



REPORTS OF THE

NATIONAL CENTER FOR SCIENCE EDUCATION

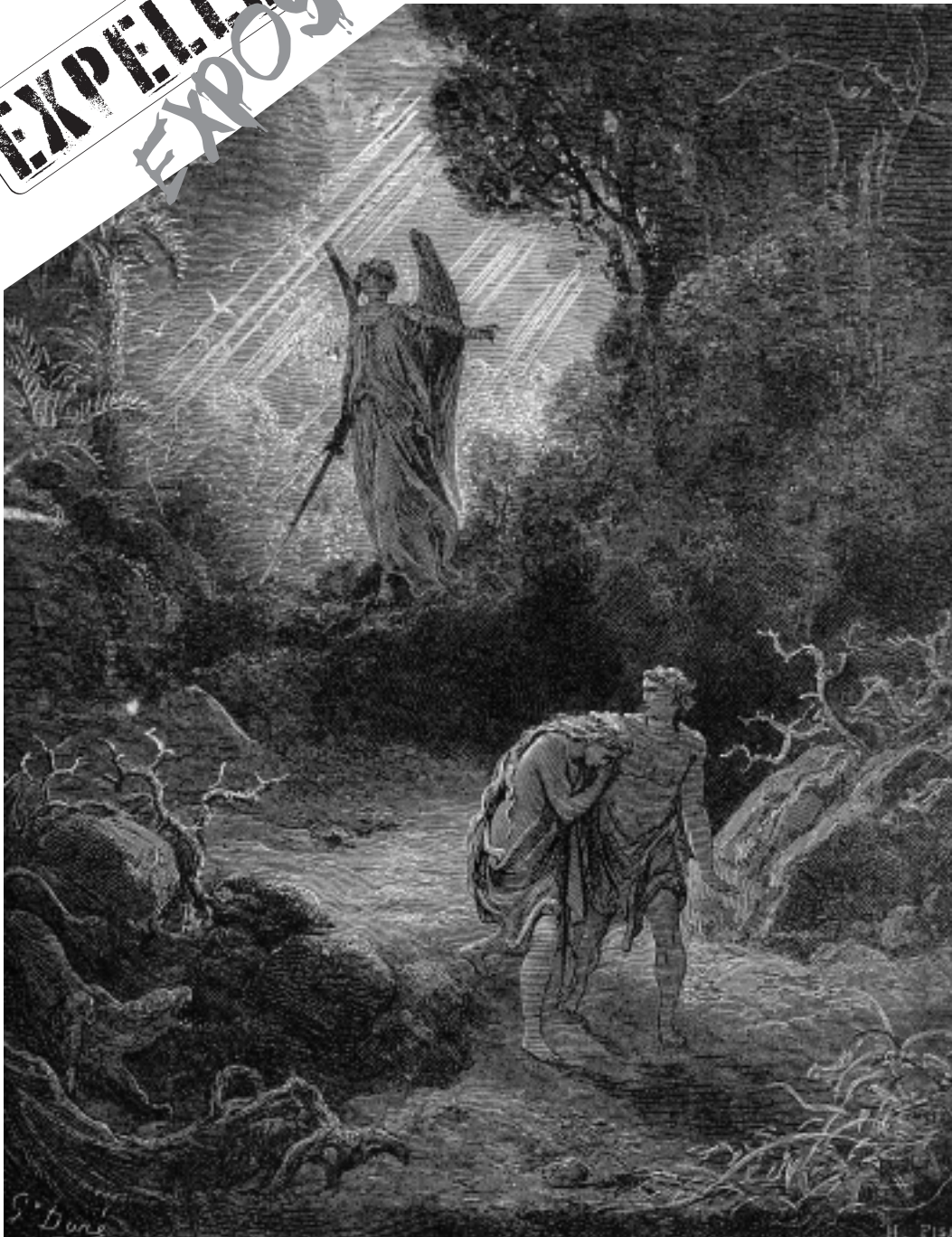
DEFENDING THE TEACHING OF EVOLUTION IN THE PUBLIC SCHOOLS

Volume 28, Numbers 5-6

SEP-DEC, 2008

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EXPULSED
EXPOSED



Expelled Exposed:
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Conspiracy
Theories

Meet the Martyrs:
A Hagiography of
Expelled

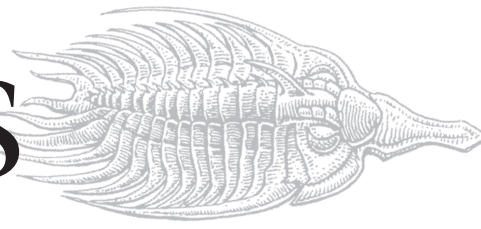
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"Intelligent
Design" Right

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Cover: *The Expulsion from Eden*
by Gustave Doré, circa 1865.

Other artwork ©Ray Troll, 1997
For more information on Ray's work explore his website at <www.trollart.com>.



The movie *Expelled* is the latest media salvo in a series of attacks on the nature and process of scientific inquiry. Its main premise is that people who embrace "intelligent design" have been unfairly excluded from mainstream research and academic institutions merely for pursuing their "scientific" studies of ID. Of course, these studies can be considered scientific only if we change the meaning of that word — something that anti-evolutionists are eager to do.

Science is not defined by the subject matter it pursues, but how scientists pose problems, test solutions, and exchange results with colleagues. One can study inheritance scientifically by asking how the instructions in our DNA are expressed or how that expression is modified in complex organisms. Or one can examine inheritance unscientifically by using DNA sequences to label populations as undesirable, unfriendly, or potentially dangerous. *Expelled* would do away with — or at best ignore — the process of scientific inquiry.

This film is full of questionable assertions and illogical leaps. In many cases, it gets basic scientific facts wrong. In all cases, it misrepresents the practice of science as a profession. It claims that "fairness" should be the criterion for deciding how dissenting ideas should be accepted and supported. It suggests that scientists who do not "toe the line" are never accepted into academic and research circles and their ideas are never seriously considered by scientists. NCSE's Carrie Sager and Josh Rosenau have these rebuttals to that claim: Barbara McClintock, Lynn Margulis, Stephen Jay Gould and Niles Eldredge, Motoo Kimura, Carl Woese, Barry Marshall, and Stanley Prusiner. And this is just the short list of scientists who proposed initially unpopular, non-Darwinian models of biological change and yet had their ideas tested and accepted by the scientific community.

So what are these scientists doing that the ID proponents are not? Original research based on the predictions of their models! By its own accounting, ID has failed to live up to its promise as a research paradigm. The much denied Wedge Document (available on-line at <<http://www.antievolution.org/features/wedge.html>>)

predicted that ID would produce 30 books and 100 research (scientific, academic, and technical) articles by 2003. NCSE's Eugenie Scott and Josh Rosenau report that this aspect of the Wedge Strategy is as complete a failure as

some of the public relations aspects have been a success. ID just "can't get no respect" in the scientific community, because it has not earned it — something every one on our short list of scientific "dissenters" did simply by participating in the practice of science. Somehow, being judged on the basis of their scientific research output is being "unfair" to those who embrace "intelligent design".

CURSE OF THE ELECTRONS

I am sorry to report a catastrophic failure of the computer used for RNCSE editorial work in mid-November. Fortunately, there was a complete backup of files, documents, and emails on October 25, 2008. However, if you submitted any files or correspondence electronically between October 25, 2008, and November 17, 2008, these materials are irretrievably lost. If you would like to have these items considered for use in RNCSE in the future, please send them again to editor@ncseweb.org.

— Anj Petto

The errors in *Expelled* are so deep and broad and high that it would take volumes to correct every one. However, NCSE did take on this daunting task in creating its *ExpelledExposed* website (<<http://www.expelledexposed.com>>). In this issue, we have included excerpts, extracts, and adaptations of some of the material on that website. In addition, we have added commentary from a number of science supporters.

We reprint newspaper columns by Robert Pennock and Kenneth Miller showing the problems with the premises and conclusions of *Expelled*. We have reflections by Gary Hurd on the ham-handed bungling of origin-of-life research by the film's host, Ben Stein. And Kevin Fisher assesses the potential uses of *Expelled* in the classroom.

Add to this a round of reviews of *Expelled*, and our usual updates and member news, and we have an issue!



ERRATUM

In Lawrence S Lerner's "Good, bad, and lots of indifferent: The state of state K-12 science education standards" (*RNCSE* 2008 May/Jun; 28 [3]: 19-22), the description of Figure 3 in the text (p 20) was incorrect. It should have read, "Figure 3 shows the changes. Standards quality did not change in the states shown in gray. Quality improved in the white states, and declined in the black ones." The legend of Figure 3 was correct.

described as saying "that if there were members of the audience who thought that the board supported the teaching of anything of a religious nature, they were incorrect; and that if there were people present who believed that members of the board were religious fanatics intent on teaching creationism they were mistaken." Darger added that the board was only investigating "the status of intelligent design" and was not planning any action. Board member Steve Hart said that the board passed a motion not to teach anything of a religious nature, including "intelligent design".

Louisiana: In a September 4, 2008, press release, the Society of Vertebrate Paleontology urged Louisiana citizens and legislators to repeal the recently enacted "Science Education Act" (see *RNCSE* 2008 Jul/Aug; 28 [4]: 4-10) in their state, writing:

The Act was drafted under the guise of "academic freedom" and appeals to cherished values of fairness and free speech. However, SVP says the Act intends to garner support and legal protection for the introduction of religious, creationist concepts, including intelligent design, in public school science curricula. By permitting instruc-

California, Weed: The proposal to add "intelligent design" to the seventh-grade science curriculum in the Butteville Union Elementary School District that surfaced in August 2008 (see *RNCSE* 2008 Jul/Aug; 28 [4]: 11-4) is already defunct, according to the *Mount Shasta News* (2008 Sep 17). Claiming that the issue was "blown out of proportion," board president Stephen Darger read a statement that the newspaper

tional materials that are not reviewed by the state's science standards committees, the Louisiana Act and those like it encourage teachers and administrators to work outside these standards. This makes it possible for local school boards to define science and science education to suit their own agendas, thereby compromising the quality of science education for students, and allowing religious discrimination in America's public school science classrooms.

Founded in 1940, the Society of Vertebrate Paleontology is the leading North American scientific and educational organization concerned with vertebrate paleontology. According to its position statement on evolution education, "Evolution is fundamental to the teaching of good biology and geology. ... The record of vertebrate evolution is exciting, inspirational, instructive, and enjoyable, and it is our view that everyone should have the opportunity and the privilege to understand it as paleontologists do." In decrying the Louisiana law, the Society joins a host of scientific organizations, including the American Society for Biochemistry and Molecular Biology, the American Association for the Advancement of Science, the American Institute of Biological Sciences and seven of its member societies, and (together) the Society for the Study of Evolution and the Society of Systematic Biologists.

Louisiana: "Eroding Evolution," published in the July/August 2008 issue of *Church and State* (available on-line at <http://www.au.org/site/News2?abbr=cs_&page=NewsArticle&id=9947>), addressed the recently enacted "Science Education Act" in Louisiana, which threatens to open the door for creationism and scientifically unwarranted critiques of evolution to be taught in public school science classes (see *RNCSE*

2008 Jul/Aug; 28 [4]: 4-10). Veteran science teacher Patsy Peebles told *Church and State* that she worries about the scientific literacy of Louisiana's students: "Now this muddies the waters and keeps students from having a really good education," she said. "When they go to college, they will be at a disadvantage because they will not have a good understanding of science."

As *New Scientist* (2008 Jul 9) reported, "Supporters of the new law clearly hope that teachers and administrators who wish to raise alternatives to evolution in science classes will feel protected if they do so. The law expressly permits the use of 'supplemental' classroom materials in addition to state-approved textbooks." Creationists have historically often tried to undermine evolution education by proposing supplementary materials: *Of Pandas and People* is a notorious example. NCSE's Joshua Rosenau told *Church and State*, "They may not be saying 'Noah's flood' or 'Adam and Eve' anymore, but it is the same creationist argument they are making."

Barbara Forrest, a professor of philosophy at Southeastern Louisiana University, a member of NCSE's board of directors, co-author of *Creationism's Trojan Horse* (New York: Oxford University Press, 2007), and a leader in the pro-science grassroots group Louisiana Coalition for Science, put the law in historical context. Referring to the radical religious right organization that engineered the bill, the Louisiana Family Forum, she explained, "The LFF has been lobbying the legislature for nine years laying this groundwork. They have been waiting for a number of factors to come together — now the legislature as a whole is conservative and we have a governor who favors creationism."

After observing that a previous anti-evolution law in Louisiana occasioned the Supreme Court's decision in *Edwards v Aguillard* (1987) that it is unconstitutional to

teach creationism in the public schools, the *Church and State* article remarks, "It looks like Louisiana is repeating history, despite concerns from teachers, scientists and legal scholars." And, returning to the perspective of the science teacher, it concludes by quoting Peebles again: "They just aren't even paying attention to what teachers are telling them ... We don't need this, we don't want it." *Church and State* is a publication of Americans United for Separation of Church and State, a non-profit organization that protects separation of church and state by working on a wide range of pressing political and social issues.

North Carolina, Brunswick County: After a local parent complained that it was unfair for only evolution to be taught, "[t]he Brunswick County school board is looking for a way for creationism to be taught in the classroom side by side with evolution," reported the *Wilmington News-Star* (2008 Sep 16). "It's really a disgrace for the state school board to impose evolution on our students without teaching creationism," said board member Jimmy Hobbs. Asked for their opinions, his fellow board members all agreed with Hobbs, and the board's attorney reportedly said that it might be possible for the board to add creationism to the curriculum as long as evolution was still taught. But Edd Dunlap, the science section chief in the North Carolina Department of Public Instruction, told the *News-Star* (2008 Sep 17) that creationism cannot be taught as a required course of study: "These are considered religious teachings and may not be taught in science class or as fact, although they may be included as part of an elective, such as a course on religion or philosophy, he said." He also observed that creationism is not included in the state science standards: "If you're teaching something not in the standards, you're not teaching what students need to be assessed on." And he mentioned the precedents of *Edwards v Aguillard* and *Kitzmiller v Dover*, cases in which teaching creationism was ruled to be unconstitutional. The *News-Star* (2008 Sep 18) then offered its editorial assessment of the proposal:

JOHN MARKS TEMPLETON

John Marks Templeton, the financier and philanthropist, died on July 8, 2008, in Nassau, the Bahamas, according to the obituary in *The New York Times* (2008 Jul 9). Born in Winchester, Tennessee, on November 29, 1912, Templeton graduated from Yale University and attended Balliol College at Oxford University as a Rhodes scholar. He went to work on Wall Street in 1937, where he pioneered the field of global securities investment. A naturalized British subject, he was knighted by Queen Elizabeth II in 1987. Although trained in neither theology nor science, he dedicated the last third of his life to supporting research on the interface between science and religion, largely through the John Templeton Foundation, founded in 1987. Among the numerous science-and-religion initiatives funded by the foundation are books, academic conferences, college courses, and local discussion groups. The foundation also administers the Templeton Prize for Progress in Religion, since renamed the Templeton Prize for Progress Towards Research or Discoveries about Spiritual Realities, conferred on "outstanding individuals who have devoted their talents to those aspects of human experience that, even in an age of astonishing scientific advance, remain beyond the reach of scientific explanation." The amount of the prize is pegged to exceed that of the Nobel Prize; it is currently one million pounds (about two million dollars). The list of recipients is eclectic, including Mother Teresa, Charles Colson, Aleksandr Solzhenitsyn, Ian Barbour, and Charles H Townes.

Templeton's and the Templeton Foundation's funding of research on science and religion is not without its critics, among them cosmologist Sean Carroll, journalist John Horgan, and zoologist Richard Dawkins, who described the prize as "a very large sum of money given ... usually to a scientist who is prepared to say something nice about religion." A central concern is whether the foundation supports "intelligent design" creationism. The *New York Times* (2005 Aug 21) noted, "Charles L Harper Jr, the senior vice president of the Templeton Foundation, said he had rejected the [Discovery Institute's] entreaties since providing \$75 000 in 1999 for a conference in which 'intelligent design' proponents confronted critics." The foundation, for its part, states on its website, "We do not support the political movement known as 'Intelligent Design'. This is for three reasons[:] 1) we do not believe the science underpinning the 'Intelligent Design' movement is sound, 2) we do not support research or programs that deny large areas of well-documented scientific knowledge, and 3) the Foundation is a non-political entity and does not engage in, or support, political movements. It is important to note that in the past we have given grants to scientists who have gone on to identify themselves as members of the 'Intelligent Design' community. We understand that this could be misconstrued by some to suggest that we implicitly support the 'Intelligent Design' movement, but, as outlined above, this was not our intention at the time nor is it today."

"If you wonder why American children are falling behind the rest of the world in science, look no further than the Brunswick County school board. While educators and policy makers debate how to improve the teaching of science and mathematics in American schools, the Board of Education has been talking about ways to teach creationism alongside evolution. Fortunately, the state put the brakes on this idea before it could get rolling. Creationism can't be taught in science class because it isn't science."

Northern Marianas, Saipan:

Plans for the young-earth creationist ministry Answers in Genesis to build a creationist "museum" in Saipan are on hold. In November 2007, a delegation from AiG met with the governor of the United States Commonwealth of the Northern Marianas Islands to discuss the possibility (see *RNCSE* 2008 Mar/Apr; 28 [2]: 16-8). But the *Saipan Tribune* (2008 Sep 11) reported that a spokesperson for AiG acknowledged, "Unfortunately, at this time no progress has been made of this project," although he added, "We are certainly hopeful that the necessary funding and



location for such a project will become a reality.” AiG opened a new \$27-million edifice in northern Kentucky in 2007 (see *RNCSE* 2007 Jan-Apr; 27 [1-2]: 21-4) to promote its version of young-earth creationism — although not without protest from the scientific community. As the *Saipan Tribune* observed, “In a 2007 statement that was signed by more than 800 scientists after the opening of the Creation Museum, the National Center for Science Education said that students ‘who accept this material as scientifically valid are unlikely to succeed in science courses at the college level. These students will need remedial instruction in the nature of science, as well as in the specific areas of science misrepresented by Answers in Genesis.’”

Texas: A recent article in the *Fort Worth Weekly* (2008 Sep 3) warned of the impending battle over the place of evolution in Texas’s state science standards. “The basic fight is expected to be over what kids are taught about evolution — which takes up only about three days of teaching in a 180-day school year,” Laurie Barker James wrote. “But scientists and teachers argue there are much bigger things at stake: the intimidation of teachers and the possible beginning of biblical beliefs being taught as science in Texas public schools.”

Steven Schafersman, the president of Texas Citizens for Science, told the *Weekly* that the current educational climate “intimidates [science] teachers,” forcing them “to avoid or minimize” the topic of evolution. James added, “The fact that none of the other science teachers interviewed for this article wanted their names used would seem to back up his allegation of fear in the teaching ranks. All but [Kevin] Fisher said they believe that any statement with their names on it could come back to them in the form of a pink slip.”

Naturally, the case of Chris Comer, who was forced to resign from her position as director of science at the Texas Education Agency in October 2007 over her forwarding a note announcing a talk by Barbara Forrest (see *RNCSE* 2008 Jan/Feb; 28 [1]: 4-7), was discussed. As NCSE previously report-

ed (*RNCSE* 2008 Jul/Aug; 28 [4]: 11-4), she is now suing the TEA, seeking, among other things, a declaratory judgment that its policy of requiring its employees to be “neutral” with respect to creationism violates the Establishment Clause. The TEA is asking for the lawsuit to be dismissed.

The article proceeded to explain the political dynamics of the Texas state board of education. Dan Quinn, the communications director of the Texas Freedom Network, told James that Texans have “elected a board with a bloc of ideologues who care more about promoting their own personal agendas than educating Texas kids,” with seven of the fifteen members of the board — one short of a majority — identified as allied with the religious right. Among them is the chair of the board, Don McLeroy, whose hostility to evolution education is notorious.

Reacting to a claim that those seven members of the board are only seeking accuracy, Schafersman explained, “The intent of the SBOE creationists is to ask for misrepresentation of science, not for accuracy.” They plan, he said, to “damage evolution instruction by trying to get the new science standards to include [lessons on] alleged but false ‘weaknesses’ of evolution, in order to weaken evolution content, confuse students, and make them think science is less accurate and reliable about biological origins than it really is.”

What’s next? “Experts are currently composing drafts, according to the TEA’s schedule, and the SBOE will have another ‘discussion’ about the science curricula in November. [A spokesperson for the TEA] said the public can comment now, or at any of the meetings between November 2008 and March 2009, as well as via the agency’s web site.” But, James added, “Science teachers and their advocates are urging interested Texans to write directly to TEA Commissioner Scott or to their local SBOE members now — and not to wait until the official proposal is released in January.”

The TFN’s Dan Quinn emphasized the importance of the issue, saying, “Right now, what the SBOE

does will determine whether the next generation of Texas public school students get a 19th-century education in their 21st-century classroom ... The adoption of the science curriculum will determine whether students will be prepared to succeed in college and jobs of the future, or whether their education is subordinated to the views and beliefs of a fringe group of SBOE members.” And James added, “What happens here will also ripple through the textbooks of other states.”

Canada: Writing in the September 2008 issue of the *United Church Observer*, Drew Halfnight discussed the public understanding of evolution in Canada. With the evolution wars constantly raging to the south, “Canadians see themselves as spectators to someone else’s battle,” he wrote, adding, “Though it may not have the profile or scope here that it has in the US, the tension between a Bible-based understanding of the origins of creation and the science of evolution evidently does not stop at the border.”

As NCSE previously reported (*RNCSE* 2008 Jul/Aug; 28 [4]: 10-1), according to the latest poll of Canadian public opinion, 58% accept evolution, while 22% think that God created humans in their present form within the last 10 000 years, and 20 percent are unsure. (In the United States, 50% of respondents preferred the pro-evolution responses, with 44% preferring “God created human beings pretty much in their present form at one time within the last 10 000 years or so,” and with only 5% volunteering a different response or declining to answer.)

The article devoted several paragraphs to the episode in which Brian Alters’s project to study the effects of the popularization of “intelligent design” on Canadian students, teachers, parents, administrators, and policymakers was denied funding by the Social Sciences and Humanities Research Council of Canada, in part on the grounds that the proposal lacked adequate “justification for the assumption in the proposal that the theory of evolution, and not intelligent-design theory, was correct.”

Halfnight wrote, “The problem, of course, is that evolution is a sci-

entific theory, while ID theory is not. Evolutionary biology is based on mountains of observable evidence, while ID cannot be tested at all. In short, ID has nothing to do with science, and everything to do with belief." Jason Wiles, who manages the Evolution Education Research Centre at McGill University, commented that the SSHRC "put evolution and ID on the same footing, then said, 'Our position is to have no position.'"

Evolution is neglected in Canada's public school curricula, too: "In all but one provincial science curriculum, evolution is relegated to a single unit in a Grade 11 or 12 elective course taken by a sliver of each graduating class. It would not be a stretch to say the majority of Canadian high school students graduate without ever encountering Darwin's theory of natural selection." Additionally, private religious schools are allowed to teach creationism alongside evolution.

As in the United States, there is plenty of opposition to the teaching of evolution in Canadian schools. Leesa Blake, vice-president of the Science Teachers' Association of Ontario, told Halfnight that teachers often experience pressure from parents or students to teach creationism. And as with their counterparts in the United States, Canadian teachers often feel unprepared to teach evolution: "A lot of the people who are teaching biology don't actually have the training [to teach evolution]," Blake added.

The article ended with a plea for keeping religious views out of science classes, quoting Denis Lamoureux, described as "a devout evangelical Christian and confirmed evolutionist who teaches science and religion at St Joseph's College in the University of Alberta." (He is also the author of *Evolutionary Creationism* [Eugene (OR): Wipf & Stock, 2008]). "So how are we going to teach biology?" he asks. "Teach the science as metaphysically free as possible. In other words, keep God out of it, keep the atheistic world view out of it."

Kenya: While the Nairobi Museum of the National Museums of Kenya was under renovation, it was under pressure by fundamen-

talist churches to de-emphasize its famous collection of hominin fossils, which include the most complete skeleton yet found of *Homo erectus* ("Turkana Boy"), unearthed by Richard Leakey's team in 1984 (see *RNCSE* 2006 Sep/Oct; 26 [4]: 13-6). A report in the *Africa Standard* (2008 Jul 24) on the reopening of the museum, however, suggests that human evolution is still front and center: "Next to the 'Great Hall of Mammals' is 'The Cradle of Humankind' — the most favourite gallery of all. Inside are stories of human evolution going back tens of millions of years ago. The section successfully justifies why Kenya and East Africa in general are the true cradle of mankind." But the same report also noted that stringent security measures are in place: "In a strong-room dubbed the 'Hominid skull room', several selections of original human fossils are on display inside bullet-proof glass with special lighting. The fossils include the famous 'Turkana Boy' and 'Lucy' of Ethiopia. To step inside these 'hallowed' grounds, one needs special clearance. You also have to pay extra to go in. The tight security is enforced owing to the sensitivity of the historical material contained inside."

United Kingdom, Northampton: A controversy over four lines of text on a display about Darwin and fossils at Northampton's Abington Park Museum seems to have been resolved, if not necessarily to anyone's satisfaction. According to a press release from the National Secular Society issued on August 29, 2008, the Northampton Borough Council instructed the museum to cover a sentence about Darwin — "He used the same layers of fossils that had supported the Genesis view of evolution to show the slow changes that are taking place over the millennia of earth history, each small change enabling a species to the rigours of it's [*sic*] environment — the struggle for survival through natural selection leading to the survival of the fittest" — after receiving a complaint about it.

The NSS apparently received its information from a recent visitor

to the museum who asked a docent about the covered sentence. Initial reports differed as to the exact nature of the complaint that occasioned the alteration to the display: the NSS described it as coming from a fundamentalist, while 24dash.com (2008 Aug 29; <http://www.24dash.com/news/Local_Government/2008-08-29-Council-accused-of-censoring-evolution-exhibition>) reported that a NBC representative disavowed any knowledge of the religious views of the complainant, and the *Telegraph* (2008 Aug 29) characterized the complaint as objecting to the idea that there is a Genesis view of evolution.

Brendan Glynane, the borough council member responsible for museums, told the *Telegraph*, "There was absolutely no attempt at censorship, the text contains a factual error which could cause confusion." In any case, according to 24dash.com, a new display will be produced, with the phrase "that had supported the Genesis view of evolution" removed.

A subsequent story in the local newspaper, the *Northampton Chronicle and Echo* (2008 Sep 10), reported that Gary Arthur, the museum docent who claimed that the display was covered because of a complaint from a fundamentalist, resigned over the incident, saying, "I have no problem with what people believe but the moment it impinges on education or politics they need to back off." The story also identified the original complainant, Lewis Houston, who told the newspaper, "I have no complaint about the display. I didn't ask that they put in a creationist view." He added, however, "I was an evolutionist but when I graduated as a professional engineer I lost my faith in evolution," and he reportedly is linked to a local creationist group.

The *Chronicle and Echo* (2008 Sep 10), eventually threw up its editorial hands: "It is almost beyond us to try to unravel the arguments and counter-arguments now spinning around this particular issue."

United Kingdom: Anticipating the bicentennial of Darwin's birth and the sesquicentennial of the publication of *On the Origin of*





NCSE NEWS

News from the Membership

Glenn Branch

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

Francisco Ayala was interviewed about evolution and creationism for the August 2008 issue of *HHMI Bulletin* (28 [3]: 38-9), published by the Howard Hughes Medical Institute. Responding to a question about whether the controversy ended with the decision in *Kitzmiller v Dover*, he explained, "Creationism is still a live issue in Florida, Kansas, Louisiana, Alabama, Michigan, and

Missouri — other places." Noting that opposition to evolution is typically motivated by religion, he insisted that nevertheless, "One can accept scientific principles and also hold religious beliefs." And he urged that "[t]he only way to deal with the problem is education and specifically science education, which is unfortunately lacking, by and large, and not only in this country." A Supporter of NCSE since its founding, Ayala is University Professor, the Donald Bren Professor of Biological Sciences, and Professor of Philosophy at the University of

California, Irvine. Among his contributions to the defense of the integrity of science education are his testimony for the plaintiffs in the challenge to Arkansas's 1981 Balanced Treatment for Creation-Science and Evolution-Science Act (*McLean v Arkansas*) and his lead authorship of the recent publication from the National Academy of Sciences and the Institute of Medicine, *Science, Evolution, and Creationism* (Washington DC: National Academies Press, 2008). His latest book is *Darwin's Gift: To Science and Religion* (Washington [DC]: Joseph Henry Press, 2007).

Species, the Church of England unveiled a new section of its website entitled "On the origin of Darwin" (available on-line at <<http://www.cofe.anglican.org/darwin>>), discussing Darwin's relationship to the church, the development of his own views on faith, and a brief historical sketch, bibliography, and listing of celebrations of the Darwin anniversaries. Attracting the most attention, however, was "Good religion needs good science" — a short essay by the Church's director of mission and public affairs, the Rev Malcolm Brown — owing to its call for the Church of England to apologize to Darwin.

Addressing Darwin, Brown wrote, "200 years from your birth, the Church of England owes you an apology for misunderstanding you and, by getting our first reaction wrong, encouraging others to misunderstand you still. We try to practice the old virtues of 'faith seeking understanding' and hope that makes some amends. But the struggle for your reputation is not over yet, and the problem is not just your religious opponents but those who falsely claim you in support of their own interests." As the

Associated Press (2008 Sep 15) reported, however, Brown's statement was not an official apology on behalf of the church.

Reaction among Darwin's descendants to Brown's call for the church to apologize for misunderstanding Darwin was mixed. Andrew Darwin, a great-great-grandson of Darwin, told the *Daily Mail* (2008 Sep 13) that the apology was pointless: "Why bother?" he said. "When an apology is made after 200 years, it's not so much to right a wrong, but to make the person or organisation making the apology feel better." But Horace Barlow, a great-grandson of Darwin, thought that Darwin would have been pleased to hear the church's apology; he noted also, "They buried him in Westminster Abbey, which I suppose was an apology of sorts."

Reaction was also mixed in the Episcopal Church in the United States of America, the Church of England's sister church. *Episcopal News Service* (2008 Sep 17) quoted the Rev Norman Faramelli of Episcopal Divinity School and Boston University as concurring with Brown's proposed apology, with the caveat that "it's not just

the Church of England that owes him an apology." The Rev Canon Ed Rodman, a member of the Episcopal Church's Executive Council and the council's Committee on Science, Faith and Technology, however, felt that Brown's call for an apology did not go far enough, saying that it was time for the church to "fully acknowledge its culpability in discrediting Darwin's work."

The question of apologizing to Darwin arose in the Catholic Church as well, according to Reuters (2008 Sep 16). In discussing "Biological Evolution: Facts and Theories" — a conference of scientists, theologians, and philosophers addressing the Origin, to take place in Rome in March 2009 — Archbishop Gianfranco Ravasi, the Vatican's culture minister, indicated that the church was not planning to issue a posthumous apology to Darwin. "Maybe we should abandon the idea of issuing apologies as if history was a court eternally in session," he said, while adding that Darwin's theories were "never condemned by the Catholic Church nor was his book ever banned."

NCSE's **Glenn Branch** and **Louise S Mead** collaborated on the third installment of NCSE's regular column — Overcoming Obstacles to Evolution Education — for the new journal *Evolution: Education and Outreach* (2008; 1 [3]: 287-9). In their contribution, entitled "'Theory' in Theory and Practice," they wrote,

A central obstacle to accepting evolution, both among students and the general public, is the idea that evolution is "just a theory", where "theory" is understood in a pejorative sense as something conjectural or speculative. Although scientists and textbooks constantly explain that the scientific use of "theory" is quite different, the pejorative use continues to cause confusion, in part because of its deep roots in a popular, Baconian, understanding of science. A constructivist approach, whereby students are helped to examine the adequacy of their preconceptions about "theory" for themselves and to revise or replace them appropriately, is recommended.

Their article is available on-line at <<http://www.springerlink.com/content/fr258627q2x3t378/fulltext.html>>.

"A teacher on the front line as faith and science clash" — a story on the front page of *The New York Times* (2008 Aug 24) — examined the creationism/evolution controversy as it plays out in the classroom of **David Campbell**, a member of NCSE who teaches high school biology in Orange Park, Florida. The *Times*'s reporter Amy Harmon wrote, "in a nation where evangelical Protestantism and other religious traditions stress a literal reading of the biblical description of God's individually creating each species, students often arrive at school fearing that evolution, and perhaps science itself, is hostile to their faith." Campbell's students are a case in point, and "their abiding mistrust in evolution, he feared, jeopardized their belief in the basic power of science to explain the natural world — and their ability to make sense of it themselves."

In addition to helping his own students, Campbell also helped to improve the treatment of evolution throughout Florida by co-founding the grassroots organization Florida Citizens for Science and by serving on the committee that revised Florida's state science education standards in 2007. The new standards describe evolution as a "fundamental concept underlying all of biology" — a far cry from their predecessors, which sedulously avoided even using the e-word. Harmon wrote, "Campbell defended his fellow writers against complaints that they had not included alternative explanations for life's diversity, like intelligent design. His attempt at humor came with an edge: 'We also failed to include astrology, alchemy and the concept of the moon being made of green cheese,' he said. 'Because those aren't science, either.'"

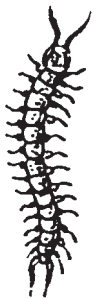
As well as explaining the scientific evidence for common descent and natural selection, Campbell discusses the limits of science, telling his students, "Faith is not based on science ... And science is not based on faith. I don't expect you to 'believe' the scientific explanation of evolution that we're going to talk about over the next few weeks. But I do ... expect you to understand it." The approach seems to be helpful, to judge from a case recounted in the article. One student who earlier refused to answer a test question that asked for two forms of evidence supporting evolutionary change and natural selection, writing, "I refuse to answer ... I don't believe in this," later relented. Grading the student's retest, Campbell found that "the question that asked for evidence of evolutionary change had been answered."

Accompanying the article was a sidebar discussing the treatment of evolution in state science education standards, comparing the ratings assigned by **Lawrence S Lerner** in his 2000 study *Good Science, Bad Science* with NCSE's assessment, using Lerner's criteria, of the standards currently used. The standards "have improved in many states since 2000 ... [b]ut most states' standards do not explicitly require teachers to explain that humans evolved from

earlier life forms." There is also a historical timeline illustrating "A fading resistance to evolution education," furnished by NCSE, and, apparently only on the newspaper's website, a version of NCSE's answers to Jonathan Wells's "Ten questions to ask your biology teacher about evolution". (For a more extensive rebuttal of Wells's claims about evolution, see **Alan D Gishlick**'s "Icons of Evolution?", available on line at <<http://www.ncseweb.org/creationism/analysis/icons-evolution>>).

In a later issue of the *Times* (2008 Aug 31), a number of letters to the editor about "A teacher on the front line" were printed. Among them was **Philip Appleman**'s, which observed, "By the time students reach high school, many of them have been indoctrinated for years by perhaps well-intentioned people whose own backgrounds were formed by religious indoctrination. No wonder it is so hard for teachers to make the case for facts, evidence or even common sense. As a 21st-century society, we owe a deep debt of gratitude to teachers like David Campbell, who year after year work patiently at the difficult job of replacing indoctrination with learning." Emeritus Professor of English at Indiana University, Appleman is the editor of the Norton Critical Edition of *Darwin* (New York: WW Norton, 2000), now in its third edition.

Steve Harvey, **Lauri Lebo**, and **Vic Walczak** were among the figures from the *Kitzmiller v Dover* case who met the Boss, legendary rocker Bruce Springsteen. According to Mike Argento, writing in the *York Daily Record* (2008 Aug 29), "Vic Walczak, the American Civil Liberties Union's legal director [for Pennsylvania] and one of the lawyers in the Dover case, is a big Springsteen fan, and on a whim, he e-mailed Springsteen's people to see whether he could get some backstage passes. He knew Springsteen had followed the Dover case and was a supporter of the ACLU's mission of protecting civil rights — and figured it was worth a try. It was." They met Springsteen backstage before a recent concert in Hershey, Pennsylvania. "And then," Argento wrote, "there he was, face-to-face



with the Sneaths and the rest of the Dover gang. Walczak introduced everybody and Lauri gave Bruce a copy of her book about the Dover case, *The Devil in Dover*, telling Springsteen that the book contains a reference to his song, 'Part Man/Part Monkey' — a song that Walczak and NCSE's **Nick Matzke** were in the habit of playing loudly every morning on their way to court during the trial. At the concert, Springsteen and his band performed "Part Man/Part Monkey", dedicating it to "the Dover parents and good science education".

Jay Hosler discussed his science-themed comic books at the 2008 Course, Curriculum, and Laboratory Improvement conference, held August 13–15, 2008, in Washington DC, which brought together more than 500 stakeholders in a National Science Foundation initiative to transform teaching methods on campuses across the country for courses on science, technology, engineering, and mathematics. Hosler was quoted in a September 8, 2008, press release from the American Association for the Advancement of Science as saying, "Comic books are an example of great innovative education models to reach students who are nervous or not confident in the science classroom ... Many of them take science courses just to fill a distribution requirement ... but end up taking other science courses throughout their undergraduate experience." He added, "Many of my incoming students are scared out of their minds about science ... And if they are afraid of science, there is no way they could teach it well. We need to show them that they can not only learn about it, but, eventually, teach it to the next generation." Hosler teaches biology at Juniata College; his latest book is *Optical Allusions* (Columbus [OH]: Active Synapse, 2008), which will be reviewed in a future issue of *RNCSE*.

Kevin Padian, president of NCSE's board of directors, received the 2008 Western Evolutionary Biologist of the Year award at the Western Evolutionary Biology meeting held at the University of California, Irvine, in May 2008. The Webby is awarded annually by the Network for Experimental

Research on Evolution to a scientist from the west of North America (including western Canada and Mexico) who has contributed significantly to the scientific study of biological evolution. Padian is Professor of Integrative Biology at the University of California at Berkeley and Curator of Paleontology at the University of California's Museum of Paleontology. He testified for the plaintiffs in *Kitzmiller v Dover*, the 2005 case establishing the unconstitutionality of teaching "intelligent design" in the public schools.

NCSE Supporter **Michael Ruse's** *The Evolution-Creation Struggle* (Cambridge [MA]: Harvard University Press, 2005) and NCSE executive director's **Eugenie C Scott's** *Evolution vs Creationism: An Introduction* (Berkeley [CA]: University of California Press, 2005) were reviewed by Michael W Apple of the University of Wisconsin in *Educational Policy* (2008; 22 [2]: 327–35). About Ruse's book, Apple wrote:

His arguments against creationism and intelligent design are powerful, but he has written a book that is respectful to both sides. For educators, there may be times when his historical exegesis of major figures and positions in the history of evolutionary science and in those who oppose it are a bit too detailed. Yet when combined with Scott's volume, about which I shall say more in a moment ... there is no doubt that it will give us a better understanding of the stakes in the current debates.

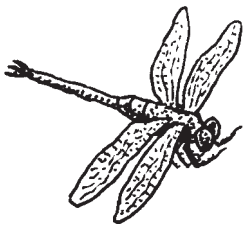
Scott's book he described as "a very useful book that is aimed more specifically at an educational audience," adding, "Scott's ... own position is visible. For science educators, and thoughtful educators in general, to counter the growing strength of the anti-evolutionary movements, they must become much more knowledgeable about what counts as good science, about the history of these debates, and about what the flaws are in the arguments presented by creationism in all its forms."

A new book by the prolific

Michael Ruse, *Evolution and Religion: A Dialogue*, was published (Lanham [MD]: Rowman & Littlefield, 2008). The publisher writes, "Ruse presents a fictional dialogue among characters with sharply contrasting positions regarding science and religious belief. Ruse's main characters — an atheist, a skeptic, a liberal, and an evangelical — represent different positions concerning science and religion often held today, as they passionately argue about evolution versus creation, technological advances in medicine, and the everlasting debate over free will." Ruse, a Supporter of NCSE, is Lucyle T Werkmeister Professor of Philosophy at Florida State University.

Texas Citizens for Science's president **Steven Schafersman** is now a regular blogger for the Houston *Chronicle's* Evo.Sphere blog (<<http://www.chron.com/commons/readerblogs/evo-sphere.html>>), which also features five biologists at the University of Houston. In his inaugural posting, he explained, "My plan is to cover evolution education in public schools in Texas and the United States, to discuss the reasons why learning about evolution in middle and high school biology classrooms is important, and to answer the arguments of creationists and other anti-evolutionists who object to evolution for a variety of reasons and wish to damage biology instruction in schools using a variety of methods." A long-time and pertinacious critic of creationism in all its forms, Schafersman received NCSE's Friend of Darwin award in 2003.

On September 8, 2008, **Jason Wiles** spoke on "Teaching evolution in schools: What's the issue?" to the Technology Alliance of Central New York, a group that seeks to "enhance and facilitate the development, growth, and advancement of education, awareness and historical appreciation of technology" in central New York state. Wiles joined the faculty in the Department of Biology at Syracuse University in 2008 and enjoys a secondary appointment in Syracuse's Department of Science Teaching.



A Rude Introduction to **EXPULSED**

Eugenie C Scott

I meet a whole lot of creationists in my job, as one might expect. Some are confrontational or even rude; most are civil; a few are cordial — sometimes a bit too cordial, like the fellow who offered to take me out for dinner and dancing the next time I happened to be in his town. It is all part of the routine. But when they flat-out lie to me about what they are doing, I get angry.

In early 2007, I received a request from a representative of Rampant Films, asking to interview me for a documentary entitled *Crossroads: The Intersection of Science and Religion*. Judging from the producer's description, its approach was going to be objective and reportorial. I agreed to the request, and spent several phone calls, e-mails, and the better part of a day chatting on camera about the creationism/evolution controversy.

I thought nothing more about it until the summer, when NCSE received a tip about a forthcoming creationist movie, called *Expelled: No Intelligence Allowed*. The movie was reported to be arguing that a dogmatic scientific establishment was fiercely suppressing the evidence for "intelligent design" and ruthlessly punishing — "expelling" — those who dared to challenge the orthodoxy.

Standard creationist fare, of course. But big money was evidently behind the effort. *Expelled* was going to have a major theatrical release — unheard of for a creationist film — and its production company, Premise Media, enlisted Motive Marketing, the company that successfully used viral marketing techniques to promote *The Passion of the Christ* to fundamentalist Christians.

So we were prepared to take *Expelled* seriously. Imagine my surprise, though, when we discovered that I was already involved! Rampant Films turned out to be a front for Premise Media, and the person who interviewed me was in fact the associate producer of *Expelled*. I had been lied to. And so had a lot of people who were interviewed, including my friends Michael Shermer, PZ Myers, and Richard Dawkins.

As I told *The New York Times* (2007 Sep 27), which ran a story about the interviews, "I have certainly been taped by people and appeared in productions where people's views are different than mine, and that's fine." I added that I probably would have appeared in the film anyway, even if the producers had been candid about their intentions: "I just expect people to be honest with me, and they weren't."

Perhaps just as revealing as who was interviewed is who was not. Myers and Dawkins were interviewed because, in addition to being lucid expositors of evolution, they are also both outspoken atheists. A spokesperson for *Expelled* later divulged to *Scientific American* that people of faith who accept evolution, such as NCSE Supporter Kenneth R Miller, were not interviewed for the movie because they "would have confused the film unnecessarily."

What kind of film is it that is confused by telling the truth? That's right: a propaganda film. There are only two ways of dealing with propaganda: ignoring it and refuting it. Because of the potential influence of *Expelled* over a mass audience, we decided that it was not safe for NCSE to ignore its claims. Instead, we took on the massive task of debunking it — carefully, thoroughly, and authoritatively.

EXPULSED EXPOSED: THE NCSE RESPONSE

As we prepared, we identified four central points likely to form the core message of *Expelled*: that "intelligent design" is a scientifically credible alternative to evolution, that proponents of "intelligent design" have been persecuted by the scientific establishment, that evolution is intrinsically atheistic, and — most outrageously — that acceptance of evolution was responsible for historical atrocities such as the Holocaust.

We decided to devote a separate website, *Expelled Exposed* (<<http://www.expelledexposed.com>>), to debunking *Expelled*. NCSE's staff, especially Carrie Sager and Josh Rosenau, labored long and hard at designing the website and writing its content. We even commissioned four short videos to accompany — and draw traffic to — the website, on such topics as the forced resignation of Chris Comer (see *RNCSE* 2008 Jan/Feb; 28 [1]: 4–7) and the evolution of complex structures such as the eye.

It was a lot of hard work. But it was worth it. When *Expelled* opened — in over one thousand theaters across the country — our website was already live, receiving tens of thousands of visitors every day. NCSE's allies in the scientific, educational, and civil liberties communities updated their websites to link to it. Reviewers, journalists, and bloggers availed themselves of its resources, too.

At the end of the day, *Expelled* was a critical failure — "a conspiracy-theory rant masquerading as investigative inquiry ... an unprincipled propaganda piece that insults believers and nonbelievers alike," wrote the reviewer for *The New York Times* (2008 Apr 18). And despite a seemingly impressive box office tally, it is likely to

Eugenie C Scott is NCSE's executive director.

have lost money for its producers and failed to reach beyond a small audience (see p 15 and 17).

NCSE's efforts were not the only cause of *Expelled*'s failure. The ignorance, arrogance, and incompetence of the film, its producers, and its spokesperson, actor and pundit Ben Stein, were invaluable assets — to our side (see p 21). And Scientific American, the Skeptics Society, the American Association for the Advancement of Science, and Dawkins, Myers, Shermer, and a host of bloggers all played their parts.

I think that it is fair to say, however, that NCSE's contribution to the response to *Expelled* was indispensable. As the only national organization focused exclusively on defending the teaching of evolution, NCSE was in a unique position to coordinate, as well as provide the bulk of, the response, both through *Expelled Exposed* and through one-on-one communications with reporters, reviewers, and bloggers.

But *Expelled* is not going away. It was released on DVD on October 21, 2008, and creationists are sure to be screening it from now till kingdom come. For that reason, we decided to devote a special issue of *RNCSE* to *Expelled*. Much of the content comes directly from *Expelled Exposed*, although we took the opportunity to correct and update a few details where necessary.

The limitations of our discussion should be acknowledged. For some topics, such as why Guillermo Gonzalez was not granted tenure at Iowa State University (see p 34), or whether Premise Media was guilty of plagiarism in developing the animations of the cell it used (see p 19), it is impossible for us to know exactly what happened and why — although it is still possible to tell that *Expelled* and its producers are not reliable guides to the events in question.

For other topics, such as *Expelled*'s charges that evolution instigated the Holocaust (see p 50)

or that evolution is incapable of accounting for complexity in nature (see p 43), a complete discussion would have been neither feasible nor, given the attention span of the typical internet browser, desirable. Here, too, we do not pretend to have done more than highlight the more obvious ways in which *Expelled* misleads, errs, and flatly lies.

More than one critic of *Expelled* took note of the ironic suitability of its subtitle, *No Intelligence Allowed*: Arthur Caplan wrote, for example, "There is not a shred of intelligence on display in this just released 'documentary' purporting to be a careful examination of the fight over teaching creationism and evolution in America" (MSNBC 2008 Apr 23). I am sure that you will agree that the same cannot be said of NCSE's rebuttal.

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Bait and Switch: *Expelled*'s Questionable Interview Tactics

Anne D Holden and Eugenie C Scott

For a number of scientists, their introduction to what became *Expelled* came during the spring and early summer of 2007. Several prominent scientists and creationism critics — including Eugenie C Scott, PZ Myers, Michael Shermer, Hector Avalos, and Richard Dawkins — received similar e-mails, saying the following:

My name is Mark Mathis. I am a Producer for Rampant Films. We are currently in production of the documentary film, "Crossroads: The Intersection of Science and Religion."

At your convenience I would like to discuss our project with you and to see if we might be able to schedule an interview with you for the film. The interview would take no more than 90 minutes total, including set up and break down of our equipment.

We are interested in asking you a number of questions about the disconnect/controversy that exists in America between Evolution, Creationism and the Intelligent Design movement.

Please let me know what time would be convenient for me to reach you at your office. Also, could you please

let me know if you charge a fee for interviews and if so, what that fee would be for 90 minutes of your time?

I look forward to speaking with you soon.

Sincerely,

Mark Mathis
Rampant Films

The scientists agreed to be interviewed for the documentary, and Mathis and the participants exchanged cordial e-mails organizing interview schedules and discussing the questions which would be asked. In personal communications after *Expelled* was revealed for what it was, Scott, Dawkins, and Avalos reported that

each got the impression that Mathis was “pro-science” and “sympathetic to science and evolution”.

Some, like Dawkins and Shermer, were interviewed by the host of the film, Ben Stein. Other scientists, such as Scott and Myers, were interviewed by Mathis and other production crew.

After the interviews, some of the scientists noted peculiar elements in the interviews. Dawkins recalled Stein’s being unusually aggressive in his questioning; Myers recalled Mathis’s odd behavior of holding up flashcards with prominent creationists’ names written on them to get his reactions. It seemed a curious approach for a documentary supposedly on the “controversy that exists in America between Evolution, Creationism and the Intelligent Design movement.” (Being quite low-key in person — contrasting with the sharpness of his writing on his popular science blog, Pharyngula — Myers apparently did not react to the flashcards strongly enough on camera, so none of this footage was used in the movie.) Shermer found Stein “rude and arrogant” (see his review for *Scientific American*, available on-line at <<http://www.sciam.com/article.cfm?id=bensteins-expelled-review-michael-shermer>>).

All of these interviews were represented as being for a quite generic-sounding documentary film called *Crossroads*. Here is a short description taken from the Rampant Films website in spring 2007:

Crossroads: The Intersection of Science and Religion

It has been the central question of humanity through the ages: How in the world did we get here? In 1859 Charles Darwin provided the answer in his landmark book, “The Origin of Species.” In the century and a half since, geologists, biologists, physicists, astronomers, and philosophers have contributed a vast amount of research and data in support of Darwin’s idea. And yet, millions of Christians, Muslims, Jews,

and other people of faith believe in a literal interpretation that humans were crafted by the hand of God. The conflict between science and religion has unleashed passions in school board meetings, courtrooms, and town halls across America and beyond.

Therefore, it came as a bit of a shock when Scott and Myers independently discovered that the film *Crossroads* was not the film that they had been interviewed for. Myers says he suspected that something was amiss when he found an August 22, 2007, press release for an upcoming “intelligent design” film entitled *Expelled*, starring Ben Stein and produced by Premise Media (see sidebar above). The release proclaimed, “The film confronts scientists such as Richard Dawkins, author of *The God Delusion*, influential biologist and atheist blogger PZ Myers and

WHAT IS PREMISE MEDIA?

Premise Media is a film production company based in British Columbia, Canada. According to its website (<<http://www.premisemedia.com/>>), Premise Media “develops, finances, and produces independent films, books, and DVD’s [sic] for the domestic and international marketplace.” Its motto is “Producing world class media that stirs the heart and inspires the minds to truth, purpose, and hope.”

Premise Media’s top management consists of two men. A Presbyterian minister from Santa Fe, New Mexico, named Logan Craft is Chairman of the Board of Directors. He also produced a television show called “Church and State TV.” Walt Ruloff is Premise Media’s CEO. Prior to joining Premise Media, Ruloff was a salesman and entrepreneur who founded the software company ILTS in 1991, later selling it to Microsoft. Craft and Ruloff also appear to be the source of much of the funding for Premise Media and for *Expelled*.

Additional staff listed on Premise Media’s website included several that are associated with Rampant Films, including Mark Mathis. Also of interest is Paul Lauer, who is listed as the “Grassroots Marketing Director.” Lauer is the founder of Motive Marketing, an entertainment marketing firm that specializes in promoting entertainment geared towards the faith and family markets. Motive Marketing was behind such grassroots marketing campaigns as those for Mel Gibson’s *The Passion of the Christ*, and Walden Media/Disney’s *The Chronicles of Narnia*. Lauer himself is described on the Motive Marketing website as “one of the most well connected entrepreneurs in the faith and family market.”

The connections between Premise Media and Motive Marketing, as well as the strong religious background of Craft, all point to a religiously motivated film. It is not surprising, then, to find that *Expelled* is not an unbiased documentary, but rather a movie with a clear religious agenda: to attack mainstream science, falsely presenting it as being anti-religious.

Of course, Premise Media has a free speech right to promote its views, religious or otherwise, and nobody is objecting to its exercise of that right. But its critics have a right to correct the record. And part of that record is the attempt to pass off to the public as a “documentary” a film that is clear propaganda.

Eugenie Scott, head of the National Center for Science Education.” Since Myers did not recall ever being interviewed for a film called *Expelled*, he dug a bit deeper, only to find that listed in the credits for *Expelled* was a familiar name: Associate Producer Mark Mathis of Rampant Films.

Independently, at about the same time, Scott had been tipped off about an upcoming pro-“intelligent design” film titled *Expelled*. When she and her staff at NCSE began to research the specific details of the film, they discovered that Rampant Films, the company behind *Crossroads*, and Premise Media, the company behind *Expelled*, were closely linked. Most notably, the staff members listed on the Rampant Films website, including Mark Mathis, were also listed as staff members on the website for Premise Media.

Research into the “upcoming and recently released features” listed by Rampant Films on their web-

site led to dead ends; no Rampant Films products were listed anywhere. In fact, the Rampant Films website itself only appeared after Mark Mathis asked to interview “intelligent design” critic Barbara Forrest in late February 2007. According to Forrest, when she asked, “Do you have a website?” Mathis replied with a vague, “Oh, yes, I’ve been telling them we should put a site up.”

How credible is it that a company of several film makers that supposedly had collectively made or were in the process of making a half dozen or more films, did not have a website? Is there really an independent Rampant Films? Or is it a shell for Premise Media, invented for the purposes of acquiring the cooperation of scientists who might otherwise be wary of participating in a production coming from Premise Media?

Though the producers have claimed that the title *Crossroads* was altered at the advice of marketing experts, a search for the registration date for the URL for *Expelled*’s website (<<http://www.expelledthemovie.com>>) came back with a date of March 2, 2007 — well in advance of the interviews of Scott, Shermer, Myers, and Dawkins. The URL was registered to Premise Media. It appears that the producers of *Expelled* simply created *Crossroads* as an alternate title and description.

And regardless of the title of the movie, there is evidence that the concept of *Expelled* — rather than the generic concept of *Crossroads* — was the plan all along. In an April 19, 2008, interview in the Christian publication *World*, Ben Stein relates that the concept of *Expelled*, not the concept of *Crossroads*, was pitched to him “a couple of years ago”:

STEIN: I was approached a couple of years ago by the producers, and they described to me the central issue of *Expelled*, which was about Darwinism and why it has such a lock on the academic establishment when the theory has so many holes. And why freedom of speech has been lost at so many colleges to the point where you

can’t question even the slightest bit of Darwinism or your colleagues will spurn you, you’ll lose your job, and you’ll be publicly humiliated. As they sent me books and talked to me about these things I became more enthusiastic about participating.

Plus I was never a big fan of Darwinism because it played such a large part in the Nazis’ Final Solution to their so-called “Jewish problem” and was so clearly instrumental in their rationalizing of the Holocaust. So I was primed to want to do a project on how Darwinism relates to fascism and to outline the flaws in Darwinism generally.

The claim made by Mathis and others of the Premise team that going from *Crossroads* to *Expelled* was merely a name change has no credibility. They flunk this one.

Although the producers probably believed that they would not have been able to secure interviews with scientists on the evolution side if they had told them they were filming a pro-“intelligent design” film, several of the scientists interviewed have previously participated in films favorably portraying “intelligent design” or “creation science”. As Scott was quoted as saying in the September 27, 2007, issue of *The New York Times*, “I have certainly been taped by people and appeared in productions where people’s views are different than mine, and that’s fine; ... adding that she would have appeared in the film anyway. I just expect people to be honest with me, and they [Premise Media] weren’t.” And for those scientists like Forrest (who declined to be interviewed) and Dawkins who refuse to participate in creationist productions, is deception to obtain their participation ethically justifiable?

Mark Mathis has tried to deflect attention from these actions by arguing that all participants signed a release allowing footage taken to be used for “the feature length documentary tentatively entitled *Crossroads* (the ‘Documentary’) and/or any other production”. Such broad releases are common

in the movie business, so none of the scientists would have realized that none of the footage would be used for a nonexistent movie! Mathis also contends that the issue is irrelevant because participants (or their nonprofits), were paid for their appearances, and they were sent their questions in advance. But these efforts to explain away bad behavior miss the point, which is the dishonesty and deception involved in obtaining the interviews.

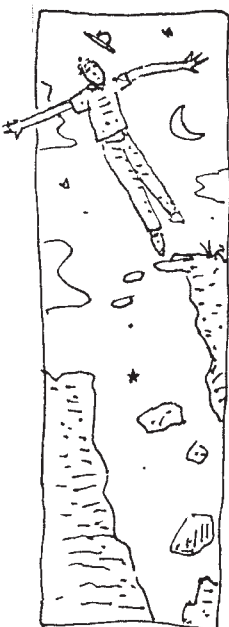
The scientists interviewed are often requested to give their time and expertise to media, including unknown or little-known documentary producers. There is a consequence for documentarians and other media as a result of Premise Media’s actions: these scientists as well as others may be much less willing to participate in such projects in the future. As usual, Dawkins expressed their collective opinion the most eloquently, in an e-mail to Scott and Myers, August 22, 2007 (quoted with permission):

I feel betrayed and very angry. This has only happened to me once before, in a very long career of doing hundreds of interviews. I find that life is much more pleasant if I assume a reasonable level of trust with everyone I meet. It is extremely easy to take me for a ride. I am actually quite proud of being so trusting. It is frustrating and disillusioning to feel that in future I am going to have to be a lot more suspicious and grudging. The quality of life is sensibly diminished by having to do this.

Of course, there are consequences for *Expelled*, as well: if these producers cannot be trusted to interview scientists honestly, can we trust them to present an honest documentary? A perusal of the content of the movie suggests such trust would be misplaced.

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CAUTION:
WHEN ON
GEOLOGIC
TIME THE
EARTH BEGINS
TO SHIFT
BENEATH YOU.

Marketing **EXPULSED**

Anne D Holden and Eugenie C Scott

MARKETING WITH A MOTIVE

Documentaries in general — even relative “blockbusters” like those of Michael Moore or Al Gore — reach a remarkably small proportion of the American public. The religious goals of the producers of *Expelled* would not have been met if the movie appealed only to conservative Christians, the movie’s natural base. Making *Expelled* successful required creating a “buzz” to attract mainstream viewers.

Motive Marketing was an obvious choice for the grassroots marketing that is essential to the success of a movie like *Expelled*. This company was successful in applying viral marketing techniques to promote Mel Gibson’s *The Passion of the Christ* and Walden Media/Disney’s *The Chronicles of Narnia*, and their skills (plus those of three other public relations firms) were employed to promote *Expelled*.

Giving the impression that people are flocking to see *Expelled* requires a big opening weekend, and the team at Motive Marketing strived to inflate the number of tickets sold in three ways: the “*Expelled* Challenge”, political screenings, and planted reviews.

THE *EXPULSED* CHALLENGE

In the “*Expelled* Challenge,” the makers of *Expelled* offered to pay Christian schools by reimbursing them for their tickets based on students’ attendance. On a website described as “specifically designed for students, teachers, pastors, youth leaders and organizations to provide useful tools and resources to promote the ideas surrounding this highly anticipated film,” the following enticement appears:

Anne D Holden was NCSE’s Post-Doctoral Scholar in 2007 and 2008; Eugenie C Scott is NCSE’s executive director.

What is the *Expelled* Challenge?

To engage Christian schools and home school groups to get as many students, parents, and faculty from their school/group out to see Ben Stein’s new movie *Expelled: No Intelligence Allowed* (opening in theaters April 2008).

Each school/home group that registers through the link below and submits their ticket stubs will be eligible for a donation as funds permit, but the school that submits the most ticket stubs will win a donation of \$10 000!

It was never made clear how many schools have taken up the *Expelled* challenge, or how many donations “funds permit”. However, offering to pay people to see their film seems to be, at best, a bad business model. It is, however, an excellent way to encourage a large turnout for the first weekend’s take.

POLITICAL SCREENINGS

Another way the producers of *Expelled* sought to increase that important opening weekend attendance is by stirring up controversy over the film. Unfortunately, they chose to do so by exacerbating one of the most unfortunate trends in American society today: the politicization of education. There have been at least two private screenings for state legislatures that have anti-evolution bills on the docket. One was held to drum up support for Florida’s Senate Bill 2692: the so-called Evolution Academic Freedom Act, which aims to encourage the teaching of creationism by providing legal protection to educators who present “alternatives to evolution” — that

is, “intelligent design” and/or creation science. (See *RNCSE* 2008 Mar/Apr; 28 [2]: 4–7.) Another screening was held in Missouri, where two similar bills, House Bills 2554 and 1315, aimed to promote “academic freedom” and “protect intellectual diversity”; the former bill was introduced by a legislator who previously introduced a bill that would have fired teachers who didn’t give equal time to “intelligent design”. (Both these bills died; for background on HB 2554, see *RNCSE* 2008 May/June; 28 [3]: 5–10.)

Though the showings were not as well-attended as the makers of *Expelled* might like us to believe — “Few lawmakers were among about 100 people who showed up for the private screening of Stein’s film,” reported the *Tallahassee Democrat* (2008 Mar 13) — these events still illustrate Premise Media’s disturbing willingness to politicize science.

PLANTED MOVIE REVIEWS

Another way to swell the first weekend’s gate is to hype the movie by salting reviews from friendly sources. Those who signed up for the *Expelled* newsletter updates began receiving promotional materials for the film in late March. Newsletters were peppered with stellar reviews from various conservative talk show hosts, such as Rush Limbaugh and Michael Medved, who resonate with conservative audiences. Medved, in addition, is a Senior Fellow at the “intelligent design”-promoting Discovery Institute, heralded in the film; it is unsurprising that he would be an *Expelled* enthusiast. These positive reviews from conservative pundits and similar friendly sources are useful in helping the marketing company reach the base of conservative Christians.





However, other positive reviews seem to be from actual movie critics. Ted Baehr of Movieguide says “Four stars!” For someone who has not heard of Movieguide, it may sound more legitimate and unbiased than conservative pundits like Limbaugh or Medved. However, a little research reveals that “Movieguide” is a misleadingly neutral title.

Movieguide’s website describes it as a “ministry dedicated to redeeming the values of the mass media according to biblical principles, by influencing entertainment industry executives and helping families make wise media choices” (<<http://www.movieguide.org/>>). Such conservative evangelical reviewers will be sympathetic to *Expelled*’s religious message, and less likely to be familiar with the existing arguments against its distortions of science and history. To draw as many people to the movie theaters as possible, it makes sense for Motive Marketing to promote reviews of its film from such sites — and ignore negative reviews from mainstream movie critics.

Of course, it is not unusual for a marketing company to promote a movie — that is exactly what they are hired for. And none of this promotion is illegal or necessarily unethical. But only time, not artificially inflated turnout statistics, will tell whether *Expelled* has the “legs” of successful documentaries such as those of Michael Moore. Nevertheless, we predict that it will have a several-year career in church basements.

SILENCING THE DISSENTERS

While the makers of *Expelled* were busily organizing private screenings for legislatures and friendly audiences, they were also snubbing those who would be critical of the film. All of this is, of course, quite ironic, considering that the premise for *Expelled* centers on the supposed silencing of evolution critics. There have been several examples of how the makers of *Expelled* are, in fact, expelling their own critics.

EXPULSION FROM *EXPULSION*

Biologist and science blogger PZ Myers signed up for an invitation

to one of *Expelled*’s pre-release screenings across the country via the *Expelled* website. In his RSVP he reported he would be bringing guests, as permitted by the invitation. His guests included family members and famed biologist Richard Dawkins. Dawkins was in town for a conference, and Myers invited him along to the screening. After all, both had been filmed for the documentary, and wanted to see what footage of theirs had been used.

Myers signed up for the screening using his own name and was told through the website-generated reservation-confirming e-mail to bring personal identification to the theater. Upon arrival, Myers and his guests presented their identification as instructed, and he and his guests went to wait in line to enter the theater. (Dawkins’s British passport, which he presented, lists his full legal name: Clinton Richard Dawkins.)

However, while waiting in line, Myers was approached and told that the producer said he was not welcome at the theater and must leave. His guests, however, were permitted to stay, including Dawkins. Of course, the blogosphere rolled on the floor laughing at the notion that the relatively obscure college professor from a Minnesota state college was expelled from *Expelled* while one of the world’s most famous evolutionary biologists — and creationism critic — entered unrecognized. Myers’s own account is available on-line (<<http://www.scienceblogs.com/pharyngula/2008/03/expelled.php>>); Richard Dawkins also has a detailed account of Myers’s “expulsion”, as well as a review of the film, available on-line (<<http://www.richarddawkins.net/article,2394,Lying-for-Jesus,Richard-Dawkins>>); and Greg Laden has a lengthy list of blog posts about Myers’s expulsion (available on-line at <http://www.scienceblogs.com/gregladen/2008/03/pz_myers_expelled_gains_sainth.php>).

The producers of the film, including Mark Mathis, tried to explain away the multitudes of gaffes, although they never quite got their story straight. First they

claimed that the reason Myers was denied entry was that he had not received an invitation. Evidence that he had signed up on-line and RSVPed like every other attendee required the abandonment of that approach and the substitution of the claim that they feared that the mild-mannered Myers would be disruptive. And the embarrassment that Dawkins had not been recognized and therefore allowed to attend was quickly brushed off by the producers. Perhaps most amusing was an effort to spin the story as a big public relations success by proudly noting that the Myers/Dawkins “expelling” had been the top story in the blogosphere that weekend. But if doing something foolish and then getting laughed at is their idea of a PR success, they might join ranks with Governor Elliot Spitzer, whose sordid tale and resignation was the previous big story of the week.

No matter how they spun the story in their favor, the truth was clear. Participants in a movie about alleged suppression of dissent were themselves suppressed for fear of their dissent.

SELECTIVE SCREENINGS

Others also have been expelled from *Expelled*’s pre-release screenings, which were intended to build up enthusiasm for the movie. Motive Marketing scheduled close to one hundred of these early screenings across the country like the one in Minneapolis attended by Myers and Dawkins. Signing up for these screenings was straightforward: a potential viewer would enter a name and e-mail address on a website, and await a confirmation of the reservation. Depending on the screening, this confirmation would be followed by a second e-mail listing the time and location of the screening. However, after the Myers/Dawkins incident in mid-March, a different procedure was instituted at many subsequent screenings. People who had received confirmation of the screening began receiving e-mails notifying them that the screening for which they had registered was canceled. Yet these individuals later found out that the screening happened anyway — they were just disinvented.

One incident involved an April 3, 2008, showing of *Expelled* in Tempe, Arizona. Evolutionary biologist and science blogger John Lynch had heard about the Tempe screening and followed all the protocol in RSVPing for the event. At the end of March he received an email stating that the time of the screening had been changed from 7:00 to 6:00 PM. Then, on April 2, Lynch received an e-mail, stating simply: "The Tempe, AZ Screening has been canceled."

Lynch was curious about this sudden cancellation, and wondered whether it was due to poor response, or if the cancellation e-mail had only gone out to those who were less sympathetic to the movie's message.

The next day he found out from a fellow Tempe resident that the show had, indeed, gone on. Lynch's fear that he had been pre-expelled appeared to be correct. Additional digging by Lynch revealed that on April 2, some people received the

cancellation e-mail, while others received an e-mail stating that the show would still go on, but the time had been changed to 6:00. When someone arrived at the theater they were asked if they registered for 6:00 or 7:00 — in order to "weed out" the undesirables.

Lynch's account of his adventures with *Expelled* is available online (<http://www.scienceblogs.com/strangerfruit/2008/03/even_m7pmore_on_expelled_in_te.php> and <http://www.scienceblogs.com/strangerfruit/2008/04/expelled_in_tempe_the_expected.php>).

NCSE's Eugenie C Scott, who registered in March for a screening in Danville, California, under her own name, using her NCSE e-mail address, received a computer-generated acknowledgment of registering — but never any promised announcement of what movie theater would show Ben Stein's film. Apparently, she was pre-pre-expelled! And the same is true for

RNCSE editor Andrew Petto, who registered for showings both in Milwaukee (where he lives) and in Philadelphia (where he would be just prior to opening weekend).

Now, of course, it is perfectly legal for Premise Media to decide that it does not wish to have critics attend its pre-release screenings, but it is not exactly in the spirit of the movie, which bleats in dismay at the Big Science "Darwinist" bullies stifling debate on "intelligent design" and evolution. One might have expected more from the makers of a documentary on an important social issue. But this is just another example of how *Expelled* is not so much an evenhanded treatment of a controversial topic as it is a heavy-handed exercise in propaganda.

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EXPULLED Tanks at Box Office after Big Start

Eugenie C Scott

Expelled: No Intelligence Allowed had one of the best opening weekends of any documentary, according to data on the Box Office Mojo website (<<http://www.boxofficemojo.com/>>). But Ben Stein's attack on science and evolution faltered fairly quickly and was out of theaters after a brief run of 56 days (eight weeks). The total gross reported by Box Office Mojo was \$7 690 545 — almost 40% of it obtained during that highly successful opening weekend.

Expelled opened in 1052 theaters, opening on more theaters than any other documentary on Box Office Mojo's list of the top 100 documentaries. Most documentaries start out in a handful of theaters, and as word of mouth spreads, the number of theaters increases. The number two docu-

mentary, *March of the Penguins*, for example, opened on only four screens, but eventually was shown on 2506 screens (grossing \$77 437 223). The top-grossing documentary, Michael Moore's *Fahrenheit 9/11*, perhaps because of Moore's drawing power, opened on a whopping 868 screens and topped out at 2011 theaters (grossing \$119 194 771). Part of the reason for most documentaries' beginning their runs in a more modest number of theaters is the expense of producing and distributing films to theaters: each print costs upward of \$1500-\$2000 (according to <<http://www.howstuffworks.com/moviedistribution1.htm>>). *Expelled*'s big opening weekend was therefore a pricey venture.

Expelled's producers apparently were willing to gamble on a big opening weekend because they believed they had a successful strategy for box office success (p 15). Motive Entertainment, the mar-

keter for *Expelled*, claims credit for building up interest in Mel Gibson's 2004 Hollywood movie *The Passion of the Christ* through "viral" word-of-mouth marketing, including private screenings in churches and parish halls, among other promotions. Similarly, for several months before its theater release, *Expelled* was shown to religious conservatives in churches and rented theaters, and heavily promoted on-line. The intent in the marketing of both films was to excite conservative Christians about the movies and to encourage them to show up on the opening weekend. Large crowds on opening weekend create a buzz for a movie that can carry it through several weeks' tenure in the theaters, increasing the box office and — for a documentary with a mission, like *Expelled* — ensure it a wide audience. The plan worked very well for *The Passion of the Christ*, which opened on Ash Wednesday

Eugenie C Scott is NCSE's executive director.

WHO WAS SHOWING EXPELLED?

Andrew J Petto, RNCSE Editor

On the weekend of the nation-wide opening of *Expelled*, I was visiting Philadelphia, in part to present an update on anti-evolutionism to the Philadelphia Association for Critical Thinking (PhACT). As a part of the preparation, I checked Philadelphia-area theatres to see where and when *Expelled* was being screened.

There were 16 theaters within 25 miles of Philadelphia showing *Expelled* on the opening weekend. However, it turned out that 11 of these were owned by or affiliated with the Regal Entertainment Group, which claims to have 6754 screens in 549 theatres (<http://investor.regalcinemas.com/>). If the pattern in the Philadelphia area is repeated across the country, then Regal alone would be responsible for over half the theater listings of *Expelled*.

Why does this theater chain seem so fond of *Expelled*? Well, former CEO Philip Anschutz was also a major donor to the Discovery Institute (<<http://www.media.transparency.org/story.php?storyID=218>>). Though he stepped down as CEO in 2006, he remained on Regal's Board of Directors. So maybe opening *Expelled* on so many screens was not a business, but an ideological, decision.

on 3006 screens and collected more than \$125 000 000 by the end of the following weekend. Walt Ruloff, *Expelled*'s executive producer, clearly placed a great deal of confidence in this strategy; he suggested to the *Los Angeles Times* (2008 Apr 18) that the movie might top *Fahrenheit 9/11*'s opening weekend of \$23.9 million!

Things did not go quite that well for *Expelled*, although the movie had a very successful opening weekend, April 18–20, 2008. Patrons at those 1052 theaters contributed \$2 970 848 to the total gross, which was enough to put *Expelled* into the top ten grossing movies opening that week. For a documentary, those numbers were stunning. I must say, we at NCSE were dismayed at this successful beginning, but we hypothesized that the audiences probably were composed primarily of conservative Christians who had seen the movie or heard of it through their churches, and that the general public might be less enthusiastic about it in future weeks.

Our hypothesis appeared to be confirmed: after scathing reviews (see p 24) and apparent public indifference beyond its conservative Christian base, *Expelled* quickly sank from the top ten; by its second weekend in the theaters, it had dropped to 13th. By the third weekend, only 656 theaters were carrying the film — about a 40% drop. By the fourth weekend, only

402 theaters were still showing the film, and the average gross/theater had dropped from a high on opening day of \$1149 to a dismal \$300. Within a few more days, the average gross/theater had dropped to around \$100; by the end of May, the producer had ceased reporting statistics to Box Office Mojo (personal communication from website staff). The reported close date for *Expelled* was August 7, 2007. The total reported gross from *Expelled*'s theatrical release is \$7 690 545. The successful opening weekend accounted for 38% of this gross, suggesting a lack of “legs” for this film.

A good point of comparison is the Bill Maher documentary *Religulous*, which is sharply critical of the Abrahamic religions and opened October 1, 2008. The production budget of *Religulous* was roughly \$2.5 million, 30–40% lower than that of *Expelled*, and it opened in less than half as many theaters. Yet it grossed \$3 409 643 on its opening weekend, about 15% higher than *Expelled*'s opening weekend gross of \$2 970 848. Whereas the number of theaters showing *Expelled* had steadily and rapidly decreased from its opening weekend, *Religulous* was actually shown in more theaters in its second and third week (568 and 540, respectively) than its first (502). By its seventh week, according to the website The Numbers (<<http://www.the-numbers.com/>>),

Religulous was still showing in 238 theaters, with a gross per theater of \$968. Box Office Mojo's most recent numbers show its total gross at \$12 572 995 — 61% higher than that of *Expelled*'s entire theatrical run! Despite *Expelled*'s higher production budget and wider distribution, *Religulous* has surpassed it by virtually every measure of box office success. *Expelled*'s website continues to call it the “#1 documentary of 2008”, but that is clearly no longer the case.

Expelled's successful opening weekend at least provided bragging rights. According to Box Office Mojo, *Expelled* is the fifth most successful political documentary (after three Michael Moore films and *An Inconvenient Truth*), the twelfth most successful documentary (between *Hoop Dreams* and *Tupac: Resurrection*), and the twelfth most successful Christian film (between *Facing the Giants* and *Megiddo: The Omega Code II*). But those rights did not come cheap: Premise Media's Logan Craft told the *Dallas Morning News* (2008 Apr 27) that nearly \$4 million was spent on producing the movie and “a multiple of that” in distribution and marketing so far. So it is unlikely that the producers have recouped their investment.

Not all viewers will have paid for a ticket to see *Expelled*. Its producers were encouraging visitors to book a theater and rent the movie for a special showing, and it is not known whether they got many takers. Additionally, the producers have released the movie in DVD form on October 21, 2008. We can anticipate that *Expelled* will have a future in living rooms and in church basements, even if it had a short life on the big screen. NCSE and its allies will have to remain vigilant to ensure that the movie or segments from it are not taught in public schools because of its religious message. Even without the religious message, however, the anti-science message of *Expelled* is sufficient to keep it from classroom use (see p 27).

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Expelled's Copyright Woes *Glenn Branch*

Adding to the controversies around *Expelled* were two separate allegations that the film infringed on the copyright of *The Inner Life of the Cell* (a video produced by XVIVO for Harvard University) and of "Imagine" (the 1971 song by John Lennon). These allegations involve contentious matters both of fact and of law, and it is not easy to ascertain to what extent they are valid, especially because neither was ever fully tested in a court of law. But the allegations certainly contributed to the view that the producers of *Expelled* were less than scrupulous — although they may also have reinforced the view that *Expelled* tried so hard to foment, that the proponents of "intelligent design" are the victims of systematic persecution.

"THE INNER LIFE OF THE CELL"

In the course of claiming that the complexity of the cell bespeaks design, *Expelled* uses a segment of computer-generated imagery of various cellular processes. PZ Myers, who obtained a promotional DVD for *Expelled* at the showing from which he was excluded (see p 15), argued in a March 23, 2008, post on his blog (available on-line at <http://www.scienceblogs.com/pharyngula/2008/03/about_that_cell_video_in_expel.php>) that the segment on the DVD was clearly derived from "The Inner Life of the Cell":

they both have roughly the same layout and the same elements in view; this is a remarkable, umm, coincidence, since these are highly edited, selected renderings, with many molecules omitted ... and curiously, they've both left out the same things.

He added:

I previously criticized the

Glenn Branch is NCSE's deputy director.

Harvard video for a shortcut. That kinesin molecule is illustrated showing a stately march, step by step, straight down the microtubule. Observations of kinesin show it's more complex, jittering back and forth and advancing stochastically. That's a simplification in the Harvard video that is also present in *Expelled's* version.

Also leveling the charge of plagiarism against Premise Media was Abbie Smith, in a series of ram-bunctious blog posts at <<http://www.endogenousretrovirus.blogspot.com>> (she now blogs at <<http://www.scienceblogs.com/erv/>>).

Responding in part to the blogospheric attention to the promotional DVD, David Bolinsky and Michael Astrachan of XVIVO sent a letter (dated April 9, 2008; available on-line at <<http://www.ncseweb.org/files/pub/creationism/EXPULSED-Letter.pdf>>) to the chairman of Premise Media, Logan Craft, stating:

... promotional material for the *Expelled* film ... clearly shows in the "cell segment" the virtually identical depiction of material from the "Inner Life" video. Among the infringed scenes, we particularly refer to the segment of the *Expelled* film purporting to show the "walking" models of kinesic activities in cellular mechanisms. The segments depicting these models in your film are clearly based upon, and copied from, material in the "Inner Life" video." ... We have also obtained legal advice that your copying, in virtually identical form, of material in the "[I]nner Life" video clearly meets the legal test of "substantial similarity" between the copied work and our original work.

And they warned that they would

pursue legal action if the segment was not removed from *Expelled* before its scheduled commercial release and if all copies of the *Inner Life* video were not returned to XVIVO.

Premise Media responded first with a note denying the charge posted on the *Expelled* blog on April 11, 2008, and then with a lawsuit filed on April 14, 2008, in the United States District Court for the Northern District of Texas. In the filing, Premise Media asserted that the promotional DVD contains a different segment than is contained in the final version of *Expelled*, that both segments were created independently of the XVIVO video, and that even if the segments relied in part on the XVIVO video, the reliance would have been permissible as fair use, as a *de minimis* use, and as implicitly permitted by XVIVO's making the video available on-line for educational use. Premise Media thus sought a declaratory judgment that neither *Expelled* nor the promotional DVD "infringe any copyright or other claimed intellectual property rights XVIVO may have, if any, in the Inner Life Video or otherwise." The lawsuit ended uneventfully on June 23, 2008, when the parties agreed to dismiss the case with prejudice (meaning that a lawsuit on the same charges cannot be filed); as part of the settlement, XVIVO agreed not to file suit over the alleged copyright infringement.

Interestingly, a leading light of the "intelligent design" movement was previously accused of misusing *The Inner Life of the Cell*. After William Dembski spoke at the University of Oklahoma on September 17, 2007 (see *RNCSE* 2007 Sep-Dec; [5-6]: 7-8), Abbie Smith noted that his presentation featured portions of *The Inner Life of the Cell*. She later wrote in a November 20, 2007, post at the Panda's Thumb blog (available on-line at <<http://www.pandas-thumb.org/archives/2007/11/diexpelled-for.html>>) that in the

version shown by Dembski in Oklahoma:

Harvard/XVIVO['s] narration, all of the science, is whisked away and replaced with a "surrealistic [L]illiputian realm" — "robots", "manufacturing", "circuitry", "nano motors", "UPS labels". Maybe they think it is "okay" because they turned all of Harvard's science into "Magic"! ... From my point of view, as a virologist and former teaching assistant, this isn't just copyright infringement. This is theft and plagiarism.

Smith alerted XVIVO and Harvard University about the possibility of copyright infringement on Dembski's part, and apparently they took action, for in a November 26, 2007, post at his blog (available on-line at <<http://www.uncommondescent.com/molecular-animations/news-release-harvards-xvivo-video/>>, Dembski announced that he was no longer going to use the film in his presentations, although he admitted no wrongdoing.

"IMAGINE"

A snippet — about fifteen seconds — from John Lennon's 1971 song "Imagine" is on the soundtrack of *Expelled*, playing as images of Joseph Stalin and the Chinese Red Army are shown along with a verse from the song: "Nothing to kill or die for / And no religion too." Writing on the Huffington Post blog (2008 Apr 14, available on-line at <http://www.huffingtonpost.com/james-boyce/yoko-ono-sells-out-john-1_b_96527.html>), James Boyce sharply criticized Lennon's widow for allowing *Expelled* to use the song: "I guess that the \$20 million plus the estate earns every year isn't enough for Yoko Ono." Boyce was forced to retract his criticism on learning that in fact Ono had not given her permission; the *Wall Street Journal* (2008 Apr 16) reported, "Ms Ono's lawyer ... said in an interview Wednesday: 'It was not licensed.' With respect to the filmmakers, he says: 'We are exploring all options.' It is not clear what remedies if any may be available to Ms Ono." In a written statement, the producers of *Expelled* admitted

that they failed to seek permission, but they called the snippet used "momentary" and claimed that the usage was "protected under the fair use doctrine of free speech."

On April 23, 2008, Yoko Ono, Sean Lennon, Julian Lennon, and EMI Blackwood Music — who own the song "Imagine" — filed a lawsuit against Premise Media in the United States District Court for the Southern District of New York. Noting that *Expelled's* producers sought permission for other music used in the film, the filing contended that "Defendants have intentionally and willfully used the Song without authorization because they knew that they would likely be unable to secure permission from Plaintiffs and/or because they wished to avoid the costs associated with lawfully licensing these works and paying royalties" and that "Defendants have also intentionally and willfully used the Song in a fashion that suggests to the public that such use was authorized, endorsed or sponsored by the Plaintiffs." EMI Records and Capital Records — which own the recording of "Imagine" used in *Expelled* — also filed a lawsuit against Premise Media in the New York state court system. Assisting Premise Media in its legal defense was the Stanford Center for Internet and Society's Fair Use Project, which seeks "to provide legal support to a range of projects designed to clarify, and extend, the boundaries of 'fair use' in order to enhance creative freedom."

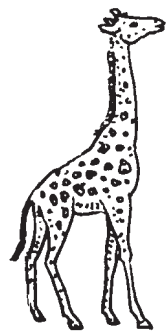
In both cases, the plaintiffs sought a preliminary injunction prohibiting the continued distribution of the movie, and in both cases, they were unsuccessful. On June 2, 2008, the judge hearing the federal case wrote that the plaintiffs "have not shown a clear likelihood of success on the merits because, on the basis of the current record, defendants are likely to prevail on their affirmative defense of fair use. That doctrine provides that the fair use of a copyrighted work for purposes of criticism and commentary is not an infringement of copyright." (The ruling is available on-line at <http://online.wsj.com/public/resources/documents/expelled_sdeny.pdf>). On August 2, 2008, the

judge hearing the state case noted that to succeed the plaintiffs would have had to demonstrate a likelihood of success on the merits, a danger of irreparable injury, and a balance of equities in their favor; he ruled that they failed on the first, succeeded on the second, and failed on the third. (The ruling is available on-line at <<http://cyberlaw.stanford.edu/system/files/EMI+v.+Premise+PI+Order.pdf>>.) The defendants, however, lost a motion for dismissal of the case because they failed to meet their burden of showing that the plaintiffs could not prevail even if the facts were exactly as the plaintiffs allege.

Although the plaintiffs appealed the ruling in the federal case, they also showed signs of being ready to abandon the case, filing a motion on September 5, 2008, for the case to be dismissed with prejudice and without costs or attorney fees, primarily on the grounds that the film was already released with "Imagine" included, and secondarily on the grounds that "the Defendants may lack the financial resources to satisfy a potential judgment." Then, in a press release issued on October 6, 2008 (available on-line at <<http://cyberlaw.stanford.edu/node/5876>>, the Fair Use Project announced that "all of the plaintiffs in both cases have now withdrawn their claims and dismissed their cases"; the *Wall Street Journal* (2008 Oct 8) confirmed with announcement with Yoko Ono's spokesperson and EMI's lawyer. The Fair Use Project lamented, "There should never have been any doubt the filmmakers who were sued here had every right to use a short segment of a song for the purpose of criticizing it and the views it represents. But the right result came far too late." Why? Because "[t]he mere pendency of these cases caused the film's DVD distributor to shy away from releasing the full film — the version that includes the Imagine segment."

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Ben in His Own Words

In promoting the creationist propaganda film *Expelled*, Ben Stein managed to stick his foot in his mouth over and over again, issuing what seemed to be a ceaseless stream of ignorant, offensive, and just plain daffy claims.

The following are from the Set Ben Straight contest, which NCSE administered in connection with the *Expelled Exposed* website. Entrants were asked to provide the text or transcript of a claim made by Ben Stein in promoting *Expelled* (not in the movie itself — we saw no need to encourage people to see it) along with a brief rebuttal. We were quickly inundated with entries, and we posted the best at the *Expelled Exposed* website (<<http://www.expelledexposed.com/index.php/contest>>) for all the world to see. Five lucky entrants received a year's subscription to *Reports of the NCSE* along with their choice of a book from NCSE's shelf — including such useful books as Mark Isaak's *The Counter-Creationism Handbook*, Eugenie C. Scott's *Evolution vs. Creationism*, and the AAAS's *The Evolution Dialogues: Science, Christianity, and the Quest for Understanding*.

Before you visit the *Expelled Exposed* website to see the rebuttals that we posted, why not try to rebut Ben Stein's claims yourself? Or just marvel the views of someone described by Answers in Genesis's Ken Ham as "a 21st-century Einsteinian figure."

ON THE EVIDENCE FOR EVOLUTION

... nobody's ever seen an individual species evolve!
— interview on *Fox & Friends*, no date

Darwin was never able to point to any clear evidence of any species that had originated by evolution. And there hasn't been much progress in Darwinism since then.
— interview on the Glenn Beck show, November 13, 2007

Despite the fact that no one has ever been able to prove the creation of a single distinct species by Darwinist means, Darwinism dominates the academy and the media.
— *Expelled* blog entry "Darwinism: The imperialism of biology?", October 31, 2007

ON "OPPRESSION"

... If they are Darwinists and they

owe their jobs to being Darwinists, they are not going to challenge the orthodoxy because that would challenge the whole basis of their jobs and their lives. So they are not going to challenge the ideology that has given them lush positions in real life.
— interview with CNS News, January 17, 2008

WORLD: After spending so much time listening to scientists on both side of the issue, why do you think so many actively oppose even the consideration of "intelligent design"?

STEIN: For one thing, these people's lives and livelihoods depend on having Darwinism as the dominant scientific idea. And if that idea starts being questioned, their position becomes more tenuous. Nobody wants their livelihood rendered more tenuous.

WORLD: Do you think that's their primary motivation?

STEIN: No. I also think they don't want there to be a God because if there's a God they're going to be judged, and they don't want to be judged. And I don't blame them for that — that's sort of standard for human nature. But what we would like is for people who do have a belief in God to be able to express themselves without getting pushed out of their schools and jobs.
— interview by *World*, April 19, 2008

We don't see any reason why you surrender your free speech rights and your free inquiry rights when you pick up your registration card in high school or college.

— press conference at Missouri state capitol, April 3, 2008

Neo-Darwinists ask us to believe in things not seen. We're not supposed to have an established religion in America, but we do, and it's called Darwinism.

— Citizen Link: Friday Five: Actor Ben Stein, April 4, 2008

... ["Intelligent design"] is] an effort to try to fill in some very obvious gaps.
— interview on *The O'Reilly Factor*, October 22, 2007

ON ADVANCEMENTS IN SCIENCE

And there hasn't been much progress in Darwinism since [the life of Darwin].

— interview on the Glenn Beck show, November 13, 2007

ON DARWIN'S HISTORICAL INFLUENCE

Darwinism led — in a pretty much straight line — to Nazism and the Holocaust.

— quoted by Ken Ham, *Crosswalk*, April 15, 2008

Darwinism is not a sufficient condition for the Holocaust, but it is a necessary condition.

— quoted in *Florida Baptist Witness*, February 28, 2008

Well, the issue with that Darwinism, which is a brilliant theory, and a great, great relic of the Age of Imperialism in the 19th century, basically said that mankind evolved from apes, and monkeys, and primitive cells, and so forth.

— interview on *The O'Reilly Factor*, October 22, 2007

Hitler was a lineal descendent of Darwin.

— interview on *Hannity & Colmes*, April 11, 2008

ON GENETIC INFORMATION

We drove through hellacious traffic between Paris and Brussels to interview a very famous Polish geneticist, who was in Brussels with the European Parliament. He made a point so brilliant, I've never heard anyone even come close to repeating this point. He said, "In random mutation and natural selection, genetic material is destroyed. But to advance and make a more sophisticated human being, you have to add to genetic material. So, how can you both destroy genetic material by random mutation and natural selection and have a more advanced creature by the addition of DNA?" So, nobody's ever answered that even remotely.

— interview with Jerry Newcombe, April 3, 2008, circulated via e-mail by Coral Ridge Ministries

Darwinism asks us to believe that you can destroy genetic material through random mutation and natural selection and yet end up with more genetic material.

— Assist News Service, April 10, 2008

ON SCIENCE AND MORALITY

If you're a purely materialistic naturalist you would have no objection [to the Holocaust] because no human life has any meaning.

— interview on the Dennis Prager syndicated radio program, April 15, 2008, 3rd hour, about 15:30 into the program

Anyway, I couldn't give a [profanity] whether a person calls himself a scientist. It doesn't earn any extra respect from me, because it's not as if science has covered itself with glory, morally, in my time. Scientists were the people in Germany telling Hitler that it was a good idea to kill all the Jews. Scientists were telling Stalin it was a good idea to wipe out the middle-class peasants. Scientists were telling Mao Tse-Tung it was fine to kill 50 million people in order to further the revolution.

— interview by *Christianity Today*, April 15, 2008

ON SCIENCE AND RELIGION

Einstein worked within the framework of believing there was a God. Newton worked within the framework of believing there was a God.

For gosh sakes, Darwin worked within the framework of believing there was a God. And yet, somehow today you're not allowed to believe in it. Why can't we have as much freedom as Darwin had?

— interview on *The O'Reilly Factor*, October 22, 2007

Some of the greatest scientists of all time, including Galileo, Newton, Einstein, operated under the hypothesis that their work was to understand the principles and phenomena as designed by a creator.

— *Expelled* blog entry "Ben Stein's Introductory Blog," August 21, 2007

And for me, it's pretty clear-cut that until we learn some better explanation for how life began, there is a God who always existed and created the heavens and the earth. And until somebody gives me a better explanation, I'll go for it.

— interview with *Christianity Today*, April 15, 2008

ON SPECIATION

And aside from modification within species, I don't think anyone has ever been able to prove one species that evolved by Darwinian means. It's incomprehensible to me how Darwinism could explain something as complex as the organic cell, and it's incomprehensible to me how Darwinism could explain how life began. And they don't even try.

— interview with *Christianity Today*, April 15, 2008

Despite the fact that no one has ever been able to prove the creation of a single distinct species by Darwinist means, Darwinism dominates the academy and the media.

— "Darwinism: The imperialism of biology?" article in *Baptist Press*, April 4, 2008

And I was just overwhelmed by the fact, at least as I am told, that Darwinists have never observed natural species being originated.

— interview with *CNS News*, January 17, 2008

ON THE HISTORY OF LIFE

Darwinism asks us to believe that one day there was nothing but mud and ooze, and the next day there was life, and very soon after there was intelligent life.

— Assist News Service, April 10, 2008

ON THE ORIGIN OF LIFE

Evolutionism, as taught by

Darwinism, has nothing — nothing — to say about how life originated.

— interview on *CNN: Impolite Conversation*, April 18, 2008

But when I talk to people who are Darwinists or evolutionists and say, "Well, how did life begin" — they're ... they don't have an answer. I mean, they have an answer, but it's a BS answer. It's an answer that wouldn't make sense to a small child.

— interview on the Glenn Beck show, November 13, 2007

Darwinism also has not one meaningful word to say on the origins of organic life, a striking lacuna in a theory supposedly explaining life.

— *Expelled* blog entry "Darwinism: The imperialism of biology?", October 31, 2007

ON WHAT EVOLUTION EXPLAINS

Darwinism explains so little. It doesn't explain how life began. It doesn't explain how gravity works to keep the planets in their orbits. It doesn't explain how thermodynamics works. It doesn't explain how physics or the laws of motion work.

— interview on Pat Robertson's *700 Club*, March 17, 2008

Darwinism doesn't explain where gravity comes from. It doesn't explain where thermodynamics comes from. It doesn't explain where the laws of physics come from. It doesn't explain where matter came from.

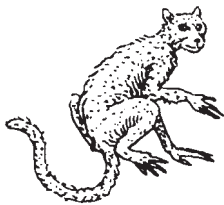
— interview on Beliefnet, no date

We were concerned that Darwinism, which is a brilliant theory, just beyond words brilliant, and explains a great deal about microevolution [within] species, was being taught as the only scientific explanation for creation, for development of life, for development from inorganic to organic matter, for explanation of every kind of science. Even astronomy, even physics, even thermodynamics.

— press conference at Missouri State Capitol, April 3, 2008

And I would say to these people, well, how did life begin? "We don't know, but it had to be by Darwinian means." Well, how did gravity begin? "We don't know, but it had to be by Darwinian means."

— interview on Fox News, no date



Trouble Ahead for Science

Kenneth R Miller

American science is in trouble, and if you wonder why, just go to the movies. Popular culture is gradually turning against science, and Ben Stein's new movie, *Expelled*, is helping to push it along.

"Intelligent design", the relabeled, repackaged form of American creationism, has always had a problem. It just cannot seem to produce any evidence. To scientists, the reasons for this are obvious. To conservative *Washington Post* columnist Charles Krauthammer, "intelligent design" is nothing more than a "phony theory". No data, no science, no experiments, just an attempt to sneak a narrow set of religious views into US classrooms.

Advocates of "intelligent design" needed a story to explain why the idea has been a nonstarter within the scientific community, and Ben Stein has given it to them. The story line is that "intelligent design" advocates are persecuted and suppressed. *Expelled* tells of this terrible campaign against free expression, and mocks the pretensions of the closed-minded scientific elite supposedly behind it.

There are many things wrong with this movie. One example: Viewers are told that Dr Richard Sternberg lost his job at the Smithsonian Institution because he edited a paper favorable to "intelligent design". Wrong.

Sternberg was not even employed by the Smithsonian (he had no job to lose) and he had

resigned as journal editor six months *before* the paper was published. In fact, the irony is that neither Steinberg nor any of the other people featured as "martyrs" in *Expelled* lost jobs as a result of their advocacy of "intelligent design", while many others who supported evolution have. In 2007, Chris Comer, the director of science education for Texas schools, was fired for having done nothing more than forwarding an e-mail announcing a pro-evolution seminar.

The movie also uses interviews with avowed atheists like Richard Dawkins, author of *The God Delusion*, to argue that scientific establishment is vehemently anti-God. Never mind that 40 percent of the members of the American Association for the Advancement of Science profess belief in a personal God. Stein, avoiding these 50 000 people, tells viewers that "Darwinists" do not allow scientists to even think of God.

Puzzled, the editors of *Scientific American* asked Mark Mathis, the film's co-producer, why he and Stein did not interview such people, like Francis Collins (head of the Human Genome Project), Francisco Ayala, or myself. Mathis cited me by name, saying "Ken Miller would have confused the film unnecessarily." In other words, showing a scientist who accepts both God and evolution would have confused their story line.

Despite these falsehoods, by far the film's most outlandish misrepresentation is its linkage of Darwin with the Holocaust. A concentration camp tour guide tells Stein that the Nazis were practicing "Darwinism", and that's that. Never mind those belt buckles proclaiming *Gott mit uns* (God is with us), the toxic anti-Semitism of Martin Luther, the ghettos, and murderous

pogroms in Christian Europe centuries before Darwin's birth. No matter. It is all the fault of evolution.

Why is all this nonsense a threat to science? The reason is Stein's libelous conclusion that science is simply evil. In an April 21 interview on the Trinity Broadcast Network, Stein called the Nazi murder of children "horrifying beyond words." Indeed. But what led to such horrors? Stein explained: "that's where science in my opinion, this is just an opinion, that's where science leads you. Love of God and compassion and empathy leads you to a very glorious place. Science leads you to killing people."

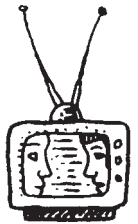
According to Stein, science leads you to "killing people". Not to cures and vaccines, not to a deeper understanding of nature, not to wonders like computers and cell phones, and certainly not to a better life. Nope. Science is murder.

Expelled is a shoddy piece of propaganda that props up the failures of "intelligent design" by playing the victim card. It deceives its audiences, slanders the scientific community, and contributes mightily to a climate of hostility to science itself. Stein is doing nothing less than helping turn a generation of American youth away from science. If we actually come to believe that science leads to murder, then we deserve to lose world leadership in science. In that sense, the word "expelled" may have a different and more tragic connotation for our country than Stein intended.

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EXPULSED

and the Reviewers *Glenn Branch*

The creationist propaganda movie *Expelled* was anything but a critical favorite, with the Rotten Tomatoes movie review website reporting that only 10% of reviews (4 of 40) were favorable and summarizing the critical consensus as “Full of patronizing, poorly structured arguments, *Expelled* is a cynical political stunt in the guise of a documentary” (<http://www.rottentomatoes.com/m/expelled_no_intelligence_allowed/>).

Not surprisingly, reviewers who were already familiar with, or took the time to investigate, the “intelligent design” movement and its claims saw through *Expelled*. Reviewers who took the film on its own merits were generally unimpressed, although they sometimes worried that there might be a grain of truth in the complaints of the “martyrs” featured in the movie. And, of course, reviewers who were predisposed to accept the claims of *Expelled* were effusive in their praise.

A summary of the reviews would be lengthy and repetitive, but there are a few reviews that deserve special notice — because they were particularly informative and complete, or because they appeared in particularly influential publications, or because they were particularly fine examples of the same rhetorical excess in which *Expelled* indulged. (Not included here are organizational statements about or reactions to *Expelled*, whether favorable or unfavorable; for these, see p 52).

INFORMED REVIEWS

Dan Whipple was perhaps the first journalist to review *Expelled*, having been invited (“probably by mistake,” he wrote) to a preliminary screening. His preliminary review appeared in *Colorado Confidential* (2007 Dec 16; available on-line via <<http://www.coloradoconfidential.com/tag.do?tag=Expelled>>), and he continued to keep his eye on

Expelled, publishing a detailed review in *Skeptical Inquirer* (2008 May/June; 32 [3]: 52–3).

After attending a preliminary screening in Minneapolis, Richard Dawkins, who was himself interviewed for *Expelled* under false pretenses (see p 24), discussed the screening and the film in a post on his website (2008 Mar 23; available on-line at <<http://richarddawkins.net/article,2394,Lying-for-Jesus,Richard-Dawkins>>) with his characteristic brio: “Quite apart from anything else, it is dreadfully boring, the tedium exacerbated by the grating monotony of Stein’s voice.”

Most extensive, and most impressive, was *Scientific American’s* package of reviews and commentary (available on-line at <<http://www.sciam.com/article.cfm?id=sciam-reviews-expelled>>). At its center was a lengthy review by Michael Shermer, who like Dawkins was interviewed for *Expelled* under false pretenses. Also included were a review by *Scientific American’s* editor John Rennie and a lengthy, and revealing, discussion with *Expelled’s* associate producer Mark Mathis.

Lauri Lebo, a journalist who covered *Kitzmiller v Dover* for the *York Daily Record* and then wrote a book, *The Devil in Dover* (New York: The New Press, 2008), about the trial, reviewed *Expelled* for AlterNet (2008 Apr 24; available on-line at <<http://www.alternet.org/movies/83427/>>), writing that it is “a slick misleading piece of shrill propaganda. ... It exploits both the concept of democracy and the victims of the Holocaust.”

MAINSTREAM REVIEWS

Time’s reviewer Jeffrey Kluger (2008 Apr 10; available on-line at <<http://www.time.com/time/magazine/article/0,9171,1729703,00.html>>) was intrigued by the tales of martyrdom (“if there’s anything to it at all, it’s a matter well worth exposing”) and critical of evolutionary biologists espousing “sneering, finger-in-the-eye atheism,” but dismissive of the movie’s scientific claims and even more so of its attempt to link

Darwin to euthanasia, abortion, eugenics, and Nazism.

Variety’s review (2008 Apr 11; available on-line at <<http://www.variety.com/review/VE1117936783.html?categoryid=31&cs=1>>) began unpromisingly — “There’s an intelligent case to be made for intelligent design” — but was critical of the film’s style and claims, especially regarding its attempt to link evolution and the Holocaust, which it described as offensive and fatuous. The review added, slangily and punningly, that the film “will be a natural selection for Christian audiences.”

The New York Times’s reviewer Jeanette Catsoulis (2008 Apr 18; available on-line at <<http://movies.nytimes.com/2008/04/18/movies/18expe.html>>) hit the nail on the head: “One of the sleaziest documentaries to arrive in a very long time, *Expelled: No Intelligence Allowed* is a conspiracy-theory rant masquerading as investigative inquiry ... the only expulsion here is of reason itself.”

The *Los Angeles Times’s* Mark Olsen was dismissive in his review (2008 Apr 18; available on-line at <<http://articles.latimes.com/2008/apr/18/entertainment/et-expelled18>>), recommending that *Expelled* be viewed as “a tiresome ideological bludgeon, an attempt to deceive audiences into believing it is one thing when it is, in fact, quite another.” “As a work of nonfiction filmmaking it is a sham,” he concluded, “and as agitprop it is too flimsy to strike any serious blows.”

FAVORABLE REVIEWS

Tom Bethell, a veteran anti-evolutionist, wrote in the *American Spectator* (2008 Feb; 41 [1]: 54–5; available on-line at <http://www.spectator.org/dsp_article.asp?article_id=12759>) that *Expelled* “is surely the best thing ever done on this issue, in any medium. At moments it brought tears of joy to my eyes. I have written about this controversy for over 30 years and by the movie’s end I felt that those of us who have insisted that Darwinism is a sorry mess and that life surely was designed are going to prevail.”

Glenn Branch is NCSE’s deputy director.

Creationist Culture Wars, Hollywood Style

Robert T Pennock

Forget about Hollywood liberals. It is the religious right that is blazing the new trails in making Hollywood serve politics, as seen in the current movie-legislation one-two punch from creationist activists in Michigan and elsewhere.

The movie is *Expelled: No Intelligence Allowed*. With Ben Stein ("Bueller?!") as the bad boy narrator, *Expelled* purports to reveal a sinister pattern of atheistic prejudice, whereby the "Darwinian Machine" in the academy spits out anyone who dares to suggest that God, not evolution, created biological complexity. In addition to interviewing key figures of the "intelligent design" (ID) creationist movement, all affiliated with Seattle's Discovery Institute (DI), Stein presents several academic martyrs who purportedly lost jobs for even mentioning ID. As Stein spins it, the Goliath of "Big Science" is stomping on the freedom of speech of these courageous Davids.

Robert T Pennock is Professor of Philosophy at Michigan State University and the author of *Tower of Babel: The Evidence against the New Creationism* (Cambridge [MA]: MIT Press, 1999). He received NCSE's Friend of Darwin award in 2003.

The legislation comes in the form of so-called "Academic Freedom" bills, which aim to protect public school teachers who want to introduce "scientific" views like ID into their classrooms to challenge evolution. A half-dozen of these bills have been introduced around the country to coincide with *Expelled*, including one in Michigan (HB 6027) by Rep John Moolenaar, R-Midland, who has sponsored several pro-ID bills in the past. These bills are meant to give David his slingshot.

I enjoy an underdog fantasy tale as much as the next movie-goer, but not when my kids' education is on the line. This is not *Star Wars*; these are the culture wars. Unable to earn a place in science honestly, creationists are using a deceptive propaganda film and insider political connections to get into science classes by stealth.

In *Expelled*, the deception began early. Scientists like Richard Dawkins were snookered into appearing in the film, having been solicited to be interviewed for what was purported to be a documentary called *Crossroads: The Intersection of Science and Religion* that was to examine the interplay of science and religion in America. Stein has denied that any-

one was deceived and implied that no one even asked about what the film was about. Not so.

How do I know? Because I received the same solicitation and was interviewed by *Expelled* producer Mark Mathis, though he never mentioned that name or Stein's involvement. I questioned Mathis in detail about his production company, the nature of the *Crossroads* documentary and plans for its distribution before agreeing to be interviewed for it. I now know that his answers were misleading and dishonest.

What did Mathis want to interview me about? Why, he asked, can't ID be discussed in the academy? In retrospect, I see how this question fit with *Expelled*'s message, but at the time I simply thought that he was new to the topic and misinformed. I explained that in fact ID has been given very careful consideration in the academy for more than 15 years. It has been the subject of numerous symposia, academic talks and university courses. ID advocates have been invited to speak at universities, professional conferences and in college classrooms. Their views have been published and discussed in dozens of academic books and hundreds of articles.

The conclusion of all this discussion? That ID is not science but just creationism in a new disguise. It is no surprise that *Expelled* says nothing about the "science" of ID

In *World* (2008 Apr 5; 23 [7]; available on-line at <<http://www.worldmag.com/articles/13903>>, Marvin Olasky wrote that *Expelled* "is perfect for adults and children of middle-school age or above: It should be rated R not for sex or violence but for being reasonable, radical, risible, and right," and endorsed the claim that "Darwinism bulwark[ed] Hitlerian hatred by providing a scientific rationale for killing those considered less fit in the struggle for survival."

In the *Baptist Witness* (2008 Apr 18; available on-line at <<http://>

www.bpnews.net/BPFirstPerson.asp?ID=27872>, "intelligent design" proponent William Dembski acknowledged that the scientific establishment is not likely to be convinced by *Expelled*, but added, "The unwashed masses, in which I place myself, will love the film." He concluded, "When future intellectual historians describe the key events that led to the fall of 'Darwin's Wall,' Ben Stein's *Expelled* will top the list."

Writing in the *California Catholic Daily* (2008 Apr 26; available on-line at <<http://www.calcatholic.com/news/newsArticle.aspx?id=38c958afe3dd-4c92-b28b-f8db9ba4c172>>), Matthew Lickona and Ernie Grimm discussed the film, with Grimm wholeheartedly endorsing its claims and going beyond: "The Darwinists even have their own Gestapo in the National Center for Science Education led by a modern day Heinrich Himmler named Eugenie Scott."

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besides the claim that God is responsible for life, for ID has no positive evidence to present. Like previous forms of creationism, ID is nothing more than an attempt to poke holes in evolution. Their arguments have been dissected and dismissed. The truth is, ID was not expelled; it flunked out.

I also explained to Mathis how ID advocates misrepresent evolutionary science as equivalent to atheism. Science is no more atheistic than plumbing. Science cannot test God and so cannot include God in its explanations, but that does not mean that science and belief in God are incompatible. Indeed, the dominant theological view accepts that God could have created using evolution. But ID explicitly rejects theistic evolution. The untold story is that mainstream religious critics of ID are as dismissive of them for theological reasons as scientists are for scientific reasons. Mathis ignored this information.

Apparently the truth did not fit with the good-vs-evil tale of closed-minded atheistic science that they were fabricating. After my phone interview, Mathis never called back to set up the film interview. The movie presents only scientists like Dawkins who are avowed atheists and never mentions the scientific problems with ID or its many religious critics. Such dishonesty runs all through the film. What about the *Expelled* martyrs who supposedly lost their jobs for questioning evolution and mentioning ID? *Expelled* Exposed documents those and other falsehoods as well.

The "Academic Freedom" bills are similarly dishonest. They are a ruse to get ID creationism in without using the name. Rep Moolenaar and other ID advocates in the [Michigan] Legislature have introduced a series of bills over the last eight years aimed to get ID in public schools. Early bills introduced ID explicitly, but recent ones follow the new DI strategy of just calling for "critical evaluation" of evolution. DI Fellow Ralph Seelke was brought to Lansing to speak on behalf of the last such bill. It has nothing to do with ID, he testified, but in the very next breath spoke of how it would allow students to learn important arguments against evolution such as those of Michael Behe. Come

again? Not about ID? Behe is another DI Fellow, and one of the most prominent ID creationists. The bills may speak of free speech, but their goal is to bring in ID and to undermine evolutionary science.

But is it really wise to paint science as a Goliath to be slain? Toppling science will be great for Michigan's economy, won't it? In 2002, *Forbes* magazine printed an acerbic article titled "How to Ruin American Enterprise" that looks like a primer for the anti-science nonsense pushed in *Expelled* and the "Academic Freedom" bills. It begins by suggesting that we allow schools to fall into decay: "Do not expect students to know the basics of mathematics, chemistry and physics. ... Destroy the knowledge base on which all of mankind's scientific progress has been built ..." It concludes by suggesting that we "elevate mysticism, tribalism, shamanism and fundamentalism ... to an equal status with technology in the public mind" and "act as if science were on an equal footing with voodoo." Ironically, the author of that article was Ben Stein. Perhaps TV game-show contestants won too much of his money and he hopes to boost his overseas investments.

Is this an exaggeration? Is ID creationism really so extreme? Sadly, *Expelled* is only the tip of the iceberg. ID creationists blame evolution for everything from the undermining of social morality to product liability laws. Creationists regularly link evolution with communism. *Expelled* does this in a particularly ham-handed way, speaking of scientists as conspiring like "comrades" and repeatedly flashing images of the Berlin Wall.

And no ideological rant (or Hollywood fantasy) would be complete without linking one's enemies to the Nazis. The climactic section of the movie does just that, blaming Darwinian evolution for Hitler's atrocities, as Stein tours German concentration camps and replays horrific images of the piles of the Dachau dead. Darwinism was a necessary condition for the Holocaust, claims DI Fellow David Berlinski in *Expelled* — without evolutionary science it would not have happened. In an interview last week on Trinity Broadcasting Network, Stein emphasized this central point of the movie. The

Holocaust is "where science leads you" he opined. "Love of God and compassion and empathy leads you to a very glorious place, and science leads you to killing people."

It is hard to know how to respond in a civil manner to such ignorant extremism. Evolution caused the Holocaust? Science leads you to killing people? Is this really the kind of thing we want to be teaching kids in science classes? Such a view deserves to be expelled.

There are signs that Americans have had enough of this kind of zealotry. A massive campaign by the same firm that marketed *The Passion of the Christ* may have brought out fundamentalists for a while, but I had the theater entirely to myself when I watched *Expelled* just two weeks after it opened. Even political conservatives — most recently Dinesh D'Souza, joining George Will and Charles Krauthammer — are distancing themselves as they learn more about the nature of the ID movement. In a recent *National Review* article about *Expelled*, conservative commentator John Derbyshire minced no words in identifying ID advocates as "liars and fools." And in a federal court case that tested a pro-ID school policy, a Bush-appointed Republican judge listened to ID advocates present their best case and concluded that including ID was not only unconstitutional but nothing less than "breathtaking inanity." Of the six "Academic Freedom" bills, the ones in Alabama, Florida and Missouri have already failed.

Let us hope that Michigan legislators are not deceived by Stein's propaganda and Moolenaar's deceptively named bill. With freedom comes responsibility, and it would be the height of academic irresponsibility to allow the shameful dishonesty that is ID creationism into Michigan science classrooms.

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Does *Expelled* Belong in the Science Classroom?

Kevin Fisher

Expelled was released recently on DVD, so it is now widely available. Since most states' science education standards require the science curriculum to explore the role of science (and scientists) in our society and the impact of scientific ideas, it is reasonable for educators to ask whether viewing the film in science classes would be a valid learning experience for students. The quick answer is a resounding "No!"; an answer that is not a simple uninformed bias against "intelligent design" but the result of assessing the film for integrity, scientific accuracy, and, most important, the education of the students entrusted to us in our classrooms.

INTEGRITY

Expelled failed in the first category even before it was filmed: participation by scientists was secured under false pretenses (see p 12). Scientists were told they were being interviewed for a documentary entitled *Crossroads* examining conflicts between science and religion. By this time, the domain name used for the film (<<http://expelledthemovie.com>>) had been secured, so the producers clearly had already decided that the movie would be different from what they originally described.

The film also fails because it claims that legitimate scientific research is being blocked by "Darwinists" and that proponents of "intelligent design" are being unfairly excluded from universities, research centers, and public discourse on the sciences simply because they support "intelligent design". However, as many items in this issue show, the "facts" on which these claims rest are misconstrued. The "martyrs" of ID are not *participating* in the process of scientific research, and so they have excluded *themselves* from the scientific research community.

ACCURACY

The film promises to explain "intelligent design" and give supporting evi-

dence. It also boasts that it will show fatal flaws in the evidence for evolution. Does *Expelled* really have something new to offer, or are tired old half-truths repeated and embellished?

Instead of examining the "science" of ID, the first half of the film examines the cases of "martyrs" allegedly fired by their employers for nothing more than supporting "intelligent design" or merely questioning "Darwinism" (see p 31-40). These cases may make for interesting viewing, but there is nothing here that either explains ID or shows any evidence in its support. This is the first warning bell for a science educator: Where is the science that the film promises to deliver?

The second half of the film simply denigrates scientists by portraying them as atheists. But not one of the 40% of scientists who profess a religious faith was in the film; nor were their perspectives mentioned. Neither was there any discussion of the many religious denominations that reject ID, but accept evolution. But if ID is a scientific — and not a religious — proposition with its own scientific evidence — as it claims — then why is atheism even an issue?

The most astonishing and insulting part of the film blames an atheistic evolution for the Holocaust. In a powerful emotional presentation, the film overlooks one basic historical fact: German soldiers had the phrase, "*Gott mit uns*" (God is with us), on their belt buckles. Where is the tie-in to evolution or atheism in that phrase?

EFFECTS ON STUDENTS

What will students understand if they watch this film in school? *Expelled* implies there is a controversy as to whether evolution can produce complexity and diversity in life. The real controversy among scientists, however, is about competing models that explain *evolutionary* change and their roles in particular cases. This discussion can be stimulating, but it is usually outside the scope of a K-12 science classroom — mostly because none of the alternative models would change the content taught in these classrooms or how it was presented. A science educator buying into this "controversy" would give students the false impression that evolution itself was

in question, instead of just the details of how evolutionary changes produce diversity and complexity.

More obvious is the outrageous claim that scientists suppress new ideas that challenge mainstream science. Any new idea is subjected to scientific testing and peer review. Only if it survives does it become part of the scientific consensus, and only then will it enter textbooks and classrooms. Non-Darwinian models now common in K-12 texts are clear evidence that science is open to new ideas that have the research record to back them up.

STILL UNDECIDED?

Consider the potentially catastrophic educational effects of the pseudoscience in *Expelled*. In *Only a Theory: Evolution and the Battle for America's Soul* (New York: Viking, 2008), NCSE Supporter Kenneth R Miller writes: "the choice we face is whether we will continue to be the world's scientific leader or quietly watch as the torch of discovery is lifted from our hands. The message that these attacks send is that proven scientific processes, methods, and well tested theories are not to be trusted; an entire generation of students will reject all of science, not just certain tenets."

It is offensive and dangerous when a false controversy is manufactured for the purposes of subverting sound science education. Students deserve nothing less than a 21st-century science education, which scientists uniformly agree includes evolution, presented in an uncompromised fashion. *Expelled* would push science education back into the 30s — the 1530s.

Expelled claimed it would define "design", present evidence for ID, and offer a devastating rebuke of evolution. Instead, *Expelled* delivers a muddled, distorted vision of science, scientists, and evolution that will confuse and mislead students with its slick, polished presentation and empty intellectual calories.

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BIOLOGICAL LIVES

With the bicentennial of Darwin's birth and the sesquicentennial of the publication of the *Origin of Species* imminent, the tendency to refer to evolution as "Darwinism" and as evolutionary scientists as "Darwinists" is almost irresistible. But it is no disrespect to Darwin and his monumental achievements to observe that identifying him with evolution is a bad idea. It is inaccurate; it confirms the creationist rhetoric of talking about "Darwinism" as if the evolutionary sciences are supported only by the whimsy of a single man; and, perhaps most important, it overlooks the contributions of the men and women who have toiled over the centuries to add their mite of knowledge to our scientific understanding of the natural world. Recommended here are a sampling of biographies about, and autobiographies by, a few of the scientists who have so advanced our understanding. The following books are now available through the NCSE web site: <<http://www.ncseweb.org/store>> — look in the "In the latest RNCSE" section. And remember, every purchase benefits NCSE!



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

BEFORE DARWIN

Linnaeus: The Compleat Naturalist

Wilfrid Blunt

Lavishly illustrated and enlivened by a host of vivid passages from Linnaeus's own work, Wilfrid Blunt's biography, originally published in 1971, gives a fascinating and rounded portrait of the developer of the *Systema Naturae*, Linnaeus's ambitious and seminal project of systematic taxonomy. The eminent botanist William T Stearn provides an introduction and an appendix on Linnaean classification, nomenclature, and method. "This evocative account of Linnaeus's life and achievements has become a natural history classic," writes Janet Browne. "Wilfrid Blunt beautifully captures Linnaeus's zest for botany and its key place in the intellectual ferment of the eighteenth century."

The Spirit of System: Lamarck and Evolutionary Biology
by Richard W Burkhardt Jr

A definitive study of Jean-Baptiste Lamarck, often credited as the first scientist to develop a truly coherent evolutionary theory, Richard W Burkhardt Jr's *The Spirit of System* considers Lamarck and his achievements in their own context, rather

than as a mere, and misguided, anticipation of Darwin. Praising the revised edition, Michael Ruse wrote, "*The Spirit of System* was a classic from its first appearance. It was and still is simply the definitive account of the great French founder of evolutionary biology. ... Burkhardt's remains the one essential volume that one must read on the topic."

Erasmus Darwin: A Life of Unequalled Achievement
by Desmond King-Hele

Physician, botanist, inventor, physiologist, and poet, the polymath Erasmus Darwin is also noteworthy for anticipating the scientific theory of evolution — complete with a recognition of the fossil record, the reality of extinction, and the immense age of the earth. The reviewer for *Nature* wrote of Desmond King-Hele's thorough biography, "Few scientific lives have ever been so carefully and thoughtfully examined. There are no final words in history, but this is a biography for which the word definitive can be aptly applied." King-Hele is also the editor of Charles Darwin's *The Life of Erasmus Darwin*.

Buffon: A Life in Natural History
by Jacques Roger

"If a man's destiny were written in

his origins or his heredity, Buffon would have died president of the Burgundy parlement," Jacques Roger begins his biography of Georges-Louis Leclerc, Comte de Buffon and the premier French scientist of the Enlightenment. "That he had a passion for the sciences and became the greatest French naturalist is a sort of joke of nature, the result of a personal calling, and ultimately inexplicable." The reviewer for *American Zoologist* wrote, "*Buffon* is a work of great charm, interest, and importance. Anyone wanting to know about the life sciences in the eighteenth century will find it exceptionally rewarding."

IN DARWIN'S DAY

Huxley: From Devil's Disciple to Evolution's High Priest
by Adrian Desmond

A lively and definitive biography of Thomas Henry Huxley. Not merely Darwin's bulldog, Huxley was also instrumental in promoting the public understanding of science and in establishing science as a profession. Writes the reviewer for the *New York Times Book Review*, "Desmond moves briskly and wittily through the entertaining events of Huxley's life ... Desmond writes on the public and scientific life



with gusto and skill, offering himself up, unwittingly, as a competitor to his subject in the art of inventing one-liners and telling phrases." Adrian Desmond is also the coauthor (with James Moore) of *Darwin: The Life of a Tormented Evolutionist*.

The Monk in the Garden

by Robin Marantz Henig

From the publisher: "The perplexing silence that greeted Mendel's discovery and his ultimate canonization as the father of genetics make up a tale of intrigue, jealousy, and a healthy dose of bad timing. Telling the story as it has never been told before, Robin Henig crafts a suspenseful, elegant, and richly detailed narrative that fully evokes Mendel's life and work and the fate of his ideas as they made their perilous way toward the light of day. *The Monk in the Garden* is a literary tour de force about a little-known chapter in the history of science, and it brings us back to the birth of genetics — a field that continues to challenge the way we think about life itself."

The Tragic Sense of Life

by Robert J Richards

Subtitled "Ernst Haeckel and the Struggle over Evolutionary Thought," *The Tragic Sense of Life* offers not only a biography of Haeckel, who was the foremost champion on evolution in Germany before World War I, but also a meticulous examination of his impact on biology and politics. The reviewer for the *Times Literary Supplement* writes, "*The Tragic Sense of Life* is an immensely impressive work of biography and intellectual history, and a fitting testament to a complex and contradictory character, a 'polymorphic scientist-artist-adventurer'. Richards succeeds brilliantly in re-establishing Haeckel as a significant scientist and a major figure in the history of evolutionary thought."

In Darwin's Shadow: The Life and Science of Alfred Russel Wallace

by Michael Shermer

Reviewing *In Darwin's Shadow* for *RNCSE* (2003 Mar/Apr; 23 [2]: 36-7), Aubrey Manning wrote, "This is a distinguished and scholarly biography with excellent coverage of the science. Shermer is concerned with the history of evolutionary ideas and uses the interaction between Wallace, Darwin, and others to great effect. He goes beyond this to examine the extraordinary range of Wallace's interests and how they came to dominate different stages of his life." A prolific author and a regular columnist for *Scientific American*, Michael Shermer is also the founder of the Skeptics Society and the publisher of *Skeptic* magazine.

AFTER DARWIN

Lives of a Biologist: Adventures in a Century of Extraordinary Science

by John Tyler Bonner

From the publisher: "Part autobiography, part history of the extraordinary transformation of biology in his time, Bonner's book is truly a life in science, the story of what it is to be a biologist observing the unfolding of the intricacies of life itself. Bonner's scientific interests are nearly as varied as the concerns of biology, ranging from animal culture to evolution, from life cycles to the development of slime molds." "If you like biology, biography, and history of science and don't mind having fun reading it, then this book is for you," writes Mary Jane West-Eberhard.

A Feeling for the Organism

by Evelyn Fox Keller

A scant five months after the original publication of Evelyn Fox

Keller's biography of her in 1983, Barbara McClintock won the Nobel Prize for her discovery of mobile genetic elements — transposons, or "jumping genes". As Rollin Hotchkiss writes in the foreword, "Keller's calm recital of how McClintock faced professional gender hurdles and prejudices is factual reportage that can give every reader, male or female, a vicarious experience of these problems. Moreover, her analysis of McClintock's scientific work — in its broad context — describes some difficult aspects of modern genetics and itself constitutes a significant contribution to the broad history of thought."

Sewall Wright and Evolutionary Biology

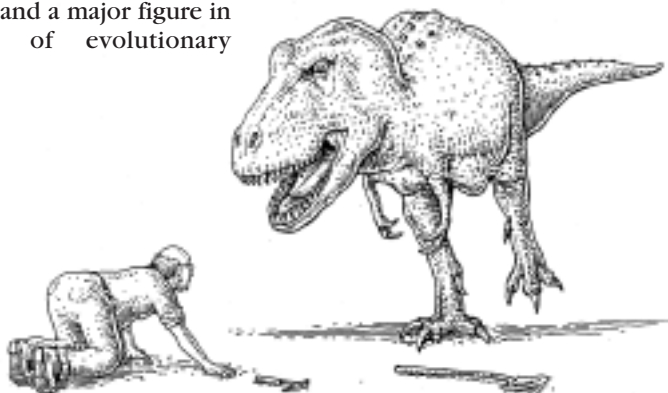
by William B Provine

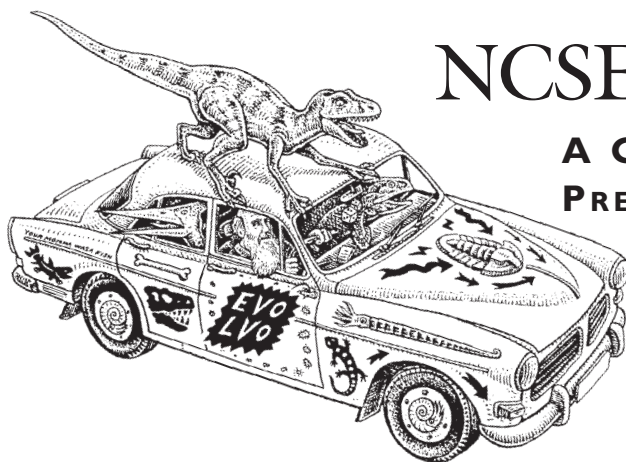
In *Sewall Wright and Evolutionary Biology*, William B Provine offers a massive (545 pages) biography of and testament to the work of Sewall Wright, who, together with RA Fisher and JBS Haldane, founded modern theoretical population genetics. The book was praised by Stephen Jay Gould, writing in *Isis*, as "the finest intellectual biography available for any twentieth-century evolutionist. In its wealth of detail and richness of insight it has established a standard for historical work in this field." Several of Wright's seminal papers are included. The author is the Charles A Alexander Professor of Biological Sciences at Cornell University.

Naturalist

by Edward O Wilson

"Most children have a bug period," Edward O Wilson writes in his charming autobiography, *Naturalist*. "I never grew out of mine." He became a distinguished entomologist. But he also became a pioneer of sociobiology, a champion of biodiversity, and a graceful and elegant writer, winning the Pulitzer Prize twice. "In this exquisitely written memoir," wrote the reviewer for *USA Today*, "the famed Harvard scientist looks back at his childhood in the South as well as his career as a groundbreaking thinker in the field of evolutionary biology. Truly, here is the irrefutable proof that scientists have souls."





NCSE on the Road

A CALENDAR OF SPECIAL EVENTS, PRESENTATIONS, AND LECTURES

DATE February 7, 2009
CITY Berkeley CA
PRESENTER Kevin Padian
TITLE Darwin's Scientific Legacy
EVENT Darwin: The Man, His Science, and His Legacy
TIME 10:25 AM
LOCATION Valley Life Sciences Building, University of California
CONTACT Judy Scotchmoor, jscotch@berkeley.edu

DATE February 7, 2009
CITY Berkeley CA
EVENT Darwin: The Man, His Science, and His Legacy
PRESENTER Kevin Padian
TITLE Evolution and "Intelligent Design": A View from the Dover Trial
TIME 2:25 PM
LOCATION Valley Life Sciences Building, University of California
CONTACT Judy Scotchmoor, jscotch@berkeley.edu

DATE February 7, 2009
CITY Berkeley CA
PRESENTER Eugenie C Scott
TITLE What Will the Creationists Do Next?
EVENT Darwin: The Man, His Science, and His Legacy
TIME 3:00 PM
LOCATION Valley Life Sciences Building, University of California
CONTACT Judy Scotchmoor, jscotch@berkeley.edu

DATE February 15, 2009
CITY Albany CA
PRESENTER Steven Newton
TITLE Creationism and Public Education
EVENT Kol Hadash Darwin Day celebration
TIME 10:00 AM
LOCATION Albany Community Center
CONTACT Bernie Rosen, rubybear@pacbell.net

DATE February 28, 2009
CITY Evansville IN
PRESENTER Eugenie C Scott
TITLE Darwin's Legacy in Science and Society
EVENT Public lecture
TIME 7:00 PM
LOCATION Evansville Museum of Arts, History, and Science
CONTACT Mitch Luman, mluman@emuseum.org

Check the NCSE web site for updates and details — <<http://www.ncseweb.org/ncse-events>>.

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MEET THE MARTYRS: Caroline Crocker

Carrie Sager and Andrea Bottaro

Expelled claims that Caroline Crocker was fired because she mentioned “intelligent design” in a class she was teaching. However, the evidence says otherwise. While there may have been grounds to fire her with cause, Crocker was *not* fired and continued to teach her course after student complaints; in addition, she did not just “mention” “intelligent design”, but rather was teaching demonstrably false creationist material. We do not know for certain why Crocker was not re-hired for her temporary, non-tenure track job. Such positions carry no promise that contracts will be renewed. Only tenure-track jobs come with such an expectation, and only tenured professors have a guarantee of employment.

THE CLAIM

“After she simply mentioned ‘intelligent design’ in her cell biology class at George Mason University, Caroline Crocker’s sterling academic career came to an abrupt end.” (Ben Stein, *Expelled*)

“[My supervisor] said ‘nonetheless you have to be disciplined’, and I lost my job.” (Caroline Crocker, *Expelled*)

THE FACTS

Expelled makes it sound as if Crocker was immediately removed (*expelled*, even) from the George Mason University classroom. On the contrary, she completed teaching the course in the normal fashion, even after student complaints and whatever “discipline” followed that meeting with the supervisor.

Crocker’s position at George Mason University (GMU) was a non-tenure track, contract position in which the employee teaches on a course-by-course basis for a set length of time with no guarantee of a renewal. Universities commonly use such “contingent faculty”, and, while not being brought back for another term may be the result of inadequate performance, it most commonly is the result of staffing needs: whether or not an individual’s expertise is needed at a particular time, or whether regular faculty can handle the load for the particular semester. Tenured and tenure track faculty make up only 31.9% of university teaching jobs in the United States (according to a November 13, 2007, story in *Inside Higher Ed*, available at <<http://www.insidehighered.com/views/2007/11/13/hoeller>>), so Crocker’s situation was not unusual. In fact, overlapping with her contract at GMU, she held another contract position to teach at Northern Virginia Community College.

Despite claims of being fired, Crocker was allowed to continue teaching and complete her GMU contract after the department became aware of her “intelligent design” instruction due to student complaints. She was instructed to not teach about “intelligent design” and creation science, which were not part of the curriculum of the courses she had been hired to teach. Academic freedom does not mean the freedom to teach about anything one wants, regardless of the expected content of assigned courses. And, far from having her academic career “come to an abrupt end,” after leaving GMU, Crocker taught at NVCC, and additionally acquired in 2006 a post-doctoral position at the Uniformed

Services University in Bethesda, Maryland, working on T-cell signal transduction — an actual scientific investigation — suggesting that her reputation as a scientist was unaffected by the controversy over “intelligent design”.

THE CLAIM

“Not only did she lose her job at George Mason, this highly qualified researcher suddenly found herself blacklisted, unable to find a job anywhere.” (Ben Stein, *Expelled*)

THE FACTS

Neither *Expelled* nor Crocker offer any basis for the claim that she was blacklisted. Visiting lecturers lead a difficult existence in an era when there are more PhDs being granted than there are tenured positions at universities. If she were blacklisted, we would not expect her to have had regular employment after leaving GMU. But after her contract at GMU ended and the controversy about her teaching methods surfaced, Crocker continued in another adjunct faculty position at Northern Virginia Community College (NVCC), where she continued to teach demonstrably false science, as well as creationism, and was even profiled in an article at the *Washington Post* (2006 Feb 5) to which she willingly contributed.

In January 2006, she began a year as a postdoctoral scientist at the Uniformed Services University, where she did research on and taught molecular biology techniques. Currently, Crocker has a job associated with “intelligent design”: she is employed as the executive director of the Intelligent Design and Evolution Awareness (IDEA) Center, a national “intelligent design” group for students, and, according to her website, offers lectures to “churches and educational institutions” for fees ranging from \$1000 to \$5000.

Carrie Sager is Project Assistant at NCSE. Andrea Bottaro is Assistant Professor of Medicine at the University of Rochester Medical Center, where he works on immunology; with Matt Inlay and Nick Matzke he wrote “Immunology in the spotlight at the Dover ‘Intelligent Design’ trial,” *Nature Immunology* 2006; 7 (5): 433-5.

If she prefers now to work full-time promoting “intelligent design” and her religious views, she is certainly entitled to do so. But that may be a preference rather than a necessity. In any regard, she continued to hold academic jobs after leaving GMU, so she could hardly have been black-listed, nor does she offer any documentation for this very serious charge.

THE CLAIM

“And I said I mentioned ‘intelligent design’ on a couple of slides but I did not teach creationism.” (Caroline Crocker, *Expelled*)

THE FACTS

In the above-mentioned article in the *Washington Post*, Crocker is described teaching her students a laundry list of discredited creationist arguments. In a video on the Coral Ridge Ministries website (available on-line at <<http://www.coralridge.org/medialibrary.asp?mediaId=2799>>), several of Crocker’s slides are shown. Though it is not known whether Crocker used the same slides while teaching at George Mason, the *Washington Post* article provides evidence that they were part of her Northern Virginia Community College lectures. Her use of these slides suggests that Crocker shows either a shocking ignorance of evolutionary science, or a rather shameless willingness to distort the evidence.

The following are just a small sample of her erroneous and clearly creationist claims:

- *Archeopteryx* [*sic*] is a bird (like an Ostrich), not a reptobird
- Only one complete fossil, and has been questioned as a fraud

Archaeopteryx is indeed classified as a bird by scientists, but it is a transitional form because it possesses some traits characteristic of birds and other traits characteristic of the ancestors of birds. Like dinosaurs, it has teeth and a long bony tail, as well as many other characteristics which modern birds lack, but it possesses feathers and other adaptations to flight, like

birds (See <http://www.talkorigins.org/faqs/archaeopteryx/info.html#features>). Note that “reptobird” seems to be a term entirely of Crocker’s invention.

Contrary to what Crocker’s slide suggests, there are several well-preserved *Archaeopteryx* fossils, and while it is true that two non-paleontologists (astronomers) claimed in the 1980s that the original fossil was a fraud, the allegation was quickly disproved. Even Answers in Genesis, the pre-eminent creationist organization, lists this as a creationist argument against evolution that should not be used, because it was so easily disproven.

- *Eobippus* is same as modern-day hyrax

This argument also has a long creationist history, and is equally erroneous. *Eobippus* is an extinct member of the horse family, while the hyrax is a modern, rabbit-sized, mammal living in the Middle East and Africa. The hyrax was part of an early radiation of African mammals and is more closely related to elephants than to horses. Even a brief consideration of skulls makes it clear that these are two completely different animals. The rest of the skeleton and soft tissues also help to differentiate hyraxes from horses.

In another slide, titled “Scientists are confused”, Crocker offers the following quote:

Gould and Eldridge [*sic*] (evolutionists): “There is no validation of the position that speciation causes significant morphological change.”

Gould and Eldredge never wrote these words. Crocker’s dishonest quotation follows from a long tradition of creationists misusing quotations from legitimate scientific sources — a problem we also find in *Expelled*.

Gould and Eldredge actually wrote, “But continuing unhappiness, justified this time, focuses upon claims that speciation causes significant morphological change, for no validation of such a position has emerged” (“Punctuated equilibrium comes of age,” *Nature* 1993; 366: 223–7). In other words, there is a question of the order in

which speciation and physical diversification take place, not “confusion” over whether any link exists between such diversification and speciation. Crocker’s erroneous quotation and mischaracterization of the authors’ intent show poor scholarship, and encourage her students to misunderstand key concepts.

The *Washington Post* article discussing Crocker’s lecture at Northern Virginia Community College reveals her relying upon several more creationist talking points, all of which have been thoroughly debunked. These include:

Crocker “told the students there were two kinds of evolution: microevolution and macroevolution. Microevolution ... easily seen in any microbiology lab ... is ... quite different from macroevolution. No one has ever seen a dog turn into a cat in a laboratory.”

No evolutionary biologist ever proposed that “dogs turn into cats in a laboratory”, and ironically, this would be disproof of evolution! Such rapid changes are exactly contrary to any expectation of evolutionary processes. Dogs and cats do share a common ancestor, but can no more turn into one another than you can transform into your cousins. If Crocker does not understand that, she is stunningly ignorant of basic evolutionary theory, and she has no right to force her ignorance on students. Furthermore, her misrepresentation of the “micro/macro” distinction is a standard creationist distortion of evolutionary theory.

Biologists use “macroevolution” to describe the broad patterns and trends of the evolution and diversification of life over long stretches of time. Macroevolution includes such subjects as extinction, speciation, changes in traits over time, rates of change, adaptive radiation, and similar processes. To creationists, macroevolution is the change from one “kind” (in the biblical sense of “created kind”) to another, such as “a dog turning into a cat.” Microevolution refers to changes in gene frequencies within a species. Microevolution is



not “quite different” from macroevolution: microevolution is a necessary part of macroevolution, as the combined effect of microevolutionary changes produces macroevolutionary patterns. Despite Crocker’s claim, macroevolution and microevolution do not exhaust the possibilities: there are evolutionary processes which are neither microevolutionary nor macroevolutionary.

Creationists accept microevolution, but, as in Crocker’s lecture, reject macroevolution. Crocker’s statement implies that microevolution is the primary evidence for macroevolution, when there is significant and overwhelming evidence for the latter in geology, biogeography, biochemistry, anatomy and genetics. For her to teach this would be further miseducation of her students.

In the 1950s, she said, scientists Stanley Miller and Harold Urey ran electricity through a soup of chemicals to show how chemicals on the early earth could assemble themselves into the building blocks of life. ... Crocker said that subsequent research had shown that chemicals used in the experiment did not exist on earth 4 billion years ago. “The experiment is irrelevant, but you still find it in your books,” she said.

Crocker’s recitation of standard creationist attacks on origin of life research does not even accurately regurgitate their false claims! Informed creationists do not deny, as she does, that “chemicals used in the experiment did not exist on earth 4 billion years ago”; they deny that the atmospheric conditions of the Miller-Urey experiments accurately modeled the earth’s early atmosphere. Crocker presents this information as evidence that scientists are clinging to inaccurate experiments to prop up a failed theory. She ignores the results of the past 50 years of origin of life research. In the specific case of the Miller-Urey experiment, scientists have re-run the experiment with revised conditions and obtained similar results.

She cited another experiment, involving researcher Bernard Kettlewell, who produced pictures of variously colored peppered moths on tree trunks to show that when the moths were not well camouflaged, they were more likely to be eaten by birds — a process of natural selection that influenced the color of the moths. “This comes from your book — it is not actually true,” Crocker said. “The experiment was falsified. He glued his moths to the trees.”

Another creationist shibboleth drawn from the discredited “intelligent design” book *Icons of Evolution*, the “peppered moth experiment is a fraud” argument has been debunked for several years. Whether and under what circumstances moths were glued in place is a distraction from the main point of Kettlewell’s (many) experiments which explained why the frequencies of light colored and dark colored moths changed in different areas in Great Britain. Kettlewell contended that birds differentially preyed upon moths that contrasted against different backgrounds, resulting in more dark colored moths in polluted areas and more light colored moths in cleaner areas. The staged photos of moths glued to a surface were to illustrate that dark and light forms of the moths contrast against light and dark backgrounds. Kettlewell additionally glued moths to trees to test whether birds ate this species of moth (they do).

But what Crocker and other creationists avoid reporting is that no moths were glued to trees during the actual experiments that clearly demonstrated natural selection for light and dark varieties in different environments. Thus, Crocker was lying to the students — or was profoundly ignorant of Kettlewell’s research — in claiming that “the experiment was falsified.” And in fact, while scientists have questioned certain aspects of Kettlewell’s methodology, none doubt that his ultimate conclusion is accurate, and a recent replication of the experiments confirmed the original findings.

The *Washington Post*’s reporter asked Crocker “whether she was going to discuss the evidence for evolution in another class. She said no. ... she saw her role as trying to balance the ‘*ad nauseum*’ [sic] pro-evolution accounts that students had long been force-fed.” Her job at NVCC was not to “balance” the students’ experience, but to provide them with an accurate introduction to modern biology. Because evolution is an important part of any beginning biology course, she failed to teach the curriculum, and short-changed her students by not teaching them standard science in favor of a lot of misinformation. That alone would have provided NVCC grounds for dismissal, had they sought them. If she took the same approach at GMU, they too would have been justified in firing her outright, though they did not.

It is entirely possible and even likely that Caroline Crocker was let go at the end of her contracts by George Mason University and Northern Virginia Community College simply for staffing reasons: such is often (and many times, unfortunately) the fate of contingent faculty. GMU, in fact, has made this claim. But if Crocker was unable or unwilling to teach accurate science, and there is evidence of this, an institution would have been entirely justified in making a negative evaluation and not renewing her contract. Caroline Crocker is not a victim of scientific persecution, but the students who took her courses are victims of misinformation.

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MEET THE MARTYRS: Guillermo Gonzalez *Carrie Sager*

Expelled claims that Iowa State University astronomy professor Guillermo Gonzalez was denied tenure because of his views on “intelligent design”. However, this shows a naïve and distorted understanding of the tenure process at a major research university. The tenure process involves intense scrutiny of a candidate’s accomplishments in order to assess his future potential; the beliefs or extra-academic opinions held by the candidate are not a factor. Gonzalez’s academic record is not as exemplary as *Expelled* implies, and due process was rendered at every level of appeal. ISU was justified in rejecting his application for tenure.

THE CLAIM

“Normally, it is not especially difficult to attain tenure at ISU. In 2007, 91% of tenure applications were approved.” (“Tenure trouble” by David Klinghoffer, published by the *Weekly Standard* 2007 Jun 7, linked from the *Expelled* website)

THE FACTS

Gaining tenure at a major research institution is never easy. The stakes — employment protection from dismissal without due cause — are very high, and it is appropriate that candidates should face intense scrutiny. Each department at ISU determines tenure independently, so it is inappropriate to look at average tenure rates across the entire university. Professors who receive negative evaluations, or who know that they are underperforming for other reasons, often start looking for employment elsewhere before their tenure review. This makes statistics on approval of university-wide tenure decisions less valuable than the *Weekly Standard* article would have readers believe. Of the twelve candi-

dates considered for tenure in Gonzalez’s department (physics) in the last decade, four were denied tenure: only a 66% approval rate. (See Geoff Brumfiel, “Darwin sceptic says views cost tenure,” *Nature* 2007; 447: 364.)

According to a June 1, 2007, statement from ISU (available on-line at <<http://www.public.iastate.edu/~nscenral/news/2007/jun/statement.shtml>>), Gonzalez’s tenure decision was based on “refereed publications, his level of success in attracting research funding and grants, the amount of telescope observing time he had been granted, the number of graduate students he had supervised, and most importantly, the overall evidence of future career promise in the field of astronomy.” As documented below, the university had grounds to conclude that the early promise of Gonzalez’s career was not being met.

THE CLAIM

“According to a Smithsonian/NASA astrophysics database, Gonzalez’s scientific articles from 2001 to 2007 rank the highest among astronomers in his department according to a standard measure of how frequently they have been cited by other scientists. He has published 68 peer-reviewed articles, which beat the ISU department’s standard for tenure by 350 percent. He has also co-authored a standard astronomy textbook, published by Cambridge University Press, which his faculty colleagues use in their own classes.” (“Tenure trouble” by David Klinghoffer, published by the *Weekly Standard* 2007 Jun 7, linked from the *Expelled* website)

THE FACTS

Gonzalez’s publication output dropped steadily during his time at ISU. The work he did publish was based on re-evaluations of data he had previously collected or analyses of other people’s data.

An assessment by the *Chronicle of Higher Education* (2007 May 21; available on-line at <<http://www.chronicle.com/daily/2007/05/2007052103n.htm>>) found that:

... a closer look at Mr Gonzalez’s case raises some questions about his recent scholarship and whether he has lived up to his early promise. ...

Under normal circumstances, Mr Gonzalez’s publication record would be stellar and would warrant his earning tenure at most universities, according to Mr Hirsch [a scholar who analyzed the publication record]. But Mr Gonzalez completed the best scholarship, as judged by his peers, while doing postdoctoral work at the University of Texas at Austin and at the University of Washington, where he received his PhD. His record has trailed off since then.

“It looks like it slowed down considerably,” said Mr Hirsch. ... “It’s not clear that he started new things, or anything on his own, in the period he was an assistant professor at Iowa State.”

That pattern may have hurt his case. “Tenure review only deals with his work since he came to Iowa State,” said John McCarroll, a spokesman for the university.

When considering a tenure case, faculty committees try to anticipate what kind of work a professor will accomplish in the future. “The only reason the previous record is relevant is the extent to which it can predict future performance,” said Mr Hirsch. “Generally, it’s a good indication, but in some cases it’s not.”

David L Lambert, director of the McDonald Observ-



atory at Texas, supervised Mr Gonzalez during his postdoctoral fellowship there in the early to mid-1990s. ... [H]e is not aware of any important new work by Mr Gonzalez since he arrived at Iowa State, such as branching off into different directions of research. "I don't know what else he has done," Mr Lambert said. ...

Mr Gonzalez said he does not have any grants through NASA or the National Science Foundation, the two agencies that would normally support his research. ... He arrived at Iowa State in 2001, but none of his graduate students there have thus far completed their doctoral work.

That even Gonzalez's former academic advisors expressed doubts about his performance at ISU suggests that this is a serious issue. It is worth noting that the decline in his publication rate corresponds to the time when he started putting time into an "intelligent design" project that has produced no peer-reviewed results. This includes his work on *The Privileged Planet* (coauthored with Jay W Richards; Washington [DC]: Regnery, 2004; reviewed in *RNCSE* 2005 Jan-Apr; 25 [1-2]: 47-9) and his collaboration with old-earth creationist Hugh Ross from the ministry Reasons to Believe (see, for instance, <http://www.firstthings.com/article.php3?id_article=2612> and <http://www.reasons.org/resources/fff/2002issue09/index.shtml#rare_sun>).

According to another analysis (available on-line at <http://scienceblogs.com/neurotopia/2007/12/a_handy_graphictimeline_of_gon.php>) of his publication record, which includes a graph of his publication productivity:

Gonzalez had a very successful postdoc with a good research group, and that carried over to his first faculty appointment at University of Washington, where he continued to collaborate with his old colleagues from his PhD and postdoc[toral studies]. However, he peaked in 1999, and the decline began

even while he was still at the University of Washington. Even more pronounced than the drop in publications is the complete bottom-out in first authorships that is almost sustained throughout his entire probationary period leading up to tenure.

So ISU Physics [would be] stuck with a guy who publishes hardly any papers as primary author, whose publication list contracts once he strikes out on his own, and, perhaps most importantly, who doesn't publish with new colleagues. New tenure-track investigators ... absolutely MUST take an active role in pursuing one another's research interests in order to stretch meager funds as far as possible.

In addition to his declining publication record and his failure to mentor graduate students to completing their programs, it is also notable that Gonzalez brought in far fewer research grants than his colleagues. The average tenured faculty in the ISU physics and astronomy department brought in \$1.3 million in grants during their first six years. Gonzalez brought in, at most, \$200 000 during the same amount of time, \$64 000 of which was used to pay a doctoral student at a different university and \$58 000 of which was for his "intelligent design" book *The Privileged Planet*. In 2007, Gonzalez told the *Ames Tribune* (2007 Dec 4) that "he was told, beginning with his three-year tenure review in 2004, that he needed to bring in more research funding. He added he heard the same message in reviews every year since, as well. He has made the effort, he said, submitting two grant applications per year, but to no avail."

THE CLAIM

Gonzalez's "application [for tenure] was denied due to his connection with intelligent design." (Ben Stein, *Expelled*)

THE FACTS

As shown above, Gonzalez's weak academic record at ISU would have been enough to deny him

tenure. But did his views on "intelligent design" play a role? And if so, would this have been unreasonable? Gonzalez submitted his book *The Privileged Planet* as part of his tenure materials: he obviously intended that his colleagues should consider his "intelligent design" work part of his scholarly productivity. For *Expelled's* producers to castigate ISU for thus considering it places them at odds with Gonzalez. First, a caveat: personnel decisions are confidential and the reasons behind his colleagues' voting decisions are private, so one may only speculate. However, his colleagues minimally would certainly be justified in noticing that Gonzalez's decline in publication of peer-reviewed literature corresponded to his increased interest in "intelligent design". But what of "intelligent design" itself? Is it a worthy scholarly enterprise? This topic is discussed more fully elsewhere, but let's consider the view of Gonzalez's fellow astronomers.

According to the American Astronomical Society, the major US organization for professional astronomers, "intelligent design" is unscientific:

In recent years, advocates of "Intelligent Design," have proposed teaching "Intelligent Design" as a valid alternative theory for the history of life. Although scientists have vigorous discussions on interpretations for some aspects of evolution, there is widespread agreement on the power of natural selection to shape the emergence of new species. Even if there were no such agreement, "Intelligent Design" fails to meet the basic definition of a scientific idea: its proponents do not present testable hypotheses and do not provide evidence for their views that can be verified or duplicated by subsequent researchers. (<<http://www.aas.org/governance/teachevolution.pdf>>)



A scientist should not expect his colleagues to ignore his advocacy of a perspective that those in his field have overwhelmingly reject-

MEET THE MARTYRS: Richard Sternberg

Carrie Sager and Eugenie C Scott

Expelled claims that Richard Sternberg was “terrorized” and that “his life was nearly ruined” when, in 2004, as editor of *Proceedings of the Biological Society of Washington*, he published a pro-“intelligent design” article by Stephen C Meyer. However, there is no evidence of either terrorism or ruination. Before publishing the paper, Sternberg worked for the National Institutes of Health at the National Center for Biotechnology Information (GenBank) and was an unpaid Research Associate — not an employee — at the Smithsonian. He was the voluntary, unpaid editor of *PBSW* (small academic journals rarely pay editors) and had given notice of his resignation as editor six months before the Meyer article was published. After the Meyer incident, he remained an employee of NIH, and his unpaid position at the Smithsonian was extended in 2006. At no time was any aspect of his pay or working conditions at NIH affected. It is difficult to see how his life “was nearly ruined” when nothing serious happened

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to him. He was never even disciplined for his apparent violations of policies of both the *PBSW* and the Smithsonian.

Expelled is not the first attempt to portray Sternberg as a martyr. In 2005, Sternberg filed a complaint with the US Office of Special Counsel claiming discrimination at the Smithsonian. His complaint was dismissed: since Sternberg was not in fact an employee, the OSC lacked jurisdiction. That did not stop a political appointee at the OSC from sympathetically parroting Sternberg’s claims. As Nick Matzke commented at the Panda’s Thumb blog on August 19, 2005 (<http://www.pandasthumb.org/archives/2005/08/sternberg_compl.html>):

In essence, the OSC opinion, authored by Bush appointee James McVey, seems designed to give the religious right another talking point about how any criticism of ID or the ID movement’s actions amounts to religious discrimination by the evil secular scientific establishment, even though ID is allegedly science, not religion. Somehow, it manages to do this (1) while telling Sternberg that OSC doesn’t have jurisdiction, (2)

without any contrasting opinion from the accused parties, and (3) without documenting any actual injury to Sternberg, who still has his unpaid research position, an office, keys, and access to the collections. The opinion is therefore a pretty strange document to read.

Then Representative Mark Souder (R-Indiana) took up the cause on behalf of Sternberg, arranging for Sternberg’s claims to appear in a 2006 staff report from the House Government Reform Subcommittee on Criminal Justice, Drug Policy, and Human Resources, which Souder chaired. Souder has a history of creationist advocacy, including co-hosting a congressional briefing by the Discovery Institute in 2000.

Despite claims from creationists to the contrary, neither the OSC nor the House Government Reform Subcommittee conducted anything that could be considered a legitimate investigation of Sternberg’s claims.

THE CLAIM

“The paper ignited a firestorm of controversy merely because it suggested ‘intelligent design’ might be

ed. Of course, Gonzalez is free to disagree with the position of the American Astronomical Society, and does so when he insists in *Expelled* that “The questions that I ask in my ‘intelligent design’ research are perfectly legitimate scientific questions.”

But if this is so, his failure to produce any results from that research would legitimately count against his tenure application, as would pursuit of any other failed research program. If, on the other

hand, his work on “intelligent design” were not considered science, his colleagues could legitimately consider how much time he was investing in non-scientific pursuits which could otherwise have been put toward writing grants, conducting research, or publishing research results. He cannot have it both ways.

In either case, his distracting work on an unscientific enterprise like “intelligent design”, combined with his declining publication

record, his failure to obtain outside funding which would support graduate students and new research, and his failure to mentor graduate students to the completion of their degrees, all make it impossible for supporters legitimately to claim that the decision not to grant him tenure was unfounded.

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able to explain how life began.” (Ben Stein, *Expelled*)

THE FACTS

Expelled does not even get the paper's subject right. The paper was not about how life began; it was about the Cambrian Explosion, which occurred about three billion years later. The greater error is claiming that the discussion of “intelligent design” generated the controversy. There was an understandable outcry from members of the Biological Society of Washington over the embarrassing publication of what they recognized as poorly-written, inaccurate science in their journal. The argument presented in the Meyer paper had previously been reviewed and rejected by scientists. Seeing this shoddy science in their journal indeed “ignited a firestorm”, but not for the reasons given in *Expelled*. For more on why the paper was bad science, see the review posted on the Panda's Thumb blog (<http://www.pandasthumb.org/archives/2004/08/meyers_hopeless_1.html>) and the review in the *Palaeontological Society Newsletter* (2004; 57: 11-7; available on-line at <<http://www.palass.org/modules.php?name=palaeo&sec=newsletter&page=25>>).

The first question asked by BSW members was “how did this paper ever get published?” According to the Council of the Biological Society of Washington, Sternberg failed to follow proper procedure in publishing the paper: “Contrary to typical editorial practices, the paper was published without review by any associate editor; Sternberg handled the entire review process. The Council, which includes officers, elected councilors, and past presidents, and the associate editors would have deemed the paper inappropriate for the pages of the *Proceedings* because the subject matter represents such a significant departure from the nearly purely systematic content for which this journal has been known throughout its 122-year history” (<http://www.biolsocwash.org/id_statement.html>). The BSW withdrew the paper in embarrass-

ment, emphasizing that the paper was substandard science. It commented that the society endorsed “a resolution on ID published by the American Association for the Advancement of Science ... which observes that there is no credible scientific evidence supporting ID as a testable hypothesis to explain the origin of organic diversity. Accordingly, the Meyer paper does not meet the scientific standards of the *Proceedings*.”

Though Sternberg claimed that he was the best qualified to handle the review process, science blogger Ed Brayton noted (<http://www.scienceblogs.com/dispatches/2006/12/creating_a_martyr_the_sternber.php>) that this is not the case:

Systematics (the study of taxonomy) is the subject of the *PBSW* and it is the subject of Sternberg's expertise, but it is not the subject of Meyer's paper. The primary subject of the paper is the Cambrian explosion and, ostensibly, bioinformatics as it pertains to the origin of the higher phyla. This is not the focus of Sternberg's research, nor does it have much of anything to do with systematics other than an obligatory discussion of how many phyla and subphyla originated during the Cambrian. The most appropriate reviewers, then, would be paleontologists. Among the associate editors at the time (and still today) was Gale Bishop, an expert in invertebrate paleontology. There were three other specialists on invertebrates among the associate editors as well, including current *PBSW* editor Stephen Gardiner, Christopher Boyko and Janet Reid, all specialists in invertebrate zoology (the Cambrian fauna was almost entirely made up of invertebrates). Yet Sternberg felt no need to let any of those people, all more qualified than [he] on the subject, ... look at the paper, or even make them aware of its existence. He may not have been under any formal obligation to send the article to someone with a specialty in

Cambrian paleontology, but that is both the professional and the ethical thing to do.

The fact that Sternberg published the Meyer paper in his second-to-last scheduled issue as editor, and that he did not follow normal procedure, suggests that he knew that his actions and the paper would be seen as objectionable by his fellow scientists.

THE CLAIM

“In October, as the OSC complaint recounts, [Sternberg's supervisor] Mr Coddington told Mr Sternberg to give up his office and turn in his keys to the departmental floor, thus denying him access to the specimen collections he needs.” (op-ed by David Klinghoffer, published by the *Wall Street Journal* 2005 Jan 28, linked from *Expelled* website)



THE FACTS

According to Jonathan Coddington in a January 2005 communication (<<http://www.pandasthumb.org/pt-archives/000777.html#c14871>>), “Well prior to the publication of the Meyer article and my awareness of it, I asked him and another research associate to move as part of a larger and unavoidable reorganization of space involving 17 people and 20 offices. He agreed. I offered both individuals new, identical, standard research associate work spaces. The other accepted, but Dr von Sternberg declined and instead requested space in an entirely different part of the Museum, which I provided and which he currently occupies.”

The Smithsonian wrote a letter to the *Wall Street Journal* (2005 Feb 4), observing, “Dr Sternberg's characterization of his work conditions and treatment at the Smithsonian is incorrect. He was never denied office space, keys or access to the collections.”

In a January 30, 2006, letter responding to Sternberg's concerns, Smithsonian Deputy Secretary and Chief Operating Officer Sheila Burke explained:

As you know, as part of an effort to enhance security at the Museum, all researchers



were asked to return their keys in 2004 and were issued coded identification badges to provide access to non-public areas. The badge you were issued, which provides general access to doors and elevators, is still operative. ... In accordance with NMNH policy, please return your old keys as soon as possible to your sponsor, Dr Vari.

In short, Sternberg has turned two bits of bureaucratic minutiae affecting an entire division of the museum — a switch from keys to ID badges and a routine shuffling of office space — into a conspiracy to undermine him personally.

THE CLAIM

"Congressman Mark Souder ... uncovered a massive conspiracy within the Smithsonian to destroy Dr Sternberg's career [and was] continually stonewalled in his efforts to hold them accountable." (Ben Stein, *Expelled*)

THE FACTS

The conclusions drawn in Souder's report (available on-line at <http://www.souder.house.gov/_files/IntoleranceandthePoliticizationofScienceattheSmithsonian.pdf>) seem to be independent of the documents on which it is supposedly based. Blogger Ed Brayton examined the documents in detail and concluded, "They have put out a report that simply is not supported by the evidence and was designed, intelligently or otherwise, to support the disingenuous PR campaign that includes the attempt to position themselves as victims of discrimination."

We encourage readers to consult Brayton's carefully documented discussion (available on-line at <http://www.scienceblogs.com/dispatches/2006/12/creating_a_martyr_the_sternber.php>), and the appendix of allegedly supporting materials (available on-line at <http://www.souder.house.gov/_files/AppendixtoReportIntoleranceandthePoliticizationofScienceattheSmithsonian.pdf>) will learn, for example, how shocked Smithsonian Institution staff were at the publication of the Meyer paper: "All of us here at

NMNH are appalled by the Meyer paper published in the latest issue of the *Proceedings of the BSW*. I could not believe my eyes when I read it and immediately resigned from the BSW," wrote one scientist (Sues to Scott, 2004 Aug 26). Readers will learn that this was not the first time that Sternberg published a paper in *PBSW* under suspicious and controversial circumstances (Ferrari to Sues, 2004 Sep 8). They will learn that NCSE's Eugenie C Scott advised the scientists at the SI: "First, above all, we believe strongly that the discussion should not be a referendum on Dr von Sternberg's personal scientific beliefs, even though they clearly fall outside of the normal scientific mainstream. *Obviously Dr von Sternberg's religious beliefs are also off the table.*" The focus should be on the fact that he allowed into the pages of *PBSW* a paper that was inappropriate for the journal in both content and quality" (Scott to Sues, 2004 Aug 26, emphasis added). That the embarrassing publication of a shoddy research paper was the issue — not Sternberg's religious orientation — is echoed by many other Smithsonian scientists, although viewers would not learn this from the producers of *Expelled*.

Also in those files, anyone can see that Sternberg violated standard rules users of museum collections must follow. A letter from the Chair of the Entomology department chides him first over missing library books (Coddington to Sternberg, 2005 Feb 15):

At the request of SI Libraries, we recently attempted to find and return your more than 50 overdue library books, but several dozen apparently are still missing. If, perchance, you have removed those from the building, please return them immediately as we insist that all SI library books remain on the premises. If not, where are they? ... You are welcome to check books out from our libraries, but they should remain in your designated work space.

He is also criticized for mishandling museum specimens. Such specimens are irreplaceable relics,

and mismanaging them is a cardinal sin in the museum world:

My only other concern is that your old IZ work area seems to contain specimens from other institutions (Univ Miami?), but we have no records of an incoming loan in your name. For obvious reasons, we like to be aware of non-SI material in the building, so please clarify the status of these specimens with Marilyn and/or Vic. If they do belong to another institution, the transaction should be recorded in our transaction management system.

THE CLAIM

Sternberg's "life was nearly ruined when he strayed from the party line while serving as editor of a scientific journal affiliated with the prestigious Smithsonian Museum of Natural History." (*Expelled*)

THE FACTS

As stated above, Sternberg did not lose his office or his access to collections, he did not lose his job, he was not "fired" from the (unpaid) editorship of the journal (he had resigned six months before the publication of the Meyer article), and from the e-mails in the appendix to the Souder report, it appears that his colleagues were civil in their communications with him. The Smithsonian renewed his Research Collaborator status for another three years in 2006. It seems, then, that the worst that happened to Sternberg is that people said some unkind things about him in private e-mail to one another. Since the same can be said of almost every person, it is hard to see how this could be construed as "life ruining". There is no evidence of any material harm done to Sternberg as a result of the publication of the Meyer article. And any damage done to his reputation would seem to have been self-inflicted.

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MEET THE MARTYRS: Robert Marks, Pamela Winnick, Michael Egnor

Carrie Sager

In addition to Richard Sternberg, Guillermo Gonzalez, and Caroline Crocker, *Expelled* also discussed, more briefly, the cases of three other individuals supposedly persecuted at the hands of a dogmatic scientific establishment.

ROBERT MARKS

Robert Marks is a professor of engineering whose university declined to host his website that advocated “intelligent design”.

THE CLAIM

“A few months after this interview Baylor University shut down his research website once they discovered a link between his work and ‘intelligent design’.” (Ben Stein, *Expelled*)

THE FACTS

Robert Marks’s “Evolutionary Informatics Laboratory” website — touting “intelligent design” — was originally hosted on a Baylor University server. Concerned that the material on the website misleadingly suggested a connection between the “intelligent design” material and Baylor, administrators temporarily shut the website down while discussing the issue with Marks and his lawyer. Baylor was willing to continue hosting the website subject to a number of conditions (including the inclusion of a disclaimer and the removal of the misleading term “laboratory”), but Marks and Baylor were unable to come to terms. The site is currently hosted by a third-party provider.

This was not Baylor’s first conflict with “intelligent design”. In 1999, the Michael Polanyi Center, a two-person “intelligent design” think tank unaffiliated with Baylor’s science or religion depart-

ments, was established at the university. Though the center only existed independently for about a year, it caused significant discord among faculty, many of whom were concerned that Baylor’s excellent reputation for scientific research would be damaged by an association with “intelligent design”. In October 2000, the center was integrated into Baylor’s Institute for Faith and Learning, and shortly afterwards its director, William Dembski, was demoted for his failure to work collegially with other faculty, as indicated in a press release from Baylor University. (For details, see *RNCSE* 2000 Jul/Aug; 20 [4]: 9–11.) Dembski was listed as an associate on Marks’s Evolutionary Informatics Laboratory website.

Given this history, it was consistent for Baylor to be sensitive to attempts to portray it as sponsoring “intelligent design”: the science departments have been reluctant to be associated with a field they consider unscientific, and the issue has been a source of strife at Baylor for several years. In any event, the worst that happened to Marks was that he had to remove his website from Baylor’s webserver. In no other way was his free speech impinged, nor have his work conditions changed in any way: he remains a Distinguished Professor of Electrical and Computer Engineering at Baylor, holding a full professorship in the School of Engineering and Computer Science. He continues to teach his courses and conduct research. Where is the harm?

PAMELA WINNICK

Pamela Winnick is a journalist who claims that, despite her objective treatment of “intelligent design”, she was blacklisted. Her treatment was not objective, but in any case, she was clearly not blacklisted.

THE CLAIM

“I was not taking a position in favor of creationism, I was writing about ‘intelligent design’. ... And having merely written on a subject was enough to put you on this blacklist. If you give any credence to it whatsoever, which means just writing about it, you’re just finished as a journalist.” (Pamela Winnick, *Expelled*)

THE FACTS

Winnick’s earliest known writing on “intelligent design” appeared in the *Pittsburgh Post-Gazette* during the adoption of the Pennsylvania science education standards in late 2000 (for example, *Pittsburgh Post-Gazette* 2000 Nov 29). At the time, her articles regularly used phrases and characterizations about evolution that derived from “intelligent design” talking points. Her position did not necessarily support “intelligent design” in particular, but communicated the general notion that “fairness” required access to the marketplace of ideas and that students were somehow poorer for not hearing about “intelligent design” (and similar alternatives that falsely claimed scientific status).

However, this relatively innocuous coverage was only the beginning. In February 2001, Winnick interviewed “intelligent design” proponent Michael Behe with a collection of softball questions and presented his answers uncritically (*Pittsburgh Post-Gazette* 2001 Feb 8). Later that year she wrote a review of PBS’s *Evolution* series in which she criticized it for not covering “the Intelligent Design movement, which began about a decade ago when serious scientists — many with doctorates from prestigious universities — began to tackle evolution on scientific grounds” (*Pittsburgh Post-Gazette* 2001 Sep 23). This is not “just writing about” “intelligent design”. This is an endorsement.



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So Winnick was advocating “intelligent design”. Even so, this sounds like a poor basis for being blacklisted as a journalist — but there is no evidence that this ever happened. As a supposedly “black-listed” reporter, Winnick continued to write for the *Pittsburgh Post-Gazette* until August 2002, almost two years after she began her supposedly career-ending articles on “intelligent design”; she continues to write occasional guest columns for the paper (including an anti-evolution opinion piece; 2005 Dec 11), and has written recent articles for the *Weekly Standard* (2005 May 29) and the *Wall Street Journal* (2006 Jul 21).

She also wrote a book, *A Jealous God: Science's Crusade Against Religion* (Nashville [TN]: Thomas Nelson, 2005), which was described by the foundation funding her research as “analyzing why there seems to be little tolerance for teaching creationism in America.” (For a discussion of the foundation's description of her research, see Wesley R Elsberry's report, available on-line at <http://www.antievolution.org/events/pbsevo/wre_prw_20011129.html>.) The book received a negative review from a writer at her previous employer, the *Post-Gazette* (2006 Jan 22) — which nonetheless still publishes her work.

So no evidence was presented in *Expelled* that Winnick was blacklisted as a journalist, and there's evidence to the contrary. She may have been criticized for her shoddy journalism or for advocating bad science — Jeffrey Shallit describes her book as “not a fair, reliable, or objective look at the battles between science and religion,” for example (see *RNCSE* 2007 Sep-Dec; 27 [5-6]: 50-1) — but it is insupportable and absurd to characterize such criticism as blacklisting.

MICHAEL EGNOR

The Alliance for Science, a citizen's group in Virginia, sponsored an essay contest for high school students on the topic “Why I would want my doctor to have studied evolution,” to highlight the important role of evolution in the medical sciences. Physician Michael Egnor posted an essay on an “intelligent design” blog in response,

claiming that evolution was irrelevant to medicine. This was more a statement of Egnor's ignorance about evolution than a reflection on evolution's place in medicine.

THE CLAIM

“When neurosurgeon Michael Egnor wrote an essay for high school students saying doctors didn't need to study evolution in order to practice medicine, the Darwinists were quick to try and exterminate this new threat.” (Ben Stein, *Expelled*)

THE FACTS

Although most physicians accept evolution — 63% of those surveyed in a 2005 poll (see <<http://www.hcdi.net/News/PressRelease.cfm?ID=93>>) — there have certainly in the past been anti-evolutionist physicians; Egnor's views are hardly a “new threat.” Criticism of the essay came not only from the university professors and researchers who supposedly make up “Big Science”, but from Egnor's fellow medical professionals, who recognized Egnor's arguments as old hat, and another attempt by creationists to co-opt the respectability of a white coat. Oncologist, surgeon, and blogger “Orac” wrote:

After my having written repeated debunkings of various physicians who are creationists (mostly of the “intelligent design” variety), in retrospect I should have seen this one coming. I should have seen that the Discovery Institute, eager to use anyone they can find whom they can represent to the public as having scientific credentials (never mind whether those credentials have anything to do with evolutionary biology) and thus dupe the public into seeing them as having authority when they start laying down ignorant brain farts about how they “doubt Darwinism”, would settle on physicians. After all, as I have pointed out before, until recently medical schools taught little about evolutionary biology (that is, if they taught anything at all about

it), and as a result all too many physicians, particularly the ones whose undergraduate majors were not biology, tend to be no more knowledgeable about evolution than your average lawyer....

The reason that a contest with such a topic was thought to be a good idea, I'd guess, is because evolution-ignorant creationists like Dr Egnor are constantly attacking evolution in a manner that you don't see other of the basic sciences that form the basis of medicine ever being attacked. (“Train wreck, thy name is Egnor!” posted March 12, 2007; available on-line at <http://www.scienceblogs.com/insolence/2007/03/train_wreck_thy_name_is_egnor.php>)

Physician and blogger Burt Humburg added:

What's going on here is that Egnor dislikes evolution and is hoping to de-emphasize its importance. Why? It is possible that he earnestly and sincerely believes that evolution has not contributed to his art. It is possible that he earnestly and sincerely believes that recognizing the validity of evolution would render his life meaningless or without value. ... Whatever his motivations may be, readers should not credit his testimony: he is at least dead wrong.

Further, his perspectives are very difficult to distinguish from ignorance advocacy. Egnor first came to attention when a blogger at *Time* magazine criticized him for not being an expert in evolution. He has stated that he does not use evolution, but this is more an admission of a willful disregard for the evolution he does use and upon which his art is based. Taken together, along with his assurance that the only contribution evolution has made to medicine was eugenics, his writings bespeak the dangerous com-



EXPULSED
ERRORS

Challenging Science

Carrie Sager and Joshua Rosenau

With statements like, “The questioning of Darwinism was a bridge too far for many,” Ben Stein wants viewers of *Expelled* to believe that scientists subscribe to an unquestioned Darwinian orthodoxy, and that those who dare to question “Darwinism” will quickly be silenced.

No one denies it is difficult to get a new scientific idea accepted, but that is not the same as claiming that the doors of science are slammed shut to those who challenge the status quo. When scientists question facets of existing theories or propose new ones, they present the best evidence available and make the strongest arguments they can to their colleagues. Colleagues in turn challenge that evidence and reasoning. The rigor of this process is what makes science such a powerful tool. Because scientists have to fight hard to get their ideas accepted, good ideas win out — when they are proven to be sound. “Intelligent design” advocates, in contrast, have no research and no evidence, and have repeatedly shown themselves unwilling to formulate testable hypotheses; yet they complain

about an imagined exclusion, even after having flunked the basics.

The scientific enterprise is open to new ideas, however much they initially may be challenged. Here are some examples of people who have challenged the scientific status quo and, far from being “expelled” from science, were lauded as visionaries — once they had successfully proven their ideas.

BARBARA MCCLINTOCK

Barbara McClintock’s research on maize in the 1940s and 1950s showed that sequences of DNA called transposons can change positions within a chromosome, and in doing so, can regulate the expression of other genes. This discovery went against the accepted view that DNA was merely a static set of instructions, and the initial response to her research was so skeptical that, after several years of developing her ideas, she stopped publishing about them out of concern that she would alienate the scientific mainstream.

Unlike “intelligent design” proponents, however, she did not claim discrimination and attempt to circumvent the peer review process. Rather, she continued to research the evolution and genetics of maize. As new technology developed, other scientists verified her discoveries. McClintock was the recipient of many awards,

including the National Medal of Science, the first MacArthur Foundation grant, and the Nobel Prize for Physiology or Medicine.

LYNN MARGULIS

In 1967, Lynn Margulis wrote a paper, “On the origin of mitosing eukaryotic cells,” which argued that eukaryotic cells — those with a true nucleus — arose when cells with no nucleus symbiotically incorporated other such cells to make new cells that could perform more functions. The paper was rejected by many journals, and when eventually published by *The Journal of Theoretical Biology* it was highly criticized. Margulis spent decades defending her work, but scientists now accept her suggested mechanism through which organelles such as mitochondria and chloroplasts evolved. Her suggestions about other organelles have not stood up to experimental tests and are not as widely accepted.

Margulis strongly opposes the idea, widely held within the scientific community, that the driving force in evolution is competition, and thinks cooperative and symbiotic relationships are underemphasized by many evolutionary scientists. Despite holding views different from many in the scientific community, because of her research, she is well respected, and



Carrie Sager and Joshua Rosenau are, respectively, NCSE’s Project Assistant and Public Information Project Director.

bination of ignorance and arrogance, traits altogether common with creationists, but that shine in Dr Egnor to such an extent that a neologism should bear his name-sake. (“Egnorance: The egotistical combination of ignorance and arrogance”, posted March 7, 2007; available on-

line at <http://www.pandasthumb.org/archives/2007/03/egnorance_combo_arrogance.html>)

THE CLAIM

Michael Egnor says in *Expelled* that he expected criticism, but was shocked by the “viciousness” and “baseness” of the response.

THE FACTS

Michael Egnor had apparently never been on the internet before.

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has been elected to the National Academy of Sciences and awarded the National Medal of Science.

BARRY MARSHALL

Prior to Barry Marshall's discovery that peptic ulcers are caused by the bacterium *Helicobacter pylori*, the accepted explanation was that they were the result of stress, diet, and an excess of acid in the stomach. When Marshall presented his research, it was greeted with skepticism, and it took many years for his theories to become widely accepted. Although Marshall suggested that a conspiracy prevented acceptance of his work (in his case, pharmaceutical companies which stood to lose money on ulcer treatments; see Kimball C Atwood IV, "Bacteria, ulcers, and ostracism?" *Skeptical Inquirer* 2004 Nov; 28 [6]: 27-34), he did not respond by withdrawing from the scientific process, but by continuing to run experiments that would allow others to replicate his findings. Because he did so, scientists were able to evaluate his work and conduct their own experiments to test his proposals. Whether or not there was a pharmaceutical company conspiracy, scientists were willing to pursue Marshall's idea and to publish results that supported it. In time, the community of science came to accept his results. Marshall received many awards, including the Nobel Prize in Physiology or Medicine, and was made a Companion of the Order of Australia.

As Marshall himself observed in a 1998 interview (available on-line at <<http://www.achievement.org/autodoc/printmember/marlint-1>>), "Although people were skeptical, and they all went home with the aim of trying to prove me wrong, that's how science moves forward. Someone has a hypothesis and you say, 'Okay, if I can prove it wrong, I can publish a paper saying he's wrong.' Gradually, over the next few years, one by one, these people trying to prove me wrong fell by the wayside and actually converted over to my side."

In contrast, scientists who have responded to the claims of "intelligent design" proponents have all found that evidence for "intelligent design" claims was lacking and that

"intelligent design" advocates' hypotheses — in the rare situations where they offered them — did not stand up to scrutiny.

STANLEY PRUSINER

In 1982, Stanley Prusiner published an article on his research into scrapie — a disease in sheep related to Creutzfeldt-Jakob disease in humans — which argued that the infectious agent was not a virus but a protein, which Prusiner called a "prion". Because no one had heard of a protein replicating without a nucleic acid like DNA or RNA, many virologists and scrapie researchers reacted to the article with incredulity. When the media picked up the story, "the personal attacks of the naysayers at times became very vicious," according to Prusiner (in his Nobel autobiography, available on-line at <http://nobelprize.org/nobel_prizes/medicine/laureates/1997/prusiner-autobio.html>). However, his critics failed to find the nucleic acid they were sure existed, and less than two years later, Prusiner's lab had isolated the protein. Subsequent research provided even more support for prions, and in 1997 Prusiner was awarded the Nobel Prize in Physiology or Medicine. The Nobel Prize Committee explained:

The hypothesis that prions are able to replicate without a genome and to cause disease violated all conventional conceptions and during the 1980s was severely criticised. For more than 10 years, Stanley Prusiner fought an uneven battle against overwhelming opposition. Research during the 1990s has, however, rendered strong support for the correctness of Prusiner's prion hypothesis. The mystery behind scrapie, kuru, and mad cow disease has finally been unravelled. Additionally, the discovery of prions has opened up new avenues to better understand the pathogenesis of other more common dementias, such as Alzheimer's disease.

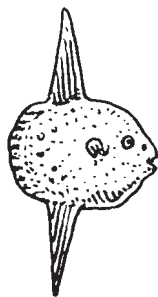
MOTOO KIMURA

In 1967, Motoo Kimura published a paper showing that the genetic

content of the genome must have been influenced substantially by selectively neutral genetic drift. Other authors built on this work to argue that molecular evolution might be dominated by neutral drift, and not by natural selection. As William Provine writes, "The initial reaction to the neutral theory of Kimura, King and Jukes was generally very negative" (see "The neutral theory of molecular evolution, random drift and natural selection," in RJ Berry, TJ Crawford, GM Hewitt, editors, *Genes in Ecology: The 33rd Symposium of the British Ecology Society* [Oxford: Blackwell, 1991], p 23-5). Provine adds, "when DNA sequence data began to pour in after the early 1980s, the situation changed dramatically." The abundance of selectively neutral differences within populations and among species matched the predictions of the neutral theory, and could not be explained by selection alone.

"By 1990," Provine continues, "molecular evolutionists had largely abandoned the null hypothesis of selection to explain observed molecular differences and accepted the neutral theory... Even the molecular evolutionists who argue for the importance of selection at the DNA level construct and use models for which the neutral theory is the assumption." This represented a radical change in the scientific approach to evolution, which had formerly considered natural selection to be paramount. Clearly, evolution at the molecular level operated by different rules. Although the neutralist hypothesis was a break with traditional neo-Darwinism, its incorporation into evolutionary biology was smooth — once researchers had the ability to gather DNA sequence data and test the predictions of the theory.

So the scientific consensus can be and is challenged regularly. There is no unchallengeable orthodoxy, which is what *Expelled* would have you believe. The preceding stories are just a few well-known examples of biologists who challenged the scientific consensus, including principles of Mendelian genetics and of Darwinian evolution. These scientists prevailed because they did good science: they backed their



EXPULSED ERRORS Evolution

Joshua Rosenau and Eugenie C Scott

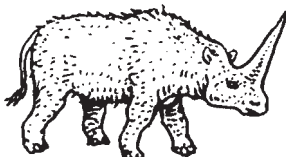
challenges with successful predictions and empirical evidence. And they were right. Scientists are constantly questioning, refining, and expanding theories, including evolution — and natural selection theory. As Michael Shermer writes in his review of *Expelled* for *Scientific American* (available online at <<http://www.sciam.com/article.cfm?id=ben-steins-expelled-review-michael-shermer>>), “Anyone who thinks that scientists do not question Darwinism has never been to an evolutionary conference.”

There is no reason why “intelligent design” proponents cannot try to follow in the footsteps of these distinguished scientists who overcame sometimes considerable opposition, sometimes for a very long time, before their scientific views prevailed. Unlike “intelligent design” advocates, these researchers did not skip past the research phase to try to influence the public before they had scientific support. None of them formed groups to lobby school boards to teach their views in the public schools; they just buckled down and did the work. None of them drafted model legislation or penned op-eds in newspapers and magazines decrying the supposed persecution they suffered at the hands of the Establishment; they just buckled down and did the work. None of them hired former Nixon speechwriters or game-show hosts to compare their opponents to Hitler; they just buckled down and did the work.

The difference between what scientists do and what “intelligent design” proponents do is that when scientists question aspects of evolution they do it with science, while “intelligent design” proponents do it with dishonest movies, tired slogans, and slick marketing.

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In practically every scene, *Expelled* insults the science of evolution and the scientists who study it, accepting the long-ago-debunked criticisms and conspiracy theories of the “intelligent design” proponents as valid. On the contrary, evolution is well accepted in the scientific community, where it is considered the organizing principle of biology and central as well to the field of geology. The notion that scientists have formed an atheistic cabal to keep “intelligent design” from its day in the sun is ludicrous.

THE CLAIM

Large numbers of scientists are secretly questioning evolution. “One on one, in a scientific meeting, after the third or fourth beer, my experience has been that many evolutionary biologists will say, ‘Yeah, this theory’s got a lot of problems.’” (Paul Nelson, *Expelled*)

THE FACTS

For a movie obsessed with evolution, it is odd that *Expelled* never bothers to define evolution properly. The big idea of biological evolution is that living things have common ancestors: that they have descended with modification from earlier forms. To understand evolution, we have to study the pattern that the branching tree of life has taken through time as well as the processes or mechanisms that bring about the changes. It is well documented by statements from scientific societies large and small (see *Voices for Evolution* [third edition: Berkeley (CA): NCSE, 2008]) that scientists no longer feel any need to debate whether

evolution took place; what they are doing now is working out the details. Scientists agree that natural selection, genetic drift, gene flow, genetic recombination, mutation, and symbiosis are major evolutionary processes, but they continue to debate the relative importance of each mechanism to the history and diversity of life. Similarly, scientists agree on the basic contours of the tree of life, although they continue to refine and revise the picture in detail in the light of further data and theory.

Expelled confuses the debates among scientists about the details of evolution — how it works and what descended from what — with a nonexistent dispute about whether evolution occurred. This approach plays into the conspiracy theme of the movie: somehow, scientists are scheming to keep the unwary public from learning the truth about the supposed falsity of evolution. Science, however, rewards dissent and independence of thought — when it has a solid base. Scientists are an independent lot who find success and professional advancement by successfully overturning established ideas and through vigorously debating the evidence supporting scientific interpretations in scientific conferences and journals. The thought that anyone could herd them together to conspire against anything — even “intelligent design” — is laughable. One may as well conspire to herd a roomful of cats.



THE CLAIM

“When we see an elite — and it is an elite — an elite that controls essentially all the research money in science saying ‘There is no such thing as moral truth, science will not be related to religion.’ I mean, it’s essentially official policy at the National Academy of Sciences, that

Joshua Rosenau and Eugenie C Scott are, respectively, NCSE’s Public Information Project Director and executive director.

religion and science will not be related.” (Jeffrey M. Schwartz, *Expelled*)

THE FACTS

Expelled claims that an atheistic, amoral scientific elite is barring the door to the consideration of ideas like “intelligent design” that include a religious component. Yet scientists who are religious also perform science without bringing God in as part of their theories. Scientific theories do not include God because scientific theories must be tested. Testing requires holding constant some variables, and no one can “control” God; therefore, scientific explanations are restricted to the natural causes that are testable. All scientists work this way, whether they are religious or nonreligious. This is a practical restriction on what science can do, not a philosophical or moral restriction imposed by some elite.

The implication that the National Academy of Sciences is anti-religious is equally absurd. Its recent booklet *Science, Evolution, and Creationism* (Washington [DC]: National Academies Press, 2008; reviewed in *RNCSE* 2008 Jan/Feb; 28 [1]: 35–6) answers the question “Aren’t evolution and religion opposing ideas?” by writing:

Newspaper and television stories sometimes make it seem as though evolution and religion are incompatible, but that is not true. Many scientists and theologians have written about how one can accept both faith and the validity of biological evolution. Many past and current scientists who have made major contributions to our understanding of the world have been devoutly religious. At the same time, many religious people accept the reality of evolution, and many religious denominations have issued emphatic statements reflecting this acceptance.

THE CLAIM

“If Darwin wanted to challenge the consensus today, how would he do it? Science is not a hobby for rich aristocrats anymore, it’s a multi-million-dollar industry. And if you

want a piece of the pie, you’ve got to be a good comrade.” (Ben Stein, *Expelled*)

THE FACTS

New scientific views challenge the consensus all the time. Is “intelligent design” being kept out of the scientific consensus because of some “old boy” network that requires scientists to “go along to get along?” Hardly. New scientific ideas do get a hearing — that is how a scientist makes a reputation, after all.

In the 1980s and 1990s, Carl Woese proposed a radical rearrangement of the evolutionary tree of life, splitting bacteria into two groups and dividing life into three “domains,” rather than the traditional five kingdoms. As he produced new evidence for this approach, his colleagues began to apply his ideas in their own papers. When it became accepted within the scientific community, textbook authors rewrote the chapters on the classification of life, and college professors and high school teachers were glad to modify their lesson plans.

Darwinian evolution and Mendelian genetics both went through a similar process, as did plate tectonics, Big Bang cosmology, atomic theory, and Einstein’s theories of special and general relativity. A number of non-Darwinian biological theories weathered this process to become well-accepted and acclaimed, and then were incorporated into pre-college textbooks and curricula (See p 41 and “Why teach evolution?” in Andrew J. Petto and Laurie R. Godfrey’s *Scientists Confront Creationism: Intelligent Design and Beyond*. [New York: WW Norton, 2007], p 405–41).

Thus far, “intelligent design” has not made a scientific case that its proposals help us understand nature, and the ideas have not generated the sort of research which led Woese’s ideas to wide acceptance. Protestations in *Expelled* to the contrary, scientists knowledgeable about relevant subject areas have critiqued “intelligent design” — it has not merely been waved away without consideration (see reviews of classic “intelligent design” statements like Michael

Behe’s *Darwin’s Black Box* [New York: Free Press, 1996] and William Dembski’s *The Design Inference* [Cambridge: Cambridge University Press, 1998]) The burden of proof is upon “intelligent design” advocates to show through scientific research that “intelligent design” is a useful scientific proposition. If they did, the science-funding agency review panels would gladly fund such research. As things stand now, “intelligent design” can be considered neither scientific nor useful for understanding nature.

There has been a history of promissory notes from “intelligent design” proponents, but where is the actual research? Here we can agree with “intelligent design” proponent Stephen C. Meyer when he says, “The debate isn’t going to be settled by numbers, it’s going to be settled by the evidence and the arguments.” But these arguments must be made to the scientific community, not to the movie-going public.

Expelled makes so many erroneous claims about the science of evolution that it would require several movies to correct the record. Whenever Ben Stein talks about evolution, the viewer should remember that actor-pundits are not known for their scientific training. There simply is not time to correct so much misinformation, but NCSE would like to set the record straight on at least some examples.

THE CLAIM

“Darwinism also has not one meaningful word to say on the origins of organic life, a striking lacuna in a theory supposedly explaining life.” (Ben Stein, “Darwinism: The imperialism of biology?” posted on the *Expelled* website)

THE FACTS

Darwin was not trying to explain the origin of life; someone could just as easily complain that the theory of island biogeography does not explain the origin of islands. Darwin himself says, in the sixth edition of the *Origin of Species*, “It is no valid objection that science as yet throws no light on the far higher problem of the essence or origin of life.” (On the same page, Darwin notes, “Great is the power of steady misrepresentation.” Here,



at least, is one place where the makers of *Expelled* apparently agree with Darwin.)

Darwin was writing 150 years ago. We no more expect modern evolutionary theory to be dependent on what Darwin knew in the 19th century than we expect modern physics to be dependent on what Lord Kelvin knew then. In the 20th and 21st centuries there has been significant research into the origin of life, which Ben Stein would have realized if he had interviewed a scientist who works in the area, or even searched for “origin of life” on the internet.

Rather than consulting a researcher on the origin of life, *Expelled* instead consults a historian and philosopher of science, Michael Ruse, who tries his best — amid numerous sneering interruptions — to convey a layman-friendly explanation of a complicated theory devised by AG Cairns-Smith. This theory suggests that the lattice-like nature of clay crystals could form a template of sorts for the lattice-like structure of organic molecules that eventually produced the carriers of heredity, RNA and DNA (see p 54). Rather than honestly presenting an intriguing scientific idea that is being actively researched, *Expelled* instead ridicules Michael Ruse for suggesting “joyriding crystals,” clearly a silly and bizarre idea. But how does this theory sound when described by people who are actively pursuing related research?

In his book *Genesis: The Scientific Quest for Life's Origin* (Washington [DC]: Joseph Henry Press, 2005), scientist Robert Hazen observes:

The crux of his argument rests on a simple analogy. Cairns-Smith likens the origin of life to the construction of a stone archway, with its carefully fitted blocks and crucial construction central keystone that locks the whole structure in place. But an arch cannot be built simply by piling one stone atop another. “The answer,” he says, “is with a scaffolding of some kind.” A simple support structure facilitates the construction and can then be

removed. “I think this must have been the way our amazingly ‘arched’ biochemistry was built in the first place,” he wrote ... in 1985. “The parts that now lean together surely used to lean on something else — something low tech.” That something, he suggests, was a clay mineral. (p 161)

Hazen then presents a number of testable hypotheses arising from this approach to the origin of life, noting that research into the ways that clay crystals interact with organic molecules has yielded scientific insights which improve the production of pharmaceuticals. Hazen emphasizes that the clay lattice theory is not the only one available for the origin of life, and that there are a number of viable ideas being tested by chemists, geologists and biologists right now.

This ongoing research draws on evolutionary ideas, and Ben Stein could have interviewed those researchers if he wanted to. Nonetheless, answers to questions about the origin of life are no more necessary to understand the diversity of life today than such an understanding is necessary to treat cancer, or to understand the emergence of new strains of the flu virus. But *Expelled* is more interested in ridiculing science than in presenting it honestly.

THE CLAIM

Natural selection is inadequate to produce complicated things which require the infusion of some sort of “information” unavailable from natural processes. “But natural selection reduces genetic information and we know this from all the genetic operation studies that we have.” (Maciej Giertych, *Expelled*)

THE FACTS

“Intelligent design” advocates spend a great deal of time discussing “information”, yet rarely define the term. Natural selection reduces genetic variability, which can indeed be used as a measure of information, but to say then that selection therefore cannot produce complex structures demonstrates a basic misunderstanding of how natural selection works.

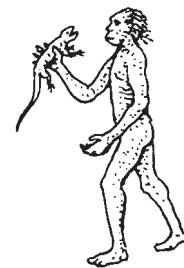
In addition, while natural selection reduces variability, and may even remove traits from a population entirely, it is not the only evolutionary mechanism. Genetic mutations, gene flow, genetic exchange from symbiotic organisms, genetic recombination, and neutral genetic drift all play important roles in evolutionary processes, and anyone who attempts to explain the complexity of life without considering all of these processes is presenting a one-sided and fundamentally inaccurate account of evolution.

THE CLAIM

“Intelligent design” proponents are on the verge of making great new discoveries because they are applying the concept of design to complex biological structures, and gaining new insights. For example, Ben Stein claims in *Expelled*, “Jonathan Wells is also making progress using ‘intelligent design’ theory in his research on cancer.”

THE FACTS

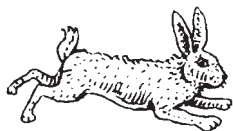
Expelled uses the term “design” equivocally. The film regards a complicated cellular structure composed of many interacting parts as similar to a human machine that also is made of many interacting parts. Because the machine requires an intelligent human to assemble these parts to make a functioning product, *Expelled* infers that the cellular structure also required an intelligent agent to plan it and put it together. “Design” in this sense refers to a “purposeful assemblage of parts,” implying both function and origin. But scientists commonly speak of the “design” of structures in an informal sense of “parts working together to produce a function”; they might say, for example, that the elongated wrist bones of a deer are designed to allow the deer to run fast. The study of structure and function is common in medical and other biological research; there is much utility in finding out how something works. This research can be done — and ordinarily is done — without making any assumptions of “design” in the “intelligent design” sense: that there needs to be a guiding hand purposefully assembling those parts.



“Intelligent Design”

Eugenie C Scott and Joshua Rosenau

Expelled's main theme is that “intelligent design” is under systematic attack by “Big Science” — the scientific establishment — which refuses to recognize its scientific validity because of a previous commitment to atheism and materialism. In truth, the arguments of “intelligent design” have been examined by the scientific community and found to be lacking in both utility and accuracy. If mainstream science declines to accept “intelligent design”, it is the fault of the “intelligent design” advocates, who have not performed the research and theory-building demanded of everyone in the scientific enterprise.

**THE CLAIM**

“Intelligent design was being suppressed in a systematic and ruthless fashion.” (Ben Stein, *Expelled*)

THE FACTS

“Intelligent design” has not produced any research to suppress.

Eugenie C Scott and Joshua Rosenau are, respectively, NCSE's executive director and Public Information Project Director.

When prominent “intelligent design” proponent Michael Behe was asked during his testimony in *Kitzmiller v Dover* about his research, and why “you don’t do those tests?” he responded, “I myself would prefer to spend time in what I would consider to be more fruitful endeavors.” If even proponents of “intelligent design” do not think it is a fruitful enterprise, why should the scientific community take any interest in it?

As shown elsewhere in this issue of *RNCSE*, the supposed cases of suppression offered in *Expelled* are dishonest attempts to make mountains out of molehills and to create martyrs where martyrdom does not exist.

“Intelligent design” is scientifically unproductive, and this perhaps explains why scientists like Guillermo Gonzalez and Michael Behe publish far fewer papers after they become attracted to “intelligent design”. Ultimately, ID’s lack of success in science departments is the fault of the flawed and unscientific nature of “intelligent design” itself, not the result of bias in the scientific community.

The issue is not the suppression

of “intelligent design”, but the lack of warrant for its scientific claims. And ultimately, “intelligent design” has an uphill struggle to demonstrate that it is, indeed, science. The fundamental problem with “intelligent design” as science is that “intelligent design” claims cannot be tested. Scientific testing requires that there be some set of phenomena which are incompatible with your idea. No observation could possibly be incompatible with a claim that an “intelligent agent” (whom everyone recognizes as God) acted, say, to introduce information into a system. Untestable claims are not scientific claims. Regardless of their attractiveness as religious ideas (although many people of faith strongly reject “intelligent design”) “intelligent design” has not passed muster as science.

THE CLAIM

Referring to evolution, scientists “say the debate has been settled, that the issues are settled.” (Bruce Chapman, *Expelled*)

THE FACTS

Scientists have been researching

Jonathan Wells’s research on the function of centrioles in cell division is directly in this tradition, and does not require an assumption of an intelligent agent to determine the structure and function of these cellular components. Although Wells presents “intelligent design” as an important precursor guiding his discovery, in actuality it is an add-on. Even if he is right about the relationship of centrioles to broken chromosomes to cancer — and it seems likely that he is not (see, for example, a post at the blog *Afarensis*, available on-line at http://scienceblogs.com/afarensis/2006/01/16/_wells_

centrioles_and_cancer_b/>) — to say that “intelligent design” provides unique insight into cancer research is, to put it mildly, stretching things.

And contrary to what the movie would have viewers believe, evolution — common ancestry — is often of considerable assistance when researchers are investigating structure and function. By looking at the same structure — for instance the whip-like tail of a bacterium, called a flagellum — across several related species, scientists can discover similarities and differences that help them more fully understand

the workings of complex structures (see, for example, Mark J Pallen and Nicholas J Matzke, “From *The Origin of Species* to the origin of bacterial flagella,” *Nature Reviews Microbiology* 2006; 4: 784–90). This paradigm has been much more fruitful than one that suggests an intelligent agent produced complex biological structures as a “purposeful arrangement of parts”.

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evolution for 150 years, and it continues to be well supported by new research. Modern evidence for evolution derives from fossils, from genetics, from the development of organisms, and from many other fields unimaginable to Darwin or even to early 20th-century evolutionary biologists.

The nature of the scientific enterprise is for scientists to debate different explanations vigorously until research changes people's minds, and a consensus gradually emerges. But even a consensus view is capable of being modified and in rare instances, even replaced. That living things descended with modification from common ancestors — the big idea of evolution — has been part of the scientific consensus now for over 100 years. It is conceivable, of course, that any well-founded theory could be overturned (as evolution itself overturned earlier ideas), but the more confirmatory evidence accumulates, the less likely this is to happen. *Expelled* expresses the opinion that the universal support of evolution in the scientific community is the product of some sort of bias or ideological inflexibility. It is, on the contrary, the result of decades of hard scientific work, building theory and conducting research. Similarly, the failure of "intelligent design" can readily be laid at the feet of its advocates, whose main activity appears to be to carp about the success of evolution.

THE CLAIM

"Neurosurgeon Michael Egnor is already taking a design approach to his study of the human brain. [...] Jonathan Wells is also making progress using 'intelligent design' theory in his research on cancer." (Ben Stein, *Expelled*)

THE FACTS

These claims to be applying "design" in science rest on a weak foundation, since the term "design" is used in inconsistent and in confusing ways throughout the movie. The Discovery Institute's Paul Nelson describes "design theory" as "the study of patterns in nature that are best explained as a result of intelligence," though that definition presupposes that we know when something is or is not the result of

intelligence. Walter Bradley, however, seems to think that the question central to design is how to distinguish whether life and other phenomena "arise by some type of intelligent guidance or design," while Ben Stein and several of his interviewees seem to think that "intelligent design" is about determining whether God intervenes directly in the world around us.

Egnor's and Wells's examples of "design" research, though, fit none of these three disparate definitions. Instead, Wells and Egnor use a tortured and discredited analogy in which cellular and anatomical structures composed of many interacting parts are compared to a machine which a human made from many interacting parts. Because a machine requires an intelligent human to assemble these parts to make a functioning product, Egnor and Wells assume that their structures require an intelligent agent to plan them and put them together. "Design" in this sense refers to a "purposeful assemblage of parts," implying both function and origin.

But scientists commonly speak of the "design" of structures in an informal sense of "parts working together to produce a function," as the "design" of the elongated wrist bones of a deer, which produces a leg capable of fast running. The study of structure and function is common in medical and other biological research; there is much utility in finding out how something works. This work can be done — and ordinarily is done — without making any assumptions of "design" in the "intelligent design" sense: that there needs to be a guiding hand purposefully assembling those parts.

Wells claims that "the underlying cause of cancer is 'chromosomal instability,' or damage to extra-genic structures — not mutations to individual genes." As biomedical researcher Ian Musgrave points out, though, "this knowledge seems to have eluded most researchers in the field." Musgrave then cites numerous examples of successful cancer medicines which specifically target "mutations to individual genes," concluding, "I hardly need to make the point that researchers were guided by experimental and observational evidence (such as experimental evidence of mutations, generation of

tumours by transferring mutant genes, mouse transgenic models etc. etc.) rather than blind allegiance to Darwinist dogma." (Musgrave's discussion is available on-line at <http://www.pandasthumb.org/archives/2005/07/thats_another_f.html>.)

Based on his incorrect beliefs about the basic biology of cancer, Wells speculates that chromosomal instability must result from problems in the functioning of a cellular organelle called the centriole. He proposed, supposedly on the basis of "intelligent design", that centrioles operate like turbines, which spin and produce something called the "polar ejection force", which drives chromosomes apart when a cell divides. Wells made certain predictions on that basis, as a scientist should do, and as it happens, the predictions of this model turn out to be wrong (for discussion, see Ian Musgrave's "Wells vs tiny flies," available on-line at <http://www.pandasthumb.org/archives/2006/08/wells_vs_tiny_f.html>). The polar ejection force does not depend upon the centriole, since the force still exists when centrioles are absent, or when they are not configured the way Wells describes. Even before Wells published his speculation, a research group had submitted a paper which went beyond speculation, actually showing that a molecule called a chromokinesin generates the polar ejection force.

The way that Wells responded to this refutation of his hypothesis concerning the link between centriole structure and cancer is revealing. Even though refutations of his hypothesis have been known to Wells for over a year, he continues to repeat the disproven claim in *Expelled* and in publications. "Intelligent design" advocates are anxious to promote Wells's work as an example of how "intelligent design" can function as real science. Unfortunately, Wells's work fails on three accounts as an example of this desire. First, the hypothesis is wrong: it reflects a misunderstanding of how cancer works and it makes incorrect predictions about how cells operate. Second, it is unclear what role (if any) "design" plays in the claims, since an investigator might have come to the same



erroneous conclusions without the overlay of a design inference. Third, by not incorporating criticisms and corrections into his model or, if necessary, abandoning his model and moving on to another research area, Wells illustrates that “intelligent design” is not as interested in actual scientific discovery as it is in clinging for propaganda purposes to a scientific-sounding example of “‘intelligent design’ in action”.

Egnor also proceeds from a strained analogy between a machine and a naturally occurring object, in this case the brain and a device to reduce vibrations, a “pulsation absorber”. He believes that looking at engineering solutions to structural problems (in his field, protecting the brain against too-strong flows of blood from the arteries) provides unique insight. Perhaps, but it remains unclear why a link between an engineered solution to a mechanical problem and a structural solution to a biological condition is evidence of “design.” Recognizing similarities between a machine and a biological structure does not prove that both structures are designed, only that there is a successful solution to a shared problem; there may be multiple solutions to a problem, from either an engineering or a biological perspective.

While it is not clear how the assumption of design advances the claims by Wells or Egnor, evolution — common ancestry — is of considerable assistance when researchers are investigating biological structure and function. Comparing the same structure across several related species, scientists can discover similarities and differences that help organisms deal with different environmental challenges. With that knowledge, pharmaceutical researchers can develop more effective drugs to block infectious diseases and can trace the lineage of medicinal plants, identifying relatives that may contain life-saving compounds. Agricultural scientists can see which traits help wild plants in difficult environments and genetically engineer these traits into crops, allowing them to thrive in harsh environments. Other researchers use knowledge of the traits shared within a family of insects to refine pesticides and target only harmful families, leaving

others unharmed. The evolutionary perspective has been much more fruitful than the “intelligent design” alternative that suggests an intelligent agent produced complex biological structures for reasons unknown and by means unknown. (For discussions of evolution’s practical usefulness, see, for example, David P. Mindell, *The Evolving World* [Cambridge (MA): Harvard University Press, 2006] and Randolph M. Nesse and George C. Williams, *Why We Get Sick* [New York: Vintage, 1996].)

THE CLAIM

“Intelligent design” deserves a place in academia: “What about academic freedom? I mean, can’t we just talk about this?” (Ben Stein, *Expelled*)

THE FACTS

Actually, “intelligent design” is talked about in academia. Teaching about “intelligent design” in higher education institutions is not forbidden or censured, and in fact, new courses are added every year. Indeed, the “intelligent design”-promoting web site ResearchIntelligentDesign.org proudly lists “100+ universities and colleges” that officially include ““intelligent design” in their lesson plans.” These courses generally examine “intelligent design” objectively and in an appropriate context, and their instructors do so openly. So “intelligent design” has, in fact, entered academia, although not quite in the fashion its advocates might prefer. What they seek, of course, is for “intelligent design” to be accepted as a valid scientific alternative to evolution. They have failed to make a convincing case for it, yet they seem to believe that they have an entitlement to a place in academia.

On the contrary, new ideas are not automatically installed in universities and classrooms: they must earn their place. The “intelligent design” movement diligently promotes the idea that “intelligent design” belongs in science classes, even while acknowledging that progress in the laboratory is lagging. In 1998, Discovery Institute personnel drafted a strategy document, commonly called the Wedge Document (available on-line at <http://www.antievolution.org/features/wedge.html>). The authors

laid out a multi-phase plan, beginning with research, building up to a wholesale cultural renewal, including inclusion of “intelligent design” into public school classrooms. The promises of this document, compared to the actual accomplishments of the movement, are telling.

The Wedge Document proposed that by 2003 they would have “Thirty published books on design and its cultural implications (sex, gender issues, medicine, law, and religion)” and “One hundred scientific, academic and technical articles by our fellows.” They are nowhere near that benchmark even five years past their deadline, especially in the critically important “academic and technical articles” category. And yet, they described this first phase, “Research, Writing and Publication” as “the essential component of everything that comes afterward. Without solid scholarship, research and argument, the project would be just another attempt to indoctrinate instead of persuade.” They lack solid scholarship, research, and argument; yet the project is continuing. (See Barbara Forrest and Paul R. Gross, *Creationism’s Trojan Horse*, revised edition [New York: Oxford University Press, 2007], for details.)

The second, indoctrination, phase, has been far more successful. This phase, according to the Wedge Document, was to include:

... production of a ... documentary on “intelligent design” and its implications.
... Alongside a focus on influential opinion-makers, we also seek to build up a popular base of support among our natural constituency, namely, Christians.

Expelled is clearly a part of that agenda, and the fact that they have released this film before completing or even making a serious effort at “the essential component of everything that comes afterward” is a sign where their priorities lie.

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EXPULSED

ERRORS

Science and Religion

Eugenie C Scott and Peter MJ Hess

Expelled caricatures scientists and the scientific enterprise as dogmatically committed to atheism. It also makes much of a supposed inherent incompatibility between evolution and religion. Although some religious beliefs are indeed incompatible with evolution, Catholic, mainstream Protestant, and Jewish theology long ago accommodated evolution. And, as in any profession, scientists as individuals embrace a wide range of beliefs as well as no belief; science itself cannot honestly be said to be either pro- or anti-religious.

THE CLAIM

Scientists are atheists, as proven by leading spokespeople for science: "I think that God is about as unlikely as fairies, angels, hobgoblins." (Richard Dawkins, *Expelled*) "Religion. I mean, it's just fantasy, basically. It's completely empty of any explanatory content. And it's evil, as well." (Peter Atkins, *Expelled*)

THE FACTS

Expelled makes a big point of connecting atheism to advocacy of evolution, reinforcing the "conspiracy" theme that atheist scientists are actively repressing "intelligent design" advocacy. The movie sets up an unnecessary dichotomy between science and religion by pretending that a selected group of atheist scientists represent all scientists. Associate Producer Mark Mathis admitted in an interview with *Scientific American* that religious scientists like Kenneth Miller of Brown University, a practicing Catholic, were deliberately excluded from the movie because their views would have "confused the

film unnecessarily" (a podcast of the interview is available on-line at <<http://www.sciam.com/article.cfm?id=a-conversation-with-mark-mathis>>; a partial transcript is available on-line at <<http://www.heardworld.com/higgaion/?p=999>>).

But why assume that Richard Dawkins or Kenneth Miller speaks for science? In truth, the religious views of scientists reflect a wide range: it is impossible for any one scientist to reflect the diversity of opinion among scientists, any more than the Pope or Jimmy Swaggart can speak for all Christians. To present only one of the views about religion among scientists as characteristic of all of them is inaccurate at best, and dishonest at worst. But it is part of the strategy to link evolution to atheism.

THE CLAIM

Science has a commitment to atheism. "There are people out there who want to keep science in a little box where it can't possibly touch a higher power, and it can't possibly touch God." (Ben Stein, *Expelled*)

THE FACTS

Science and religion are distinct domains of human thought and experience, and thus their methodologies are different. In the centuries after the Scientific Revolution (1650-1870), both scientists and clerics recognized that science is obliged to restrict its attention to the natural world. This was not because either scientists or clerics suddenly became atheists, but because it was realized that attaining a more complete understanding of nature required testing explanations against the natural world. Any explanation that involves God as a direct actor ("God makes the planets go around the sun") cannot be tested: any result of an experiment is compati-

ble with the hypothesis that an omnipotent God was responsible. So scientists restrict themselves to explanation through natural causes regardless of whether or not they are people of faith. Biological evolution attempts to explain the diversity of living things through natural causes, just like any other science. It is neither more nor less atheistic than is the study of cell division, gravitation, or the movement of continents.

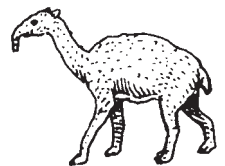
But *Expelled* seeks to conflate adherence to scientific method with materialist atheism, the philosophical view that only material causes operate in the universe: dark comments linking "material mechanisms" and evolution abound in *Expelled*. Logically, however, the link is weak. Employing the scientific method in investigating the natural world, and not appealing to the supernatural to explain natural phenomena, does not require scientists to reject religion — a fact demonstrated by the thousands of scientists who are also people of faith.

THE CLAIM

Evolution leads to a devaluation of human worth. "First of all, if you take seriously that evolution has to do with the transition of life forms, and that life and death are just natural processes, then one gets to be liberal about abortion, euthanasia, all of those kinds of ideas, it seems to me, follow very naturally from a Darwinian perspective. The de-privileging of human beings, basically." (Steve Fuller, *Expelled*)

THE FACTS

Powerful ideas are always seized upon by ideologists to advance their own interests. A powerful scientific idea like evolution has been used at different times and by different social and political movements to



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Hitler and Eugenics

Joshua Rosenau and Susan Spath

Expelled's inflammatory implication that Darwin and the science of evolution "led to" eugenics, Nazis, and Stalinism is deeply offensive and detrimental to public discussion and understanding of science, religion, and history.

THE CLAIM

"Darwinism" "led to" Nazism, the Holocaust, and other heinous historical events.

THE FACTS

Since the 1920s, a narrow group of Christians who rejected the modernizing changes made by mainstream Protestants have wrongly tried to blame evolution for what they see as the ills of modern society. World War I, atheism, and communism have all been attributed to evolution. After World War II, this narrow group added Nazism and fascism to the horrors supposedly caused by evolution. Such claims occur in the writings of the young-earth creationist Henry M Morris, a founder of the modern creation science movement, and have been repeated by "intelligent design"

promoters and creationist Christian organizations such as Answers in Genesis, the Institute for Creation Research, and Coral Ridge Ministries.

Understanding the history of Nazi Germany and how the Holocaust could happen is obviously a very serious subject — and, in an era when ethnic cleansing and genocide are resurgent, a critically important one. The public interest is not well-served by the efforts of sectarian groups to advance their own narrow agendas through distorted and simplistic explanations of horrific events.

Any serious attempt to understand the Nazis' rise to power in the 1920s would consider the devastation suffered by all of the belligerent countries in World War I, especially Germany, and the resulting deep political, social, and economic crisis in that country. The huge military losses (more than two million soldiers killed), the extraordinary number of civilian casualties, the fragmentation of German politics, the economic consequences of reparations Germany was required to pay to the war's victors, the intensification of nationalism, and the exploitation of deeply rooted anti-Semitism are some of the factors that a serious history would address.

Anti-Semitic violence against Jews can be traced as far back as the Middle Ages at least, seven centuries before Darwin. As Hitler and the Nazis rose to power in Germany in the aftermath of World War I, they distorted and abused anything they could in their despicable campaigns to foment hatred of Jews and others they stigmatized as "asocial" or "outside society." The Nazis appropriated language and concepts from many sources, including evolution, genetics, medicine (especially the germ theory of disease), and anthropology as propaganda tools to promote their perverted ideology of "racial purity."

On April 29, 2008, the Anti-Defamation League (ADL) issued this statement (available on-line at <http://www.adl.org/PresRele/HolNa_52/5277_52.htm>) about *Expelled*:

The film *Expelled: No Intelligence Allowed* misappropriates the Holocaust and its imagery as a part of its political effort to discredit the scientific community which rejects so-called intelligent design theory.

Hitler did not need Darwin to devise his heinous plan to exterminate

promote both racism and the equality of races, to justify both the exploitation and the conservation of natural resources, the necessity of economic competition and the need for economic cooperation, and so on for many opposed views. But it is necessary, and important, to separate the science from the rhetoric, and it is unclear precisely what Fuller is proposing.

If the claim is that accepting evolution logically requires a devaluation of human worth, it is clearly wrong. For a biologist, life and

death are indeed natural processes, but evolutionary biology does not and cannot show that because they are "just" natural processes they are therefore any less important or meaningful. That inference is a philosophical, not scientific, conclusion.

On the other hand, if Fuller's claim is that accepting evolution leads causally to a devaluation of human worth, it is a sociological claim for which no plausible evidence has been offered. Given that the scientific and industrial revolu-

tions (of which the development of evolutionary theory was only a part) were world-shaking in their economic, political, and social effect, it seems unlikely that it would be possible to tease out any changes that are distinctively due to evolutionary theory.

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the Jewish people and Darwin and evolutionary theory cannot explain Hitler's genocidal madness.

The ADL press release also said, "Using the Holocaust in order to tarnish those who promote the theory of evolution is outrageous and trivializes the complex factors that led to the mass extermination of European Jewry."

THE CLAIM

Evolutionary biology leads to eugenics.

THE FACTS

Expelled erroneously implies that the theory of evolution necessarily "leads to" eugenics. While many geneticists were supporters of eugenics in the early 20th century, the movement drew on support from many sources. As the United Methodist Church recently stated in an apology (available on-line at <<http://calms.umc.org/2008/Text.aspx?mode=Petition&Number=1175>>) for its support for eugenics:

Ironically, as the Eugenics Movement came to the United States, the churches, especially the Methodists, the Presbyterians, and the Episcopalians, embraced it. Methodist churches around the country promoted the American Eugenics Society "Fitter Family Contests" wherein the fittest families were invariably fair skinned and well off. Methodist bishops endorsed one of the first books circulated to the US churches promoting eugenics. Unlike the battles over evolution and creationism, both conservative and progressive church leaders endorsed eugenics.

Opposition came from many quarters as well; some clergy, secular critics, and scientists spoke out against eugenics on social and scientific grounds. Clarence Darrow, famous for defending the teaching of human evolution in the 1925 Scopes trial, wrote a scathing repudiation of eugenics, "The eugenics cult" (published in *The American Mercury* 1926; 8 [30]: 129-37):

We have neither facts nor theories to give us any evidence based on biology or any other branch of science as to how we could breed intelligence, happiness, or anything else that would improve the race. We have no idea of the meaning of the word "improvement." We can imagine no human organization we could trust with the job, even if eugenisists [sic] knew what should be done and the proper way to do it.

Darrow concluded his article by writing, "Amongst the schemes for remolding society this is the most senseless and impudent that has ever been put forward by irresponsible fanatics to plague a long-suffering race."

By the 1930s, scientific support for eugenics continued to wane in the United States as it became clear that human genetics was far more complex than had been realized thirty years earlier. Evolutionary biologists were in the forefront of developing this understanding, another fact which *Expelled* ignores.

In recent decades, Harvard evolutionary biologists Richard Lewontin and the late Stephen Jay Gould have been among the most outspoken critics of crude biological determinism and eugenics. Gould's book *The Mismeasure of Man* (second edition: New York: WW Norton, 1996) is an excellent and readable account of the history of misuses of science to support racist ideologies, and why modern evolutionary biology does not support these ideologies. *Not in Our Genes* by Richard Lewontin, Steven Rose, and Leon J Kamin (New York: Random House, 1984) argues for extreme caution in making claims about the genetic basis of behavior.

Diane B Paul's *Controlling Human Heredity: 1865 to the Present* (Atlantic Highlands [NJ]: Humanities Press, 1995) gives a full and critical account of the eugenics movement in the United States and internationally. See also Daniel J Kevles's *In the Name of Eugenics: Genetics and the Uses of Human Heredity* (Cambridge [MA]: Harvard University Press,

1998) and Christine Rosen's *Preaching Eugenics: Religious Leaders and the American Eugenics Movement* (New York: Oxford University Press, 2004).

THE CLAIM

Charles Darwin advocated eugenics in the *Descent of Man*.

THE FACTS

In *Expelled*, Ben Stein reads a passage (omitting ellipses) from *The Descent of Man* that was also read by anti-evolutionist William Jennings Bryan in the Scopes trial:

With savages, the weak in body or mind are soon eliminated. We civilized men, on the other hand, do our utmost to check the process of elimination. We build asylums for the imbecile, the maimed and the sick, thus the weak members of civilized societies propagate their kind. No one who has attended to the breeding of domestic animals will doubt that this must be highly injurious to the race of man. Hardly anyone is so ignorant as to allow his worst animals to breed.



But Stein does not quote the very next passage in *The Descent of Man*, which makes it clear that Darwin was not advocating eugenics. Rather, he remarked, "The aid which we feel impelled to give to the helpless is mainly an incidental result of the instinct of sympathy, which was originally acquired as part of the social instincts, but subsequently rendered, in the manner previously indicated, more tender and more widely diffused. *Nor could we check our sympathy, if so urged by hard reason, without deterioration in the noblest part of our nature*" (emphasis added).

These are hardly the words of someone arguing for the sort of totalitarian eugenics practiced by the Nazi state, as implied by *Expelled*.

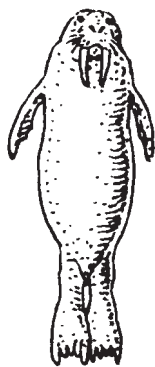
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Divergence over *Expelled*

Glenn Branch

Organizations with a stake in the creationism/evolution controversy reacted to *Expelled* in a variety of ways. Thanks in part to a zealous campaign on the part of the film's producers, creationist organizations generally lauded and even helped to promote the film — although there was a conspicuous and honorable exception in the old-earth creationist ministry Reasons to Believe. On the other side, it was generally understood among the scientific, educational, and civil liberties organizations with which NCSE works to defend the teaching of evolution in the public schools that NCSE would take the lead in responding to the film: there is no point, it was agreed, in reinventing the wheel. Groups like Americans United for Separation of Church and State and the National Science Teachers Association were thus able to refer enquiries to NCSE and provide links to *Expelled Exposed*. Additionally, a handful of organizations issued welcome statements of their own denouncing the film.



CREATIONIST ORGANIZATIONS

There was not a major effort to publicize *Expelled* on the part of the traditional creation science organizations. The Institute for Creation Research featured a piece, "Intelligence expelled" (*Acts & Facts* 2008; 37 [4]:9), which uncritically touted the film, and the ICR's John Morris later invoked *Expelled* in a complaint about Texas's denial of certification to its graduate school ("Academic censorship, round two," *Acts & Facts* 2008; 37 [6]: 3), writing, "What a strange coincidence for Texas to be caught in the act of censorship and institutional bias just after the blockbuster exposé *Expelled: No Intelligence Allowed* hit the theaters," but that seems to have been

the extent of its efforts. The Creation Research Society, which focuses on creationist scholarship, seems not to have taken notice of *Expelled* except for a brief mention in its newsletter *Creation Matters*, where a footnote refers to the *Expelled* website for further information about Guillermo Gonzalez (2007 Nov/Dec; 12 [16]: 11–2).

In keeping with its brasher approach to creation evangelism, Answers in Genesis hyped *Expelled* relentlessly, even while warning that the film emphasized "intelligent design" (which the ministry generally criticizes for not being sufficiently biblical) and neglects its favored version of creationism. According to a March 13, 2008, post on the AiG website (<<http://www.answersingenesis.org/articles/2008/03/13/meeting-of-minds>>), AiG's Ken Ham met with *Expelled*'s star Ben Stein at the annual convention of the National Religious Broadcasters, where "Ken pledged AiG's strong promotional support to Mr Stein, indicating that AiG will use its multiple outlets to spread the word about his excellent film." The same post described Stein as "actor/economist/lawyer/presidential speechwriter/science observer — a 21st-century Einsteinian figure." Ham lived up to his promise: AiG published articles lauding *Expelled* on its website and in its print publications, and encouraged its supporters to attend the film, lobby theater owners to screen it, and spread the word.

Creation Ministries International — formerly the Australia, New Zealand, Canada, and South Africa branches of Answers in Genesis, before the 2005 schism (see *RNCSE* 2006 Nov/Dec; 26 [6]: 4–7) — welcomed *Expelled* with a February 15, 2008 post on its website (available on-line at <<http://creationontheweb.com/content/view/5626>>): "The controversial movie, *Expelled: No Intelligence Allowed*, is a documentary that will expose how the Darwinist hierar-

chy has closed ranks against the rise of intelligent design, a theory that opposes evolution and says that a Designer is responsible for life." CMI subsequently featured a discussion with *Expelled*'s associate producer Mark Mathis and a glowing review of the film by D Russell Humphrey (who commented, "But the movie made me realize that our God-ordained right of free thought and speech is under systematic and increasing attack") With little presence in the United States, where the bulk of the screenings occurred, however, it seems unlikely that CMI was as influential in promoting *Expelled* as was AiG.

The Discovery Institute, the *de facto* institutional home of "intelligent design" creationism, enthusiastically promoted *Expelled*, even devoting a section of its website (<<http://www.discovery.org/expelled/>>) to doing so. Its enthusiasm was no surprise, since a number of the people featured in the film are associated, in one way or another, with the Discovery Institute. A major project was attempting to rebut criticism of the film, especially on the blog Evolution News & Views (<<http://www.evolutionnews.org/>>), which specializes in complaining about negative media coverage of "intelligent design" — "The misreporting of the evolution issue is one key reason for this site," it explains, apparently oblivious to the unintended reading. But the Discovery Institute also used the film in connection with the so-called academic freedom bills it was promoting in 2008, and it recently was soliciting donations in order to send DVD copies of *Expelled* to "key policy makers, opinion makers and leaders throughout the country."

A refreshing contrast to the general creationist embrace of *Expelled* was the response from the old-earth creationist ministry Reasons to Believe, headed by Hugh Ross. Asked to endorse or

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promote *Expelled*, RTB issued a statement reading, in part, "In Reasons [t]o Believe's interaction with professional scientists, scientific institutions, universities, and publishers of scientific journals we have encountered no significant evidence of censorship, black-balling, or disrespect. ... Our main concern about *Expelled* is that it paints a distorted picture. It certainly doesn't match our experience. Sadly, it may do more to alienate than to engage the scientific community, and that can only harm our mission." A subsequent clarification expressed sympathy for "the pain and discrimination suffered by those scientists featured in the movie" but stood by the assessment of the film's inaccuracy. (The statement and clarification are available on-line at <<http://www.reasons.org/resources/apologetics/expelled.shtml>>).

NON-CREATIONIST ORGANIZATIONS

The American Scientific Affiliation, a group of evangelical Christians working in the sciences, commissioned Jeffrey Schloss, a professor of biology at Westmont College, to review *Expelled*. The result — entitled "The *Expelled* controversy: Overcoming or raising walls of division?" (available on-line at <<http://www.asa3.org/ASA/resources/Schloss200805.html>>) — runs over 17 000 words, but its conclusion suggests the tone:

Sadly, the film contributes to an approach that has raised rather than lowered walls between Christians and the surrounding culture. Sadly, it raises the already growing walls of suspicion about any scholarly attempts to explore the relationship between science and faith. Sadly, it raises walls that don't protect but constrain the spiritual growth of our students, if they are driven to believe they must choose between God and evolution. And most sadly, it is raising all these walls unnecessarily, along a border that is never demonstrated to have been accurately surveyed, much less to be in need of defending.

Schloss's review ought not to be

taken as reflecting the ASA's official position: according to its website, "the ASA does not take a position when there is honest disagreement between Christians on an issue"; in particular, "the ASA has no official position on evolution; its members hold a diversity of views with varying degrees of intensity." Its official neutrality apparently extends to *Expelled*: its website (<<http://www.asa3.org>>) contains links to both the *Expelled* website and NCSE's *Expelled Exposed* website, as well as to commentary from the American Association for the Advancement of Science, the Discovery Institute, and Reasons to Believe. In addition to Schloss's review, there are also briefer assessments from Isaac, the executive director of the ASA, and Frank Percival, a biology professor at Westmont College. And Richard Weikart, a historian and fellow of the Discovery Institute, attempts to rebut Schloss's review's claims about the supposed connection of Darwinism and Nazism.

The American Association for the Advancement of Science, the world's largest general interest scientific society, issued a statement on April 18, 2008 (available on-line at <http://www.aaas.org/news/releases/2008/media/0418aaas_statement.pdf>) decrying "the profound dishonesty and lack of civility" of *Expelled*, which it described as "grossly unfair to millions of scientists in the United States and worldwide who are working to cure disease, solve hunger, improve national security, and otherwise advance science to improve the quality of human life." The statement also emphasized the efforts of the AAAS and religious leaders to "build a constructive bridge between scientific and religious communities." Accompanying the statement was a brief film (available on-line at <<http://www.youtube.com/watch?v=58UDTq3kaZM>>) on "Evolution, education, and the integrity of science", featuring the AAAS's Alan I Leshner and Jo Ellen Roseman, Francis S Collins, and two biology teachers (Rob Eshbach and Jennifer Miller) from Dover, Pennsylvania.

Focusing on *Expelled*'s outrageous claims about evolution as a

cause of the Holocaust, the Anti-Defamation League issued a press release on April 29, 2008 (available <http://www.adl.org/PresRele/HolNa_52/5277_52.htm>):

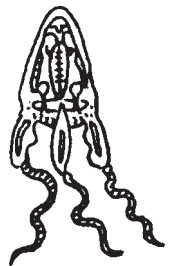
The film *Expelled: No Intelligence Allowed* misappropriates the Holocaust and its imagery as a part of its political effort to discredit the scientific community which rejects so-called intelligent design theory. Hitler did not need Darwin to devise his heinous plan to exterminate the Jewish people and Darwin and evolutionary theory cannot explain Hitler's genocidal madness. Using the Holocaust in order to tarnish those who promote the theory of evolution is outrageous and trivializes the complex factors that led to the mass extermination of European Jewry.

Peter McKnight, a columnist for the *Vancouver Sun* (2008 Jun 21), later asked Stein for his reaction to the statement; Stein instructively replied, "It's none of their f—ing business."

Finally, the Center for Theology and the Natural Sciences issued a press release on May 21, 2008 (available on-line at <http://ctns.org/news_050908.html>), declaring, "Evolution and Christian Theology are Compatible, Scientists and Theologians Say," and adding, "Ben Stein's New Movie *Expelled* Ignores Years of Constructive Dialogue." Citing Francisco Ayala, Francis Collins, and Martinez Hewlett as examples of scientists who have affirmed the compatibility of evolution and the Christian faith, the press release also quoted Robert John Russell, the Ian G Barbour Professor of Theology and Science at the Graduate Theology Union, as saying, "The movie *Expelled* does a disservice to religious believers and scientists alike by failing to offer a constructive alternative to conflict."

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Why Re-Invent the Crystal?

Gary Hurd

Creationists attack the question of the origin of life because few scientists are sufficiently familiar with the current research to explain it. The movie *Expelled* further obscured the issue by dishonest reporting.

The contribution of inorganic crystals to the formation of complex organic molecules has been an important part of origin-of-life research for over four decades. When interviewed by Ben Stein, Michael Ruse said that life could have originated by molecules binding to crystals. The scene cuts to an old movie clip of a fortune-teller with a crystal ball, and Stein has a sneering laugh at Ruse's expense. The derision heaped on the idea that crystals contributed to the origin of life is an excellent example of scientific ignorance's being exploited by the producers of *Expelled*.

The role of crystalline minerals in the origin of life was proposed by JD Bernal over forty years ago. Bernal, following Aharon Katchalsky, pointed out that the clay montmorillonite's surface readily bound simple organic molecules (Bernal 1967). Most clays are plate- or lath-shaped micro-crystals made of silicon, oxygen, and aluminum, interspersed with other

elements (commonly iron, calcium, or sodium) which can replace the major elements. These substituted metals alter the electric charge on the crystal's surface, providing locations where organic molecules can attach. The structure of the clay crystal provides stability and organization essential for the origin of life (for example, Wang and Ferris 2005; Hanczyc and others 2003; Saladino and others 2002).

Leslie Orgel (1973) coined the now famous term "specified complexity" to distinguish between crystals, which are organized but not complex, and life, which is both organized and complex. He was well aware then of the potential role of crystalline minerals in the origin of life. Twenty-five years later, Orgel demonstrated the thermodynamic favorability of polymer formation on grains of the mineral apatite, or hydroxylcalcium phosphate (see Ferris 2002 for a "reader-friendly" account).

Consider for a moment: our teeth contain calcite — a crystal of calcium carbonate. Our bones are made from calcite, and marine shells are made from calcite coupled with aragonite (both crystals). Those bones and our teeth also need another crystal: apatite, or hydroxylcalcium phosphate. Marine shells are made from calcite and aragonite (both crystals). Plants, particularly grasses, need silicon crystals called phytoliths to exist. The bodies of diatoms are mostly crystal silicon. Silicon or calcium crystals are found in nearly all life on earth. Crystals made of iron oxide (magnetite $[\text{Fe}_3\text{O}_4]$) or its sulfide counterpart (griegite $[\text{Fe}_3\text{S}_4]$) are found in many life forms on earth, from bacteria to vertebrates — including humans. These crystals are chemically indistinguishable from those formed abiotically — that is, produced entirely from the normal actions of

physical processes on earth without any input by a living organism. Since we must have crystals to live at all, it is only reasonable to ask what role crystals may have played in the origin of life.

Studies of pre-biotic chemistry shows that interactions between mineral crystals and naturally occurring molecules leads to increased complexity, and more abundant yields from abiotic synthesis. Here again we see an important role for the mineral calcite. Robert Hazen has studied the binding of amino acids to surface of calcite crystals and discovered that they are aligned in a way that favors one structural form — the "left-handed" isomer — over others (Hazen 2005; Hazen and others 2001). The isolation of these amino acids was an important step in the origin of life (the "bias" of life for left-handed forms when the laws of physics would predict equal proportions of right- and left-handed forms is a strident creationist objection to most origin-of-life scenarios). Crystals in another group, the borates, stabilize the naturally forming sugar ribose, which is an important molecule needed to form the cellular workhorse RNA (Ricardo and others 2004).

Finally, the most common creationist objections to origin of life research is the insistence that the famous Miller-Urey experiment was a failure. This 1953 experiment was the first to demonstrate that a simple energy source, an electrical spark, could induce the spontaneous formation of amino acids from a mixture of gases. Creationists from the Discovery Institute to the young-earth creationists of Answers in Genesis all claim that the gases used by Miller could not have been found on the early earth. Whether or not this objection is true, Stanley Miller's last paper (published posthumously



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ly in 2008) demonstrated that the presence of the crystal calcite and the iron crystal pyrite in the preparation leads to high yields of amino acids even from neutral gas mixtures (Cleaves and others 2008).

Are there traces of these ancient events found today? Yes, as evolutionary theory suggests that there must be. We see that inorganic crystals common in the ancient earth are part of all living things. First of all, we remember that these “complex” minerals found in living organisms are in fact mostly identical to the inorganic crystals we find in rocks today; biominerals are merely smaller. We also see that all living things — from bacteria to mammals — utilize chemical reactions and pathways that interact with these crystals. There are numerous enzymes and proteins that are part of a cell’s chemistry that operate to build up or break down these crystals.

One example found in all vertebrates is osteocalcin. Recent research related osteocalcin to other vitamin K-dependent proteins that control calcium metabolism, including in bacteria (Berkner 2005). Finding this enzyme in bacteria confirms that the use of dissolved minerals and crystal surfaces was a part of the earliest forms of life on earth — and one that has been maintained and passed along to successive branches in the tree of life.

Is it then silly, or irrational, to think that these essential crystals were part of the origin of life? Not at all! Only the ignorant will be fooled by the derisive scoffing of Stein in his propaganda movie into thinking that Ruse’s comments were just grasping at straws to avoid a theistic solution to life’s origin. While the exact relationship of crystalline minerals to the first complex organic molecules is incompletely understood, it is an active and productive area of scientific research — in stark contrast to the sterility of “intelligent design” creationism.

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EXPULSED IN CANADA

The pro-“intelligent design” movie *Expelled: No Intelligence Allowed*, starring Ben Stein, opened on June 27, 2008, in theaters across Canada. But the opening was significantly smaller than the movie’s April 2008 debut in the United States, when it played on over a thousand screens. In Canada, according to the movie’s website, it was screening in only thirty-six theaters in seven provinces.

Canadian critics were as unimpressed with the movie as their American colleagues. The Toronto *Globe & Mail* (2008 Jun 27) called it “an appallingly unscrupulous example of hack propaganda,” while *Maclean’s* critic wrote (2008 Jun 26), “I found this film so distasteful I hesitate to dignify it with even a thumbnail review,” and the *Edmonton View Weekly* (2008 Jun 26) described it as “full of disingenuous ploys, cheap tricks, and outright mendacity.”

Peter McKnight, a columnist for the *Vancouver Sun* (2008 Jun 21), asked Stein for his reaction to the Anti-Defamation League’s statement condemning the movie’s misuse of the Holocaust to further its anti-evolution agenda, to which Stein replied, “It’s none of their f—ing business.” McKnight remarked, “the producers are doing precisely what the Nazis did: Distorting Darwin’s writing in order to justify their beliefs.”

McKnight’s column concluded, “I don’t ... expect the producers to disavow any part of the movie because their disdain for truth comes through loud and clear. I’m not particularly bothered by the existence of *Expelled*. For it displays, in a way a movie review never could, the intellectual and moral bankruptcy of the ID movement which, unable to construct a convincing argument, resorts to dishonesty and deceit.”

As in the United States, *Expelled* was screened to friendly audiences before it opened in theaters. Following one such screening in Toronto, a group left a private screening of *Expelled* and marched to the Royal Ontario Museum, which was hosting “The Evolution Revolution,” an exhibit on the life and work of Charles Darwin, in order to protest the omission of any material alleging that Darwin was a racist.

“Charles McVety stood in front of a giant poster of Charles Darwin and called the father of natural selection a giant racist,” the *National Post* (2008 Jun 13) bemusedly reported, adding, “the protest was part of an odd campaign to stake out the higher ground for creationists, using the unlikely racism card.” McVety is the president of Canada Christian College in Toronto, which rejects evolution as a matter of faith.

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