (http://www.huffingtonpost.com/2012/11/27/bigfoot-dna-proves-creature-exists-genetic_n_2199984.html).

This story emerged late in the semester. My bioanthropology class had covered cellular DNA, population genetics, osteology, and comparative primate research, and was nearly finished with the paleoanthropology unit. This was just too good to pass up: a unique opportunity to put what we had learned to use in a contemporary and entertaining format.

I sent out a class announcement with the link to the original story and instructions to join in a new discussion forum. To get the discussion started, I offered a few questions:

1. From whom and where do the samples come and how has the process been documented?
2. Has this result been corroborated by another lab?
3. Given what we have learned about hominin phylogeny, how do these claims fit within the framework?
4. What other types of evidence might we need to have?

STUDENT RESPONSES

The week began with a flurry of posts. Initial comments included the predictable, but others soon followed with queries about the samples, and how they were collected and tested.

Not all students were completely skeptical. One student, echoing an earlier discussion about *Gigantopithecus*, attempted to formulate a reasonable hypothesis for research: “We know that there are regions in Canada or the northwest where little human activity occurs. We know that some humans have lived for years without detection in California ... *If* Sasquatch

(or whatever) has lived or continued to live, it will be in these remote regions.”

At least one student recognized the fallacious linear evolutionary thinking of the supposed half-ape/half-human theory and the problems with chronology: “This reminds me of a missing link that we talked about earlier.”

OUTCOMES AND ASSESSMENT

Reflecting back, I was pleased with the outcome. This project energized student participation and enthusiasm, providing the opportunity to use what they had learned. A review of their comments reveals that what students objected to most was not the claim that Bigfoot or its DNA might be real. Rather, they were objecting to the violation of the principles of scientific inquiry, which demonstrated that such claims were unreliable.

Finally, based on student comments both immediately following the exercise and at the end of the course, there was a high level of student interest and enthusiasm for this project. There was a general agreement that this assignment helped to clarify some course content and enabled students to feel more confidence in their ability to apply the new skills they had obtained.

At the top of the list of learning outcomes is for students to demonstrate critical thinking and an understanding and application of scientific knowledge. Contemporary events such as the one described here provide grand opportunities to capture student attention and to assess how well they have mastered the learning outcomes we designed into our courses. Most of our students are not likely to become scientists, but this case study illustrates how the scientific method can be used to assess student ability to recognize unreliable and untested (and untestable) claims that so often appear and reappear in our popular media.

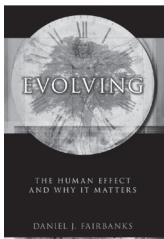
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Summary of *RNCSE* 2013;33(5):3.1–3.8; the full text is available from <http://reports.ncse.com/index.php/rncse/article/view/248/360>

SUMMARIES OF BOOK REVIEWS



Evolving: The Human Effect and Why It Matters by Daniel J Fairbanks (Amherst [NY]: Prometheus Books, 2012; 328 pages). “This sweeping summary of why the general public should understand the recent evidence for human evolution is an ambitious stab at rectifying the pitiful state of science teaching currently masquerading as modern biological education in many of our schools and universities,” writes reviewer **Rebecca L Cann**. She delivers a mixed verdict, praising the treatment of Nikolai Vavilov’s work and of the human and chimpanzee genomes but complaining of the discussion of AIDS and the timing of human evolution: “Overall, this book is a slow read in places and a great read in others. ... uneven and pedantic in places, energizing and uplifting in others.”

Summary of *RNCSE* 2012;33(5):4.1–4.3; the full text is available from: <http://reports.ncse.com/index.php/rncse/article/view/236/364>



Evo: Ten Questions Everyone Should Ask about Evolution directed by John Feldman (Spencertown [NY]: Hummingbird Films, 2011; 107 minutes). *Evo* “provides clear explanations for some of the basic principles of evolution and the history of life on the earth,” writes

reviewer **Mitchell B Cruzan**. “The film is structured around explanations of evolution by attendees at [a] conference—some of the best known researchers in the field of evolutionary biology. Their lucid explanations of evolutionary processes are separated by colorful footage of organisms in nature that illustrate the primary ideas.” But he worries that “the presentation was bland and probably would not hold the attention of most students” and would require supplementary information and discussion to be effective in a classroom.

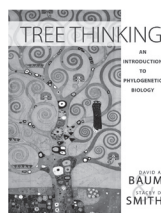
Summary of *RNCSE* 2012;33(5):5.1–5.2; the full text is available from: <http://reports.ncse.com/index.php/rncse/article/view/234/363>



The Fact of Evolution by Cameron M Smith (Amherst [NY]: Prometheus Books, 2011; 346 pages). Reviewer **Eric W Dewar** writes, “*The Fact of Evolution* presents itself as a means to end the argument over evolution by portraying evolution as the unavoidable logical consequence of replication, variation, and selection.” He

appreciated the book’s extensive survey of the literature of evolution, but took issue with its choice of examples, its ahistorical treatment of evolution, its neglect of common misconceptions about evolution, and its idiosyncratic choices of terminology. He concludes, “Smith’s work has many strengths as a reference for the recent literature about evolution, and would probably be a good resource as a text that supports a course, but not as a primary textbook.”

Summary of *RNCSE* 2012;33(5):6.1–6.3; the full text is available from: <http://reports.ncse.com/index.php/rncse/article/view/194/362>



Tree-Thinking: An Introduction to Phylogenetic Biology by David Baum and Stacy Smith (Greenwood Village [CO]: Roberts & Company, 2012; 496 pages). “Until reviewing this text, I had yet to find a valuable text resource that explains tree thinking on a conceptual level appropriate for people new to the subject,” writes reviewer **Kristy L Halverson**. “This text did not disappoint. ... I was pleasantly surprised at how incredibly easy it was to read this text. ... I was impressed with the variety in tree representations, the attractive appearance and size of the text, and the welcoming introductory chapter.” Her main complaint was that the pretest contained several lengthy and confusing questions, with some errors in its key.

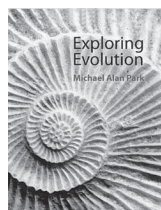
Summary of *RNCSE* 2012;33(5):7.1–7.3; the full text is available from: <http://reports.ncse.com/index.php/rncse/article/view/213/365>



Evolution Challenges: Integrating Research and Practice in Teaching and Learning about Evolution edited by Karl S Rosengren, Sarah K Brem, E Margaret Evans, and Gale M Sinatra (New York: Oxford University Press, 2012; 504 pages). Reviewer **Tania Lombrozo** describes

Evolution Challenges as “a broad-ranging volume that straddles basic research on evolutionary understanding and educational practice. As a result, it’s likely to have something new for both teachers and researchers, and may be of interest to general readers hoping to learn more about the psychological underpinnings of people’s understanding (or misunderstanding) and acceptance (or rejection) of evolution. The chapters are well written and fairly accessible, but this ... is not a light read for the uninitiated.”

Summary of *RNCSE* 2012;33(5):8.1–8.4; the full text is available from: <http://reports.ncse.com/index.php/rncse/article/view/190/343>



Exploring Evolution by Michael Alan Park (London: Vivays, 2012; 160 pages). “The combination of compelling illustrations and lucid text makes it the perfect antidote to (and certainly not to be confused with) the cryptocreationist publication *Explore Evolution*,” writes reviewer

Rebecca A Reiss. “*Exploring Evolution* is written without a trace of the condescending tone that characterizes other publications on this topic. Park takes a holistic approach to evolutionary science and conveys his enthusiasm with language appropriate for a general audience. ... *Exploring Evolution* successfully demonstrates that science is not a replacement for spiritual beliefs, but provides common ground for everyone to celebrate the diversity of life, including dinosaurs, the bacteria of the Grand Prismatic Springs, and us.”

Summary of *RNCSE* 2012;33(5):9.1–9.3; the full text is available from: <http://reports.ncse.com/index.php/rncse/article/view/209/332>

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