NCSE

REPORTS OF THE NATIONAL CENTER FOR SCIENCE EDUCATION

DEFENDING THE TEACHING OF EVOLUTION AND CLIMATE SCIENCE

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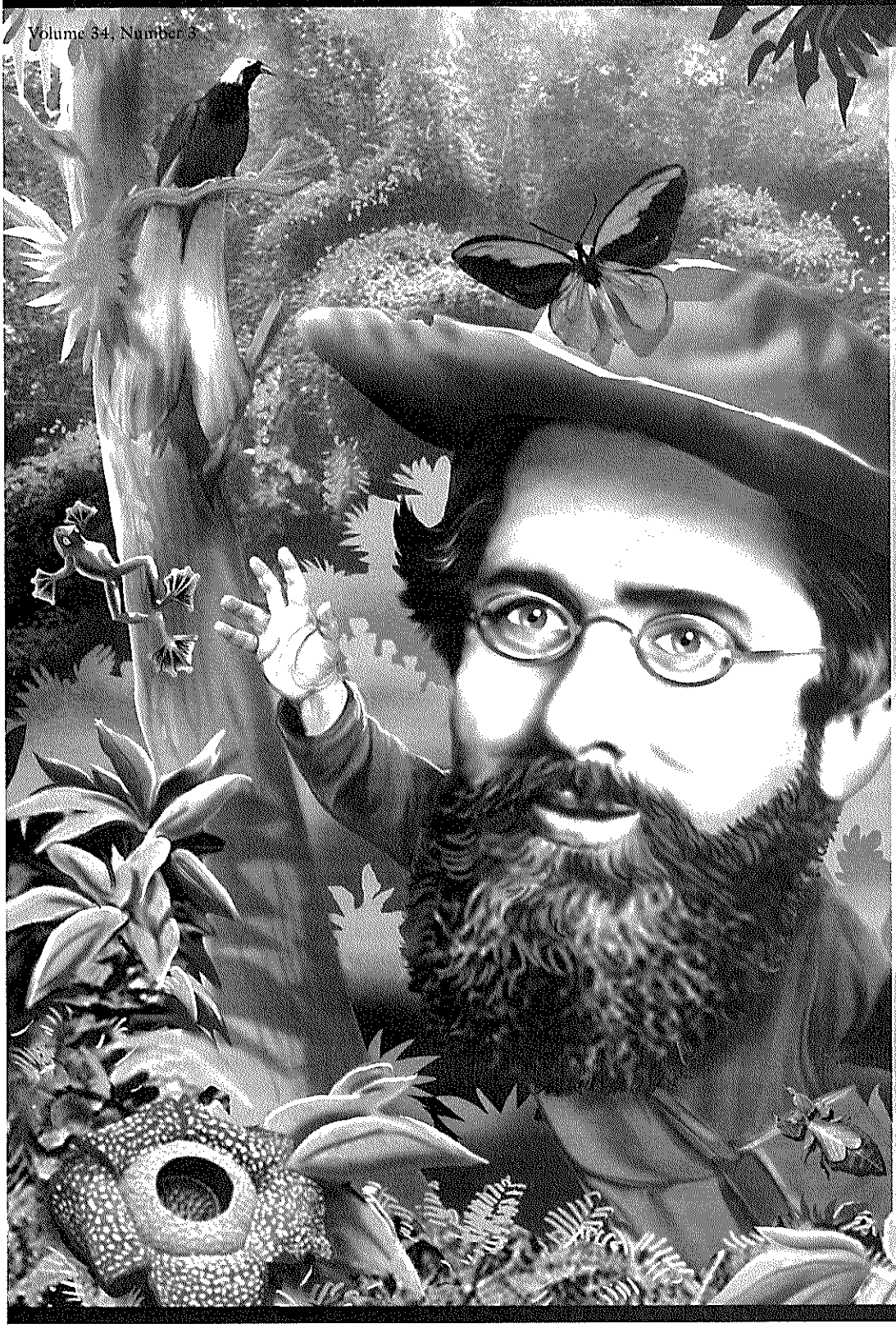

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UPDATES

COVER IMAGE

Peter Von Sholly's mixed media depiction of Alfred Russel Wallace captures the Victorian naturalist's joy at discovering rare and exotic creatures in the Malay Archipelago.
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Louisiana: A sixth-grade teacher's advocacy of creationism is at the center of a lawsuit filed in the US District Court for the Western District of Louisiana on January 22, 2014. The lawsuit was filed by the American Civil Liberties Union and the ACLU of Louisiana on behalf of Scott Lane, Sharon Lane, and their three children, including their son, CC, a Buddhist of Thai heritage. Documents from the case, *Lane et al v Sabine Parish School Board et al*, are available from the ACLU's website (https://www.aclu.org/religion-belief/lane-v-sabine-parish-school-board).

According to the complaint, CC's former sixth-grade teacher "treats the Bible as scientific fact, telling students that the Big Bang never happened and that evolution is a 'stupid' theory that 'stupid people made up because they don't want to believe in God.'" She tells her students that "if evolution were real, it would still be happening: Apes would still be turning into humans today." She "repeatedly instructed students that evolution is not valid as a scientific theory and that God made the world 6000 years ago." She skipped the chapter on evolution in the science textbook and she includes religious material on her science tests. On one examination, students were expected to fill in the blank in the sentence "ISN'T IT AMAZING WHAT THE _____ MADE!!" CC was penalized for not supplying the word "LORD." The teacher similarly grants extra credit for writing "Isn't it amazing what the Lord has made" on assignments and examinations.

Although CC's parents complained of his teacher's misbehavior, the superintendent was not responsive, telling them "this is the Bible Belt" and suggesting that CC change his religion. The complaint cites the teacher's behavior, the superintendent's response, and a pattern of "official promotion and inculcation of religion generally, and Christianity, specifically" on the part of the district. A complaint was also filed with the US Department of Education's Office for Civil Rights.

According to the Associated Press (2014 Jan 23), the school board issued a statement reading, "The Sabine Parish School Board has only recently been made aware of the lawsuit filed by the ACLU. A lawsuit only represents one side's allegations, and the board is disappointed that the ACLU chose to file suit without even contacting it regarding the facts. The school system recognizes the rights of all students to exercise the religion of their choice and will defend the lawsuit vigorously."

Missouri: Missouri's House Bill 1472, which would require school districts to allow parents to excuse their children from learning about evolution, was referred to the House Committee on Elementary and Secondary Education on February 3, 2014.

Interviewed by the *Kansas City Star* (2014 Feb 6), the bill's sponsor Rick Brattin (R–District 55) said that requiring students to study evolution is "an absolute infringement on people's rights" and that evolution is "just as much faith and, you know, just as much pulled out of the air as, say, any religion."

David Evans, the executive director of the National Science Teachers Association, explained, "Evolution by natural selection is the unifying principle in the study of biology," and warned that Brattin's bill would undermine American competiveness in science education.

Brattin also claimed to have received complaints about students ridiculed in school for not accepting evolution, telling CBS affiliate KCTV (2014 Feb 7) that "[o]ur schools basically mandate that we teach one side," adding, "It is an indoctrination because it is not [an] objective approach."

Two high school students in Brattin's district interviewed by KCTV, however, claimed not to be taught about evolution, and evidently were unaware of or confused about it. The station also quoted a supporter of Brattin's as reasoning, "Evolution is not taught in the Bible so it shouldn't be taught in the class."

A separate anti-evolution bill in Missouri, House Bill 1587, which would deprive administrators of the ability to prevent teachers from miseducating students about "scientific controversies" around evolution, was referred to the House Committee on Elementary and Secondary Education on February 5, 2014.

Oklahoma: Two national organizations declared their opposition to Oklahoma's Senate Bill 1765, which, if enacted, would deprive administrators of the ability to prevent teachers from miseducating students about "scientific controversies". Although no scientific topics are specifically identified as controversial, the fact that the primary sponsor of SB 1765 is Josh Brecheen (R–District 6), who introduced similar legislation that directly targeted evolution in two previous legislative sessions, is suggestive.

The letter from the American Institute of Biological Sciences, dated February 10, 2014, and addressed to the Senate Education Committee, described the bill as "bad for science and bad for science education," adding, "If enacted, SB 1765 would merely offer a vehicle for advocates of particular non-scientific belief systems to introduce their personal ideologies into the curriculum," and observing, "There is no legitimate scientific

controversy about evolution or climate change. Scientists have, and continue to, empirically test these concepts and with each test the evidence grows stronger and our understanding more thorough."

Dated February 12, 2014, and addressed to the chair of the Senate Education Committee, the letter from the National Association of Biology Teachers warned that the bill "could easily permit non-science based discussions of 'strengths and weaknesses' to take place in science classrooms, confusing students about the nature of science. Well-established scientific principles and theories such as cell division, photosynthesis, or evolution should not be misrepresented as controversial, or in need of special exploration. Instead, they should be presented to students as they are understood by both the scientific and education communities."

A similar bill, House Bill 1674, would, if enacted, require state and local educational authorities to "assist teachers to find more effective ways to present the science curriculum where it addresses scientific controversies" and permit teachers to "help students understand, analyze, critique, and review in an objective manner the scientific strengths and scientific weaknesses of existing scientific theories pertinent to the course being taught," prohibiting administrators from interfering. As introduced, the bill specifically mentions "biological evolution, the chemical origins of life, global warming, and human cloning" as subjects which "some teachers may be unsure" about how to teach. The House sponsors of HB 1674 are Gus Blackwell (R–District 61) and Sally Kern (R–District 84).

In *The Oklahoma Daily* (2013 Mar 6), Richard E Broughton of the University of Oklahoma described HB 1674 as "a 'Trojan horse' bill specifically crafted by an out-of-state, religious think tank to open the door for the teaching of religious or political views in school science classes. This is clearly understood by everyone familiar with the bill on both sides. HB 1674 would write false claims about science into state law, contradicting the wealth of scientific evidence, our own curriculum standards and the expertise of Oklahoma's scientists and teachers." He concluded, "Passage of this bill will damage the education of our students, diminish the ability to attract scientifically-based industries to Oklahoma and will likely lead to costly lawsuits over constitutionality."

South Carolina: At its February 10, 2014, meeting, the South Carolina Education Oversight Committee (EOC) approved a new set of science standards for South Carolina—with the exception of a clause involving the phrase "natural selection." According to the Charleston *Post and Courier* (2014 Feb 10), Senator Mike Fair (R–District 6) explained, "Natural selection is a direct reference to Darwinism. And the implication of Darwinism is that it is start to finish." He added, "To teach that natural selection is the answer to origins is wrong. ... I don't have a problem with teaching theories. I don't think it should be taught as fact."

"What frustrates us are when pieces of [the standards]—evolution—are singled out for religious and political reasons," South Carolinians for Science Education's Robert T Dillon, a professor of biology at the College of Charleston, told *The State*. "Mike Fair singles out evolution for special treatment. It is no more scientifically controversial than photosynthesis."

Previously, the South Carolina state board of education voted in January 2014 to adopt the new set of science standards, rejecting two different proposals that would have compromised the treatment of evolution in the process. The EOC was supposed to have voted on the standards before the board's vote, but instead sent the standards to the board with a list of recommended changes, including a revision that seemed to be intended to open the door to the use of non-scientific critiques of evolution. Both the EOC and the state board must agree on the standards for them to be adopted.

Dillon suggested that Fair "gets his marching orders" from the Discovery Institute, but when asked about his connections with the de facto institutional headquarters of "intelligent design," Fair demurred, saying, "I talk to them regularly, but their views aren't like mine." Fair is a young-earth creationist, but Dillon observed that "his latest shenanigans" are similar to the Discovery Institute's strategy: "The idea, Dillon says, is to suggest that the theory of evolution is somehow controversial among scientists, or that it 'needs further study,' without explicitly offering an alternative theory."

South Dakota: Senate Bill 112, introduced in the South Dakota Senate and referred to the Senate Education Committee on January 29, 2014, would have, if enacted, provided that "[n]o school board or school administrator may prohibit a teacher in public or nonpublic school from providing instruction on intelligent design or other related topics."

Senate Bill 112 was subsequently deemed the "odd bill of the week" by the *Rapid City Journal* (2014 Feb 2). The newspaper commented, "If South Dakota lawmakers can't tell schools what to teach, some apparently are willing to try the old double-negative end run, and instead prohibit schools from prohibiting what can be taught." Noting that the bill "could lead to legal challenge in any public schools that might make ["intelligent design"] part of a curriculum" and that teaching "intelligent design" in the public schools was

ruled to be unconstitutional by a federal court in the 2005 case *Kitzmiller v Dover*, the *Journal* speculated, "This measure may fall into the category of bills that South Dakota lawmakers file each year just to make a personal political statement."

NCSE's deputy director Glenn Branch told CBS affiliate KMEG (2014 Feb 3), headquartered in Sioux City, Iowa, just across the Missouri river from South Dakota, "A federal court has already established in 2005 that teaching intelligent design creationism in the public schools is unconstitutional. [SB 112 is] in effect encouraging teachers to teach 'intelligent design' creationism confident [in] the knowledge that there's a law telling their superiors that they can't interfere with that." Warning of the potential for litigation as the result of enacting the bill, he commented, "In the case [*Kitzmiller v Dover*] that provoked the decision in 2005, a local school district was left paying a million dollars and it could have been more."

The primary sponsor of the bill, Jeff Monroe (R–District 24), argued that the *Kitzmiller* case is irrelevant: "That case was based on the fact that it forced the teachers to introduce it. That's different from this." But KMEG's report quoted a key passage from the *Kitzmiller* decision: "intelligent design cannot uncouple itself from its creationist, and thus religious, antecedents." KMEG also quoted the superintendent of a local school district as reporting that no elected officials have sought his advice on the bill and as saying, "We don't plan on changing the way we teach right now and will be following the law of the land."

SB 112 finally died in the Senate Education Committee on February 6, 2014, according to the *Rapid City Journal* (2014 Feb 6). The bill was killed at the request of its sponsor Jeff Monroe, who told the Associated Press (2014 Feb 6) that he decided that it was poorly written: "Some [members of the Senate Education Committee] agreed with the bill, but they would have had to vote against it, based on the fact that it was written poorly." Monroe also told the Sioux Falls *Argus Leader* (2014 Feb 6) that he thought that students should be allowed to "see both sides."

Virginia: Virginia's House Bill 207, which would deprive administrators of the ability to prevent teachers from miseducating students about "scientific controversies," died in the House Education Committee on February 11, 2014, when a deadline for bills to pass their house of origin passed.

Before the bill died, it was in search of a home. On February 3, 2014, the House Committee on Education referred the bill to the House Committee on Courts of Justice on a 14–8 vote. But, unusually, the latter committee refused to accept the bill, so it returned to the former committee.

The referral was recommended by the House Subcommittee for Elementary and Secondary Education, which voted 4–3 for it at its January 30, 2014, meeting, according to the *Washington Post* (2014 Jan 31). The bill's sponsor Richard P "Dickie" Bell (R–District 20), who chairs the subcommittee, was one of the three voting against the referral, so the vote was regarded as a setback for the bill.

The day before the subcommittee hearing, the *Post* (2014 Jan 29) reported on HB 207, quoting Bell as acknowledging that evolution and climate change "might fall into [the] category" of scientific controversies mentioned by the bill. Those topics were cited in similar bills enacted in Tennessee and Louisiana. Bell earlier told *The Recorder* (2014 Jan 23) that he was himself a creationist and regarded global warming as "all theory at this point."

Discounting HB 207's appeal to "lofty secular ideals of openness and inquiry," NCSE's deputy director Glenn Branch told the *Post* "giving teachers this license will encourage them to use it, and no one will know what is going on." Branch earlier explained to *The Recorder*, "After all, they could claim that in doing so, they're simply helping their students to understand the scientific strengths and scientific weaknesses of evolution, climate science, heliocentrism, etc."

Juanita Jo Matkins, a past president of the Virginia Association of Science Teachers—representing the supposed beneficiaries of the bill—told the *Post* that the bill was unnecessary, citing the emphasis on critical thinking and scientific exploration throughout the Virginia state science standards. "That is part and parcel of every standard," she said. Matkins also took exception to the bill's emphasis on "opinion" and "belief".

ABC affiliate WRIC (2014 Jan 31) later reported that Bell acknowledged that the bill was brought to him by the Virginia Christian Alliance, which explicitly promotes young-earth creationism; its vice president of public policy Rita Dunaway, who also works for the Rutherford Institute, represented Ohio middle school teacher John Freshwater in his failed appeal of his dismissal for insubordination, which included his use of anti-evolution methods and materials in the classroom.

Bell also reportedly claimed that the bill would allow students to challenge topics like evolution and global warming—although only teachers, not students, are mentioned in the text of the bill. Autumn Reinhardt-Simpson of the Secular Coalition of Virginia described the bill as "code for creationism" and as "completely unnecessary".

Before the bill's demise, the *Virginian-Pilot* (2014 Feb 4) editorially commented, "[A]nti-evolutionists have shifted their approach to advocate teaching evolution theory with a scientifically unjustified emphasis on its uncertainties ... That approach animates Bell's bill, which would work by tying the hands of school administrators," adding, "[S]cience teachers—alone among educators—[would be] exempt from guidance about what they should teach and repercussions for failing to cover required curricula."

NCSENEWS 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!

Brian Alters, president of NCSE's board of directors, was profiled in the *Orange County Register* (2014 Apr 1). The article described how Alters's twin interests in Charles Darwin and Walt Disney now intersect in his popular class "Pursuit of Happiness: Charles Darwin and Walt Disney," in which he "compares and contrasts the lives of Darwin and Disney and delves into the philosophical and scientific question: What is happiness and why do we pursue it? Did we evolve for happiness?" Alters teaches the class at Chapman University, where he is Professor of Education.

The *Register*'s story also summarized Alters's involvement with the creationism/evolution controversy: "Today, he's director of the Evolution Education Research Center at Chapman and president of the board of directors for the National Center for Science Education, a San Francisco-based organization that advocates for science in the classroom. He is co-author of several books, including *Defending Evolution in the Classroom.* Before Bill Nye 'the Science Guy' debated creationist Ken Ham, Alters debated Ham at Harvard University in 1999, and he helped Nye prep for his debate with Ham."

Victor H Hutchison spoke at the Norman, Oklahoma, Science Café on March 6, 2014, to inform the audience about the fallacies of "intelligent design" and the then-current creationist bills in the Oklahoma state legislature. Hutchison is George Lynn Cross Research Pro-fessor Emeritus in the Department of Zoology at the University of Oklahoma and a cofounder of the grassroots organization Oklahomans for Excellence in Science Education. He received NCSE's Friend of Darwin award in recognition of his effective advocacy for evolution education.

Victor H Hutchison speaking at the Norman Oklahoma, Science Café on March 6, 2014

James J Krupa contributed "Scientific method & evolutionary theory elucidated by the ivory-billed woodpecker story" to *The American Biology Teacher* 2014;76(3):160–170. The abstract of his article:

> Large, introductory, nonmajors biology classes present challenges when trying to encourage class discussion to help reinforce important concepts. Lively in-class discussion involving hundreds of students is more successful when a relevant story told with passion is used to introduce a topic. In my courses, each semester begins with thorough treatment of the scientific method, followed by the multiple Darwinian theories of evolution. To reinforce these two important themes, the story of the ivory-billed woodpecker's ecology, evolution, conservation, and probable extirpation has been effective in provoking class dialogue and reinforcing the two themes. Although I describe this approach as a large-class activity, it works well in courses of all sizes. In this article, I discuss teaching with storytelling and detail the use of the ivory-billed woodpecker story as a teaching tool.

Krupa is Professor of Biology at the University of Kentucky and the recipient of the Evolution Education Award from the National Association of Biology Teachers in 2012.

NCSE is pleased to congratulate **Kenneth R Miller**, who received the University of Notre Dame's Laetare Medal for 2014. According to a March 30, 2014, press release from the University, the award, established in 1883, is "the oldest and most prestigious honor given to American Catholics." "Kenneth Miller has

Glenn Branch is NCSE's deputy director.

National: House Resolution 467, introduced in the United States House of Representatives on January 29, 2014, would, if passed, express the House's support of designating February 12, 2014, as Darwin Day.

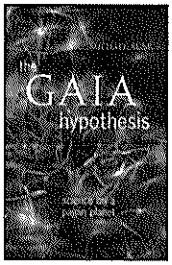
Rush Holt (D–New Jersey), one of the few members of Congress with a PhD in a scientific field, is the sole sponsor of the bill. In a January 29, 2014, press release from the American Humanist Association, he explained, "Charles Darwin is even more than the author of the theory of evolution, as great as that is. He represents a way of thinking, a philosophy, a methodology. It was his thirst for knowledge and his scientific approach to discovering new truths that enabled him to develop the theory of evolution. This lesson, about the value of scientific thinking, is almost as valuable as the theory he uncovered."

H Res 467 is identical to H Res 41, introduced by Holt in 2013, and to H Res 81, introduced by Pete Stark (D–California) in 2011. Explaining the earlier resolution, Stark said, "Charles Darwin is worthy of recognition and honor. His birthday should be a time for us to celebrate the advancement of human knowledge and the achievements of reason and science." Both of the previous resolutions eventually died in committee.

given eloquent and incisive witness both to scientific acumen and religious belief," explained Notre Dame's president John I Jenkins. "As an accomplished biologist and an articulate believer, he pursues two distinct but harmonious vocations and illustrates how science and faith can mutually flourish." A member of NCSE's Advisory Council, Miller is Professor of Biology of Brown University. He is the coauthor, with Joseph S Levine, of four popular high school and college textbooks, and author of *Finding Darwin's God* (1999) and *Only a Theory* (2008). Among his awards are the Public Service Award from the American Society for Cell Biology, the AAAS's Award for Public Understanding of Science and Technology, and the Stephen Jay Gould Prize from the Society for the Study of Evolution. He testified for the plaintiffs in *Kitzmiller v Dover*, the 2005 case establishing the unconstitutionality of teaching "intelligent design" in the public schools.

Bill Nye "The Science Guy" gave his take on his February 4, 2014, debate with Answers in Genesis's Ken Ham in the pages of *Skeptical Inquirer* (2014;38[3]:14–17). He relates that in preparing for the event, "I flew to Oakland, California, and consulted with the famed, venerable, and formidable **Genie Scott**, along with **Josh [Rosenau]**, and the staff at the National Center for Science Education (NCSE). They schooled me on what to do in great detail." Nye is a member of NCSE's Advisory Council. Of interest in the same issue of *Skeptical Inquirer* are **Kendrick Frazier**'s discussion of the National Science Board's *Science and Engineering Indicators 2014* (5–7), Pennilyn Higgins's report on the Nye/Ham debate (18–19), **Kenneth L Feder**'s article about how easy it is to misidentify animals in the wild as cryptids, "Connecticut's hidden animals?" (56–57), **Glenn Branch**'s review of Edward Caudill's *Intelligently Designed: How Creationists Built the Campaign against Evolution* (60–61), and a letter from Glenn Branch correcting a misstatement about a supposed mandate to teach creation science in Georgia (65).

Michael Ruse's *The Gaia Hypothesis: Science on a Pagan Planet* (Chicago: University of Chicago Press, 2013) was published. The publisher describes it as follows:



> In 1965 English scientist James Lovelock had a flash of insight: the earth is not just teeming with life; the earth, in some sense, *is* life. He mulled this revolutionary idea over for several years, first with his close friend the novelist William Golding, and then in an extensive collaboration with the American scientist Lynn Margulis. In the early 1970s, he finally went public with the Gaia hypothesis, the idea that everything happens for an end: the good of planet earth. Lovelock and Margulis were scorned by professional scientists, but the general public enthusiastically embraced Lovelock and his hypothesis. People joined Gaia groups; churches had Gaia services, sometimes with new music written especially for the occasion. There was a Gaia atlas, Gaia gardening, Gaia herbs, Gaia retreats, Gaia networking, and much more. And the range of enthusiasts was—and still is—broad.
>
> In *The Gaia Hypothesis*, philosopher Michael Ruse, with his characteristic clarity and wit, uses Gaia and its history, its supporters and detractors, to illuminate the nature of science itself. Gaia emerged in the 1960s, a decade when authority was questioned and status and dignity stood for nothing, but its story is much older. Ruse traces Gaia's connection to Plato and a long history of goal-directed and holistic—or organicist—thinking and explains why Lovelock and Margulis's peers rejected it as pseudoscience. But Ruse also shows why the project was a success. He argues that Lovelock and Margulis should be commended for giving philosophy firm scientific basis and for provoking important scientific discussion about the world as a whole, its homeostasis or—in this age of global environmental uncertainty—its lack thereof.

A member of NCSE's Advisory Council, Ruse is the Lucyle T Werkmeister Professor of Philosophy at Florida State University.

Writing in the *Columbia Tribune* (2014 Mar 18), **Frank Schmidt**, a professor of biochemistry at the University of Missouri and president of the grassroots organization Missouri Citizens for Science, expressed dismay with the recurrent legislative attempts to undermine the teaching of evolution in his state, particularly House Bill 1472, which would require school districts to allow parents to have their children excused from learning about evolution. "Our colleagues call us up or seek us out at conferences to commiserate about the sorry state of science in Missouri," Schmidt wrote. "They look behind our backs to see whether they can move one of our bio-based businesses across the border, into Iowa or Illinois. Even worse, they cluck their tongues semi-sympathetically, telling us to be glad we're not in Kansas." Schmidt also offered a sarcastic comparison of HB 1472 with a parallel provision of state law allowing parents to have their children excused from sex education, suggesting, "So maybe if the General Assembly puts evolution on a par with sex, the young ones will decide it's worth learning about. Otherwise, why take them out of class?"

Eugenie C Scott, the former executive director of NCSE and the current chair of its Advisory Council, was presented with a Distinguished Service to Science Education Award from the National Science Teachers Association (NSTA). The award is presented to members of NSTA "who, through active leadership and scholarly endeavor over a significant period of time, have made extraordinary contributions to the advancement of education in the sciences and science teaching." Scott received the award at a special banquet and ceremony on April 4, 2014, during the NSTA's national conference in Boston.

A New Editor for RNCSE

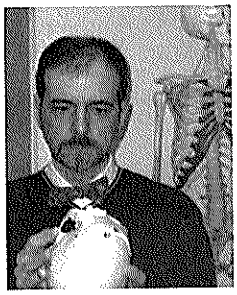
NCSE is pleased to welcome Stephanie Keep as the new editor of its journal *Reports of the National Center for Science Education.* She succeeds Andrew J Petto who is retiring from the post after nearly twenty years of service. She can be reached at editor@ncse.com.

"I'm thrilled to become part of NCSE's team working to defend the integrity of science education," Keep said. "I'm looking forward not only to editing *Reports* but also to helping NCSE's communication efforts in any way I can."

Keep was trained as a paleobiologist at Wellesley College and Harvard University (where she served as a faculty assistant to Stephen Jay Gould). In the publishing world, she is involved in editing college- and high school-level textbooks in environmental science, earth science, and biology, including Kenneth R Miller and Joseph S Levine's *Biology*, and in the education world, she recently worked on science curriculum and assessment initiatives in the Massachusetts Department of Elementary and Secondary Education.

"We're delighted to welcome Stephanie Keep, with her comprehensive background in environmental science and evolution as well as her writing, editing, and education experience, as the new editor of *Reports*," said NCSE's executive director Ann Reid. "She has all the skills needed to succeed Anj Petto, who has been so critical to the journal's success."

In addition to editing *Reports of the NCSE* and serving on the board of directors of NCSE from 1995 to 2014, Petto was the editor, with Laurie R Godfrey, of *Scientists Confront Creationism: Intelligent Design and Beyond* (WW Norton, 2008). A physical anthropologist, Petto is currently Senior Lecturer in the Departments of Biological Sciences and Kinesiology, and a workshop leader for elementary science specialists in the Department of Curriculum and Instruction at the University of Wisconsin, Milwaukee. He plans to use his "retirement" to re-animate Wisconsin Citizens for Science, which was guided by former NCSE staff member Skip Evans until his untimely death.



"I'm retiring, but I'm not disappearing," Petto explained. "I'll be enthusiastically supporting *Reports* and its new editor. And of course I'll still be supporting NCSE and all it does to promote the cause of good science education."

Reports of the National Center for Science Education is published by NCSE to promote the understanding of evolutionary sciences, of climate sciences, and of science as a way of knowing. The contents are freely available on-line at http://reports.ncse.com, and submissions are welcome. ■

Project Steve: N > 1300

With the addition of Stefan Roitsch on January 15, 2014, NCSE's Project Steve attained its 1300th signatory. 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 with PhDs 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.)

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 evolution, 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 pseudoscience, including but not limited to 'intelligent design,' to be introduced into the science curricula of our nation's public schools."

Among the 1307 current signatories to Project Steve are 100% of eligible Nobel laureates (Steven Weinberg and Steven Chu), at least ten members of the National Academy of Sciences, and the authors of popular science books such as *A Brief History of Time, How the Mind Works,* and *Darwin's Archipelago.* When counted by David H Bailey in April 2012, almost 60% of the signatories were found to have a PhD degree and/or professional posiition in a core field closely related to evolution. Of the most recent dozen or so Steves, most are Austrian or German, apparently owing to the recent publication of "Wissenschafter namens Stefan(ie) gesucht!" ("Scientists named Stefan(ie) wanted!") in the Austrian newspaper *Der Standard* (2014 Jan 12).

Visit http://ncse.com/taking-action/project-steve for information about Project Steve.

from THE STAFF

Mark McCaffrey

MARK MCCAFFREY writes: I'd been to the White House once before, and many times to the District of Columbia, but none of these visits can compare to my trip there this spring. But I'm getting a little bit ahead of myself.

My first visit to Washington DC was in the early 1980s when my former congressman from Colorado, Tim Wirth, (later Senator Wirth and now head of the United Nations Foundation), hosted a tour of Congress for anyone willing to get themselves from Colorado to DC. I was living in New York at the time, but came down, met my parents in Washington, and got the nickel tour of Congress.

More than a decade later, while working at the University of Colorado at Boulder for a NOAA cooperative institute, I was afforded the opportunity to visit DC irregularly but frequently. Once, I testified in favor of climate and environmental science education in front of a Congressional subcommittee chaired by then Congressman Bob Inglis, a Republican from South Carolina. Inglis, who was sympathetic to our cause having talked with scientists himself about climate change, took the issue very seriously. (As a side note, Inglis lost his seat to a Tea Party candidate in 2010 in part because of his stance on climate change.)

In early 2012, shortly after joining NCSE to help launch the climate change education program, I wrangled an invitation at the last minute to attend what was described as the first-ever White House Summit on Environmental Education, hosted by then EPA director Lisa Jackson (now Apple's environmental director) and Department of Education secretary Arne Duncan.

It was a somewhat odd event that featured speeches and panels that highlighted achievements in environmental education, such as recycling at NASCAR events and outdoor education at Disneyland. Climate change, however, was mentioned only once and in passing, by Charles Saylan, one of the authors of the book *The Failure of Environmental Education (And How We Can Fix It)* (Berkeley [CA]: University of California Press, 2014), who lamented that environmental education hadn't really been able to address issues like climate change.

I agree with this sentiment. As I describe in my upcoming book with Corwin Press (*Climate Smart & Energy Wise*, due out in the fall of 2014), the reasons for this failure to convey the causes, effects and risks of climate change (as well as possible responses) are complex, but they can be boiled down to this essential problem: environmental education tends focus on attitudes and behavior—tilting more toward the outdoor and experiential, rather than on the science. And, historically, environmental education has often avoided an exploration of climate change, preferring to sidestep the "controversy" rather than address it head-on.

That brings us to the end of April 2014, when I was invited not only to attend another event at the White House, but also to speak on a panel myself. The reason: the launch of the National Climate Assessment (NCA) on May 6, 2014. I was asked to represent the education community and discuss the ways the NCA—the third such report to the nation to summarize the research on changing climate conditions in the United States—could be used in the classroom.

Luckily, I didn't need much prep time. Just over a year ago, because there was no education group associated with the report, an education affiliate group was established as a part of NCAnet, a public/private partnership of over one hundred organizations that have been focused on supporting the launch and on-going efforts of the NCA. NCSE is a partner in NCAnet, and I lead the education affiliate group.

Additionally, over recent months, my colleague Minda Berbeco and I had been holding monthly teleconferences with members of the Climate Literacy & Energy Awareness Network, or CLEAN, which I had helped to establish before joining NCSE. The monthly calls were meant to socialize NCA with the climate education community and plan what we could do to help teachers to use the NCA to bring climate science into the classroom and—since much learning now occurs well outside of classrooms—beyond.

I arrived in DC on the day before the big event. There were to be two panel discussions after the main speaker, John Holdren, the president's senior advisor on science and technology issues, spoke. The first panel featured scientists involved with writing the NCA; the second featured representatives of various stakeholders who could benefit from the report, including me, on behalf of educators. I was told originally that I would have five minutes, which was later whittled down to three. Knowing from experience that a lot of ideas can be packed, with care, into 180 seconds, I wrote and re-wrote my notes and practiced the timing in my hotel room.

The White House event would be on the afternoon of May 6, 2014, but the NCA Development and Advisory

Committee (NCADAC), an official federal advisory committee made up of sixty people who helped to move the process along in various ways, had to formally approve the report first.

At the NCADAC meeting, there were around twenty committee members in the room and another dozen or more on the phone, more than enough for a quorum. The meeting was chaired by Jerry Melillo, who chaired the committee and was leading its last meeting. Opening the meeting at 8:00 AM and then taking attendance, the committee unanimously approved the report by 8:16 AM. The rest of the morning involved practicing with the panel, tweeting up a storm (#ActOnClimate and #NCA2014 from @McCaffreyMark and @NCSE).

After lunch, I joined the entourage of speakers to the White House secret service entrance off of 17th Street. Already pre-screened, we were among the first through the gate once it opened at 1:00 PM, heading into the south auditorium for orientation.

By then I had trimmed my talk to the bone. When it was my turn to speak, I began by acknowledging that I was nervous about speaking at the White House, especially at such a historic moment, because the NCA had the potential to be a game-changer for climate education. It would help us respond to the President's call to "educate your classmates, your colleagues, your parents, your friends. Tell them what's at stake … . Broaden the circle."

I went on to say that education is a vital part of dealing with the challenges of climate change. The NCA abounds in content and context ripe for classroom use. It helps build understanding of what's happening to the climate, how scientists know what they know, and what can be done to minimize impacts and maximize resiliency. I explained how the education affiliate group of the NCAnet was working to maximize the educational opportunities and teachable moments inherent in the report.

I then stressed that, while this fledgling public/private partnership currently lacks funding, it is not lacking in talent. CLEAN, the Alliance for Climate Education, the Presidents' Climate Commitment, Climate Stewards, the Climate Change Education Partnerships, the Green Schools Alliance, and many other organizations have established foundations that we can build on, and the NCAnet can serve as the supporting backbone to link these efforts.

There are, I said, seventy-six million students in the United States today; in other words, one in four Americans is a student. Millions more are parents, grandparents, employers, or future employers of these students. Yet most of those students are not learning the basics of climate change in school, and even when it is taught it is being skimmed over or, worse yet, taught as controversy.

I went on to describe survey research that has shown how most teenagers and adults fail quizzes on the essentials of climate and energy, and that those who know more are, in general, more concerned. So, higher levels

MARSHALL HALL DIES

Marshall Hall, a colorful young-earth creationist and geocentrist, died on March 8, 2013, at the age of 82, according to Whitefield Funeral Home in Baldwin, Georgia. With his wife Sandra Hall, he established the Fair Education Foundation in 1973.

According to the "About the Authors" page of *The Truth: God or Evolution* (1974), "[u]pon discovering one unbridgeable gap after another in evolutionary theory, Hall—a previously convinced evolutionist, atheist, and leftist-humanist—turned with his wife to do research on one of the most important truths of all: the truth about the origin of life." After establishing the Fair Education Foundation, the Halls published a stream of antievolution books (most famously *The Truth: God or Evolution?*) and pamphlets in the 1970s. Randy Moore and Mark D Decker note in their *More than Darwin* (2008) that their publications linked evolution "with such topics as Catholicism, astrology, Masonry, Mormons, the United Nations, NASA, homosexuality, and equal rights for women," to which might be added heliocentrism and the metric system. In 1977, Hall led a protest of about fifty people to picket in front of the White House, urging President Carter "to back a congressional investigation challenging the theory of evolution and the tax-supported promotion of it through public schools[,] museums[,] and government publications," the *Washington Post* (1977 Jul 28) reported. Thirty years later, Hall was in the news again when a memorandum he composed calling for the teaching of evolution to be banned because it is "derived concept-for-concept from Rabbinic writings on the mystic 'holy book' kabbala" was circulated by a Texas legislator to all of his colleagues in the Texas House of Representatives; the legislator circulated it at the request of a Georgia state legislator whom Hall described to *The New York Times* (2007 Feb 17) as a long-time friend and supporter. The memorandum was widely condemned as anti-Semitic as well as crankish, and the Texas legislator later apologized. The Fair Education Foundation's activities now seem to be conducted mainly from its "non-moving Earth & anti-evolution web page": http://fixedearth.com.

Hall was born on August 9, 1930. The "About the Authors" page of *The Truth: God or Evolution?* describes him as "BS Cum Laude, MA" and "a resident PhD student at the Center for Advanced International Studies at the University of Miami." Further biographical data was unavailable.

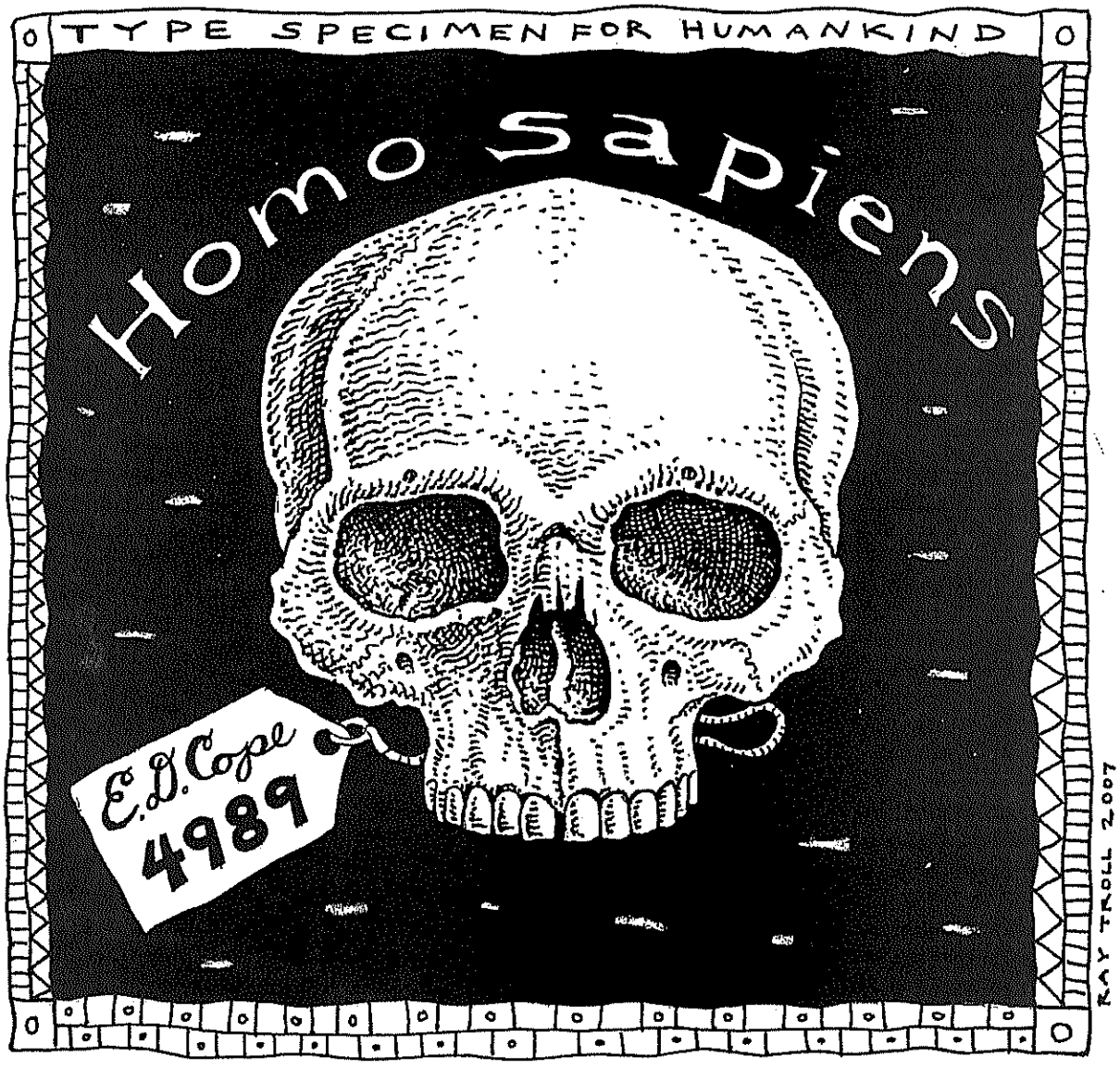
of scientific literacy not only provides the understanding of the causes and effects of climate change, and the knowledge and know-how to address the risks and develop appropriate responses, but it also leads to better informed decision-making.

I tried to energize the audience by pointing out that the NCA provides thousands of examples of actionable science that teachers and students can unpack from this report—and thousands of new career paths that can be identified as well; That we are poised for a new American revolution in learning, transforming schools into living laboratories that are climate-smart, climate-safe, energy-wise, energy-efficient R&D incubators that use climate and energy as engaging, interdisciplinary, and integrating themes for learning. That, more or less, is what I managed to pack into my 180 seconds.

As the last panelist, I also had the final word in the question-and-answer session before the final wrap-up. What keeps me up at night, I said, is the feeling that we're not doing nearly enough to prepare this and future generations with the knowledge and know-how to be able to deal with the changing planet. But seeing the creative solutions that teachers and students are coming up with to solve the challenges we face inspires me. Imagine what would be possible if we were more methodical, more rigorous, more scientific in approaching the problem of climate change illiteracy.

Later in the afternoon, heading to another room in the building for a conference call with students and teachers, I ran into the president's science advisor John Holdren in the hallway, and he complimented me on a job well done. That made my day.

It was something of a personal triumph for me to speak at this event. But more importantly, it was a triumph for the cause of science education, as it was made clear—at this very high profile event—that education is as a vital part of any solution to the challenges of climate change. And, of course, it was a triumph for NCSE to be asked to represent the science education community at such a momentous occasion. ■



Rediscovering Wallace's "Species Notebook"

James T Costa

An obscure notebook in the Library of the Linnean Society of London contains the earliest views on "transmutation" (as evolution was then called) by the naturalist Alfred Russel Wallace (1823–1913), who nearly scooped Darwin, and eventually became one of the most famous scientists of his day in his own right.

In the years before Darwin's publication of *On the Origin of Species*, Wallace was in the tropical rain forests of the Malay Archipelago sketching ideas for his own book on the subject in this notebook, later called "the species notebook." The revelation that he had hit upon the same idea as Darwin, who was already working towards a book on the subject, led Wallace to shelve his plan and defer to Darwin.

Wallace's modesty has led to an underappreciation of his own talents. Wallace's species notebook is a corrective, revealing his plan and deep insight like no other document in those pre-*Origin* years. Attacks on the prevailing arguments for benevolent design and harmony in nature mix with discussions of island species, morphology, domestic varieties, fossils, embryology, and instinct. But the centerpiece of the notebook is Wallace's long critique of Charles Lyell's anti-transmutationism in *Principles of Geology* (1830–1833). Lyell was the pre-eminent geologist of Britain and his long attack on transmutation in his immensely successful *Principles* was viewed as the final word on the subject.

For example, Lyell asserted that a fossil mammal found among Mesozoic reptiles dealt a fatal blow to the idea of a progressive succession of groups in the fossil record. Wallace rebutted, "[A]ll that is required for the progression is that some reptiles should appear before Mammalia & birds or even that they should appear together. ... Not one fact contradicts the progression," Wallace declares: "each group goes on progressing after other groups have branched from it. They then go on in parallel or diverging series ..." In modern terms, this is evolutionary-tree thinking.

The significance of unique species on remote islands was equally clear to Wallace. He noted from Darwin's *Journal of Researches* that the Galápagos Islands contain unique species yet resemble those from the nearest mainland. He asks, "if they are special creations why should they resemble those of the nearest land? Does not that fact point to an origin from that land?" He saw that unique island species descend from ancient colonists that arrived by chance from the nearest mainland, observing that this is why older islands have more unique species than younger ones—more time for colonization and subsequent slow modification.

In a third line of attack, Wallace tackled domestication. Several of Lyell's anti-transmutation arguments stemmed from the supposed limited variability of domestic breeds. Species can vary only so much, Lyell maintained, as no domestic variety had been transmutated into a new species. Wallace first points to strikingly different dog varieties as themselves evidence for a great capacity for change: "is not the change of one original animal to two such different animals as the Greyhound & the bulldog a transmutation?" Wallace recognized that changes made "artificially in short periods may have a tendency to revert to the parent stock ... but when the Change has been produced by nature during a long series of generations, as gradual as the changes of Geology, it by no means follows that it may not be permanent & thus true species be produced."

There are frustrating gaps in the species notebook—nothing on the struggle for existence, or on his February 1858 discovery of natural selection in a fevered state. Upon recovery, Wallace wrote an essay in which he announced his discovery, fatefully posting it to Darwin. He soon received word of the dramatic effect of his essay in England—the reading hastily arranged by Lyell and botanist Joseph Hooker at the Linnean Society on July 1, 1858, along with Darwin's unpublished writings on the subject.

The species notebook reveals Wallace's tenacity, creativity, and impressively deep insight into the then-revolutionary idea of species change and underscores Wallace's stature as co-founder with Darwin of modern evolutionary biology. The notebook passed to his son William, who in turn presented it to the Linnean Society in 1936. And there it sits on a paneled shelf, a portal to a lost time and place, and a remarkable record of the thinking of a remarkable naturalist and his plans for a remarkable book that never was ... but should have been.

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Summary of *RNCSE* 2014;34(3):1.1–1.5; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/273/476

Out of Darwin's Shadow

Sherrie Lyons

The year 2013 marked the 100th anniversary of the death of Alfred Russel Wallace, naturalist, collector, and—most famously—independent discoverer of evolution by natural selection. Three books—new editions of Wallace's *Island Life* (2013a) and *Letters from the Malay Archipelago* (2013b), and John van Wyhe's *Dispelling the Darkness* (2013)—focus on the most scientifically important time in Wallace's life: his time in the Malay Archipelago. These books are important additions to the growing scholarship on Wallace. As has become increasingly clear, Wallace did not define his contribution primarily as the co-discoverer of natural selection. He was most interested in what we now call biogeography, which is the study of relationships among species distribution, phylogeny, and geography.

The first book is a facsimile reprint of Wallace's 1880 book *Island Life*. The value in reprinting this book rests not only in making it more easily accessible to modern readers, but also in its outstanding introduction and commentary by island biogeographer Lawrence R Heany. For each chapter, Wallace marshals impressive evidence from a variety of disciplines, identifies possible weaknesses of his ideas, and suggests how his inferences could be tested. Wallace recognized that "islands offer the best subject for the study of distribution" (2013a:3) and that they are model systems for understanding the distribution patterns in the world at large.

The book is divided into two parts. Part I provides a detailed examination of the processes that influence the distribution patterns of life on earth. He argues that the complexity of the patterns observed are the product of the earth's history, influenced by climate, changes in sea and land, persistence, migration, and extinction.

The second part of the book provides illustrative examples of the insular floras and faunas of islands that provide additional insight and evidence for his explanations of the pattern and distribution of all organisms worldwide. Heany concludes that "the questions [Wallace] raised and the framework he established remain a large part of the foundations of biogeography today" (2013a:xxix).

The John van Wyhe-edited volume of *Letters from the Malay Archipelago* will probably be of interest primarily to historians of science, yet these letters provide the general reader with a glimpse into Wallace's life. Each letter is numbered and dated, and the correspondents are identified. The letters are grouped by the country from which Wallace wrote or received them. This will allow a reader an extremely efficient way of accessing particular letters either by the correspondent or by the country; something researchers will appreciate.

Dispelling the Darkness, also by van Wyhe provides a relatively brief background of Wallace and his early years, setting the context for his travels. We are introduced to Darwin and also Charles Lyell, whom he greatly admired. By making extensive use of archival material, van Wyhe provides a vivid portrait of Wallace's travels on the Malay Archipelago. We learn about how he traveled, his living conditions, his collecting activities, and his financial struggles. The details on how he collected, preserved, and mounted his specimens, right down to the ink that was used for labeling, and how he prepared them for shipping might strike some readers as a bit tedious, but I personally found this level of detail quite interesting. The book contains many fine illustrations, many in color, including some showing wonderful beetles from Wallace's own collections.

However, the book was marred by its continual claims that the traditional story of the relationship between Darwin and Wallace was full of misinformation. By selectively quoting various authors he seems to imply that no one really has gotten the Wallace story right, but this is simply not true. The basic story van Wyhe tells did not change my understanding of Wallace or his relationship with Darwin. This does not mean that there is nothing new in this book, however. His detailed analysis of the correspondence between Darwin and Wallace, for example, and of important essays such as the Sarawak paper and the Ternate Essay do an excellent job of "dispelling the darkness."

The authors/editors of these three books have relied heavily on Wallace's own words in their commentaries. While they have made important additions, they also illustrate that the most important person to read in understanding Wallace is Wallace himself, and Wallace has much to say that is still worth reading today.

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Summary of *RNCSE* 2014;34(3):2.1–2.5; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/261/482

Three Birds of a Feather: Darwin, Wallace, and Attenborough

Richard Milner

Three of Britain's greatest naturalists, Charles Darwin, Alfred Russel Wallace, and—a century later—Sir David Attenborough, were moved by awe and wonder in remote tropical forests. Those experiences inspired their lives as observers and explorers of the natural world—and fueled their passion to observe, understand, and interpret it for the rest of us.

More than twenty years before Darwin published *On the Origin of Species* in 1859, he wrote about a Brazilian rain forest "it is nearly impossible to give an adequate idea of the higher feelings [of] wonder, admiration & sublime devotion that fill & elevate the mind" (Darwin 2001:59). The beauty of diverse life forms amazed and delighted him, instilling "a feeling of wonder that so much beauty should be apparently created for such little purpose" (Darwin 2001:22).

After Darwin returned to England and published his rapturous descriptions, a naturalist fourteen years his junior, Alfred Russel Wallace, was inspired to embark on his own odyssey through the tropics. Wallace's accounts of his eight years in Southeast Asia and four years in the Amazon jungles echoed and extended the unremitting enthusiasm of a naturalist's adventures and discoveries.

In 2013—the centenary of Wallace's death—I was privileged to bring renowned wildlife filmmaker Sir David Attenborough to New York as part of a Wallace Centenary Celebration at the American Museum of Natural History (AMNH). Attenborough told his enthusiastic audience that despite many differences between Darwin and Wallace, they were unified both by their discoveries of evolution through natural selection and by their mind-bending, toe-curling passion for nature.

Part of Wallace's impetus for launching an eight-year expedition to the Malay Archipelago was to find the elusive birds of paradise in the wild. In 1857, a group of tribal bird hunters finally led him to a forest glade where the birds performed their courtship displays. Wallace, the first European to witness this greatest of all avian spectacles, later described it in *The Malay Archipelago*:

> They fly from branch to branch in great excitement so that the whole tree is filled with waving plumes in every variety of attitude and motion ... the Bird of Paradise really deserves its name, and must be ranked as one of the most beautiful and most wonderful of living things (Wallace 1869:2:252–253).

As a young boy, Sir David had read Wallace's breathless, wide-eyed descriptions, and immediately decided that one day he must see those remarkable dancing birds for himself. Their great variety of plumage, colors, and bizarre displays raised perplexing question about evolutionary origins. Wallace, wrote in *The Malay Archipelago*:

> I had obtained a specimen of the King-Bird of Paradise ... . I thought of the long ages of the past, during which the successive generations of this little creature had run their course...with no ... [appreciative human] eye to gaze upon their loveliness ... (Wallace 1869:2:222–224)

Attenborough recently echoed those sentiments in a *Nature* interview available on YouTube:

> When you look at birds of paradise, you realize that there's a whole aspect of life, of liquidity, the essence of life ... which has got nothing to do with humanity ... [The sight is] amazingly beautiful ... all that pullulating with vigor and variety and passion ... that you realize that humanity ... is only a very small part of [nature]. And that's what I find moving (Attenborough 2009).

The prolonged standing ovation Sir David received at the AMNH was only partly for his lecture; it was an expression of heartfelt appreciation and gratitude for his 61 years of exploring and filming the last wild places on the planet, for bringing home to us the Darwin–Wallace tradition, and for connecting us with earth's natural wonders, which has so enriched our own lives.

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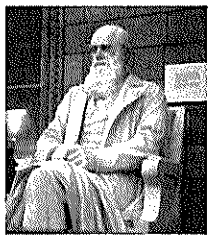
Summary of *RNCSE* 2014;34(3):3.1–3.5; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/301/484

The Natural History Museum

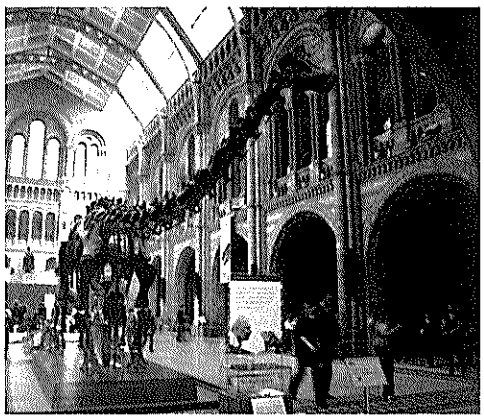
Randy Moore



A statue of Charles Darwin in the Museum of Natural History.

Photographs: Randy Moore.

The Natural History Museum in London originated in the British Museum, which was established in the will of Sir Hans Sloane (1660–1753), a naturalist, collector, and physician (Thackray and Press 2001). During his life, Sloan collected more than 70 000 objects; he also had a library and herbarium. Sloan bequeathed his collection (which Linnaeus described as being in "complete disorder") to King George II for Britain in return for a payment of £20 000 to Sloan's heirs. Although King George II wasn't overly interested in Sloan's collection, Arthur Onslow—the Speaker of Parliament—helped pass an Act establishing the British Museum on June 7, 1753, to house Sloan's donation. Funded by more than £90 000 raised in a scandal-plagued lottery, the British Museum opened to the public on January 15, 1759. Except for parts of World Wars I and II, the Museum has been open ever since. In 2003, the British Museum marked its 250th anniversary as the first national, public, and secular museum in the world. The Museum made science accessible to the public (admission is free) and, in doing so, transformed the public's expectations of natural history museums.



The Natural History Museum is famous for its dinosaur skeletons and ornate architecture, both captured in this photograph of a cast of Diplodocus carnegii *that dominates the Museum's Main Hall. Photograph: Randy Moore.*

In 1856, Richard Owen, a famed anatomist, became Superintendent of the Natural History Departments of the British Museum. Owen, a foe of Charles Darwin, was well known for his reconstructions of extinct animals and for coining the word *dinosaur*. In 1881, the natural history collection of the British Museum was moved to a new building designed by architect Alfred Waterhouse (1830–1905), and was named the British Museum (Natural History). In 1896, the Museum absorbed the adjacent Geological Museum of the British Geological Survey, and in 1963 the British Museum of Natural History became independent of the British Museum. In 1992, the title of the British Museum of Natural History was formally changed to the Natural History Museum. Its Darwin Centre contains millions of specimens, including many collected by Charles Darwin, Alfred Russel Wallace, and John Gould. In 1912, the Museum accepted the Piltdown skull from Charles Dawson, who described it as the most important fossil ever. However, in 1953 the skull was proven a fake.

The Natural History Museum memorializes several famous British biologists. On June 9, 1885, Thomas Huxley unveiled the Museum's first statue, a marble monument to Charles Darwin. In 1897, Owen—who had opposed Darwin's statue—was memorialized with a statue, and three years later a statue of Huxley was seated in the Museum. Since then, the Museum has incorporated memorials to Wallace and others. Antievolutionist Ken Ham considers the museum a church of atheism.

Today, the Natural History Museum includes more than seventy million items that span botany, entomology, mineralogy, paleontology, and zoology; these specimens include those collected by Charles Darwin, Mary Anning, Gideon Mantell, Alfred Russel Wallace, Richard Owen, and other famed scientists. The Museum has a wildlife garden and a staff of more than nine hundred people, of which almost three hundred are scientists and researchers. It is famed for its skeletons of dinosaurs, especially the 26-meter-long *Diplodocus carnegii* near the Museum's entrance. That skeleton can be traced to King Edward VII (1841–1910), who visited the United States in 1903 as a guest of eugenicist and steel magnate Andrew Carnegie. When King Edward VII saw a sketch of the dinosaur and asked Carnegie for a cast of the skeleton, Carnegie shipped a cast to Britain. That cast went on display in 1905, the same year in which the original reconstruction was unveiled at the Carnegie Museum of Natural History in Pittsburgh. "Dippy" became the figurehead of Carnegie's philanthropic efforts in natural history when Carnegie gave casts to several other museums in Berlin, Paris, Madrid, Mexico City, Vienna, and elsewhere, thereby making "Dippy" the most-viewed dinosaur fossil in the world.

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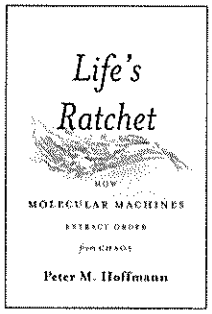
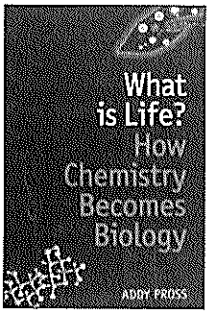
Summary of *RNCSE* 2014;34(3):4.1–4.4; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/291/474



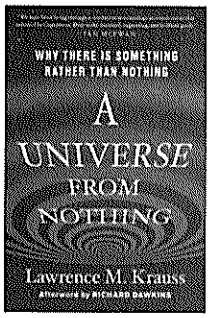
Life's Ratchet: How Molecular Machines Extract Order from Chaos by Peter M Hoffmann (New York: Basic Books, 2012; 288 pages). "The underlying theme of *Life's Ratchet* is how random thermodynamic fluctuations at the molecular level (what Hoffmann calls the 'molecular storm') are harnessed by molecular machines—biomolecules such as molecular motors, enzymes, and DNA—to generate the 'purposeful motion' that characterizes living cells," writes reviewer **Sonya Bahar,** who praises the book as "a singular achievement," adding, "The idea of an essential tension between chance and necessity has been explored before, ... but I have never seen it so clearly drawn as here."

Summary of *RNCSE* 2014;34(3):5.1–5.3; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/277/459



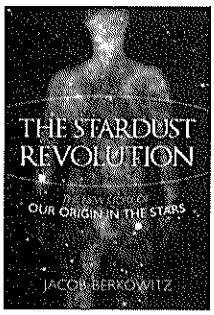
What is Life? How Chemistry Becomes Biology by Addy Pross (Oxford: Oxford University Press, 2012; 256 pages). Reviewer **David W Deamer** writes of *What is Life?*, "I would recommend this book for readers who would like a clear introduction to the fundamental chemical concepts that must have been part of the story of the origin of life. For readers like me who have a research interest in this field, it was an enjoyable exercise to think along with Addy Pross as he considered how thermodynamic and kinetic theory of chemistry could help us to understand how life began."

Summary of *RNCSE* 2014;34(3):6.1–6.3; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/251/460



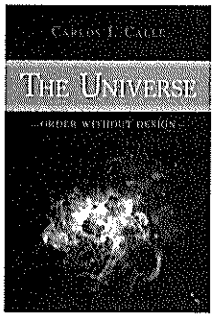
A Universe from Nothing: Why There Is Something Rather than Nothing by Lawrence M Krauss (New York: Free Press, 2012; 224 pages). Science is increasingly able to address big questions like why is there something instead of nothing, reviewer **Gordon Kane** contends, and *A Universe from Nothing* offers a "basically fair and critically impartial" treatment of such progress: "The reader can learn about the developments and issues, and in general should assume that the situation in theoretical physics is at least as promising as Krauss suggests," although Kane suggests that Krauss somewhat underestimates string theory and the idea of the multiverse.

Summary of *RNCSE* 2014;34(3):7.1–7.3; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/152/462



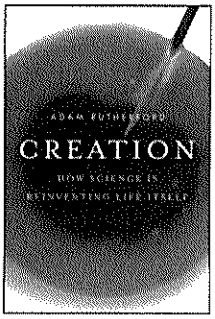
The Stardust Revolution: The New Story of Our Origin in the Stars by Jacob Berkowitz (Amherst [NY]: Prometheus Books, 2012; 376 pages). "This is a terrific introduction to the science of astrobiology, written for the lay reader," explains reviewer **David Morrison**. "Its structure, using the stories of individual scientists to illuminate the quest to understand our cosmic origin, is highly successful. This book can be read with profit and pleasure by anyone from a young student beginning her interest in science to an old astronomer, like this reviewer, who has trod many of these paths for the past half century."

Summary of *RNCSE* 2014;34(3):8.1–8.2; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/205/473



The Universe: Order without Design by Carlos I Calle (Amherst [NY]: Prometheus Books, 2009; 304 pages). Reviewer **Ian H Redmount** is disappointed with *The Universe,* complaining that it contains "glaring errors of facts and interpretation," involves "enthusiastic and uncritical acceptance of some questionable ideas and some unfettered speculation," and neglects the renaissance in scientific cosmology driven by advances in observing technology. "The upshot of all this is that this book presents the reader with a collection of cosmological models apparently every bit as arbitrary, dogmatic, unscientific, 'irrational' as anything an 'intelligent design' proponent, creationist, or medieval theologian might propose."

Summary of *RNCSE* 2014;34(3):9.1–9.4; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/305/465



Creation: How Science is Reinventing Life Itself by Adam Rutherford (New York: Penguin, 2013; 288 pages). *Creation* tells two stories, reviewer **Frank Schmidt** explains. "The first is a progress report on the origin of life," which Schmidt mildly faults for not discussing the work of Carl Woese and the revolutions induced in chemistry itself by research on the origin of life. The second is a report on synthetic biology, including a fascinating discussion of biocomputation. Schmidt concludes, "this book will serve as food for thought and an introduction to its twin topics for ... the population that regularly reads science books."

Summary of *RNCSE* 2014;34(3):10.1–10.3; the full text is available from http://reports.ncse.com/index.php/rncse/article/view/239/466

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