

Science and Religion Since Darwin The “Fairness” Issue in the Evolution-Creation Debate Voices from an American Community College and the Blogosphere

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Abstract

Proponents of teaching Intelligent Design and Creationism in public schools often use “fairness” as a rationale. Attitudes of freshmen non-major biology students regarding the fairness of the opposite proposition, i.e. teaching evolution in churches, was surveyed. For contrast, an online debate on the same question at a conservative website was examined as well. The two groups applied a different standard of fairness to integrating Darwinism in a religious setting than that which they applied to integrating creationism into public academic settings. Fairness was not viewed as symmetrical. Their views are varied but the mandatory nature of attending school versus the optional nature of attending church was expressed frequently. It seems the Free Exercise Clause is sacred while the Establishment Clause is malleable. Addressing both creation and evolution concurrently using constructivist active learning is advocated.

Introduction

This study examines some aspects of the creation-evolution controversy in an American two-year college. Selected anecdotes illustrating general student and community perspectives as well as a vigorous and continuous online creation-evolution debate at the Ann Coulter Official Chat (www.anncoulter.com) are offered to provoke discussion at the Oxford Roundtable. Students’ attitudes to the fairness dimension of the evolution-creation debate are presented, categorized and integrated with community and on-line perspectives. A method demonstrated to be more efficacious in teaching evolution in freshman college biology courses is suggested.

The First Amendment: The first item in the First Amendment of the Constitution of the United States addresses the relationship between church and state.

“Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof...”

Despite rulings against it (Edwards v Aguillard, 1987 and Tammy Kitzmiller, *et. al.* v Dover Area School District, *et. al.* 2005), advocates of teaching intelligent design (I.D.) and creationism in American public schools often use “fairness” as a rationale in their efforts to compel teaching religious ideas alongside Darwinian evolution in public school biology classes. To many, the simple but powerful word “fair” stands as reason enough to present an alternative religious explanation to evolution to explain the unity and diversity of the organic world. The motive of some advocates of fairness is fairness. But clearly some advocates feel compelled by their religious beliefs to insert creationism in the classroom and it is likely that to some others,

fairness is a compromise to avoid legal, religious and scientific arguments which can be rancorous and nonproductive.

The erroneous assumption that all conflicting views deserve equal consideration is common among lower division students. College students are largely unaware of the legal rulings and are prone to take issue with court rulings with which they disagree as they are prone to take issue with anything with which they disagree. The courts have clearly ruled that teaching creationism or I.D. as science in public schools in the United States violates the Establishment Clause of the First Amendment. That does not, though, end the controversy any more than *Roe v Wade* ended the abortion controversy. Had “Edwards” and “Kitzmiller” been ruled oppositely, it would also not have ended the controversy. Absent divine intervention, it’s unlikely the evolution-creation controversy in the USA will be resolved soon.

Community Colleges: “America’s 1,200 community colleges enroll more than 11 million students and account for more than 45% of all undergraduate enrollments nationwide. (Hess 2009.)

This is a significant segment of American higher education and continued growth is predicted. The College of Southern Maryland (CSM) is a multi-campus comprehensive community college southeast of Washington DC. The college’s genesis is in Charles County, named for Charles Calvert, 3rd Lord Baltimore. The history of the region is decidedly influenced by British colonialism, tobacco agriculture, slavery, and the Civil War. More recently, its proximity to Washington DC has shaped its growth and development. The federal government, including the military, is a significant employer of our students. The region is presently experiencing continued rapid growth and development but remains partly rural and partly suburban with rural giving way to a burgeoning suburbia.

CSM is “an open-admission, regional community college preparing students and community to meet the challenges of individual, social and global changes.” (College of Southern Maryland Website). It celebrated its 50th anniversary in 2008. Like many community colleges, it germinated with night classes in a local high school, grew rapidly in the last quarter of the 20th Century and is experiencing a pulse of enrollment associated with students seeking additional education consequent to the present economic recession.

Enrollment in 2008 was approximately 8,000 credit students and 12,000 non-credit/continuing education students. The mean age of the students is 26; the modal age is 19.4. The student body is 64% female. Sixty three percent of the students are Caucasian, 21% are African-American, 12% are reported as “other” (primarily Hispanic- and Asian-Americans) and 3% are “unknown.” Fifty percent of the students are on a transfer-track intending to complete their bachelor’s degree at a four-year institution. Twenty four percent are enrolled in developmental courses. In 2008 CSM had 129 full-time faculty and approximately twice that many adjunct instructors. (College of Southern Maryland Office of Planning, Institutional Effectiveness and Research.) The college presently has campuses in the three counties which

comprise “Southern Maryland” i.e. Charles County, St. Mary’s County and Calvert County. The largest and oldest of the campuses is in La Plata, the county seat of Charles County.

Southern Maryland: Charles County Maryland is a not atypical suburban American county. The following anecdotes offer some insight into the creation-evolution debate there. The first is a letter to the primary author’s department chairman from a student’s mother. It was written after the first class of a semester where the professor discusses the course in the context of the students’ overall education. The story that evoked this parent’s concerns was not about the professor’s experience with his own mother but was conveyed to the first author by Professor Craig Nelson in 2006 describing a conversation he had with one of his student’s in an evolution class at the University of Indiana. The student, at the end of the semester, reported that what she had learned about evolution not only had transformed her view of the world but also forever altered her relationship with her mother. Her more sophisticated world view pleased her while the tension with her mother’s traditional Christian views was described with melancholy. Details of Professor Nelson’s original account were confused in the communication between my student and her mother. That college should be a transformative experience for students is a contention of the authors. This is not a universally held opinion. The student’s mother sent the following e-mail to the CSM Biology Department Chairman, William Montgomery in 2006.

I have a student who is attending the above mentioned summer session class. The professor is Billeter. My child came home concerned about the fact that many comments were made regarding “faith” (Faith in God) and science and how the professor’s relationship changed with his mother over his knowledge of the sciences and an implied a critical look at the sciences would discount faith. With comments like these on the first day of class, I am concerned that this class will be an Anti-Faith in God approach to Zoology 1020. I am a Christian. I don’t consider these comments and opinions appropriate for a public college or used on impressionable minds. Please address this issue in your department.

No comments were made about “discounting faith.” In reality faith was described as “one of the most powerful forms of knowledge humans have.” But the assumptions of the parent and suspicion and occasional visceral repulsion to any science that conflicts with literal scripture is common among some students and undoubtedly more than this one parent. The professor avoids challenging students’ religious beliefs but this communication illustrates the “double-edged sword” pitfall of addressing, at all, religious ideas in the science classroom.

Charles County Maryland: The second anecdote describes a controversy that erupted in Charles County after a September 2004 school board brainstorming session produced a list of more than 100 issues and proposals that the board would consider in the upcoming year (Mason 2004). Among the mostly mundane issues was a proposals “inviting the Gideons to schools to offer Bibles to our students” and another to have science books removed that are “biased toward evolution.” Additional controversial proposals involved allowing students release-time from school classes to attend off-campus Bible classes and another to revise the sex education

curriculum to focus on abstinence-only and pro-life positions. The major local newspaper of Charles County is the Maryland Independent; it is a primary outlet communicating local issues to the citizenry. Animated debates over Darwin, science and religion often arise via letters to the editor in a “Community Forum” section of the newspaper particularly associated with school board elections or following controversial school board proposals. These excerpts are from letters written by Bill Green of La Plata who represents the anti-evolution position. The first letter was written during the 2004 controversy and the second was written in support of board Vice-Chairman, Margaret Young, a supporter of teaching creationism in the public schools. The letter was written in September 2006 but Mrs. Young withdrew from the race prior to the November election.

Letter 1 (excerpted): “...I for one am glad to see the board discussing topics such as removing evolution from textbooks and making Bibles available to the students. If Christianity is true, then these changes would be the most positive the school board could make. If Christianity is false, then creationism is bad science and the Bible is irrelevant, albeit it great literature.

...the real issue behind both controversies [Defense of Marriage Act and Darwinism] is this: Are God and Jesus Christ who they claim to be—creator and lord of the universe?

With history and science firmly on the side of Christianity, I give my support to those on the board interested in moving in this direction.

Anyone [who does not believe in literal creation] should be required to bring forth facts that would support their position.

After all, if evolution is true, everything in nature is some form of proof or another and it should be easy for the evolutionist to make his case.

Good luck. (Green 2004)

Letter 2: “In her letter ‘Let Margaret Young Be Sad Someplace Else’ Barbara Allen accuses Margaret Young of pushing her own beliefs in intelligent design as opposed to Darwinian Evolution. Let me set the record straight. Mrs. Young is not pushing her agenda, she’s pushing mine.

Who am I? I’m a Charles County taxpayer who voted for Mrs. Young and happens to care what Charles County children learn, especially my own. Darwin’s racist theory about superior vs. inferior species is not only garbage, but can’t be talked about at the human level without spawning hate-crime legislation.

I am proud of those on the school board who have been willing to stand up against those peddling their religion of secular humanism along with all its racism, bigotry and immorality. Darwinism can’t be defended and its racist implications shouldn’t be tolerated.” (Green 2006)

These letters illustrate that Charles County citizens often have strong opinions about evolution and religion and the insertion of religion into public school science classes. Equally strong opposing letters appear in the Maryland Independent as well. In this sense, Charles County is not significantly different from Dover PA, where the Kitzmiller case was heard, and many if not

most communities across the USA. La Plata MD, the county-seat of Charles County, and Dover PA are only 125 miles apart. Baltimore is midway between the two towns and curiously, one must pass through towns named Shiloh, Shrewsbury, and Rosaryville, among others, to travel between the two. Dover and La Plata are mirror images regarding the creation-evolution debate and Baltimore is the mirror, halfway between them. Following the 9/11 attacks, the country shifted rightward as did the composition of the school board. 2004 was the middle of the George W. Bush presidency. The political pendulum was slowly swinging left.

In the 2006 school board election, one of the evangelical candidates, Mark Crawford, a graduate of Liberty Baptist University was defeated, Margaret Young, the sitting vice-chairman withdrew before the election and Collins Bailey, the Gideon, barely retained his seat, receiving the fewest votes of the top seven candidates to the seven-member board. Mr. Bailey continues to advocate his conservative positions and is a stalwart representative of a significant segment of the Charles County electorate. In 2010 he will again be challenging Democratic House Majority Leader, Steny Hoyer, for Maryland's 5th District congressional seat. Mr. Bailey is "David" to Mr. Hoyer's "Goliath" running for a seat that Hoyer typically wins by 2:1 margins over his 15 congressional campaigns. Hoyer defeated Bailey 75% to 24% in 2008. Goliath won that battle.

As happened in Dover PA, the Charles County anti-evolution advocates fared poorly in the subsequent election. Although Republicans were rejected in the elections of 2006, their views on the evolution-creation debate were not decisive. The 2006 election was more a reflection of the declining support for the Republican Party headed by the unpopular President Bush than a referendum on Gideon Bibles and Charles Darwin. School board members do not run with party affiliation but their leanings are generally apparent. Virtually every Republican in the county, commissioners, delegates, congressmen and an extremely popular sheriff, was defeated in the 2006 election.

On the same day in 2004 that the bibles-for-students proposal was reported in the Maryland Independent, an article describing a program to provide laptop computers to minority students in a nearby northern Virginia county appeared in the Washington Post. This contrast in priorities escaped neither some readers of the Maryland Independent nor the staff of the nearby Washington Post. A Washington Post article (Partlow 2004) portrayed the school board in, what to some, would be considered an embarrassingly Scope's Trial light (Scopes v State 1926.) Partlow reported that a local high school guidance counselor was "flabbergasted" and vowed to "pull my kids out of school and teach them myself" [if the Bible handout and anti-evolution initiatives passed.] Additionally, the school board president, Kathy Levenduski, said "Voodoo is a recognized religion. Wicca is a recognized religion. My biggest concern with opening to all is just that, we open to all." A high school teacher wrote in an e-mail to Partlow "It would be a shame to see our credibility sullied by a silly literal interpretation of a borrowed Bronze Age Babylonian creation myth." The president of the local Education Association of Charles County said "It's like a throwback to the 50's. I didn't realize we're in the Bible Belt, but I guess we are." Partlow reported that, on interview, no member of the board "actively supported the idea." The board member who is also a member of Gideon International responded that discussion of

the topic was “way premature.” Another board member, the graduate of Liberty University said “anything that will help build character and instill morals...is a benefit.” He also said “Noah Webster [1758-1843] was considered the schoolmaster of the nation, and he said education without the Bible is useless. And Teddy Roosevelt said a good understanding of the scriptures is worth more than a college education.” The vice chairman of the board said “Certainly only one [theory] has been taught in the public school system, yet the kids go to Sunday school and are taught an opposing point of view. They need both theories, so they are informed students.” Opinions why children “need” both “theories” on Monday but only one “theory” on Sunday are addressed below. The chairman of the board said “We have to be very aware that anything can happen at any time. It’s up to the public to decide...and voice their opinion.”

Most of the common positions in debates over teaching creation-evolution and the Establishment Clause were stated by school board members, teachers or citizens. It was the summer and autumn of 2004. A presidential election was looming. By autumn, the Bush vs. Kerry presidential campaign was in full swing and terrorism, national defense and diversity of people, thought and religion were being debated daily. In July of 2004, the local La Plata theater group, The Port Tobacco Players, presented an adaptation of *Inherit the Wind* in which the director, Justin McKean presaged the September school board controversy portraying the fictional town of Hillsboro as La Plata. La Plata theater goers were greeted outside the theater by actors costumed in 1920’s garb carrying “Down With Darwin” and “Read Your Bible” posters jostling in front of the theater. To the south, in Florida, “Terri’s Law” was deemed unconstitutional paving the way for Theresa Schaivo’s court-ordered starvation and death in March of 2005 and a highly partisan, highly politicized, public plunge into bioethics and the constitution. To the north, Peter Jennings was reporting news of the Kitzmiller Intelligent Design case in Dover PA and in Charles County, the school board was embroiled in a Darwin and Bibles debate that found its way into the Washington Post. Class discussions in the author’s freshman biology class at CSM were uncharacteristically animated.

The school board furor subsided as the proposals were tabled. The board apparently thought it prudent to return to budgets and busses and move away from the controversy to the more immediate, more mundane functions of a local school board.

The strong and often polarized letters, the serendipitous production of *Inherit the Wind* and the swollen crowds at typically boring and sparsely-attended school board meetings allowed an interesting comparison. La Plata is Dover; Dover is Hillsboro and Hillsboro is 1926 Dayton TN. 2009 is 2004 is 1926. They are interchangeable.

CSM Students: The third anecdote comes from the CSM student newspaper’s “Student Voices” section (Sasho and Lewis 2001). This is an “inquiring reporter” column. The question posed was “What way did you prepare for your finals?” Four responses were published.

1. “You don’t know it! You won’t know it!”
2. “Pray for a miracle.”
3. “I memorize everything and do the best I can.”
4. “The way I study is get a good sleep and pray.”

Recognition of a deity not indifferent to student exam grades is, perhaps, expressed here. An alternate hypothesis explaining grade inflation is suggested as well. Prayer and sleep trump real studying. That two of four students cited prayer as a means of succeeding on exams is illustrative of the roughly 50% threshold for belief in evolution by American college students. A variety of surveys show roughly 40% of students entering college, 45% with a two-year degree and 50% with a four year degree believe in evolutionary theory. More precisely, according to a recent Gallup poll taken a few days before Darwin's 200th Birthday on February 12, 2009 (Newport 2009), 39% of Americans believe in the theory of evolution, 25% do not and 36% have no opinion. For students with "some college education" the numbers change to 41%, 29% and 30%. For college graduates the numbers are 53%, 22% and 26% while among Americans with postgraduate education they are 74%, 11% and 16%.

CSM Student Attitudes: Students' written responses to a question about teaching evolution-creation are surveyed. The question is part of a graded assignment in a freshman, non-majors biology laboratory course, BIO 1020 Zoology. This is a multi-section, terminal science course and is often simultaneously the students' first and last college laboratory science course. For many, it is the last formal science course they will take. The professors are somewhat curriculum-emancipated with moderate latitude to explore the scientific process along with the encyclopedia of biological facts typical of most freshman biology courses. The author's sections address more history-of-science and exploration of "how we know" along with "what we know" and "why we think we know it" than is found in most other sections of freshman biology at CSM. The students read *Evolution for Everyone* (Wilson 2007) and write a substantial report based on it. One of the laboratories is a case study of the Kitzmiller I.D. trial (NOVA 2007.) The laboratory course focuses on scientific problem-solving. The text, *Problem Solving in Biology*, (Kaplan and Billeter 2006) covers traditional topics as its secondary purpose, e.g. enzymes, animal taxonomy, osmosis, DNA, etc. but its primary purpose is reflected in its chapter titles: *Inductive and Deductive Reasoning, The Formulation of a Hypothesis, The Construction of an Experiment, Modeling in Science, An Analysis of a Famous Investigation*, etc., topics common to all science.

The fairness issue is addressed, in a question designed to provoke thought, by reversing the issue and asking students to comment on the fairness of teaching evolution alongside creation/I.D. in churches. The Establishment Clause is frequently embroiled in battles in the courts including questions of creationism in the schools, the phrase "under God" in the Pledge of Allegiance, the phrase "In God We Trust" on currency and the display of religious symbols on public property e.g. nativity scenes in the public square and the Ten Commandments in courthouses. The Free Exercise Clause is rarely challenged.

The Free Exercise Clause is among the most "settled" of settled issues in American law. The idea of religious freedom is so thoroughly engrained in American culture that the thought of the state dictating the teaching of anything in a church is so alien to Americans that it would be considered ludicrous by both creationist and Darwinist alike. Yet the opposite argument of

dictating the teaching of religion alongside Darwin in the public sphere is notorious for continuously finding its way into our courts. Fairness regarding these two issues is unsurprisingly asymmetrical. The students are asked to address an idea that, *a priori*, is unthinkable in America.

The assignment is part of a first-week laboratory entitled: *What is Science? Critical Thinking, Problem Solving and Empiricism*. The lab exercise is a version of the classic “black box” experiment introducing the process of science. For homework, the students read two articles from a Nobel Symposium (The Nobel Foundation 1979) dealing with science, ethics and society. The first is *People, Knowledge and Science* by Jacqueline Feldman and the second is *Science as a Source of Political Conflict* by Dorothy Nelkin. Although the Symposium was conducted 30 years ago, the students are quick to recognize that the moral and ethical dilemmas of science and society from that “ancient” time remain largely unresolved today. Feldman addresses “fragmentation” of science into a multitude of isolated enclaves, “scientism,” the attitude that scientific knowledge is the only valid form of knowledge and the methods of teaching of science. Being a socialist, she addresses also the role of science as a tool to advance society for the people and calls the prevailing view of science “imperialistic.”

Nelkin addresses the then-budding recombinant DNA controversy, rapid advancement of technology and the fears associated therewith, controversial research on race and IQ, eugenics, traditional values blocking some areas of research, equitable allocation of research monies, the responsibility of laypersons to participate in questions rooted in complex scientific theory and a plethora of other issues. Variations of these issues can be found in the headlines of 2009. Nelkin writes:

On similar grounds, fundamentalists take issue with the teaching of evolutionary biology in public schools. They feel that it intrudes on their religious beliefs and demand that schools provide “equal time” for creation theory. They are a sufficiently powerful force that many educators, biologists, and publishers view their demands as a serious threat to science education.

Even fundamentalists who seek to have the Biblical account of creation taught in the public schools, present themselves as scientists and claim that “creation theory” is a scientific alternative to “evolution theory.”

The students answer ten questions based on these readings. One is:

Some people argue that the religious concept of special creation (the account of creation presented in the Book of Genesis of the Judeo-Christian Bible) should be taught in biology classes as an alternative to the scientific theory of Darwinian evolution. Many people agree that this seems “fair.” Take a different approach to this debate: Discuss whether you think the concept of Darwinian evolution should be taught in churches.

Sixty four responses from four laboratory sections with three different instructors were examined. The responses were highly variable and many addressed both sides of the question. Three of the four possibilities (Darwin in church and school; Darwin in school but not in church;

Darwin in neither church nor school; Darwin in church but not in school) were expressed by at least some students. Unsurprisingly, no student expressed the fourth option that Darwin should be taught in church but not in school. Thirty eight percent answered yes (or a qualified version of yes) to teaching Darwin in church, 61% answered no (or a qualified version of no); one student said it doesn't matter because all the ideas are questionable.

For contrast, we also examined this question with a different audience and venue. The Ann Coulter Website (www.anncoulter.com) has a chat room, The Ann Coulter Official Chat (ACOC), with ongoing, moderated creation-evolution debates. It is lively and many postings from both sides are informed, logical, academic and collegial while at the same time, the anonymity of the *milieu* permits frequent devolution into “flaming,” animated, boorish ridicule and *ad hominem* attack. Compared to the formal graded responses of the students and the sometimes animated but attributed, debates of the letters to the editor in the Maryland Independent, the anonymity of ACOC fostered the most animated debates. We initiated a chat forum with this question:

Many biblical literalists insist that creationism be taught in biology classes in the USA. In that everyone already knows the Genesis creation account, I propose, as a matter of fairness, that Darwinian evolution, which most Americans DO NOT understand, be required to be taught and studied in all American churches?
For the sake of this discussion, disregard the application of the First Amendment's "Establishment" and "Free Exercise" clauses.

Quotes from ACOC are integrated with student responses below. (All quotations are presented *verbatim*, the notation “[sic]” will not be inserted into any quotations).

Responses: Beyond yes and no, the individual responses are difficult to characterize. They range from incredulous rejection of the premise to mischievous acceptance. Various student responses had kernels of Jerry Falwell, Blaise Pascal, T. H. Huxley, G.K. Chesterton and Christopher Hitchens. Collectively the students expressed the range of arguments associated with this debate. Politeness and lamentations seeking compromise are present in some student responses but largely absent from the self-selected ACOC environment. Several students sought amicable, rather than principled, resolution and sought common ground and integration between science and religion. Haught's Evolutionary Theology discussed elsewhere in this Roundtable (Bradt 2009) would be of interest to these students. When I steered other ACOC creation-evolution forums toward compromise and common ground, the forums tended to end in a digital yawn of disinterest. When I posted provocative replies, the responses were fast and furious. The ACOC participants were logged on for the purpose of vigorous, polarized debate. It was often so polarized and strong that the moderator locked the forum after a relatively few pages of responses. Stated succinctly, it got nasty. The evolution-creation forums at ACOC either burn fast and hot and then get locked or they die of boredom when they become polite with compromise.

The following illustrate some of the student and ACOC responses:

Devout Rejection with Suspicion of a Darwinist Conspiracy

These responses represent versions of the extreme view that evolution is a contaminating, Godless lie and should not be taught at all except in those terms. They have a tone similar to Mr. Green's letters to the Maryland Independent above.

Student 1: I do not think that Darwinian evolution should be taught in churches. I also do not think it should be taught in schools. Darwinian evolution should be discussed in churches so that people will be aware of what is being taught to those who are in school and those who do not believe in God, but it should not be taught in any church of the Lord.

Student 2: Churches, synagogues, mosques, temples, kingdom halls and other places of worship are "houses of god." Those are supposed to be sacred places to worship truth and god. We do not go to these places to learn about unfaiths, or things we do not believe in. Genesis teaches that God created the earth, the heavens, everything that lives on earth in the sea and in heaven. Going to places of worship is to build faith and to learn more about God. It is not a place to learn things you do not believe or have faith in. In a place of worship you do learn or take in knowledge of some of the things in the world so you can be guarded against them but you don't study them as if that's what you're trying to become. Darwinism is the complete opposite than what the bible teaches and states there is no god. No it should not be taught in a place of worship.

ACOC: Additionally, we have a calculated misrepresentation of scripture. It amazes me when a pagan cites scripture after saying it is of no value to them but then imply a "Christians" interpretation is incorrect...

ACOC: To wipe all "religion" from the public community is to establish Atheism as a state religion.

ACOC: I think you've just hit upon the real agenda here.

The third poster is an ACOC "conspiracy theorist." He frequently equates Darwinism with atheism and is among several posters who imply that scientists are engaged in a conspiracy to cover up evidence refuting evolution in order to foster an agenda of destroying religion. Posts refuting his conspiracy theory using notable Christian evolutionists like Francis Collins and Kenneth Miller as exceptions are dismissed or ignored by posters like this one. By contrast, philosopher Antony Flew's conversion from atheism to theism is cited and praised. The concept of a "fair test" as used in science is unknown or irrelevant to these posters.

Each In Its Place:

These represent versions of adherence to the First Amendment and an ability and desire to discriminate between natural and supernatural and their places in science. Terms like

“empirical,” “verification” and “falsification” show some sophistication in the methods and perhaps even the epistemology of science by these students.

Student 3: I don’t think Darwinism should be in churches as well as “Special Creation” should not be taught in Biology classes. I believe it is a belief, made by people or actually happened and [was] recorded. It has nothing to do with science and should be kept out of a science class. As well Darwinism is all about science and Natural Selection, it has nothing to do with religion. You go to church to hear about God and that should be it. You go to Biology to learn about evolution not religion.

Student 4: Sure! Well really, actually as much as I would like it to be taught in churches, no. I don’t think it should be. Just as I believe creationism (or any other religious belief-system creation story) should have no place in a science classroom. Church is a place to practice and celebrate a certain type of ritual belief and knowledge. It is something most people partake by choice and there should be no reason to force teaching on them in their place of worship that doesn’t jive with their creation story. Church isn’t really a place for empirical thought anyway.

Student 5: I do not think that Darwinian evolution should be taught in church. Church is meant for religion and faith. Nor do I believe that religious concepts should be taught in Biology. Science is things that are empirically verifiable and potentially falsifiable which means that religion wouldn’t fit into the scientific category. Just like science is not pure faith so it shouldn’t be taught in church.

Reciprocal Fairness:

These are responses that advocate teaching Darwin both in church and in school. They reflect reciprocal fairness and symmetry. An empathetic acknowledgment of reciprocal fairness was frequently mentioned but only rarely advocated as viable in practice.

Student 6: Yes, they should bring the concept of the Darwinian Theory into churches because it is scientifically researched. It has to do with our creation and where we came from and members of churches should be taught about it just as much as kids in school should be taught about the creation presented in the bible.

Student 7: In my opinion the theory of Darwinian evolution should be discussed in church. This scientific theory is part of what made us human animals evolve. Some people may think that scientific theories are pointless and have nothing to do with the world, but many people just don’t know about evolution. I believe the theory of Darwinian [evolution] should most definitely be discussed in church. After reading about this theory it makes life less confusing.

Student 8: I don’t understand why the two can’t be related. The Christian Bible says that God created man and woman. It says nothing about what we looked like Except for we had a rib. God made woman out of mans rib. And as far as the explanation of Time and how the Bible talks about how God made earth in several

days. Well, who is man to measure time. We know what we consider a days time to be... But God is on his own time. Not owers. So I don't see why they can't be inter twined.

Conflict Resolution in a Judeo/Christian Context:

These have a Judeo/Christian tone but also seek fairness while recognizing that in actuality the proposal is problematic.

Student 9: Everyone can learn something from the principles of evolution. On the other hand, does the teachings of evolution contradict God, who is believed by some to be the creator of our earth, our lives, all of humanity. What prove do we have that evolution played a part in that? I have to say that reading the book does spark some fascination. But, how will you convince millions of people who believe in God about Darwinian evolution? It would not be easy.

Student 10: If people want classes in Biology taught different theories as opposed to evolution. I think this gives students the option of broadening their minds about all the different theories to give them there own opinions. However in church, I think it is where you learn about spiritual belief. It could even contradict with what they are trying to teach about God. I do not think it would harm them to teach evolution in church. However, the likelihood that it will be taught is slim to none.

Student 11: Although teaching Darwinian evolution in churches would be nice and allow people to have a wider knowledge base, people would be upset. People to do not go to church to listen to what they don't believe in and I feel that most people would immediately shut the information out, so no. Darwinian evolution can be explored on personal time.

As noted, the insertion of religion into secular settings in the USA is fodder for a continuous and contentious debate. The opposite, insertion of secularism into the religious domain, is virtually non-existent. Such debates exist and are vigorous but are intra-congregational between orthodox, traditional and reformed factions. Such debates are on-going within churches. The common-property nature of the secular domain of the USA is exposed to ideas from the entire, diverse moral/religious spectrum represented in the country. Establishment is confounded broadly while free exercise is confounded narrowly.

Personal Undistrust:

These responses are rare. They illustrate students who think the scientific support for evolution is scant and arguments over religion are fruitless. They wonder why such a furor exists at all.

Student 12: I personally do not think it matters, it's a private matter of personal belief, and although people are aware that there are several possibilities of evolution, none of them are proven 100% true.

Student 7: Some people may think that scientific theories are pointless and have nothing to do with the world...

An occasional ACOC post and one Maryland Independent letter to the editor (Andreas 2006) echo similar sentiments. One could surmise that this opinion is probably underrepresented because lack of a strong opinion does not typically evoke formal expression. The Andreas letter in the Maryland Independent can be summarized as an expression of befuddlement and annoyance that the elected school board members would waste their time with these frivolities while the school budget and SAT scores suffer.

During the Scope's Monkey Trial, under examination by Clarence Darrow, William Jennings Bryan said: "I do not think about things I do not think about." (Berry 2001 132). On the Showtime television program *Bullshit!* Penn Jillette (2003) says: "Everyone who needs to believe in evolution...does." William Jennings Bryan and Penn Jillette stand on polar opposite sides of the debate but there is a sentiment expressed here that we have found, anecdotally, to be common, i.e.: Why does anyone find it necessary to have this debate at all? This is sometimes linked with versions of Pascal's Wager. The debate is a silly one intellectually because, in their minds, the issue is already decided and the other side is silly. The problem, of course is that sincere people, e.g. most evangelicals and most biologists, on either side of the issue consider the opposing view to be absurd. It may be true that personal undistrust is a common sentiment among the students yet they diligently address the first-week's homework question by choosing a viewpoint and defending it because it is a graded assignment.

In addition to where, if at all, evolution should be taught, other themes emerged from the students and ACOC posters.

Church and School Are Not Equal; School is Mandatory

This represents an obvious inequality around which students can craft their answers. But the argument that school is a mandatory arm of the government forced upon helpless children is simplistic and self-serving. Can it be untrue for arithmetic and spelling but true for biology? Dawkins (2006 349) devotes an entire chapter to the indoctrination of children by churches. The parent of my student wrote: "I am a Christian. I don't consider these comments and opinions appropriate for a public college or used on impressionable minds." This was in reference to her college-aged daughter. Introduction of a toddler to the family religion is not considered indoctrination while introducing a college-age student to evolutionary theory in a biology class is considered trespassing on an "impressionable" mind. Dawkins discusses this asymmetry at length. In Maryland, parents are permitted to send their children to religious schools rather than public schools and home-schooling is also a choice in the USA. But the argument that these alternatives to a public education are often too expensive or otherwise impossible for many families is certainly a valid one.

Student 13: Churches teach that creationism is fact and Darwinian evolution is false. There is no room for compromise. Because it is not required for you to go to church, I believe they can teach whatever they want to.

ACOC: I know this [question] is mostly in jest, however, forcing schools to present alternate theories that can't be disproven isn't such a bad thing.

1. Children are forced to go to school by the state.
2. Schools are forced to teach evolution as a theory for the diversity of life.
3. As evolution is one possible theory, alternate theories are presented.

- A. No one is forced to go to any church by the state.
- B. Churches teach specific religions where it is unnecessary to teach all religions.

ACOC: Children are required by law to attend school. They are not required to attend church. This is fallacious logic. Using the same twisted logic: If California teaches six year olds about perverted sexual practices under the guise of sex education we should also teach **How to be a Homo 101** in six grade Sunday School class. No. Notta.

The last quote in this group is also from the conspiracy theorist of ACOC and illustrates again the occasional boorish, crass and rancorous nature of the debate.

Theory Misconception and Conflation:

Some responses illustrated one of the most problematic aspects of teaching evolution—the theory is widely misunderstood. One of the most difficult tasks of the biology instructor is un-teaching misconceptions. Misunderstandings, particularly of the word “theory” as it is used in science and conflation of Big Bang, biogenesis and evolution appear frequently in student responses and at ACOC. At ACOC and among some members of the 2004 Charles County School Board, this misconception is prominent. The quote from the school board vice chairman in the Washington Post article (above) and the quotes below illustrate ignorance or denial of the meaning of the word theory in science.

Theory Misconception

Student 14: People should hear the religious theory along with the scientific theory. This way they can choose for themselves which they belief. By just hearing preaches about evolution in religious terms that individual will more than likely believe that view.

By learning the almost proven evolution theory by Darwin the individual may change his/her belief on the topic of evolution. If they just learn one theory, it creates an ignorance to the other.

Student 15: On the other hand they are both theories and should both be taught as just theories at public schools. If the church was required to teach evolution they would have to be allowed to say it's false.

ACOC: ...forcing schools to present alternate theories that can't be disproven isn't such a bad thing.

The widely-held misconception that there is anything that can reasonably be called “just a” theory in the natural sciences is pervasive. It is claimed that both the religious and the scientific ideas are theories. Sometimes the creation advocates seem oblivious to the ramifications of diminishing evolution to “just a” theory because their deeply held faith gets similarly diminished if the two ideas are compared under the same rules. “Just a theory” is an oxymoron in science. It implies that both creation and evolution are hypotheses with minimal evidentiary support--an implication offensive to both Darwinist and Creationist. Under symmetrical scrutiny, Special Creation will necessarily lose its status of being special. The ACOC poster above is one of the most scholarly and well-read of those arguing the religious position. Yet he considers the biblical interpretation to be an “alternate un-disproven theory worthy of presentation in science classes.” Among the many faulty pedagogical assumptions made by the creation/I.D. advocates, one is that, being compelled, biology teachers would present the two “theories” as approximately equal competing explanations of the extant data. But they are not. Presenting both in a science class demands they be scrutinized scientifically. Nelson (2005 923) writes:

Advocates of teaching intelligent design or creationism along with evolution assume that each alternative will be taught as equally valid (or that evolution will be critiqued and the alternative will not). That is clearly wrong, factually and morally. Verhey's approach, like those shown to be effective in physics, helps students compare alternative views. If intelligent design is presented, it must be critiqued scientifically. For example, Michael Behe's claims would be paired with Kenneth Miller's marvelous critiques. Verhey shows that such an approach appreciably increases acceptance of evolution. My experience is that it enhances understanding of the strength of the scientific support for evolution even among students who continue to reject evolution on religious grounds.

Verhey's (2005 996) findings suggest that creation/I.D. proponents might heed the old saying to be careful what you wish for.

Other Misconceptions

Other misconceptions at ACOC are the common ones: 1) Microevolution is accepted but macroevolution is believed to be totally unsubstantiated. 2) Evolution and biogenesis are the same thing and inability to prove the mechanism of biogenesis somehow falsifies evolution. 3) The statistical probability of creating even a simple functional protein randomly is so astronomical as to be impossible and this, likewise, falsifies evolution by falsifying biogenesis. The word “Origin” in the title of Darwin's book is misconstrued to mean the origin of life rather than, or in addition to origin of species. 4) There are no real transitional fossils or “missing links.” 5) The set of physical/chemical constants that fine-tune the universe could not be serendipitous and this somehow disproves evolution by proving God. Religion and evolution are

mutually exclusive and evolution and atheism are versions of the same thing. 6) There is an army of practicing scientists who reject evolution. 7) Science's uses of hedge words such as "might" e.g. "A might mean B" rather than "A proves B beyond a shadow of doubt," and this demonstrates that the evidence is weak. 8) Body counts: genocidal atheists (Stalin, Hitler and Mao are commonly posited) have killed more people than genocidal believers and evolution=atheism and this not only disproves evolution but, at the same time exposes it as the handiwork of godless, perhaps Satanic scientists. 9) Darwin=Galton=Hitler so the real plot of Darwinism is to cover a eugenics movement and this somehow falsifies modern evolutionary theory.

The following come from ACOC and illustrate some of these misconceptions or responses to them.

ACOC: Evolution has been observed. Of course, you will counter that no Hippo has ever turned into a whale, but that isn't evolution. That's a straw man.

ACOC: It actually takes more faith (belief, trust, acceptance, etc.) to believe that the universe and complex organisms simply happened as a result of a big bang. A big firecracker exploded causing life?? That would be the equal to a tornado going through a junk yard and as a result of all the parts coming together, including the computers and all the wiring, we now have a perfectly tuned and running 747???

ACOC: Luckily there is a long list of leading [creationist] scientists on my side.

ACOC: The list of [evolutionary] scientists on the other side is far, far longer, as well as more significant.

ACOC: Also, evolution "scientists" seem to think that they have a license to revise the "laws" of evolution every time the dog unexpectedly digs up a strange fossil. In fact, "scientists" arguing among themselves as to the significance of the relatively recently discovered "hobbit" fossil reflects that evolution science really isn't a solid science, simply too much conjecture involved at this point in time in evolution "laws" as evidenced by your "may be" and "could be" above.

ACOC: The bottom line is that macroevolution ideas are largely being used by atheists as hate crime against Christians, in my opinion, Christians who put their faith in young earth creationism anyway.

ACOC: Since there is already evidence to suggest that proteins and RNA could have formed under natural conditions on the early Earth, I am surprised at how skeptical some are of the possibility of abiogenesis...

ACOC: Then why can't scientists recreate the conditions and create proteins and RNA?

ACOC: Is this it? They discover some dumb lemur with a broken wrist in the Eocene strata (supposedly 47 million years old) and all of a sudden this is irrefutable proof of transitional species whereby man descended from apes? Please.

ACOC: In reality, Charles Darwin was an early booster of ... eugenics...

ACOC: The word "might" in science is a pretty lame word when presented by itself... "proven" doesn't have to be used at all!

These arguments are systematically refuted, sometimes with long lists of literature citations, by the evolutionist participants but the evidence is dismissed. This out-of-hand dismissal of peer-reviewed scientific literature at ACOC, perhaps, demonstrates the ineffectiveness of the didactic model of producing change in students' views of evolutionary theory in biology classes. It's unlikely that any pedagogy would change the views of the religious posters at ACOC. But there is a gathering body of evidence that shows that significant gains can be made if creationism and I.D. are addressed alongside evolution in the classroom.

Biology teachers and professors have been reluctant to discuss creationism in class because they know the idea is not open to scientific scrutiny. It's neither verifiable nor falsifiable. It's a supernatural "dead end." Some say it is a waste of time to discuss such ideas and that doing so is also unconstitutional. But it is surely not "against the law" to discuss what science isn't in order to convey to students what science is. Such discussions take place in philosophy classes every semester and there is no good reason that they should not take place in science classrooms. If the downside is that the biology class must reduce the detail used to explain the Krebs's Cycle or the stages of meiosis, that would not necessarily be time poorly used.

Craig Nelson (2005 923) and others have been long-time advocates of replacing the didactic model with frequent, guided, small-group exercises in lecture halls. The constructivist, active learning approach has been tested and shown to produce significant change in problem-solving abilities and sophistication of thought. Verhey's study demonstrated that this is effective for teaching evolution in freshman biology classes. Rather than the professor trying to convince student, by proclamation, that previously held scientific ideas are mistaken or religious ideas are not testable, Verhey's methods engage the students at their individual level of prior learning. Sixty-one percent of students who actively studied and compared creation theory with evolutionary theory showed a change in their beliefs and most often from a creation view to an evolution one. Only 21% showed a shift in thinking if they read evolutionary explanations alone. The AIBS, Nelson (2008) and many others have argued that creation/I.D. has no place in the science class. Scientists have largely agreed with this but the students seemingly have not. The professors know that creation and evolution were not created equal scientifically and already know why creation and I.D. are not science. More than 50% of the students do not. There is mounting evidence that the only way for students to take this same decision is by accepting ownership of the question and figuring it out for themselves. If students believe that evolution is bad science or poorly supported or filled with gaps and errors a professor declaring that it isn't

and presenting them examples from the vast body of evidence that has accumulated since 1859 and the publication of *On the Origin of Species* has not been particularly useful in changing their minds. The strongest and most vociferous advocacy of teaching creationism and I.D. has come from the American Evangelical community. It seemed improbable that college biology professors would join them in exploring both ideas in the classroom. But some have and the outcomes have encouraged them.

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