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George McCready Price

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## ARTICLE

# Faulty Survey Discredits Biology at Faith-Based La Sierra University

T Joe Willey

### INTRODUCTION

In response to complaints from some alumni and others, the Board of Trustees for La Sierra University (LSU)—a faith-based Seventh-Day Adventist institution—surveyed biology students to assess allegations that the professors failed to teach biblical creationism and “intelligent design”. Complaints from alumni, bloggers, and other members of the Adventist community alleged that the faculty had instead offered evidence and arguments favoring evolutionary explanations for the history and diversity of life and had ridiculed students who believed the biblical creation and Flood accounts.

Conservative church leaders and certain members of the LSU Board of Trustees appeared sympathetic to the continuing complaint that Adventist beliefs regarding the Genesis six-day creation narrative and Noah’s Flood had not been sufficiently affirmed by the biology faculty. Some of the conservatives on the Board joined in opposing the biology program.

The survey appears to have been designed to reveal certain “shortcomings” in the biology program, but the initial results were disappointing: there was no clear indication that the professors discredited Adventist interpretations of creation or were ridiculing or marginalizing students who held traditional religious views of origins. However, before the final report was released, a subcommittee of the Board “revised” the data summary in a way that made the state of affairs over teaching evolution seem to be more threatening to Adventist doctrine on origins than it actually was.

Relying on these manipulated results, a self-selected group of trustees issued an Open Letter of Apology publicly admitting that the biology program had certain “shortcomings” and reassuring Church leaders and members that LSU was “committed to being an institution that does not just present the Church’s view of creation, but fully supports it” (Creation-Evolution Study Group 2011). Henceforth, LSU promised that it would adopt recommendations from the Adventist Accrediting Association (AAA) promulgated by the church’s education department.

The fall-out from AAA’s probationary actions was the forced resignation of a long-term biology faculty member, the forced resignation of two administrators, and the removal of three board members. But the real story here is the way in which the data from the survey were manipulated to serve a doctrinal purpose in a struggle to control the students’ exposure to secular ideas that conflict with Church doctrine about the age of the earth and the history and diversity of life.

## ADVENTISTS' CREATIONISM

The Seventh-Day Adventist beliefs are conservative and literalistic: embracing the historical accuracy of biblical texts regarding the origin of the universe and of life, and the geologic history of the earth as a result of Noah's flood (Numbers 2006). Just as important as the Bible are the writings of the prophetess Ellen G White (1827–1915). With regard to “origins” she claimed that God carried her back in time through a vision to the historic creation week and showed her the sequence of events just as the Bible describes them (White 1864:90). Throughout her life she criticized satanic teachings found in geology and evolutionary science, stating: “God designed that the discovery of these things should establish faith in inspired history; but men, with their vain reasoning, fall into the same error as did the people before the flood,—the things which God gave them as a benefit, they turn into a curse by making a wrong use of them” (White 1891:112).

The first Adventist “scientist” was George McCready Price, a disciple of Ellen White who became most influential in holding the line against Darwinism and geology. Though not a geologist, in his book *The New Geology* (1923) he tried to poke holes in prevailing geological theories. Price's work became the foundation in 1958 for the Geoscience Research Institute (GRI). GRI continues to this day to maintain a distinctive emphasis on special creation in six literal days and on the fossil-forming Noachian Flood. Price's work is also at the foundation of the seminal work of “scientific creationism”—*The Genesis Flood* (Whitcomb and Morris 1961)—and of the Institute for Creation Research (Numbers 1998).

Adventist perspectives on Genesis creation do not allow for naturalistic processes to produce new species or to agree with the well established geologic column with million year-old fossils. However, more than a few Adventist scientists, theologians, and others accommodate theistic evolution, hoping to reconcile Genesis with a more scientific understanding of the natural world. The tension created by these factions intermittently prompts Adventist leaders to try to restore loyalty to traditional Adventism. Recently, in a speech before a group of scientists and theologians in Atlanta in 2010, Ted Wilson, the newly elected General Conference president and chairman of the GRI Board, admitted, “We don't have all the answers ...” but went on to say there is sufficient evidence for a biblical creation and a global flood. And he described theistic evolution as a meaningless process that challenges “a loving God who created us in His image.” Wilson forcefully stated that he wanted to “see that all Seventh-Day Adventist teachers—whether they are theologians or science teachers—believe and accept the biblical creation as the church has voted and understood it. That is our goal, and that is what we need to move toward” (Campbell 2010).

## ADVENTIST SCHOOLS OF HIGHER EDUCATION

Adventists maintain an extensive educational system from elementary schools to universities claiming an open mind in searching for “truth”. There are over 100 higher education institutions connected with the Church, thirteen of them in North America. There are three universities with professional programs, including the flagship Loma Linda University, which supports schools in academic medicine and other health sciences, as well as graduate programs in geology, psychology, social science, and religion.

Each institution is a separate non-profit corporation with its own by-laws and board of trustees, all of whom are members of or employed by the Church. The actions of one of

these boards—in response to the perceived threat to Adventist doctrinal purity—are the basis of a recent controversy at La Sierra University (LSU). In some ways, the situation was not unique, but symptomatic of the tension between secular scholarship and sectarian doctrine. Historically, ministerial and theological education has been fertile ground for creating controversy and academic mistrust within Adventist institutions (Bull 2007).

The expectation in Adventist higher education settings is not that evolution should not be taught in Adventist schools. Adventist authorities believe that students should be prepared to go on to further academic work prepared to cope with evolution. Rather, they want the instructors to use the more generic scientific method to point out inconsistencies in natural selection models, faults or inconsistencies within the scientific literature, discontinuities in the geological column, problems with dating methods, and “gaps” in the fossil record as an indirect way to belittle and discredit evolution (Prothero 2007:45).

### **THE LA SIERRA UNIVERSITY FLARE-UP**

During the spring of 2009, several students, parents, alumni, and other prominent Adventists alleged that certain LSU faculty had set about to corrupt the university using scientific biology (Taylor 2009). Some claimed that LSU instructors were knowingly avoiding creationism or professing ignorance of the matter; others revealed that biology faculty were actually teaching evolution as though it were a valid scientific construct. For this, Shane Hilde, one of the contributors on the *educatetruth.com* blog, stated that certain biology faculty “should both resign because their clear belief in evolution is contradictory to the teachings of the church that founded the university” (Stripling 2009).

In June 2010, the LSU Board of Trustees established an ad hoc Creation-Evolution Study Group (hereafter referred to as the “Committee”) to review the gathering concerns or allegations (Creation-Evolution Study Group 2011). The Board decided to create a questionnaire and ask questions about the science instruction from students graduating or attending LSU in the previous four years. The Committee distilled the issues with the biology program to three allegations that kept reappearing in petitions, letters, blogs, and other social media:

1. The biblical account of six literal consecutive 24-hour days of creation had been discredited and labeled as merely figurative language;
2. The theory of evolution was taught as having greater scientific merit than the biblical account of creation and as more accurately portraying the origin and development of life, and
3. Students who maintained a traditional SDA perspective with regard to creation were marginalized and sometimes ridiculed for holding this position.

To evaluate the validity of these allegations, the Committee distributed a survey instrument containing 16 statements (Table 1). Respondents indicated their level of agreement with each of these statements on a six-item Likert scale using: “strongly agree”, “agree”, “neutral”, “disagree”, “strongly disagree”, or “no basis for response”. The survey was made available on the Internet to all students, including graduates, over the previous four years who had taken biology courses. All responses were kept anonymous.

Of the 369 eligible respondents, 91 (24.7%) completed the survey. The majority (67%) had only completed a first-year general biology course. The remaining 33% were biology graduates, and nearly a third of the participants were non-Adventists. There were no attempts to ascertain if the sample were representative of the students eligible to respond (for example, "Are you a believer in creationism?"). The biologists submitted some questions used in the survey, but were not allowed to reword a few questions they perceived might be misleading in the final questionnaire placed on the Internet.

It should also be noted that there were no questions in the survey referring to specific issues of contention in Adventist doctrine: for example, the historicity of Noah's Flood, the age of the earth, paleontology or fossil evidence, geologic history, or other topics or

**TABLE 1.** *The LSU Evolution Survey Instrument*

1. It is appropriate to present evolutionary theories in biology classes at LSU.
2. Evolution is presented as a scientific working theory in biology classes.
3. The differences between theories, facts, and beliefs were explained in my biology classes.
4. The changing and always tentative nature of even strongly-established theories was explained in my biology classes.
5. Data relevant to testing the strengths and weaknesses of evolutionary theories were discussed in my biology classes.
6. Evolutionary theories were taught as the factual explanation of the origin of life.
7. My professors presented helpful ways of relating science and religious faith.
8. The Seventh-day Adventist view of creation was presented in biology classes.
9. The Seventh-day Adventist view of creation was supported in biology classes.
10. Science is an effective, but tentative, way to understand and explain natural processes.
11. Science offers an effective way to prove beliefs about God and God's creation.
12. Science and religion are valid but different ways of understanding the world.
13. Science is unable to definitively answer questions about the ultimate origins of human life.
14. Biology professors treated my questions and views on issues of origins, science, and religious faith with dignity and respect.
15. Biology professors encouraged my faith in a personal God.
16. Biology professors supported my faithfulness to my religious heritage.

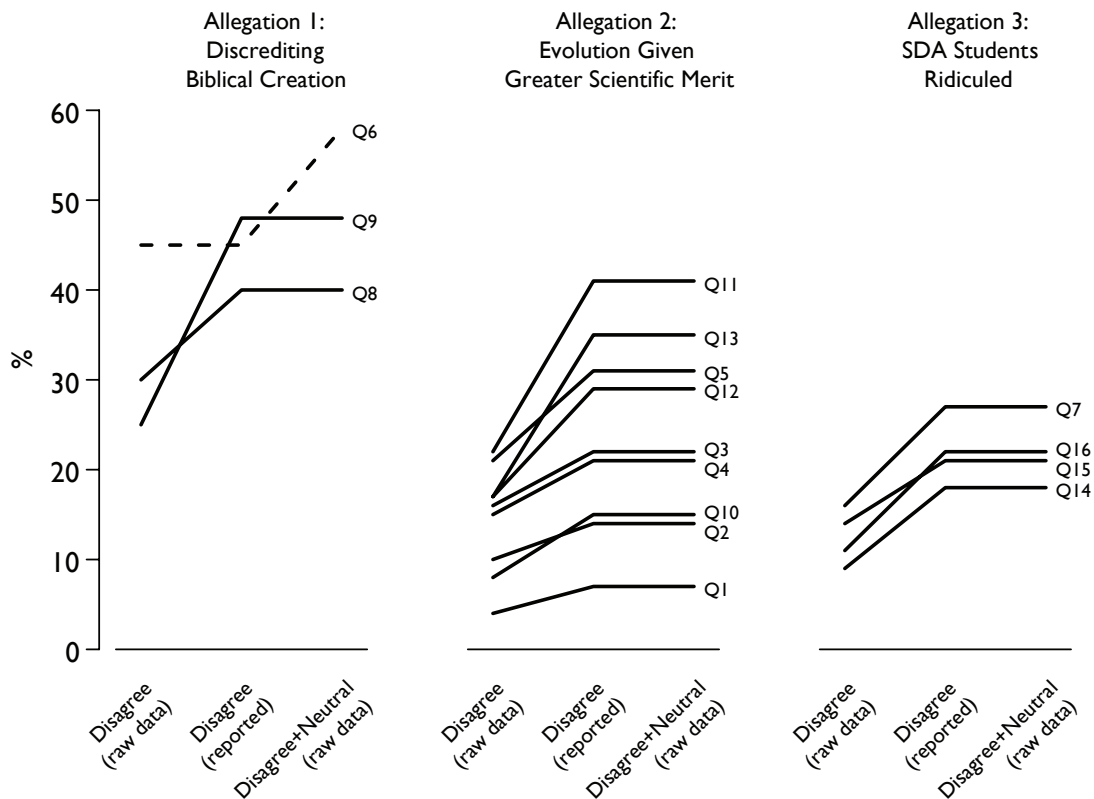
theories related to the history of life on earth that might be discussed in a typical university-level biology class. A “shortcoming” in the biology program would be revealed if the student disagreed with any of the statements in the survey, except for Question 6, which would reveal a “shortcoming” if the students agreed with it.

**SURVEY RESULTS**

Because of the small number of responses in each category, answers in the “strongly agree” and “agree” categories are grouped together, as are the responses in the “disagree” and “strongly disagree” categories. The initial results indicated, at least according to the students, that the LSU biology department was effective in communicating scientific information about evolutionary theory and scientific practices, while remaining faith-affirming for the students. Strong pluralities agreed with the statements that Adventist views were presented and that students’ faith was supported and affirmed.

When the questions are grouped relative to their relationship with the three allegations that the Board wanted to investigate (shown as the top bar of the pair for each of the questions in Figure 1), the results show no support for the charges that biology faculty at LSU were undermining either Adventist doctrine or the faith of individual students.

The data shown in the top bar associated with each question in the figure were obtained from the computer output after the survey was completed (Creation-Evolution Study Group 2011). However, before its final report, the Committee made an unusual decision on how



**FIGURE 1.** Results of the LSU Evolution Survey.

to combine categories of responses. In addition to combining the “strongly agree” with “agree” answers and the “strongly disagree” with “disagree” answers, the committee also chose to add the “neutral” responses to one of the combined categories, and to ignore the “no basis for response” altogether. The effect of these on the impression gathered from the data is shown in the lower bar for each of the questions in the figure.

In every statement the “neutral” responses were added in with the two categories of disagreement, except in Question 6. In this one instance, the “neutrals” were added in with those agreeing with the statement. In Question 6, this meant that the 14.3% of respondents who chose “neutral” were added with those who agreed that evolution was being taught as a “fact” to explain the origin of life (and therefore in defiance of Adventist doctrine).

For all the other questions, the “neutrals” were added to the “disagree” category, which made the data appear to give more support to the allegations than warranted by the way the students actually responded. For 10 of these 15 questions, this increased the percentage of negative answers by at least 11%; and for 3 of the questions, the increase was 20% or more.

Applying a t-test of differences in proportion between the “enhanced” category data reported by the Committee and the original data in the survey indicates that in all cases, the differences were statistically significant. The Committee’s presentation was significantly more negative than the original data, and this led to a distortion of the results that indicated more support for the allegations than the survey legitimately showed.

The weakest effects (1-tailed  $p < 0.05$ ) were in questions 1–4, because in these cases there were only a few neutral responses and fewer than 17% of the total were in the combined “disagree” category. In all other questions, the significance of adding the neutral responses to the “disagree” category were between  $p < 0.013$  and  $p < 0.025$ . The Committee’s results were consistently and significantly more negative than the original data.

Despite this distortion, the results still showed minimal evidence that the biology faculty were undermining Adventist doctrine or the faith of their students. For example, in the questions related to Allegation 3, no fewer than 68% of the students answered each question in a way that indicated that the faculty were both respectful and affirming of their faith. In general, answers that were favorable to the biology program convincingly outnumbered those that suggested a serious conflict with Adventist doctrine.

## DISCUSSION

### **Analysis of Allegation 1: The Biblical account of six literal consecutive 24-hour days of creation has been discredited and labeled as merely figurative language.**

This allegation was frequently made in letters and social media presented by the “truthers” on the Internet. But the questionnaire did not directly address this allegation; for example, there were no questions specifically addressing whether biology classes discussed the literal biblical presentation of six 24-hour days of creation, or labeled creation as merely figurative language. The Committee’s questions seem to focus on the degree to which non-scientific Adventist ideas were generally incorporated into the biology classroom.



The three questions corresponding to this first allegation revealed a relatively high frequency of “neutral” responses (11–25%). Despite a statistically significant distortion of the data in the Committee’s report, the general picture is still one in which more students agreed that the professors were teaching the requisite Adventist content in biology classes than disagreed.

Nearly 30% of the students were non-Adventist, and we have no way of knowing if they understood what the survey statements meant by “the SDA view of creation”. Furthermore, nearly 70% of the participants were first-year students—only beginning the study of biology—and 52% of these were in the fall quarter of the year 2009–2010, just getting started. The Committee did not appear to have any way to adjust or modify its analysis to take into account the non-Adventist students taking the survey or that these students were mostly novices in biology.

**Analysis of Allegation 2: The theory of evolution is taught as having greater scientific merit than the biblical account of creation and as more accurately portraying the origin and development of life.**

All of the questions in this section showed statistically significant differences between the survey data and the Committee’s report, although the difference was somewhat less in questions 1–4. It appears that the number of negative and neutral responses was so small in these four questions to begin with, lumping did not seem to produce a big difference in the proportions of responses supporting the allegation, so only with a 1-tailed test at the level of  $p < 0.05$  was there any statistical significance to the difference. From the survey data, one can say that LSU biology faculty were clear and appropriate in their presentation of scientific theories, models, facts, and explanations.

**Analysis of Allegation 3: Students who maintain a traditional SDA perspective with regard to creation are marginalized and sometimes ridiculed for holding this position.**

This allegation was frequently presented in blog posts, letters to the Adventist community and university and church leaders, and so on. The survey was the most direct way to determine if this allegation were true. However, the results showed this allegation was false. The students did not agree that creation was marginalized in class or that they were ridiculed for their positions and beliefs. Over 68% of the responses on each of the 4 questions indicated quite the opposite: students felt supported and encouraged in their faith by the faculty. This section also had the highest “no basis for response” overall; 7.7% in questions 15 and 16, and 8.8% in question 14.

**APPLYING THE DATA**

The final report of the Committee (February 7, 2011)—based on the data presentation that lumped “neutral” data with the data category that presented the more negative impression—came to the conclusion:

Even though there is room for improvement in most of these areas, survey questions 6, 8 and 9 require particular attention. The only way in which to fully benchmark these results, however, would be to have this same survey conducted by La Sierra’s sister institutions in North America. Without such comparisons, any criticism of La

Sierra's effectiveness at supporting Adventist beliefs relative to other institution is speculative, at best. (Creation-Evolution Study Group 2011:4)

In fact, the original "Interim Report" from the Committee to the executive session of the Trustees on November 11, 2010, was quite favorable to the biology program. There was not even a hint at this point that the biology program was any different than what the faculty had maintained concerning the pedagogy of science education in a Christian environment, including what some perceived as difficulties by some first-year biology students who had not been exposed to scientific biology before coming to LSU. What the Board actually found from the student survey was that LSU biologists:

1. Taught science in an objective manner.
2. Respected students' opinions and beliefs.
3. Supported students' religious affiliations.
4. Mentored students and encouraging personal faith.
5. Help students understand the difference between what they know and what they believe.
6. Helped students integrate faith and learning.
7. Seriously discussed complex and difficult issues with their students.

The report also mentioned that the "Biology Department generally ... explains the strengths and weaknesses of evolution ... [but] must make a greater effort to present and support the denominational view of creation" (Creation-Evolution Study Group 2011:Attachment 2).

One of the consequences of all this attention to the biology program was the visit on November 15–19, 2010, of a ten-member team from the Adventist Accreditation Association (AAA)—a church-sponsored accreditation body established to make sure that Adventist schools adhere to the Adventist philosophy of education. During the visit, a biologist from the site team, and one familiar with the problems of teaching scientific biology in the Adventist post-secondary schools, asked the Chair of Biology if he could meet with the biology faculty and discuss some of the issues. The North American Division Director of Education Larry Blackmer (serving as AAA team's advisor) and the Director of AAA, Lisa Beardsley from the General Conference, asked if they also could meet with the biology staff during this same time. During the meeting, the LSU biologists openly shared the struggle over teaching creationism in the classroom and the difficulties in reconciling science with faith. They were honest and told the three visitors that the discussion of biblical creationism was better placed in the School of Religion.

The encounter with the three visitors resulted in a "consultation letter" written on behalf of this "subcommittee". The letter was addressed directly to LSU President Randal Wisbey. In summary, the "consultation letter" reiterated that the biologists were devoted to "teaching the best science education possible" and that "one of their highest goals was to ensure that they helped their students know Jesus". But, the letter added, the "biologists stated that they were averse to teaching, much less in celebrating the faith position found in creationism" (Creation-Evolution Study Group 2011:Attachments 1–5). This thread in the letter

became known as the “deviation from the Adventist philosophy of education,” which by now everyone in leadership suspected was at the heart of the controversy. The letter itself was kept secret, and only later was it discovered that some of the things the biologists said were misrepresented.

The ad hoc Board Committee met on January 11, 2011, and reviewed the consulting letter and the initial draft of the AAA report. Three members from the Committee then were commissioned to draft a report that became a memorandum to the whole Board. As a result, the “neutral” opinions were lumped into the “disagree” column in all but Question 6. The survey data now appeared to emphasize certain significant “shortcomings” in the biology program (Creation-Evolution Study Group 2011:Attachments 1–5).

The “final draft” of the accreditation report was issued to the university on February 7, 2011. The AAA site visit team unanimously recommended that LSU receive the maximum possible years for accreditation under the AAA guidelines, but the team also advocated returning before December 31, 2012, to re-examine four important recommendations, the most notable of which was to review expected progress by the administration and faculty to enhance “the classroom for students and faculty with traditional Adventist views, seeking balance by presenting a range of views and supporting student expression according to the principles of academic freedom.” It was becoming clear that the church expected the biologists to affirm creationism in science classes. Furthermore, it was not enough to encourage a personal belief in God or even teach that science is unable to definitively answer questions about the origins of human life; the Bible was to be used in the classroom as a source of cherished principles and of “real” knowledge.

At the next LSU board meeting on February 9 and 10, 2011, after voting to accept the survey results, the Board also voted to hand off the responsibility for discussing the results to the University’s public relations department (Lenny Darnell, personal communication). Instead, during the next month a self-selected group of trustees, including the chairman of the Committee, prepared an “Open Letter of Apology” based on the distorted survey results. This apology letter was taken to the biology department to be signed by all members of the biology faculty. However, by now the biologists had seen the manipulated data and refused to sign. In reaction to this refusal, the LSU administration asked the chairman of the department to sign the apology letter, but he also refused.

So on March 9, 2011, the Open Letter of Apology appeared over the signatures of President Randal Wisbey and Ricardo Graham, chairman of the Board of Trustees. The letter framed the sensitive survey results this way:

From these who have been enrolled in biology classes, the study group learned that the university is doing well in some areas. Two-thirds responded that their professors presented helpful ways of relating science and religious faith, supported their faithfulness to their religious heritage, and encouraged faith in a personal God.

The survey, though, also showed areas in which we have fallen short of what we and our Church want for our students. We found that only 50 percent of the students surveyed agreed or strongly agreed that our Adventist view of creation was presented, and only 40 percent agreed or strongly agreed that our Adventist view was supported. This is not acceptable, and we apologize. We have already begun addressing this in

meaningful ways to ensure that our biology program seriously addresses the topic of creation. (Wisbey and Graham 2011)

In response to this apology, the consultation letter, and reviews from the visitation team, the AAA Board in the General Conference rejected the recommendation for accreditation from the site visit and moved on April 4, 2011, to grant only limited accreditation to LSU until December 31, 2012. There is no doubt that the skewed survey results had a significant effect on the AAA Board's decision (Kellner 2011), giving them the justification they needed to act to rein in the biology department. This matter had other implications for the campus, however.

An earlier visit in the spring of 2010 by the Western Association of Schools and Colleges (WASC)—a secular accreditation agency—had raised serious concerns during its Educational Effective Review before issuing accreditation to LSU for eight more years. WASC promised to return in a year and review the progress that LSU committed to make in certain administrative areas. On both occasions WASC was aware of the pressure from religious conservatives in the church over issues relating to the teaching of evolutionary biology and creationism. After returning to the campus near the end of April 2011 (following the AAA fiasco and the forced resignation of three faculty and one board trustee), WASC recognized that the crisis over institutional autonomy continued and noted that LSU was still under fire from “some segments of the ... Church because of the perception that ... faculty teach the biological sciences in a way that could be viewed as inconsistent with Church teachings” (Wolff 2011).

Furthermore, WASC noted that the LSU board appeared to have ignored earlier concerns and had failed to address this challenge in “keeping with generally accepted principles of higher education related to institutional autonomy, academic freedom, and the appropriate roles of the faculty, administration, and governing board.” As a consequence WASC issued a formal “Notice of Concern” on July 5, 2011. The loss of WASC accreditation would be a serious setback for LSU (Wolff 2011) in its aspirations to be regarded as a legitimate university of higher education, allowing students to obtain financial aid, to apply for the GI Bill, and to transfer credits to other higher educational institutions. Hiring faculty in the future will also be more difficult.

WASC was not telling LSU what it could or could not teach. WASC's concern was related to governance and procedural issues. In response, many “truthers” on social media promoted the unreflective recommendation that LSU should return to being a Bible College and abandon regional (secular) accreditation—not fully understanding the implications of either of these moves for the future of Adventist education.

## **CONCLUSION**

A survey of what the students were actually learning about scientific biology at LSU—a university sponsored by a conservative Christian church that has not always been cordial to evolution—could be a good starting place in a search for weaknesses in biology instruction. As we see here, the Board elected to test only three broad allegations frequently heard from the evolution critics, but many of the specific objections were left out of the questionnaire. Looking at the questions overall, it appears the Committee narrowed its interests to two main issues.

1. Was science given greater priority over biblical creationism (in other words, did science serve as a distraction from teaching creationism)?
2. Were students who held traditional SDA religious views of creation ridiculed or marginalized by the professors?

In the end, the survey search essentially boiled down to questions 8 and 9: the students' perceptions that biology instruction included and supported the Adventist view of creation. The addition of those with "neutral" responses to the "disagree" category increased the "negative" responses in question 8 by 33% and doubled the "negative" responses in question 9. Even though only about 40% agreed that creationism was supported in biology classes, those disagreeing amounted only to about 27% ... until the 25% of respondents who chose "neutral" was added to the "disagree" category. These distorted results were used as the basis of the Open Letter of Apology from the president and chairman of the board.

The decision to combine all the responses originally marked as "neutral" into one of the other categories significantly changed the interpretation of the survey results, and the resulting responses placed the integrity of the scientific biology curriculum and the extent of academic freedom into question on both fronts. But even with those changes, the results would not support the Committee's conclusions about biology instruction at LSU. At least one board member, in a letter that became public, protested that the Board's action in February 2011 "was very clear, and there was nothing in the voted document that involved creating new language, or new policy, let alone 'apologizing' for anything...we also voted to release the ... Committee from their duties" (Lenny Darnell, personal communication).

La Sierra University, still enmeshed in this controversy, faces the possibility of losing its accreditation by both secular and religious commissions and the loss of faculty and staff. This outcome threatens LSU's claims to legitimacy both as a regular institution of higher education and as an Adventist-sponsored school.

Biology is the second largest department at LSU. It is the academic home to many students who plan to become physicians and dentists or gain employment in other health sciences. Actions that weaken this department also weaken both the students' and the university's claim on a legitimate scientific foundation for their studies and future professions.

The biology faculty supports the solution to recognize the distinctive difference between science and religion that allows both to coexist, but perform in separate domains. And as shown here, the biology faculty appeared to have learned how to carry out this charge successfully, judging by the student survey. Perhaps most remarkable is that, even though the student survey was inspired by complaints from critics of the biology program, the results did not succeed in producing evidence that the three main allegations were true.

At LSU, the students were taught science, even evolutionary biology, while at the same time treating questions and views on issues of origins, science, and religious faith with dignity and respect, encouraging faith in a personal God, and support faithfulness to students' religious heritage, whether they were Adventist or non-Adventist. What more could one ask for?

So there must be some other reason to explain why a self-selected group on the LSU Board of Trustees manipulated the data to justify issuing an Open Letter of Apology to the Church and subsequently placing the university at peril for its continuing accreditation. It certainly was not because the survey data themselves lent any support for the perceived “shortcomings” in the biology program.

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## ABOUT THE AUTHOR

T Joe Wiley received his PhD from the University of California, Berkeley, in neuroscience. After graduation, he taught and conducted research in neuroscience at the Loma Linda University School of Medicine. He was a postdoctoral fellow at New York University in Buffalo with Nobel laureate Sir John Eccles and at the Brain Research Institute at UCLA.

**AUTHOR'S ADDRESS**

T Joe Willey  
404 Caroline Street  
San Bernardino CA 92408  
tjw@lasierra.edu



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## FEATURE

# Dover Comes to Ohio

**Richard B Hoppe**

Immediately following the *Kitzmiller* decision in December 2005, I argued before the Ohio State Board of Education in January 2006 that in adopting an “intelligent design”-friendly science curriculum indicator and model lesson plan for 10th-grade biology, the board had set a “Dover Trap” for Ohio school districts (<http://pandasthumb.org/archives/2006/02/the-dover-trap.html>). I didn’t anticipate that the trap would be sprung by an individual teacher rather than by a local school board, and I certainly didn’t anticipate that it would occur in my own school district. But that was the case in Mount Vernon, Ohio. Emboldened by the state board’s actions, a middle school science teacher systematically inserted creationist materials into his teaching of science.

As a result, over the last three years a painful drama has been playing out in Mount Vernon, Ohio. It has involved contentious school board meetings, a lengthy administrative hearing, three federal lawsuits, and occasionally acrimonious debates among citizens. Finally, it resulted in the firing of a popular and enthusiastic middle school science teacher who was found (among other things) to have injected creationism into his teaching of science and to have persistently violated the Establishment Clause of the First Amendment to the Constitution. The *Mount Vernon News* has had good coverage throughout the affair where additional details can be found (<http://www.mountvernonnews.com/local/freshwater/stories.php>).

### BACKGROUND

Mount Vernon is the county seat of Knox County, a conservative rural county an hour northeast of Columbus. With a population of just over 16 000, Mount Vernon is predominantly white (94%), Christian, and heavily churched. Mount Vernon is also home to the Ohio Conference of the Seventh-Day Adventist Church with an associated boarding high school, and also has a Catholic elementary school.

The county has three post-secondary educational institutions: Kenyon College, a secular private liberal arts college; Mount Vernon Nazarene University, a rapidly growing Christian institution; and a branch campus of Central Ohio Technical College, a vocational school.

The Mount Vernon City School District serves about 2200 students in grades 6–12 from the city and surrounding rural areas. According to a recent analysis of district personnel records, 17% of district teachers are graduates of Mount Vernon Nazarene University and another 4% are graduates of other evangelical educational institutions. Ohio’s Cedarville University—which says it takes a “creationist approach to scientific research and study” (<http://www.cedarville.edu/About.aspx>)—has seven graduates who work as teachers in the district.



## MAIN CHARACTER

At the center of the controversy is John Freshwater, a middle school science teacher with 25 years' teaching experience, most of it in Mount Vernon. He has an Associate's degree in Recreation and Wildlife and a Bachelor's degree in Education. Freshwater is also a deacon of Trinity Worship Center (<http://www.mvtrinity.com/index.php?id=497>), an Assemblies of God congregation. The church served as local headquarters for Freshwater and his attorney during the administrative hearings related to his case, and its pastor, Don Matolyak, is one of Freshwater's core advisors, providing spiritual counsel and strategic advice, occasionally serving as Freshwater's spokesman, and making his church address available for a fund-raising organization supporting Freshwater.

In 2003, after the Ohio State Board of Education adopted an "intelligent design"-friendly "critical analysis of evolution" standard for 10th-grade biology, Freshwater urged the district to adopt the Intelligent Design Network's "Objective Origins Science Policy" (<http://www.intelligentdesignnetwork.org/SchoolPolicy.htm>). He supported his proposal with Jonathan Wells's (2000/2001) *American Spectator* "Survival of the fakest" article and Wells's "Ten questions to ask your biology teacher about evolution" (<http://www.iconsofevolution.com/tools/questions.php3>). Both the district science curriculum committee and the district board of education rejected Freshwater's proposal and he was instructed not to use creationist materials.

## PRECIPITATING INCIDENT

On Friday, December 7, 2007, John Freshwater performed a classroom demonstration using a high-voltage, high-frequency, low-amperage signal generator, a sort of Tesla coil. The device can be used to stimulate light emissions from gases, and Freshwater's demonstration exploited that property, using sealed glass tubes filled with various gases and challenging students to identify each ionized gas by the color of the light it emitted.

At the end of that exercise, as he had done in previous years, Freshwater asked if any of the students wanted to see how the arc produced by the device felt on their skin. Freshwater brought the tip of the device near the forearms of several volunteers, one student at a time, allowing a high-voltage arc to jump from the tip to the student's skin. While sworn testimony differed on the shape, seriousness, and persistence of the marks produced by the device, it was undisputed that the device did produce a red mark—essentially a radio-frequency burn—on students' skin that lasted from a few hours to a few days.

The parents of one of the student volunteers reported the incident to school administrators the following Monday, and eventually it gave rise to an investigation by an outside firm on behalf of the Mount Vernon Board of Education, to several contentious board meetings, to a federal lawsuit against Freshwater and the district, and to the board's adoption of a resolution of its intent to terminate Freshwater's employment. The board resolution of intent led to a prolonged and expensive state administrative hearing on the termination over a two-year period that cost the district an estimated \$920 000; two more federal lawsuits; an appeal of the outcome of the administrative hearing in the state courts of Ohio (still in progress); and complaints by Freshwater to both the Ohio Civil Rights Commission and the US Equal Employment Opportunity Commission.

**WINTER–SPRING 2008**

On the evening of the classroom demonstration, one of the student volunteers, an 8th-grader, complained to his father about irritation on his arm, and in later sworn testimony the father said he observed and photographed a cross-shaped red mark on the child's forearm, roughly 10–15 cm by 5–7.5 cm (a photo is available here: <http://pandasthumb.org/archives/2008/06/teaching-intell.html>). Later that evening, when the student complained that the irritation was still so painful that he could not sleep, his mother took more pictures of the mark. The following Monday, December 11, 2007, the parents, Steve and Jenifer Dennis, reported the incident to the superintendent, Steve Short, showing him photographs of their son's arm.

That day Short met with William White, the middle school principal. White later testified that on Short's instructions, he and assistant principal Brad Ritchey met with Freshwater to investigate what had happened. White testified that Freshwater first denied that anything had happened, and then conceded that there had been a classroom exercise that involved "shocks" (<http://pandasthumb.org/archives/2008/10/day-4-science-c.html>). White instructed Freshwater to cease using the Tesla coil and later testified that he had observed religious materials displayed in Freshwater's classroom at that time.

Administrators met several times with Freshwater in the following months concerning the religious material displayed in his classroom, which—according to later testimony—included the Ten Commandments, some Bible verses on small wall posters, a poster depicting President GW Bush and Colin Powell praying, and Freshwater's personal Bible on his desk. In April, White sent a letter to Freshwater instructing him to remove the religious displays. White testified that he told Freshwater the religious materials had to be removed and that his personal Bible had to be out of sight when students were in the room, though he could read it during "off" time.

On April 16, 2008, four months after the initial incident, Freshwater participated in a press conference and rally on the public square of Mount Vernon. The event was organized by "Coach" David Daubenmire, formerly a teacher and coach in Mount Vernon and founder of a fundamentalist ministry (<http://www.ptsalt.com/>). Freshwater read a statement written by Daubenmire in which he focused on instructions to remove his personal Bible from his desk while students were in the room and his refusal to comply with those instructions ([http://www.secularleft.us/articles/Freshwater\\_Response\\_4.16.08.pdf](http://www.secularleft.us/articles/Freshwater_Response_4.16.08.pdf)).

When additional allegations about inappropriate conduct arose from more parents, teachers, and students, the board of education's attorneys hired an independent human resources consulting firm, HR On Call, to investigate the allegations. HR On Call personnel interviewed the Dennises, current and former teachers and administrators, and Freshwater himself. HR On Call also inspected Freshwater's classroom. A report submitted to the board by HR On Call outlined a number of areas of concern about Freshwater, including allegations regarding religious items displayed in the classroom, teaching religious beliefs in his classes by using creationist material, his conduct as monitor of the Fellowship of Christian Athletes in the middle school, and his alleged insubordination in response to instructions from administrators.

On June 20, 2008, the board of education acted on the investigator's report by adopting a "Resolution of intent to consider termination of the teaching contract(s) of John Freshwater"—the first step in the formal process of terminating a teacher for cause as mandated by Ohio statutes. That resolution specified four main grounds for the Board's action.

1. Using the high-frequency signal generator to mark students' arms with a cross, a religious symbol;
2. Failing to adhere to the Academic Content Standards and approved curriculum by teaching creationism and intelligent design;
3. Exceeding permissible limits on his activities as monitor of the Fellowship of Christian Athletes; and
4. Insubordination in his failure to comply with instructions concerning religious materials displayed in his classroom and in bringing additional religious materials into the classroom subsequent to being given those instructions.

### **LEGAL PROCEEDINGS**

Legal proceedings to resolve this case took place over a period of three years, including a lengthy administrative hearing and several court actions. The latter included a suit brought by the parents of the student marked with the high-frequency device, filed in June 2008 (*Doe v Mount Vernon Board of Education, et al*); a countersuit by Freshwater alleging defamation and intentional infliction of emotional distress, filed in September 2008; a suit brought by Freshwater (*Freshwater v Mount Vernon Board of Education, et al*); and Freshwater's appeal in the Knox County Court of Common Pleas of the school board's decision to terminate his teaching contract (<http://ncse.com/creationism/legal/freshwater-termination-hearing>).

An important player in the Freshwater affair was R Kelly Hamilton, Freshwater's personal attorney, whose behavior in the various legal actions also became a part of the story. In a radio interview, Hamilton said, "I've known for several years prior to this event taking place that God made it very clear that one day I would be arguing about the First Amendment as it relates to His Bible." (For more on that interview, see <http://pandasthumb.org/archives/2009/09/freshwater-upda-2.html>.)

There were hearings in federal court on whether sanctions should be imposed on Hamilton for his failure to comply with subpoenas issued in discovery; for access to Hamilton's billing records, which had evidentiary implications regarding the date(s) of preparation of certain affidavits; and on whether Hamilton was even Freshwater's attorney of record for settlement talks in one federal proceeding.

### **ADMINISTRATIVE HEARING**

Ohio law provides that a teacher may contest a school board's resolution of intent to terminate. In this case, the matter was heard by a neutral referee accepted by both parties and began on October 2, 2008 in the Knox County Commissioners' offices.

The initial expectation was that the hearing would take six or eight days. In the end it took 38 days spread over 21 months, with more than 350 exhibits—mostly documents—entered

into evidence. It generated more than 6300 pages of transcripts of the sworn testimony of more than eighty witnesses. I attended 36 of the 38 days and wrote over one hundred reports and commentaries on The Panda's Thumb, a group science blog. (See "Freshwater" tag cloud: [http://pandasthumb.org/mt/search.fcgi?blog\\_id=2&tag=Freshwater&limit=20](http://pandasthumb.org/mt/search.fcgi?blog_id=2&tag=Freshwater&limit=20).)

Finally on June 23, 2010, the administrative hearing adjourned. More than six months later, in January 2011, the referee delivered his report ([http://ncse.com/webfm\\_send/1545](http://ncse.com/webfm_send/1545)) to the board of education, recommending that Freshwater's teaching contract be terminated. The referee noted that there was sufficient evidence for termination whether the level of proof was the stricter "clear and convincing evidence" criterion or the more permissive requirement of merely a "preponderance of the evidence".

The referee's report listed three grounds for termination based on the evidence and testimony in the hearing:

1. Failure to adhere to the approved curriculum. According to testimony from parents, students, and at least one staff member, Freshwater used creationist handouts and a creationist video in his classes.
2. Improper participation in Fellowship of Christian Athletes activities. FCA teacher/monitors are prohibited from participating in the meetings and are forbidden from contacting prospective speakers or praying with students. According to testimony, Freshwater violated all three prohibitions.
3. Insubordination. According to testimony, Freshwater not only failed to remove all religious displays from his classroom when instructed, but after receiving these instructions in writing he added two additional Christian books, placing them on his lab table in the classroom.

The referee concluded:

By [his] course of conduct John Freshwater repeatedly violated the Establishment Clause. Without question, the repeated violation of the Constitution of the United States is a "fairly serious matter" [statutory language] and is, therefore, a valid basis for termination of John Freshwater's contract(s).

On January 10, 2011, citing the grounds in the referee's report, the Mount Vernon Board of Education voted 4-1 to terminate Freshwater's teaching contract. (The full text of the resolution is available from <http://pandasthumb.org/archives/2011/01/freshwater-the-6.html>).

### **APPEAL OF THE BOARD'S DECISION**

Freshwater appealed the board of education's decision in the Knox County Court of Common Pleas in early February 2011. Judge Otho Eyster reviewed the evidence and testimony from the administrative hearing, and on October 5, 2011, almost exactly three years after the administrative hearing started, denied Freshwater's request for additional hearings. He ruled that the hearing record provided "clear and convincing evidence" to support the Board of Education's action.

Freshwater elected to appeal Judge Eyster's decision, and in October 2011 the Rutherford Institute announced that it would support Freshwater's appeal in Ohio's Fifth District

Court of Appeals ([http://www.rutherford.org/articles\\_db/press\\_release.asp?article\\_id=972](http://www.rutherford.org/articles_db/press_release.asp?article_id=972)) That case is still pending (documents are available from <http://ncse.com/creationism/legal/freshwater-termination-hearing>). A call to the court clerk determined that the earliest date to schedule a hearing would be in early April 2012.

### **FEDERAL COURT PROCEEDINGS**

Before, during, and after the nearly two years of the administrative hearing, a series of legal actions in federal court were initiated and then subsequently settled, withdrawn, or dismissed. The various legal documents are available at NCSE's website (<http://ncse.com/creationism/legal/other-cases>).

In June 2008, the Dennises filed suit in federal court against the board of education, the superintendent, the middle school principal, and Freshwater. They alleged that Freshwater had burned the shape of a cross on their son's arm with the Tesla coil, had led prayer sessions at Fellowship of Christian Athletes meetings, and had based his science teaching in part on his religious beliefs, including the teaching of "intelligent design" (<http://ncse.com/creationism/legal/doe-v-freshwater-mv>). The district's insurance company eventually settled this suit on behalf of the district defendants in August 2010 and on behalf of Freshwater in December 2010.

This lawsuit featured prolonged disputes about discovery, with the Dennis family's finally filing a motion requesting that the court compel Freshwater and Hamilton to comply with previous discovery orders. The motion to compel was granted, and Hamilton was subsequently sanctioned by the federal court for his dilatory responses to discovery requirements (documents are available from <http://ncse.com/creationism/legal/doe-v-freshwater-mv>). The suit also featured the withdrawal of two insurance company attorneys representing Freshwater as a school employee on the grounds that certain events, never specified, made it impossible for them to represent Freshwater within the Ohio Rules of Professional Conduct.

In September 2008, Freshwater filed a countersuit in federal court, claiming that the allegations in the Dennis family's suit were defamatory and slanderous. That counterclaim was eventually dismissed after most of its allegations were eliminated in summary judgments by the federal court. In addition, in June 2009, Freshwater filed a federal suit against a range of defendants associated with the affair, including "the Board, two individual Board members and four other district administrators, the investigative firm and its two employees, and up to eight unknown (even to him) 'employees, agents or others associated' with the Board who may have 'conducted or facilitated' actions against him" (<http://ncse.com/creationism/legal/freshwater-v-mount-vernon>). That suit was eventually dismissed with prejudice at Freshwater's request.

Attorney Hamilton's behavior also became an issue in various federal actions. In one federal court hearing, Freshwater failed to produce the Tesla coil when ordered to do so by the court. In response to a question by the court, Hamilton explained that his wife mistakenly believed the Tesla coil was groceries and put it in the freezer at their home. I was in the courtroom when Hamilton proffered this excuse, and the expression on Judge Gregory Frost's face was priceless.

In a federal court session to reconsider sanctions imposed on Hamilton, he claimed that his laptop was “completely destroyed” in a flood due to a water leak in his kitchen, destroying all his billing records. As a consequence, the date of preparation of some key affidavits was left undetermined. Hamilton had not backed up his hard drive and accepted the opinion of his local computer shop that the data were unrecoverable. So, he said, he threw the laptop away. (For more on the flood as well as other problems Hamilton had in the discovery process, view the document at [http://ncse.com/webfm\\_send/1400](http://ncse.com/webfm_send/1400).) Later, Freshwater testified that he also threw away a laptop that contained records relevant to discovery when he could not turn it on.

The main results of the various federal actions were a settlement by the district’s insurance company with the Dennis family, and the imposition of sanctions, including a requirement to pay some of the Dennis family’s legal costs, on Freshwater’s attorney R Kelly Hamilton for failure to comply with the requirements of the discovery process.

Almost lost in the noise generated by the administrative hearing and federal court proceedings was Freshwater’s filing of religious discrimination complaints with the Ohio Civil Rights Commission and the federal Equal Employment Opportunity Commission. After an investigation, the Ohio Civil Rights Commission dismissed the complaint. There’s no official word yet on EEOC action, but the EEOC almost always adopts state commission findings on duplicated complaints in a sort of work-sharing arrangement.

#### **EFFECTS ON THE COMMUNITY**

In *The Devil in Dover*, journalist Lauri Lebo (2008) described the effects of the *Kitzmiller v Dover Area School District* trial on that Pennsylvania community. There was considerable rancor dividing neighbors and, in Lebo’s case at least, a disagreement that divided family members. The children of Christian plaintiffs were called “atheists” in the schools and anonymous threatening letters were sent to plaintiffs. The effects still linger, I am told.

Many of those same things happened in Mount Vernon. At school board meetings, on local web message boards, and in letters to the editor of the *Mount Vernon News*, partisans on both sides fulminated about either the injustice being done to a good Christian man or the effrontery of evangelical Christian teachers imposing their beliefs on children in the public schools. As was the case in Dover, middle school students reportedly accused children of Freshwater’s opponents of being atheists, and at least some physical intimidation among students was reported. The Dennis family, plaintiffs in the original federal suit, eventually moved to a neighboring county, in part because of harassment of their children in the Mount Vernon schools which originated not only from other students but reportedly also from at least a few district staff members.

Freshwater’s supporters persistently framed the whole affair as being solely concerned with Freshwater’s keeping his personal Bible on his desk, ignoring other charges. That was an effective public relations approach. There was even a web site called [www.bibleonthedesk.com](http://www.bibleonthedesk.com), and though the domain now has a new owner, its earlier content is available via Web Archive (<http://web.archive.org/web/20080806114819/http://www.bibleonthedesk.com/>).

As was the case in Dover, the Freshwater affair was costly to the district. While the district’s insurance company paid settlements to the Dennis family in the federal court suit,

an estimated \$920 000 has come out of the district's funds, mostly for legal costs associated with the administrative hearing. It was also costly for Freshwater, who lost his job and had to sell his home and 27 acres in the country to pay his legal costs.

Much of the length and expense of this acrimonious affair was due to Freshwater's having taken bad advice throughout the process. As I noted on Panda's Thumb:

This is becoming very sad to watch. Freshwater is not an intrinsically bad or evil person, but, like not a few of his colleagues, he is terribly misguided in his views of what is appropriate for a public school teacher. Further, he has been operating on the basis of very bad advice—from Daubenmire to start with and then Hamilton for the last two years—exacerbated by a socio-religious context full of people playing “Let’s you and them fight.” While he is not an unwilling victim (after all, he has chosen to act on the bad advice), he is clearly being set up as a hero/martyr by his co-religionists who are more than happy to see someone else taking the point (and the arrows). That’s an awfully hard social role to decline when his family, friends, congregation, and principal advisers like his pastor Don Matolyak are all enthusiastically casting him in it and supporting him. Were he to try to decline or abandon that role he would be isolated and shunned, and that’s a high social price to pay. Freshwater has literally bet his farm that it’s worth it. (<http://pandasthumb.org/archives/2010/07/freshwater-tigh.html>)

He lost the bet and lost his farm. Freshwater, and Daubenmire and his other advisers, made it virtually impossible for the district to do anything but terminate him.

### **EFFECTS ON DISTRICT VOTERS**

During the three years of the “Freshwater Affair,” there were two elections for school board. In November 2009, two new members of the five-member board were elected, defeating two incumbents who had voted for the resolution of intent to terminate Freshwater’s contract. One of the new members, Steve Thompson, is a strong Freshwater supporter and had served on the so-called Community Council for Free Expression—an organization headquartered in Freshwater’s church set up to raise funds for Freshwater’s legal defense, though his name (and others) disappeared from the Council’s website around the time of the election. The other new board member, Paula Barone, is a staunch supporter of honest science education and the separation of church and state. The difference between Thompson and Barone in votes cast to elect them to the School Board was just one vote, reflecting the deep split in the community at the time.

However, two years later, community sentiment had markedly shifted away from Freshwater. In November 2011, Jolene Goetzman and Margie Bennett—incumbents who had voted to terminate Freshwater—were re-elected by large margins, placing first and second in a field of six candidates for the three open positions. Two strong supporters of Freshwater, Jeff Cline and Steve Kelly, placed fifth and sixth. So as in Dover in the aftermath of the *Kitzmiller* trial (but before that decision came down), Mount Vernon voters in general supported board members who value honest science education and the separation of church and state.

Finally, in the weeks preceding the 2011 election, a new organization, Concerned Mount Vernon School District Citizens, was formed. The organization registered a Political Ac-

tion Committee and raised funds to place a newspaper advertisement supporting board candidates who were committed to honest science education and the separation of church and state. The organization also stimulated letters to the editor, encouraged appropriate postings on local web boards, and worked on get-out-the-vote efforts in support of those candidates. Members plan to transform the ad hoc pre-election organization into a more permanent form to find good candidates for the board and to provide continued support to board members, administrators, and (most important) teachers who are committed to the goals of honest science education and the separation of church and state.

It's not over, though. Freshwater's appeal of his termination is still making its way through the state appeals court system. Mount Vernon is still divided. Letters to the editor still make the same tired creationist arguments "... proving convincingly that [evolutionary theory] is untenable at best and should not be taught in our public education system" (thus Kenneth Dove, in a letter to the editor in the January 19, 2012, *Mount Vernon News*). A substantial minority of people in Knox County agrees with Dove. The defenders of excellence in public education need to stay on watch for the next moves to subvert the teaching of honest science in the public schools. They will surely come.

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## ABOUT THE AUTHOR

Richard B Hoppe is a life member of NCSE and an Affiliated Scholar in Biology at Kenyon College. He has written on the creationism/evolution debate since the days of the Ohio Committee of Correspondence on Evolution Education in the 1980s. He is a founding contributor to The Panda's Thumb (<http://pandasthumb.org>), an award-winning group science blog.

## AUTHOR'S ADDRESS

Richard B Hoppe  
 PO Box 85  
 Gambier OH 43022  
[rbh.third@gmail.com](mailto:rbh.third@gmail.com)



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## FEATURE

### People and Places: Aimee Semple McPherson (1890–1944)

Randy Moore



**FIGURE 1.** *Aimee Semple McPherson contends with the apelike specter of Darwinian evolution.*  
*Courtesy of the Oregon Historical Society.*

Aimee Kennedy was born on October 9, 1890, in Salford, Ontario, Canada, and by the age of 13 was an agnostic who defended evolution and questioned claims by local preachers. Aimee became a Christian in 1907 during a revival led by Robert Semple, a fiery Pentecostal missionary who died of malaria two years after marrying her. Aimee then married Harold McPherson, an accountant from New York.

By 1915, Aimee was an itinerant evangelist. In 1916, she toured the South in her “Gospel Car,” a 1912 Packard on which she painted religious slogans such as “Where will you spend eternity?” McPherson disliked being compared to fellow evangelist Billy Sunday because of Sunday’s use of “slang.” However, McPherson—like Sunday—always put on a good show. In the early 1920s, she moved to Los Angeles, where she incorporated theater and patriotism into her church services and torch-lit revivals. During one of her most famous and often repeated services, she vilified the villains—Darwin, Hitler, Mussolini, and Lenin—after which the show climaxed with McPherson’s emerging to read the national anthem.

While in California, McPherson became one of the most flamboyant and controversial preachers in the United States. Her theatrical sermons rivaled productions in nearby Hollywood, and her use of spectacle, celebrity status, patriotism, and marketing foretold modern evangelism. Although McPherson seldom delivered “fire and brimstone” sermons like Billy Sunday and Frank Norris, she often spiced her sermons with denunciations of evolution (Figure 1) and ritual hangings of biology teachers in effigy. McPherson—whose enormous church often hosted William Jennings Bryan, John Straton, and other anti-evolution crusaders—proudly proclaimed her willingness to abandon science rather than religion. In 1925, she promised Bryan that 10 000 members of her church would be praying for his success at the Scopes Trial.

McPherson wanted to abolish all barriers between church and state, and urged Christians to seize control of government by boycotting schools that taught evolution. In 1927, “Sister Aimee” denounced evolution as a Satanic plot responsible for jazz, booze, crime, student suicides, murder, and the corruption of young people.

McPherson, who participated in several highly publicized debates with atheist Charles Smith, offered \$5 000 to anyone who could find a contradiction in the Bible. Smith and McPherson repeated their debate to overflow crowds all along the West Coast. During her career, McPherson spoke directly to more than 2 000 000 people.

McPherson raised vast sums of money, often instructing her followers to contribute paper money, not coins. On January 1, 1923, her award-winning float in Pasadena’s Tournament of Roses Parade led worshipers to her newly opened Angelus Temple, which became the home base for her religious empire. McPherson held three services per day in Angelus Temple, and most services filled all of the church’s 5300 seats. “Sister Aimee” occasionally spoke in tongues, performed healings, and kept a museum of crutches and wheelchairs of people who had been healed in her services (her 1921 revival in Denver included a “Stretcher Day”).

In his 1927 novel *Elmer Gantry*, Sinclair Lewis modeled Sister Sharon Falconer—an attractive evangelical healer—on McPherson. Indeed, McPherson, who wore make-up, jewelry, and appealing clothes, was flamboyant and attractive, and often preached in a long white

gown while holding flowers. Unsurprisingly, she attracted giant crowds, and critics compared her with Cleopatra and complained of her use of sex appeal to spread her message.

The first woman to deliver a sermon on radio and be granted an FCC license (for her “Foursquare Gospel” station KFSG), McPherson became a celebrity who socialized with movie stars. When KFSG’s broadcasting license was revoked in 1925 for deviating from its assigned frequency, McPherson allegedly sent then-Secretary of Commerce Herbert Hoover a telegram demanding that his Satanic workers allow her church to continue broadcasting.

Despite her fame as an evangelist, McPherson is best known for her alleged “kidnapping” (Sutton 2007). On May 18, 1926, McPherson disappeared when she and her secretary went swimming at Ocean Park, California. Most people assumed that she had drowned (and two people died while trying to find her body). At about the same time, Kenneth Ormiston—an engineer at KFSG—also disappeared.

About a month later, McPherson’s mother (Minnie Kennedy) claimed that she received a ransom note from “The Avengers” demanding \$500 000 to refrain from selling McPherson into slavery. On June 23, McPherson reappeared in a Mexico desert just across the border from Douglas, Arizona, claiming to have been kidnapped and tortured. There were many inconsistencies in her story (she disappeared wearing a bathing suit, but reappeared in a gown; she wasn’t wearing a watch when she disappeared, but was wearing one when she reappeared), and witnesses later claimed to have seen McPherson and Ormiston at various hotels during the time that she was allegedly kidnapped. When McPherson returned to Los Angeles, she was greeted at the train station by more than 30 000 supporters.

A grand jury investigated McPherson’s alleged kidnapping, but adjourned two weeks later without delivering an indictment. The grand jury later reconvened and reviewed hotel documents written in McPherson’s handwriting and witnesses’ claims that Ormiston had been holed up in a beach bungalow with an unknown, disguised woman (more than 75 000 people later visited McPherson’s suspected “love nest”). Although McPherson stuck to her story about the kidnapping, she refused to answer questions about her relationship with Ormiston, and Judge Samuel Blake charged her and her mother with obstruction of justice. However, on January 10, 1927, those charges were dropped, and the \$25 000 reward offered by Angelus Temple for anyone who could offer information about McPherson’s whereabouts during her kidnapping was never claimed.

In 1930, McPherson—who by then was more famous than most movie stars—had a nervous breakdown. In later years, McPherson’s impact and popularity waned, but she remained active with her church and its ministries (such as its expanding radio station), as well as with patriotic shows before and during World War II.

On September 27, 1944, McPherson died of a drug overdose in a hotel room in Oakland, California. More than 40 000 mourners viewed her body as it lay in state at Angelus Temple for three days amid \$50 000 worth of flowers. McPherson was buried on October 9 (her birthday) in a 544-kg (1200-pound) bronze casket in an ornate hilltop sarcophagus in Forest Lawn Memorial Park Cemetery in Glendale, California. Rumors circulated that she was buried with a telephone in her casket to ensure her survival if her body was resurrected. In decades following her death, McPherson was often portrayed as a religious hypocrite and sexual vixen.

Angelus Temple—now a federally protected historic landmark—stands opposite Echo Park near downtown Los Angeles. Visitors to the parsonage are greeted by a large photo of McPherson and William Jennings Bryan. The Foursquare Gospel Church, which McPherson founded, has more than a million members, most of whom live outside the United States. McPherson continues to be regarded by her followers as a prophetess.

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## ABOUT THE AUTHOR

Randy Moore is the HT Morse–Alumni Distinguished Professor of Biology at the University of Minnesota. His latest book, coauthored with Sehoya Cotner, is *Arguing for Evolution: An Encyclopedia for Understanding Science* (Santa Barbara [CA]: Greenwood, 2011).

## AUTHOR'S ADDRESS

Randy Moore  
University of Minnesota, MCB 3-104  
420 Washington Avenue SE  
Minneapolis MN 55455  
rmoore@umn.edu



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## FEATURE

# “A Wall Unto Them on Their Right Hand and on Their Left”: Adventist Education in the Midst of a Sea of Science

T Joe Willey

Seventh-Day Adventist beliefs concerning the biblical creation of the earth and origin of life (including the Fall of Man) are conservative, drifting into fundamentalism. The more than 16 million members of this worldwide church—many in third world countries—aspire to “the greatest purity” as proponents of creationism by preserving the origin of life found in Genesis and attribution of the geologic history of the earth to Noah’s flood (Numbers 2006). When these beliefs enter the science classroom, scientific discussions provoke questions that are difficult to answer, a cause for confusion, and, for students, more relevant to faith than science. The crisis over the biology program at La Sierra University (LSU) examined in Willey (2012) is one manifestation of the difficulties that arise when Adventist doctrine bumps up against science education in a church-run educational institution. This situation is not unique to LSU; many Adventist higher education schools face the same conflict between a valid contemporary science curriculum and adherence to the church’s doctrine on creation.

The church supports its position from a literal reading of the Bible. But just as important are the writings of the prophetess Ellen G White (1827–1915). Her voluminous writings, even the ones written in the nineteenth century that touch on science, are accepted by the church with almost the same authority as the Scriptures. One reason is because she claimed that while writing her testimonies she was “often conscious of the presence of angels of God” at her side (White 1953:128). To add to her claim, she described how God carried her back in time through a vision to the historic creation week and showed her the sequence of events just as the Bible described (White 1864:90). In her world,

Infidel geologists claim that the world is much older than the Bible record makes it. They reject the Bible record, because of those things which are to them evidences from the earth itself, that the world has existed tens of thousands of years. And many who profess to believe the Bible record are at a loss to account for wonderful things which are found in the earth, with the view that creation week was only seven literal days, and the world is now only about six thousand years old ... I have been shown that without Bible history, geology can prove nothing. (White 1864:91–92)

During the mid-nineteenth century, White was aware of the active debate by clergymen concerning geology and Darwin’s *On the Origin of Species*. In contrast to the evolutionary science of her time, she favored models of degeneration, and she applied Lamarck’s theory of acquired characters to explain degeneration inherited by the descendants:

I have been instructed [implying that she was given this information in a vision from God] that flesh food has a tendency to animalize the nature, to rob men and women of that love and sympathy which they should feel for everyone, and to give the lower passions control over the higher powers of the being. (White 1909:159)

White's degenerationist view of human history was based on scriptural authority, and the mysterious and limited store of vital energy meant that racial exhaustion was inevitable for those individuals who continued to disobey God and natural law. White's degenerationism was more than skin deep.

If Adam, at his creation, had not been endowed with twenty times as much vital force as men now have, the race, with their present habits of living in violation of natural law, would have become extinct. ... The wretched condition of the world at the present time has been presented before me. Since Adam's fall the race has been degenerating. Some of the reasons for the present deplorable condition of men and women, formed in the image of God, were shown to me. And a sense of how much must be done to arrest, even in a degree, the physical, mental, and moral decay, caused my heart to be sick and faint. God did not create the race in its present feeble condition. (White 1873:138–139)

It is also apparent from White's writings that she did not believe in the fixity of the species after creation, but turned to inspiration from God to explain the biological mechanism in which degeneration combined with biologic amalgamation to produce "the confused species which God did not create [but] were the result of amalgamation and destroyed by the flood." To continue the story, "Since the flood there has been amalgamation of man and beast, as may be seen in the almost endless varieties of species of animals, and in certain races of men" (White 1864:75).

The Protestant evangelical zeal that was beginning to accept evolution as God's way of creating species never gained any traction in her mind. Throughout her life she criticized "satanic" teachings found in geology and Darwinism, writing

In the days of Noah, men, animals, and trees, many times larger than now exists, were buried, and thus preserved as an evidence to later generations that the antediluvians perished by a flood. God designed that the discovery of these things should establish faith in inspired history; but men, with their vain reasoning, fall into the same error as did the people before the flood,—the things which God gave them as a benefit, they turn into a curse by making a wrong use of them. (White 1891:112)

Over time, these viewpoints became the standard scientific platform for beliefs held by the churchgoers. Maintaining this literal faith in Genesis does not allow a natural process for the emergence of new species or the formation of the geologic column, even overseen by God, as in some more moderate perspectives on creationism (Scott 2004:19). Yet, as in other denominations, there is a wide range of beliefs in the church. More than a few Adventist scientists, theologians, and others accommodate theistic evolution or endorse microevolution, hoping to reconcile the Genesis origins and Flood accounts with contemporary scientific evidence. In response, church leaders continue to urge concurrence on the basic understanding and widespread affirmation of the church's fundamental belief of the biblical doctrine of creation.

For example, in a speech before a group of scientists and theologians in Atlanta in 2010, Ted Wilson, the General Conference president and chairman of the Geoscience Research Institute board, admitted, “we don’t have all the answers,” but went on to say there is sufficient evidence for a biblical creation and a global flood. And he described theistic evolution as a meaningless process that challenges “a loving God who created us in His image.”

Wilson very forcefully stated that he wanted to

see that all Seventh-Day Adventist teachers, whether they are theologians or science teachers, believe and accept the biblical creation as the church has voted and understood it. That is our goal, and that is what we need to move toward. (Campbell 2010)

For Adventists, unanswerable questions concerning the bothersome parts of the Bible and Noah’s flood story will be answered when the saints arrive in heaven and can ask God directly how He went about achieving His marvelous constructions of the universe and life. This has wondrous appeal and quiets individuals from going on an intellectual safari searching for the answers to the mysteries of life. This viewpoint is used to justify an even stronger literalist biblical position than found in most other Christian faiths. As Ronald L Numbers points out, Adventists maintain a 94% confidence in creationism, which is higher than for any other Protestant denomination (Numbers 2006:330).

### **ADVENTIST SCHOOLS OF HIGHER EDUCATION**

Despite this prior commitment to a literal reading of the Scripture, the Adventists maintain an extensive educational system from elementary schools to colleges and universities claiming an open mind in searching for “truth”. There are thirteen colleges and universities in North America and over ninety higher education institutions outside the United States connected with the Church. These are four-year, tertiary institutions dedicated to providing “quality undergraduate and advanced education in a Christian environment.”

There are three professional universities within the American group, including the flagship Loma Linda University, which supports schools in academic medicine and other health sciences, as well as graduate programs in geology, psychology, social science and religion. Instructors are expected to demonstrate a willingness to cooperate with the faith and lifestyle of the Adventist church, even though in the professional schools about half of the clinical instruction is provided by non-Adventist clinicians and instructors.

Each institution is a separate non-profit corporation with its own by-laws and board of trustees; often half are church administrators, pastors, or individuals employed by the church who serve *ex officio*. Other board members are Adventist individuals in law, business, or education, and so on, capable of enhancing the school.

A common complaint from leaders in the Church’s Educational Department is that the trustees are

poorly trained board members, on the one hand, who do not take seriously their role in the ownership of an institution, and in other instances board members taking their role seriously enough but lacking any perspective of what might be best for the needs of the Church beyond the immediacy of the institutional board of which they are a member. (GCCHE 2005:8)

The Church itself has identified other problems with its boards. On the horizon, it appears secular accrediting commissions may bring about changes in the make-up of these boards in the direction of greater institutional autonomy and academic freedom—issues that are at the core of the problems at LSU (Willey 2012)

These Adventist schools have limited endowments and require outside financial assistance. Church appropriations generally account for less than 10% of operating funds. Roughly 70% of revenues are derived from student tuition, much of this obtained through federal and state student loans; although Adventist students are eligible for some tuition support from Church funds. Regional accreditation by non-Adventist agencies is significant in providing access for student loans and grants from government agencies. Lower teacher salaries—in effect a “sacrificial wage for Christian higher education”—also provide indirect operating subsidies that might typically come from an endowment in a secular university (Riley 2002:15).

Of the more than 25 000 students enrolled in Adventist institutions in the US, a high percentage may be non-Adventist, though they tend to be from conservative Christian backgrounds. From available data, only 25% of college-bound Adventist high school students enroll in an Adventist institution (GCCHE 2005:6). More than 50% of Adventist students applying from secondary schools maintained by the church are admitted to Adventist institutions of higher education. A physician, dentist, nurse, or a PhD in a number of disciplines could have begun in elementary school and advanced all the way through doctoral studies in the Adventist learning environment without exposure to secular education.

Beginning at an early age, Adventist children receive faith indoctrination in “Sabbath School” at the church, and as they grow older, many participate in summer camps and vacation Bible schools to fill the summers. By the time Adventist youth leave high school to enter college, they are believed by their pastors and parents already to possess the orthodox religious truth sufficient for salvation. If they attend an Adventist institution of higher education, then the expectation is that they will continue to be affirmed in the faith by the institution and their instructors.

### **ADVENTIST ATTITUDES TOWARD EDUCATION**

Adventists place considerable emphasis on education to enhance Adventist youths’ future standard of living, but also hope that it will contribute to preserving their faith. Although a significant amount of church tithes is used to fund education, the limited resources available from the church have not built institutions with solid academic reputations. Dudley and Gillespie (1992:52) write: “Only a small majority of the parents, pastors, and teachers believe that Adventist schools are academically superior to public institutions.” Despite this shortfall, parents and students want an education in an Adventist institution to be as strong as programs elsewhere—while at the same time expecting the learning experience to adhere to Adventist doctrines.

Adventist higher education often gets blamed for the estimated 50% percent of young adults who are no longer practicing Adventism (Dudley 2000:35). These levels are similar to those for born-again Christians entering public universities (Kinnaman 2011). It concerns church leaders that Adventist higher education is beginning to stray doctrinally due



to their accepting non-Adventist students, their dependence on government money, and their placing less emphasis in the curriculum for training workers for the church.

The accelerated gain in worldly knowledge and breakdown in faithful adherence to church teachings also frequently causes church leaders to call for reform. In the past, there have been disruptive academic upheavals or disheartening criticism of faculty accused of teaching heretical content that challenges church doctrines (Bull and Lockhart 2007:317); the example at La Sierra University is the most recent (Willey 2012).

Students who go off to study science at non-Adventist graduate schools are likely to acquire a strong scientific background, and when they return to teach in an Adventist college or university may express sympathy for the evolutionary view—even if they themselves had been educated otherwise in the Adventist educational system. Even in non-scientific fields, there is a significant exposure to “worldly” ideas—that is, secular views that use discipline-based methods and theories, rather than religious doctrine, as the basis of scholarship and learning. Individuals who return to Adventist schools after a broader exposure to the world both philosophical and scientific often find it difficult to stay faithful to rigid Adventist doctrines. Of course this is not true for everyone. But there is an ongoing concern in these institutions over the subtle secular “seeding” that makes its way into the schools after individuals return from graduate school training. This was one reason why Adventists established their own graduate schools.

This tension between science and Adventist doctrine and professional standards in Adventist educational institutions has another dimension that bears on the legitimacy of these institutions. Outside accrediting agencies are also concerned with matters relating to institutional autonomy, academic freedom, due process for dispute resolution, and institutional pressures on faculty to conform to the Church dogma and strict indoctrination. The practical need for accreditation of Adventist universities—including their eligibility to receive state and federal aid for students, research, and other resources—also adds to the tension.

### **EDUCATIONAL STANDARDS GOVERNED BY ACCREDITATION**

There are some in the church today who believe that without the approving statements made by Ellen White in a letter written in 1910 to Church leaders in California, there probably would not be any accredited Adventist colleges and universities (Knight 2008:26). According to Knight, White opposed higher education nearly all of her life, but apparently changed her opposition about giving out academic degrees just before she died. As medical training was becoming more professional in the early 20th century, she advised administrators involved with Loma Linda College that students should be prepared to “meet the entrance requirement specified by state laws.” Thereafter Adventist higher education became the staging ground for the training of teachers and nurses who wanted to be employed outside the denomination. Graduates needed a legitimate diploma, and acceptance for pre-medical and other professional schools added further pressure for program accreditation.

In 1928, the General Conference tried to establish its own accrediting association by forming the Board of Regents. It was hoped that, with the Board’s approval, graduates would be accepted by other institutions and thereby avoid the “contamination” of seeking “outside” approval from non-Adventist agencies. However, as with other schools across the nation, it became clear that the practice of peer-reviewed accreditation would improve the financial

stability of the institutions, deepen the educational resources, and broaden the training and expertise of the teaching faculty. Still, there was always the concern that outsiders' reviews would dilute fundamental Adventist doctrines at these institutions.

The accreditation issue took center stage in 1931 when the *Journal of the American Medical Association (JAMA)* published student entrance statistics for the College of Medical Evangelists (CME)—now known as Loma Linda University School of Medicine. CME was the most ambitious education enterprise of the church (Greenleaf 2005:78) and was established to train missionary doctors to take the Adventist message into all the world. But the *JAMA* article revealed that only about 25% of first-year students came from accredited colleges (Neff 1964:248), placing CME in a precarious position. Administrators at CME emphatically insisted to Church leadership that all students entering medicine henceforth had to pass through accredited colleges, and this provided the impetus for accreditation at all Adventist junior and senior colleges. Shortly thereafter, the denomination learned that California, Nebraska, and Michigan refused to grant state teacher's certification unless students graduated from accredited institutions, which further expanded accreditation to schools where these students were trained.

Today, there remain several smaller, little known, unaccredited Adventist institutions outside the direct sponsorship of the Church. These independent schools train missionaries, evangelists, and health educators who do not require accreditation or licensure from secular agencies. All the rest of the Adventist educational institutions in the United States have voluntarily accepted accreditation through one of the six secular regional agencies, such as the Western Association of Schools and Colleges (WASC), that review and approve accreditation for higher education institutions in their regions.

### **CENTRALIZING CONTROL OF ADVENTIST PHILOSOPHY OF EDUCATION**

At the end of the twentieth century, the General Conference Department of Education again took steps to create its own accreditation facility. This time it was narrower and its mission focused to safeguard the "Adventist philosophy of education" from the secularist and naturalistic worldviews that were creeping into the schools of higher education. Educators were aware that the widespread acceptance of scientific objectivity could weaken the place of religion in the academic life in Adventist institutions as it had in liberal Protestant universities during the last half of the 19th century (Benne 2001). Hence the stated objective of the Adventist Accreditation Association (AAA) was to evaluate not only "conformity to threshold standards of academic quality" but also "evidence that the school is comprehensively achieving success in the spiritual domain and that it is truly 'Adventist'" (Beardsley 2008:16).

Citing the Bible and Ellen White's writings, the AAA maintains that genuine revelation and wisdom must be understood in light of the clear teaching of these two sources; this means that Adventist instruction is not to be subordinated to external "evidences" or influences, or to scientific authorities that challenge the doctrines of the church. The context for this ambition is the "great controversy between Christ and Satan ... [and placing] certain values and how these values are taught, thereby helping to shape the current world view and future world view of our students" (GCCHE 2005:3).

The AAA is not recognized as an accrediting agency with the United States Department of Education. As a result, the AAA is not bound by policies established by Congress under the Higher Educational Act or other government regulations. In practice, the AAA operates its evaluation programs with similar processes as those in secular accreditation agencies: for example, self-study tools, site visitation, and peer review. The site visitation teams are devoted to revealing the religious strengths and weaknesses of an Adventist institution and are composed of educational professionals selected only from other Adventist institutions.

On occasion, competing demands and constraints compelled by external accrediting bodies or partnership arrangements with non-Adventist universities can create situations that are difficult for the AAA to resolve against the backdrop of Adventist theological dogma and belief systems. In the case of the review of the biology program at La Sierra University (Willey 2012), decisions by the two accrediting agencies—the AAA and the WASC—illustrate the conflict between the goals of differing accrediting agencies. The AAA shocked the university with its determination that the university had “deviated from the philosophy and objectives of Seventh-day Adventist education” (Dwyer 2011). This was followed by the WASC’s formal “Notice of Concern” that certain governance issues be resolved by changing the bylaws and taking steps to ensure the autonomy of the university as an educational institution separate from and supported by the Church. The WASC also requested an update on the work of the faculty to address the controversy over teaching scientific biology (WASC 2011).

#### **DENOMINATIONAL CONSIDERATIONS TRUMP SECULAR ACCREDITATION**

The position of the Adventist Accrediting Association (AAA), should a conflict arise between its own philosophy of education and the findings of an outside accreditation or government agency, is clear. A strict interpretation of this position places the AAA in a higher standing than the secular accrediting agencies.

It is understood that accreditation and governmental approval can also be important to the ongoing health and credibility of educational institutions. These institutions must consequently work within the requirements and parameters of the local and national policies, while recognizing the higher calling to be true to the mission of the church. (AAA 2011:I-6)

Among other critical issues, the AAA definitely has an interest in determining how well “scientific theories of the origin and nature of the universe in light of the biblical doctrines of God, Creation, and Fall” are taught by the faculty. Is the scientific classroom “truly Adventist” and does it “promote a biblical worldview?” (Beardsley 2008).

The Church cannot afford to lose accreditation from the outside either. Not only are monies from the government important, but also students wanting to enter professional training at Adventist institutions such as Loma Linda University or elsewhere cannot be accepted unless they come from an accredited institution. The pressure to strengthen or reorient Adventist higher education is coming from many different directions.

As for evolution, it is not the official position that evolution should not be taught in Adventist schools. Rather, the emphasis is that the curriculum should prepare students to go on to further academic work prepared to “cope” with evolution. In this light, it is not unusual

to hear that the biology faculty is expected to use the scientific method to belittle and discredit evolution by pointing out inconsistencies in theories and models, faults or conflicts within the scientific literature, discontinuities in the geologic column and fossil record, and problems with dating methods.

There is a long history of using this approach in the past to support the Church's creationistic viewpoint. But this is changing. As Adventist academic institutions seek highly trained individuals as professors and researchers to support science programs and thus compete with other colleges and universities, they also attract more professionals whose training emphasizes modern, secular scholarship. This gradual secularization presents a long-term challenge to the influence of doctrinal positions (GCCHE 2005:8). Furthermore, the acceptance of both non-Adventist teachers and students into these schools has also changed the distinctive characteristics of Adventist education; all of which continues to be an engine for secularization.

### **CONCLUSION**

This overview of Adventist education shows that it is a balancing act to work in an Adventist institution as a biologist or other scientist, especially in areas that relate to creationism and evolution. As the recent events at La Sierra University show (Willey 2012), the conflict is rooted not only in the training of these faculty, but also in their professional growth as scholars whose work is accepted in their disciplines. In order for scientists to advance in their careers, they must conduct research and publish in peer-reviewed journals. If they publish work based on the evolutionary science disavowed by the church, they can face criticism and discipline from the institution or its sectarian accrediting body.

Faced with conflicting pressures from secular and Adventist accrediting agencies, LSU found its status as an accredited institution at peril in both realms. The AAA expressed concern that instruction in biology might not be meeting the sectarian goals of the church. The WASC expressed concern that standards of governance, institutional autonomy, academic freedom, and professional practice were not properly guaranteed at LSU: "The recent forced resignations, which were obtained through the actions of the board chair, reinforce concerns about institution autonomy because of the multiple roles that the board chair has in the University and in the Church" (WASC 2011:2). The WASC views the General Conference as a being outside the institution's governance arrangements because La Sierra University is a separate non-profit 501(c)(3) California corporation, and it is not owned by any of the Adventist organizations: the Pacific Union Conference, the North American Division, or the General Conference.

So far, neither accrediting agency has found that LSU was meeting all of the standards and objectives established by the accrediting commissions. In the intersection, LSU tried to pick between the two competing sets of compliance demands, with the result that the institution found itself in danger of having their carefully constructed pathway between the two come crashing down on them ... as it did for the Egyptians pursuing Moses and the Israelites through the Red Sea.

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**ABOUT THE AUTHOR**

T Joe Willey received his PhD from the University of California, Berkeley, in neuroscience. After graduation, he taught and conducted research in neuroscience at the Loma Linda University School of Medicine. He was a postdoctoral fellow at New York University in Buffalo with Nobel laureate Sir John Eccles and at the Brain Research Institute at UCLA.

**AUTHOR'S ADDRESS**

T Joe Willey  
404 Caroline Street  
San Bernardino CA 92408  
tjw@loma.edu



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## REVIEW

### *What about Darwin?*

by Thomas F Glick

Baltimore (MD): The Johns Hopkins University Press, 2010. 520 pages

reviewed by Glenn Branch

Thomas F Glick is a historian of science at Boston University, perhaps best known for his work on the reception of Darwinism, as in *The Comparative Reception of Darwinism* (Glick 1988), *Negotiating Darwin* (Artigas and others 2006), and *The Reception of Charles Darwin in Europe* (Engels and Glick 2008). His *What about Darwin?*—subtitled, in good Victorian fashion and with a scarcely avoidable pun, “all species of opinion from scientists, sages, friends, and enemies, who met, read, and discussed the naturalist who changed the world”—is about the reception of Darwinism, too, but the approach here is like that of a scrapbook. Glick explains, “I have tried to keep the mood light, looking for passages that project a sense of who Darwin was, how he affected people, and, later on, how various authors marshaled the icon” (p xv). With over four hundred passages from authors ranging from Henry Adams (who described himself in the third person as “a Darwinist because it was easier than not”; p 1) to Emile Zola (whose 1885 novel *Germinal* features characters arguing about the social implications of evolution), *What about Darwin?* succeeds in giving a tantalizing taste of the various ways in which Darwin was understood and misunderstood, from 1859 to about the mid-1940s.

Especially well represented are the members of what Glick calls “affinity groups,” tightly knit circles of people with common interests. “Entire affinity groups, such as the American transcendentalists (Emerson, Thoreau, Theodore Parker, Bronson Alcott) and the Bloomsbury Group (Virginia Woolf, Lytton Strachey, Clive Bell, John Maynard Keynes), appear here in toto, or almost so,” he explains (p. xxiii), as do the usual suspects of Darwin’s circle: Joseph Hooker, Thomas Henry Huxley, Charles Lyell, and so on. Less expected but perhaps by that token more welcome are people whose interest in Darwin might come as a surprise. It was dismaying to see Marcus Garvey blaming African-American passivity on Darwin (“If you still think with Darwin, then you can allow someone else to speak for you”; p 138), entertaining to discover Sherlock Holmes alluding to *The Descent of Man* in *A Study in Scarlet* (“Do you remember what Darwin says about music?”; p 98), and a bit ironic to find Joseph Stalin boasting that because “the Party pursues a policy of defending science in every way” (p 404), a Scopes trial in the USSR would be impossible. His boast appeared in *Pravda* in 1927—just a year before Lysenko propounded his theory of vernalization, with its disastrous consequences for Soviet genetics and agriculture.

*What about Darwin?* is simply a delightful book to browse through, and perhaps the only activity more delightful would be to argue about who should have been included, and what, and why. I’ll offer two candidates who I think were unjustly overlooked. First, why is there nothing from Hilaire Belloc (1870–1953), the English writer and Catholic apologist?

Glick includes two passages from his close ally GK Chesterton—so close that George Bernard Shaw referred to them as the Chesterbelloc (attributing the back legs to Chesterton and the front legs to Belloc)—as well as a passage from HG Wells responding to Belloc's attack on Wells's *Outline of History*, but offers nothing from Belloc himself. Belloc's critique of Wells's exposition of evolution (which was itself vetted by the biologist E Ray Lankester, who is represented in *What about Darwin?* in his own right) was worthless scientifically, but it helped to provoke JBS Haldane to study natural selection, or so McOuat and Winsor (1995) argue, so it would have been worth a mention. Amusingly, Belloc's grandmother was considered as a French translator of the *Origin*, but eventually demurred: "on reading it, she finds it too scientific," Darwin reported (Browne 2002:142).

Second, Ernest Hemingway (1899–1961), the American author, is also absent. In October 2009, I was privileged to attend a symposium on Darwinism, Science, Religion, and Society at the University of Cincinnati, where philosophers and political scientists dominated the panels, presenting detailed arguments and extensive data. So when Michael Roos, a professor of English at the University of Cincinnati, took the podium to address "Hemingway, Darwin, and the problem of God," I wondered whether those in attendance were bracing for a pointless exercise in literary vapidness. If so, they must have been pleasantly surprised. After documenting the absence of any reference to Darwin's influence on Hemingway in the scholarly literature, Roos persuasively argued that in Hemingway's background "we find, instead of a Darwinian void, almost a Darwinian ubiquity," citing such diverse and underestimated sources as his childhood visits to the Field Museum; his fondness for authors, such as Theodore Roosevelt, whose writings were permeated by evolutionary themes; and his high school zoology class. (The intrepid Roos in fact located and examined Hemingway's notes from the class.) But *What about Darwin?* skips right from Hermann von Helmholtz to John Stevens Henslow—understandably, given that Darwin's influence on Hemingway is diffuse and obscure, but regrettably.

It's tempting to go on. Why—I found myself wondering—did Glick quote the philosopher Ludwig Wittgenstein discussing Darwin on emotion at secondhand, from student notes from a lecture in the early 1930s, but ignore his famous declaration in the *Tractatus Logico-Philosophicus* that "Darwin's theory has no more to do with philosophy than any other hypothesis in natural science" (1922:§4.1122)? Addressing any readers who are prone to worry about such matters, Glick cordially invites them to add their thoughts at a Facebook page for the book, "to comment on the book in its current form, to contribute new quotations by individuals of note around the world, and to participate in an ongoing conversation on Darwin and his influence" (p xviii, the URL is <http://www.facebook.com/pages/What-about-Darwin/316747122973>). Unfortunately, as of September 1, 2011, there were only seven "likes" for the page, and no activity either from Glick or his readers since February 19, 2010. Both Darwin and Glick's project deserve better. In the meantime, it's fair to say that *What about Darwin?* is thoroughly enjoyable—though not for the same reason that Darwin found the books of Mark Twain enjoyable. Twain was told, "Mr Darwin reads them every night to lull him to sleep" (p 439), and was delighted.

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### **ABOUT THE AUTHOR**

Glenn Branch is NCSE's deputy director.

### **AUTHOR'S ADDRESS**

Glenn Branch  
NCSE  
PO Box 9477  
Berkeley CA 94709-0477  
branch@ncse.com



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## REVIEW

### *Evolutionary Restraints: The Contentious History of Group Selection*

by Mark E Borrello

Chicago: University of Chicago Press, 2010. 215 pages

reviewed by EG Leigh Jr

Darwin argued that natural selection drives adaptive evolution. Individuals must eat to survive and reproduce. Those best at finding, or at using and digesting, suitable food, generally live longest and produce the most offspring. The environment thus selects successful reproducers, thereby adapting the population to its setting. Population growth creates shortage of resources such as food or nest sites individuals need to survive and multiply. Darwin concluded that such shortages led to “struggle” for needed resources. Life, however, is not all struggle: cooperation is also a necessity of life. How can cooperation arise from struggle? In *Evolutionary Constraints*, Mark Borrello discusses, in historical context, how VC Wynne-Edwards responded to this question, and the consequences of his response.

This book shows that

1. In his *Origin of Species*, Darwin sometimes invoked “community selection” to explain how sterile workers could evolve in colonies or “communities” of social insects. Knowing that most such colonies had a single reproductive, the “queen”, Darwin also argued that selection favors queens that achieve the most effective division of reproduction between sterile workers and fertile offspring.
2. In his *Descent of Man and Selection in Relation to Sex*, Darwin proposed that morality evolved when human beings lived in small groups that often fought each other, because the groups whose members cooperated most effectively survived to produce new groups.
3. Because Darwin’s *Origin* mentioned community selection so briefly, the Russian geographer Kropotkin, who liked the book, felt that Darwin underrated the importance of cooperation. Kropotkin also saw that, in the far north, ferocious climate and competition with members of other species were important selective factors. Despite diligent search, however, Kropotkin found no evidence of “struggle” among members of the same species.
4. Borrello’s primary protagonist, Vero Copner Wynne-Edwards, another naturalist who found no evidence of competition within far northern species, thought that birds of some species produced fewer young than they could. In 1962, he wrote a famous book proposing that selection favored groups whose behavioral interactions limited their reproduction, thereby avoiding overuse of their food supply.

5. Wynne-Edwards's book briefly made group selection enormously popular among biologists. In 1966, however, George Williams annihilated its popularity with a book criticizing the evidence for group selection, arguing that only under very unusual conditions could selection among groups could override equally strong selection within groups. Although Williams's arguments were compelling, he never established what conditions would allow selection among groups to override within-group selection.

Unfortunately, neither Wynne-Edwards nor Borrello tried to learn why others doubted the effectiveness of selection among groups. In 1930, Ronald Fisher, who took the first and greatest step towards the "modern evolutionary synthesis" by reconciling evolution with Mendelian genetics, realized that reproductive competition among each group's members usually overpowers selection among groups. Fisher thought that social insect colonies suppressed such competition by allowing only one reproductive per colony. By 1963, many evolutionary biologists were wondering how group selection could override the within-group advantage of an animal that cheats by outreproducing its responsibly abstemious fellows. Wynne-Edwards and Borrello both ignore this instance of the central problem concerning any form of cooperation: how cheating is prevented.

Ignoring this problem makes it impossible for Borrello to understand the response of David Lack, Wynne-Edwards's first opponent, to the idea that birds lower their reproduction for the good of their group. In 1947, Lack had shown that in the Galápagos Islands, Darwin's finches had diverged adaptively in ways that allowed different species to coexist on the same island. This achievement helped incorporate ecology into the "modern evolutionary synthesis." In 1954, Lack wrote *The Natural Regulation of Animal Numbers*, showing without recourse to group selection how animal populations were limited by competition among individuals. In *Population Studies of Birds* (1966), Lack criticized Wynne-Edwards for thinking that group selection could eliminate unrestrainedly reproductive cheaters. Therefore, even though empirical evidence agreed equally with the presence or absence of group selection, Lack always decided against invoking group selection. Like Wynne-Edwards, Lack realized that hierarchical behavior, such as "pecking orders," could limit bird populations. Lack, however, also realized that a bird would benefit by seeking food elsewhere rather than fighting a superior competitor for its food.

In 1983, I showed that group selection overrides equally intense within-group selection if groups exchange less than one successful migrant per two groups per group lifetime and if each group is founded by migrants from a single parent group (Leigh 1983). Despite these stringent conditions, selection among groups played a crucial role in several major evolutionary transitions, such as transforming certain parasitic bacteria into mitochondria. In *The Natural Selection of Populations and Communities* (1980), David Sloan Wilson showed that weak group selection can also exert major impacts on evolution.

Meanwhile, the group selection controversy has largely degenerated into exercises in non-communication. Borrello recounts how Wynne-Edwards's second book, *Evolution through Group Selection* (1986), declined to answer the reasons why his opponents thought that group selection was usually ineffective. In 1970 Richard Lewontin showed—in a classical paper which would normally be treated as appropriately refining Darwin's authoritative precedent in the use of words—that natural selection acts on any population of replicating entities. Be they genes, individuals or groups, if entities differ in replication rate, these dif-

ferences are heritable, and replication is imperfect. Nonetheless, Borrello (p 8) notes that the philosopher Michael Ruse (1980) defined natural selection as (only) meaning selection among individuals. Nowadays, some, like West and others (2008), treat group selection as a form of kin selection, the process whereby, for example, sterile workers spread their genes by helping the queen, their mother, reproduce, a mathematical truth that is not always biologically insightful. On the other hand, Borrello himself (p 18), following Michael Wade (1984), treats kin selection as a form of group selection. This is erroneous: the concept of selection always applies to distinct, non-overlapping entities, as Maynard Smith clearly recognized, whereas kin groups overlap. Nowadays, most group selection controversialists agree on the facts, and the mathematics that explain them: the dispute centers on how to name these phenomena.

Those acquainted with the group selection controversy might benefit from this book. I learned much of interest from it about various aspects of the controversy. On the other hand, it makes a poor introduction to the controversy, because it communicates a very inadequate understanding of why opponents of group selection were so sure that it could rarely be effective. Borrello's presentation of Wynne-Edwards as the father of group selection is misguided: even group selectionists agree that Wynne-Edwards's application of the concept was inappropriate. Opponents of group selection might not like the noise, but Charles Darwin (1871:161–166) fathered that concept, as Borrello documents.

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## ABOUT THE AUTHOR

EG Leigh Jr is a staff scientist emeritus at the Smithsonian Tropical Research Institute. His principal interests are the ecology and evolution of tropical forest ecosystems, the parallels and contrasts between natural ecosystems and human economies, and the evolution of social cooperation between members of the same species and of mutualism between members of different species. His most recent publication on group selection is “The group selection controversy,” *Journal of Evolutionary Biology* 23:6–19 (2010).

**AUTHOR'S ADDRESS**

EG Leigh Jr  
Smithsonian Tropical Research Institute  
PO Box 0843-03092  
Balboa, Ancon  
Republic of Panama



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## REVIEW

### *The Science and Humanism of Stephen Jay Gould*

by Richard York and Brett Clark

New York: Monthly Review Press, 2011. 223 pages

reviewed by **David F Prindle**

For those of us who are not professionals in the natural sciences, it is great fun to learn about the theories and findings of evolutionary biology. As the readers of this journal are well aware, the issues it raises are of concern to people outside the specialty, since the topic of “life and our place in it” is inherently interesting. The science became doubly fascinating to many of us when we learned that evolutionary biologists are deeply divided among themselves on a variety of crucial issues within their profession, and that many of their internal controversies have implications for political arguments that transcend the laboratory. And we were consequently delighted when we discovered the writings of Stephen Jay Gould, who was, until his death in 2002, not only an eminent practitioner within his own profession of paleontology, but also a lucid, charming writer who could explain the science so that nonprofessionals could understand it, and was in addition quite willing to express his own position on the political issues that always rode along with the scientific issues. Some of us were so taken with Gould’s combination of scientific heft, imagination, vivid expression, and left-wing political commitment that we wrote our own books about his system of thought; mine was *Stephen Jay Gould and the Politics of Evolution* (Amherst [NY]: Prometheus, 2009).

Now Richard York and Brett Clark have offered their own take on Gould’s theories, values, and commitments, *The Science and Humanism of Stephen Jay Gould*, published by Monthly Review Press. Although the title stresses their (quite correct) interpretation of Gould’s work as being informed by humanist purposes, it is nevertheless a bit misleading. The two authors are sociologists, with a strong leftist political ideology that they do not attempt to hide. To York and Clark, “Humanism” means “Leftist Political Values,” and to the Left, the main value is equality. Whereas their book contains a great deal of explanation of the philosophical and scientific context of Gould’s writings, therefore, their main interest is in his politics, and, specifically, in the way his scientific theories reinforced, and were reinforced by, his pursuit of equality and his attacks on the way “the ideas of the ruling elite become embedded in scientific theories, which are then used to legitimate the prevailing social inequalities” (p 114).

As part of their attempt to set Gould in context, York and Clark get into some interesting historical and philosophical issues. Their discussion of the persistence of the worldview that derives from Plato (concrete objects are merely manifestations of abstract, often mathematical concepts, which are the true reality) versus the worldview that derives from Aristotle (concrete objects, while they may be described abstractly and mathematically, are the primary reality; abstraction is the means, not the end in itself), and the way Gould tried to

reconcile the two ontologies, is clear, succinct, and perceptive. Their contrast of the essential nature of biology versus the essential nature of physics (“natural selection is not a force like gravity, but rather a dynamic process,” p 49) likewise has the value of an epigram in piercing to the heart of crucial distinctions. Much of the details of their book are similarly cogent summaries of concepts and issues that must be understood if Gould’s thought is to be understood and appreciated.

Nevertheless, this book as a whole is a disappointment. The problem is not one of intelligence or understanding, but of grand strategy. York and Clark explain that they believe that “[t]he dialectic of argument and counter-argument is central to the advancement of knowledge” (p 124), and if they had followed their own expressed philosophy, they might have offered a reader something useful. A dialectical approach would have required them to understand the arguments of Gould’s professional opponents on their own terms, evaluate their criticisms of Gould’s writings fair-mindedly, and judge the evidence they employed to undermine his theories neutrally, without fear or favor. A dialectical approach would, in other words, have not started from the premise that Gould was right and virtuous in his scientific positions because he was on the correct side in his political positions; it would have listened to everybody with an equally empathetic but critical sensitivity, and then made judgments based on a set of criteria applied without partiality to everyone.

Instead, York and Clark’s position is that “[s]ince the scientific establishment remains dominated by those sympathetic to the concerns of the economic elite” (p 124), and since Gould was a critic of the doctrines endorsed by that establishment, he must be not only admirable politically but also correct scientifically, and the “establishment” must consist of people who are craven and dishonest servants of the powerful. As a result of this strategy of exposition, the authors give us, not a judicious account of politics and science, but a propaganda tract written in elevated language. Thus, they endorse without any doubts Gould’s critique of scientific reductionism as a right-wing apologist’s tool, without mentioning that many left-wing scientists (Jacques Monod comes to mind) strongly defended reductionist methodology. They celebrate the left-wing attack on sociobiology, using Gould’s own phrase “biological determinism” (p 146, 150, 151), without reporting any of the defenses of sociobiology penned by eminent scientists, and without attempting to evaluate its many additions to knowledge during the past thirty-five years. They repeat Gould’s indictment of intelligence testing as a reification, without noticing the many theoretical advances scientists have made in such tests since the era Gould criticized in *The Mismeasure of Man*, and without considering the mountain of empirical evidence suggesting that such tests do, in fact, measure something real. They parrot Gould’s oft-stated view that there are no moral lessons in nature, and then repeat his own self-contradiction by printing his famous conclusion that “human equality is a contingent fact of history” (p 159).

In short, if readers want to enjoy left-wing political views wrapped around discussions of evolutionary biology, they should read Gould’s own essays. (There are other reasons to become familiar with his work, of course.) Little of additional value would be gained by reading this book.

#### **ABOUT THE AUTHOR**

David F Prindle is Professor of Government at the University of Texas, Austin, and the author of *Stephen Jay Gould and the Politics of Evolution* (Amherst NY: Prometheus, 2009).

**AUTHOR'S ADDRESS**

David F Prindle  
Department of Government  
University of Texas  
1 University Station A1800  
Austin TX 78712-0119  
dprindle@austin.utexas.edu



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## REVIEW

### *The Price of Altruism: George Price and the Search for the Origins of Kindness*

by Oren Harman

New York: WW Norton, 2010. 464 pages

reviewed by **Stephen Pruett-Jones**

Have you ever seen the bumper sticker “Practice Random Acts of Kindness”? I was thinking about that bumper sticker as I began to write this review. A quick Google search revealed that there are, in fact, more than 300 different bumper stickers extolling the virtues of kindness or encouraging us to practice it. An act of kindness seems so simple. The concept of kindness (or altruism), however, is anything but simple. Altruism occurs in many non-human species; it ranges from helping (aid-giving) behavior, to simple or complex forms of cooperation, to the ultimate form of the evolution of sterile castes of individuals. Whether we think only about humans, or about all animals in general, the concept of altruism demands behavioral description (its form, and knowledge of who acts kindly towards whom), ecological understanding (under what conditions does it occur?), and most importantly an evolutionary explanation (why did it evolve?).

Formal thinking about the evolution of altruism began in earnest once Charles Darwin articulated the fact of evolution and proposed the theory of natural selection to account for it. Since then, there has been a rich tapestry of thought, empirical observation, and mathematical theory devoted to understanding altruism and its evolution. In *The Price of Altruism: George Price and the Search for the Origins of Kindness*, the author, Oren Harman, a professor of science, technology, and society at Bar Ilan University in Israel, takes us chronologically through this history, focusing primarily on George Price, but also detailing the lives and contributions of the other scientists contributing to the debate and theory about altruism. That list includes some of the most influential evolutionary biologists of the last century, including Ronald Fisher, JBS Haldane, Sewall Wright, John Maynard Smith, and Bill Hamilton.

As Harman details, the history of thinking about altruism ultimately converged on the fundamental question of whether there is a single, unifying explanation for the evolution of altruism in all species, ourselves included. As it turns out, the answer is both yes and no. Yes, because mathematical models that explain the evolution of altruism, and which have been shown to be very robust in their explanatory power, can be modified to include cases where individuals are or are not related. No, simply because there is not just one route to altruism and new models were needed to account for these alternative evolutionary pathways.

This book is divided into two parts. Part 1, comprising 8 chapters (191 pages) alternates between chapters (chapters 2, 4, 6, 8) on George Price’s early life, education, and scien-

tific endeavors, and chapters (1, 3, 5, 7) on either historical scientists who contributed to the thought about altruism, or contemporaries with Price who interacted with him either directly or indirectly. These alternating background chapters lay the foundation, both historical and scientific, for a reader to understand the state of the field at the time that Price entered evolutionary biology.

Part II comprises six chapters and an epilogue (171 pages) that details George Price's life from 1967 until his suicide in 1975. This is the unfortunately short period of Price's life when he was living in England, devoted initially to evolutionary biology and understanding selection and altruism, and interacting with two biologists that would collaborate and to some degree facilitate Price's contributions to the study of altruism, Bill Hamilton and John Maynard Smith. That contribution was the expansion of an equation, the covariance equation, to account for selection at different levels of organization. This was important in both Bill Hamilton's theoretical development of the rules for the evolution of altruism (known as Hamilton's Rule) but also later in the field of quantitative genetics and methods of quantifying selection.

George Price's contributions to thinking about evolution and altruism were novel, creative, and critical in the overall development of theory in this field but by themselves do not, in all reality, form the basis for an entire book about his life. What makes that a suitable subject for a book is his complex, and ultimately tragic life. Price graduated from high school in 1940 as a brilliant student with a fellowship to attend college. He took this fellowship first to Harvard and then to the University of Chicago where he graduated as a star student in chemistry in 1943. He remained at the University of Chicago for his PhD in chemistry and helped develop a reliable test to measure levels of uranium in human blood samples (work associated with the Manhattan Project there). After completing his PhD, Price returned to Harvard briefly as an instructor in chemistry, and then held a series of positions, at Bell Labs to work on the chemistry of transistors, in Minnesota to work on fluorescence chemistry and cancer biology, and then with IBM working on early CAD (computer-aided design) concepts. Price's personal life seemed at first to be stable, but it eventually began to unravel and was complicated by a thyroid disease that led to a botched operation. In 1967 Price made a complete break with his life at the time and moved to England to devote his life to his new focus on evolutionary biology. It was here that he ultimately came into contact with Bill Hamilton and John Maynard Smith and his covariance equation was written. It was also in England that he changed his life one last time. He developed a strong belief in Christianity, something he had been vocally opposed to all of his previous life, abandoned all worldly possessions, and began to devote his life to helping the homeless and people in his neighborhood.

By the accounts of everyone who knew him well and worked with him, George Price was a genius. He also, unfortunately, had psychological and behavioral problems. Whether these were due to undiagnosed conditions such as autism, or were due to other causes, no one knows. It is likely that in the end, his depression was made worse by his not taking medications for his thyroid condition. Price made brilliant contributions during his life to chemistry, medicine, engineering, and evolutionary biology, ultimately culminating in him devoting his life to the subject that appeared to consume him in the end, true altruism. Price also led a tragic life that makes for a fascinating and compelling story. Brilliance is a gift, but it often appears to come with a very high cost.

Anyone interested in evolutionary biology or the history of science will enjoy and appreciate this book. Science is a social process, and understanding the complex lives of those involved in that endeavor help us better understand ourselves and, in this case, the evolutionary process leading to behaviors such as altruism. The next time you see one of the bumper stickers, think about the message, but also about evolution and George Price.

#### **ABOUT THE AUTHOR**

Stephen Pruett-Jones is an associate professor in the Department of Ecology and Evolution at the University of Chicago. His research concerns sexual selection and the evolution of social behavior.

#### **AUTHOR'S ADDRESS**

Stephen Pruett-Jones  
Department of Ecology and Evolution  
University of Chicago  
1101 East 57th St.  
Chicago IL 60637  
pruett-jones@uchicago.edu



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## REVIEW

### *Emma Darwin: A Victorian Life*

by James D Loy and Kent M Loy

Gainesville (FL): University Press of Florida, 2010. 437 pages

reviewed by Stanley A Rice and Lisette Rice

This most recent biography of Emma Darwin is an old-fashioned “life” in the best Victorian sense, both an uplifting portrait of Emma’s qualities and an entertaining window into a world gone by. Emma Darwin was herself interesting and admirable, not just as the wife of Charles Darwin. But anyone interested in Charles Darwin will learn a lot about his personal side, especially about the long illness through which she nursed him; without her help, he could not have completed most of his important work.

Emma Wedgwood was one of the heirs to the famous pottery fortune. Emma, whom her family called “Little Miss Slip-Slop,” and her younger sister Fanny, were the two “Dovelies,” the beloved and carefree younger daughters of the family. She was used to intellectual conversations with interesting friends of the family, such as her uncle by marriage, the Swiss Count Jean Sismondi. She traveled frequently to Europe, where, according to a letter written by one of her aunts, she took piano lessons from Frédéric Chopin. The extended Wedgwood family was very close, and the book tells a lot about them because Emma and her sisters were strongly influenced by them. The Wedgwood family was important in the British abolitionist movement, a fact mentioned in this book but much more fully developed in Desmond and Moore’s *Darwin’s Sacred Cause* (2009).

As Emma and her sisters entered adulthood, they were faced with many responsibilities. Her sister Elizabeth had to take care of their mother as she lingered with dementia. And it was not long after Emma married Charles Darwin that she realized she would be living in a world of relative seclusion, in which she took care of her invalid husband. For many years, Emma seemed to be constantly pregnant, and her large family experienced frequent illnesses.

Emma also had a lot of experience with death. Of course there is a chapter about Annie’s death, which deeply affected her as well as Charles, especially as she was not present when Annie died. Charles had taken Annie to Doctor Gully’s water-cure resort at Malvern; Emma, who was pregnant, had remained home. Only years later did Emma go in search of Annie’s grave at Malvern. And in an extended family, there were many other deaths to mourn, including two of her other children, Mary Eleanor and Charles Waring. Since the book focuses on Emma, not Charles, it describes her anguish at his death. Dying in 1896 at the age of 88, she outlived almost everyone in her generation, nearly all the people that she and Charles had known.

The book also tells a little about what was going on in the British Isles at the time, such as the Reform Bill, the Corn Laws, the Potato Famine, and war in the Balkans, but not much, since both Emma and Charles were largely isolated spectators of these events.

This book does not have much to say about Emma's religious beliefs and the discomfort that Charles's skepticism caused her beyond what is already published in many Darwin biographies. The letters that Charles and Emma exchanged about religion, which are reproduced in biographies of Charles, are present in this book as well. Emma apparently did not write much in her journals about her religious views.

One may wonder if the scholarly world needs two biographies of Emma Darwin, but Loy and Loy had already begun working on this book when Edna Healey's book *Emma Darwin: The Inspirational Life of a Genius* was published (2001). Healey's book contains a lot more information about the Wedgwood family prior to Emma's generation, but pretty much ends with the death of Charles Darwin. In contrast, Loy and Loy's book has five chapters about Emma's life following Charles's death. It follows the lives of the Darwin children into adulthood, where they entered careers as diverse as banking and various branches of science.

Since it is a book about Emma, rather than Charles, readers with an interest solely in Charles Darwin may not find much in this book that will deepen their understanding of him. People who enjoy reading about Victorian history and society will enjoy the wealth of information in this book.

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## ABOUT THE AUTHORS

Stanley A Rice is a professor in the Department of Biological Sciences at Southeastern Oklahoma State University. He is the author of *Encyclopedia of Evolution* (New York: Facts on File, 2006; paperback 2007), *Green Planet: How Plants Keep the Earth Alive* (New Brunswick [NJ]: Rutgers University Press, 2009; paperback 2012), *Life of Earth: Portrait of a Beautiful, Middle-Aged, Stressed-out World* (Amherst [NY]: Prometheus Books, 2011), and *Encyclopedia of Biodiversity* (New York: Facts on File, 2012). Lisette Rice is a reference library associate for the Tulsa City-County Library.

## CORRESPONDING AUTHOR'S ADDRESS

Stanley A Rice  
Department of Biological Sciences  
Southeastern Oklahoma State University Box 4027  
1405 N Fourth Ave  
Durant OK 74701  
srice@se.edu



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## REVIEW

### *The Lucy Man: The Scientist Who Found the Most Famous Fossil Ever!*

by CAP Saucier

Amherst (NY): Prometheus Books, 2011. 136 pages

reviewed by Tom Wanamaker

Among those who have paid even the slightest attention over the years, Don Johanson is undoubtedly one of the most recognized figures in anthropology. Unlike the Leakey family, whose archeological finds built their reputations over the course of decades, Johanson abruptly burst into the scientific scene with the discovery of the fossil AL 288-1. When he unveiled the specimen of *Australopithecus afarensis* his team had dubbed “Lucy”, it captured the imagination of the general public, cementing his reputation as an authority on human evolution. His handsome face, confident bearing, and sonorous voice have given him an on-camera persona that has connected with the public for a generation. To those who are longtime students (and teachers) of human evolution, it seems nearly every production features at least a clip of him talking about Lucy.

For those who are not longtime students of human evolution, CAP Saucier’s book *The Lucy Man: The Scientist Who Found the Most Famous Fossil Ever!*, is a fine primer on Johanson’s life and his work in the field of paleoanthropology. It is short (a little over 100 pages), and is written at a level that most readers over age 12 can easily comprehend. (For the more difficult vocabulary, phonetic spellings are included.) Photographs, maps, and diagrams complement most pages of the text (see Figure 1), making it more attractive to young readers. Notes at the end of nearly every chapter direct the reader to books, articles, and websites where one can investigate in more detail.



FIGURE 1. Sample pages from *The Lucy Man*, by courtesy of Prometheus Books.

The book has eight chapters, with the first describing the dramatic discovery of Lucy. The next two chapters examine Johanson's childhood and education. Chapter 4 provides information about fossils and the fieldwork that goes into finding them. Chapter 5 gives an overview of evolution, classification, and the hominin family tree.

Chapter 6, "Risks, regrets, and rewards", looks at the factors that have affected the trajectory of Johanson's life. One characteristic that comes up repeatedly is his willingness to take risks. While Pasteur's adage about how chance favors the prepared mind applies to Johanson, his willingness boldly to pursue his own path has brought him much of his good fortune. He does admit, however, that this trait has also cost him in the realm of relationships, both personal and professional. Saucier is a personal friend of Don Johanson and overall, she treats him generously in this book. (Considering the intended audience, this is entirely appropriate.)

The final two chapters describe Johanson's professional achievements since the discovery of Lucy, his life today, and an acknowledgement that as much as we have learned about human evolution, there is still more yet to be discovered. It leaves the reader with an invitation to follow in his footsteps to bring the next Lucy to light.

It is so easy for a layperson talking about evolution to slip and perpetuate common misconceptions, especially when writing for children. Saucier deserves credit for succinctly describing evolution and natural selection at a level that is appropriate for any audience. Younger readers might get a bit lost due to insufficient background knowledge, but anyone who has gone through seventh grade science should be able to follow what she is saying. The sentence mentioning how "humans evolved from lower life forms" was the only off-key note she struck in this section. (It should be noted that in several other places, the common ancestry that humans share with the apes and all other life forms is clearly stated.) All in all, she has done quite well avoiding the pitfalls that can beset a non-scientist writing on the topic.

Don Johanson is a major figure in the field of science and this book should give anyone, expert or beginner, a better appreciation of the man and his work. It would make a fine gift to a young aspiring fossil-hunter and a worthy addition to any school library.

#### **ABOUT THE AUTHOR**

Tom Wanamaker teaches biology, genetics, and biophysical science at Appleton East High School in Appleton, Wisconsin. He is a member of the Wisconsin Society of Science Teachers, the National Science Teachers Association, and NCSE.

#### **AUTHOR'S ADDRESS**

Tom Wanamaker  
Appleton East High School  
2121 Emmers Dr  
Appleton WI 54915



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