

The Scientific American: A Casualty of the Culture Wars?

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ABSTRACT: This paper addresses two issues: 1) Do America's most religious citizens lack faith in science in general, or do they only protest select issues? And 2) what determines on which issues the most religious will disagree with the scientific establishment? Using data from the 2006 General Social Survey, I break down responses to variables measuring faith in/knowledge of science by church attendance and attitudes toward the Bible. I find that 1) most Americans, even the most religious, have faith in science most of the time, and 2) belief in biblical inerrancy is not a sufficient explanation for religious skepticism regarding evolution, the age of the earth, and the Big Bang.

Introduction

The summer of 2007 will see the latest broadside in the long-pitched battle between Creationists and Darwinists to win American public opinion. In June, Answers in Genesis (AiG), a non-profit organization that also produces one of the most-visited fundamentalist sites on the Internet, will unveil their \$24 million-dollar Creation Museum. Attempting to fight back, the American Museum of Natural History in New York plans a Darwin exhibit, but the response has been underwhelming. The corporate sponsors that regularly fund the AMNH are hesitant to take sides in the debate over the theory of evolution, and so far donors have granted the AMNH only three-million dollars (Wapshott 2005).

That America's corporations fear to associate themselves charitably with a public museum speaks to the virulence of this aspect of the Culture Wars. Indeed, partisans on both sides of the debate make it seem as if this divide is epic, separating Americans into two disparate cultures which can barely communicate due to their sheer divergence of worldviews. AiG itself makes this claim baldly in their self-published book, *The War of the Worldviews: Powerful Answers for an 'Evolutionized' Culture*. In this book, AiG asks the question, "What do aliens, dinosaurs, and gay marriage have in common?" The answer:

They are all part of the culture war—a war between two worldviews. One view is based on a biblical understanding of history, the other on pure naturalism. Our educational institutions and the media are on the frontlines of evolutionizing our culture. From Biology 101 to World History, from The Learning Channel to SpongeBob, subtle and not-so-subtle evolutionary messages bombard us. (Answers 2006)

With this passage, not only does AiG manage to implicate in the Culture Wars nearly everything in our culture, it also gives us a clear criterion for distinguishing between the opposing sides: is your worldview based on a biblical understanding of history, or on pure

naturalism? However, Creationists are not the only ones who make out the stakes in this struggle to be so high. Evolutionary biologist/atheist Richard Dawkins' website (richarddawkins.net) offers posters for fans to print out and plaster all over local coffee shops to advertise his best-selling book, *The God Delusion*. These posters depict the sun shining out from behind the Twin Towers, with the text beneath reading "Imagine No Religion." Indeed, one wonders if there is any common ground on which this zealous skeptic and AiG's president Ken Ham, who believes that dinosaurs roamed the hills of medieval England only a thousand short years ago, could have a meaningful debate.

Generalizing from highly visible figures such as these, the media often portray these men as more eloquent and charismatic representatives of large portions of the population. As such, public intellectuals looking at men like Ham mourn the death of reason in the American populace, while the religious elite look at men like Dawkins and mourn the disappearance of faith. But does the public actually subscribe to religious and scientific worldviews as pure as those expressed by their elite counterparts? Are the two mutually exclusive constructions, and if so, are their adherents actually at each other's throats? To buy into the media and other elites' hubbub, we have to swallow several uninvestigated assumptions. We have to believe that 1) the battle over evolution is always about something larger – not about the origins of man, but about the meaning of practically everything. And 2) when any American expresses his or her position on evolutionary theory, he or she is taking sides in this epic Culture War and championing one worldview while rejecting another. Prominent evangelists and intellectuals may be aware of the magnitude of their proclamations when declaring their allegiances in this battle, but what about average Americans? Just how loaded is an answer of "Yes" or "No" to a survey question on the origins of mankind?

The Culture Wars

Pat Buchanan coined the term “Culture Wars” in 1992 when he stated that America was in the middle of “a religious war . . . a culture war as critical to the kind of nation we shall be as the Cold War itself, for this war is for the soul of America” (Buchanan 1992). Since then, academics have added their voices to the fray. In *The Restructuring of American Religion: Society and Faith since World War II* (1988) Robert Wuthnow claims that rising educational levels have split religious groups into conservative and liberal camps¹. This new cleavage, Wuthnow claims, eclipsed the old salience of the divide between Catholics and Protestants (ibid.: 71-99, 138, 155-168). Wuthnow identifies pivotal issues as including abortion, homosexuality, prayer in school, gender roles, racial equality, and economic justice (ibid.: 132, 219-23, 239).

James Davison Hunter (1991) introduces into this debate the concept of religiosity, claiming that the true difference between the camps identified by Wuthnow is provided by “fundamentally different conceptions of moral order” (ibid.: 49). On one side are those who believe that God and his Word, revealed in the Scriptures, are absolute. On the other side are those who believe that morals are relative, created by man and society (ibid.: 44-45). Thus these two camps, filtering all issues through these different worldviews, come to butt heads on the broad number of issues identified by Wuthnow. Himmelfarb (1999) affixes further adjectives to these two camps, describing the two warring cultures as the “religious, puritanical, family-centered, patriotic and conformist” versus the “secular, tolerant, hedonistic, and multi-cultural” (Norris and Inglehart 2004: 94)

Since these works, many authors have attempted to debunk the Culture Wars thesis. Nancy Davis and Robert Robinson (1996) make the limited claim that while the religious

¹ Following Wuthnow’s lead, I have chosen to use education variables to control my data analysis. See the Data and Methods section for more detail.

orthodox and theological progressives differ on “issues of schooling, sexuality, reproductive rights, and the gendered division of labor,” there is no significant difference in racial equality and the orthodox are in fact more liberal on most economic issues (ibid.: 756). They also find that most Americans occupy a middle ground between progressive and orthodox theologies. These moderates do not hold “muddled” contradictory views - choosing from the far right on one issue, the far left on the other – but rather hold moderate views on nearly everything (ibid.: 780).

More recently, one of the most influential works downplaying the Culture Wars has been Morris Fiorina’s (2006) *Culture Wars? The Myth of a Polarized America*. In it, Fiorina agrees with all of the above inasmuch as he identifies religiosity as a new and very significant cleavage in electoral results over the past decade. At the same time, he shows that this is a result of electoral candidates having publicized their positions along the cultural axis, whereas earlier candidates only identified their position on the economic axis. Thus Fiorina is able to explain several undeniable phenomena (the religiosity cleavage, the vociferousness of the culture warriors, etc.) without having to posit any radical shifts in American demographics (such as a sudden emergence of traditionalist values).

However, Fiorina’s reply does little to assess the deeper conceptions of a Culture War, such as Hunter’s claim that America is divided between fundamentally different conceptions of moral order, or *Answers in Genesis*’ claim that America is in the midst of a clash of worldviews. The accuracy of these claims is largely immaterial to Fiorina’s argument, which merely contends that, in whatever case, the Culture Wars are not the explanatory variable behind elections and other political phenomena. As a political scientist, Fiorina is not expected to try to address the deeper conceptions of the Culture Wars thesis. Nonetheless, few other researchers have sought to go beyond this narrow range of political items.

In particular, quantitative studies of the link between faith in science and religiosity have been rare. Norris and Inglehart (2004) briefly address this link, showing a weak but positive relationship between countries with faith in science and high levels of religious belief (ibid.: 67-69). This finding is interesting but unsatisfying in itself. “Faith in science” was measured only by the question, “In the long run, do you think the scientific advances we are making will help or hurt mankind?” This question speaks more towards faith in applied science – technology – rather than science as a source of knowledge of the world. As it is not suggested why faith in technology and religiosity should contradict one another, this finding does little for our present research problem. Expanding this investigation, I use nationally representative survey data to explore the religious-scientific aspect of the Culture Wars. Examining the effect of religiosity on a wide array of science items, we see that the Culture Wars are also, in their most ‘epic’ and all-encompassing formulations, a largely superficial phenomenon.

To make my contrast between an epic and a superficial Culture War more clear, I offer the following as a collection of null hypotheses of sorts. I claim that all of the following would have to be maintained in order to show that the United States is split between two competing and antithetical worldviews, the adherents of one running all of their perceptions through the Bible and Christian theology, while the adherents of the other subject their beliefs to the rigors of the rational scientific outlook. Such a situation is purported to explain the size of the disagreement regarding evolution in America. However, if evolution denial were truly a consequence of two completely separate camps clinging to antithetical worldviews (i.e. an epic Culture Wars), then we would expect public opinion on science issues to be *consistently* divided in a pattern roughly resembling that of evolution. In other words, we would expect that a Christian who adhered to the text of the Bible so closely as to reject the theory of evolution would similarly reject

scientific accounts of the Big Bang, plate tectonics, the heliocentric solar system, and so on. We would expect these same Christians to express a lack of faith in science as a whole. We would expect them to appeal all of their questions to religious authorities, and they should markedly disagree with the secular public on what makes something scientific, on what fields are considered scientific, and so on. In short, if different *worldviews* are actually the sole or even main cause, the anti-science phenomenon cannot be localized to the evolution debate alone - we should see this same pattern manifest itself throughout *all* measures of faith in science.

As mentioned earlier, I believe the data tell a markedly different story. This is not to say that religious and secular Americans do not disagree on a good number of things. Rather, when we look at survey data to try to determine how people know what they know, a much more nuanced picture emerges than the one presented by the dichotomy of “traditionalist” and “secular progressive” or “fundamentalist” and “rational-scientific.” The most striking fact that emerges is that *most Americans have faith in science most of the time*. The skepticism leveled at evolution is in fact an aberration from the norm. In the end, this leaves us with a more interesting question: what causes lie behind these relatively rare aberrations from scientific faith?

DATA AND METHODS

My data is taken from the 2006 General Social Survey’s Science Module (n=1864). The GSS is a national area probability sample of noninstitutionalized adults eighteen and older. I selected my dependent variables from the Science Module, which consists of a number of questions measuring respondents’ attitudes towards and knowledge of different facets of science. For my independent variables, I selected eight indicators of religiosity, some old standards (feelings towards the Bible, church attendance), and some less common (Have you ever tried to

convince someone to accept Jesus Christ?). My control variables were also taken from the Science Module. I chose measures of *scientific* education (Have you ever taken a college science class? A high school physics class?) as opposed to the more general GSS educational item.

As the Science Module was fielded for the first time in 2006, I was unable to perform longitudinal analyses for any of the items discussed. As such, I attempted to establish reliability for my findings by analyzing a broad range of variables. I used 15 dependent variables measuring various relations towards science, 8 indicators of religiosity for my independent variables, and 2 control variables measuring levels of scientific education. I searched for cross-sectional patterns, making sure that all the patterns I observed were consistent across all measures of faith in science, religiosity, and education. I thus cross-tabbed each of my 15 dependent variables against each of my 8 indicators of religiosity, and controlled all of these with the 2 measures of scientific education. This produced an absurd number of cross tabs, the vast majority of which will not be reproduced here. I merely assured myself that any pattern which held true for a regular church attendee who took high school biology also held true for a proselytizing Christian who took a science class in college, and so forth. In the name of brevity, in this paper I highlight attitudes towards the inerrancy of the Bible as a measure of the degree to which the respondent has embraced the religious worldview, and church attendance as a measure of integration into the religious community. The Bible item is particularly useful in that it divides respondents into the two camps described by Hunter – moral absolutists and relativists. The church attendance item is important as a measure of likely exposure to anti-scientific beliefs².

² As this item does not ask what kind of church one attends, i.e. fundamentalist or progressive, analyses done with this variable are likely to mute the true relationships between exposure to and acceptance of anti-scientific beliefs.

I chose to control all of my cross-tabs for education in response to Wuthnow's claim that rising educational levels split religious groups into conservative and liberal camps. Educational controls not only allow us to contrast the educated-religious with the uneducated-religious, but also allow us to account for the observation that those with less exposure to establishment science are less likely to know the correct establishment answers. I only display controlled data if the graphs for the educational groups differ in a substantive way. Also, although the Science Module contained several educational variables, I only display data controlled by the college science item. I made this choice mainly because the high school educational variables are specific to academic subjects (e.g. have you taken high school chemistry?), whereas many of the dependent variables ask about science in general. In any case, I have included in the appendix a table listing all of the variables that I considered (their original wording can be found in the GSS codebook). As noted before, the patterns discussed in this paper existed no matter which measures of religiosity or education were used.

To make sense of my cross tabs, I selected about twenty of them to be displayed as center-anchored percentage graphs. For the sake of comparability, I always arranged the independent variables with the most secular category on top and the most religious category on the bottom. Similarly, I arranged the dependent variables so that the most scientifically supported response is always on the right and the least supported response is always on the left.

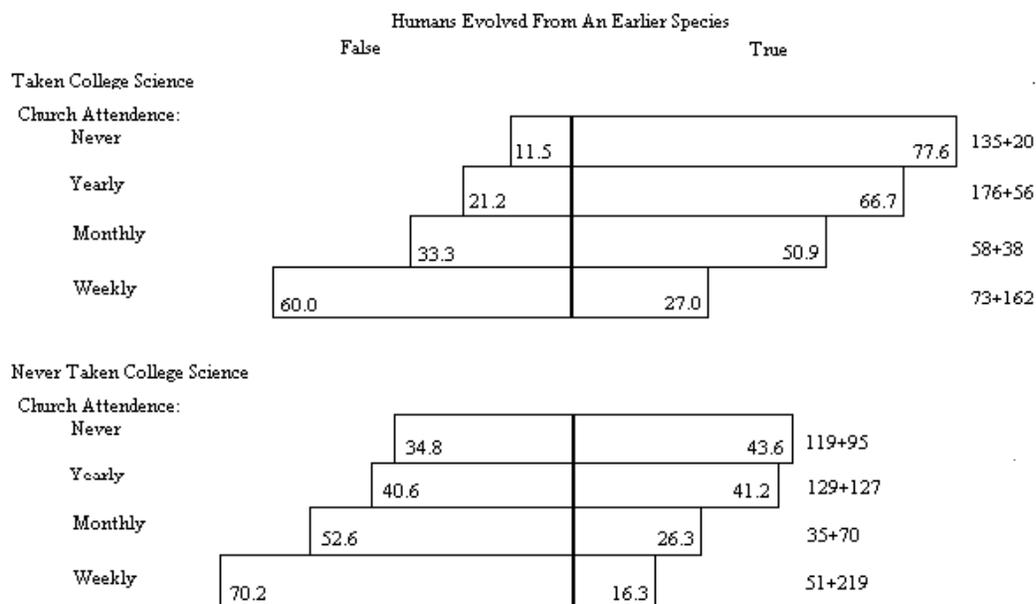
For the type of graph I chose, the selection of the "center" is arbitrary and up to the grapher's discretion - yet this choice can radically alter the shape of the graph. This consideration disturbed me greatly as much of my argument centers around "step distributions" and "box distributions". To address this issue, I tried to adhere to a few principles.

I put right of center only those response categories with which the most devout rationalist could fully agree (or, for true and false questions, those responses which the scientific community would hold to be true). In practice, this meant that when graphing “Is astrology very scientific, pretty scientific, not too scientific, or not scientific at all,” only the latter category would be placed right of center. “Not too scientific” simply wasn’t a strong enough response to merit placement on the “rationalist” side of the graph. This same principle applied when graphing, “The results of the research are consistent with common sense. Would you say this is very important, pretty important, not too important, or not important at all in making something scientific?” Again, I placed only the last response item right of center. (If this seems too harsh, consider quantum mechanics.) All of these choices remain slightly arbitrary and certainly reflect my own biases towards science, religion, and the specific items mentioned. In the end, however, I hope that by having remained constant in the above principles, my graphs are able to be compared fairly one against the other.

The Evolution “Step”: The Shape of a Religious Culture War

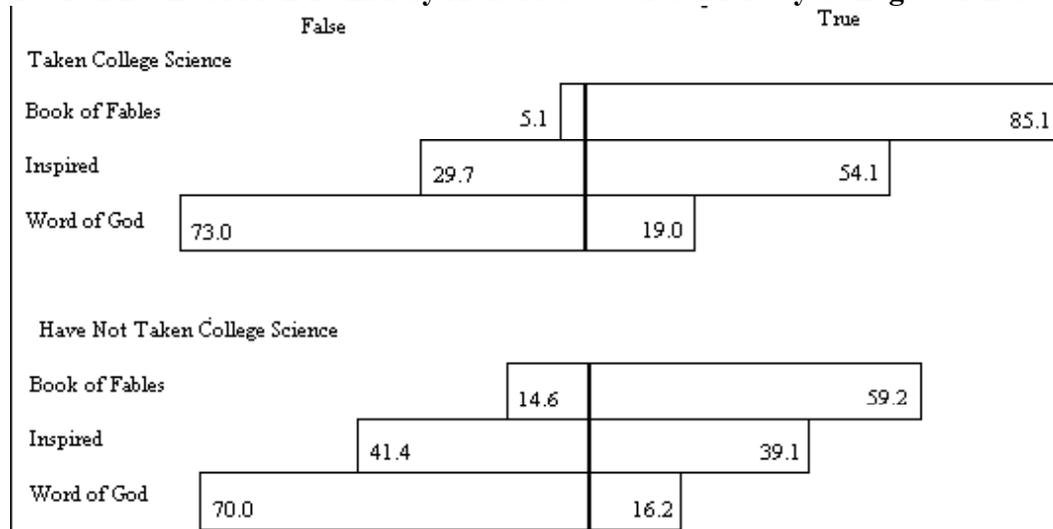
Reproduced below is a simple center-anchored graph representing responses to the question “Human beings, as we know them today, developed from earlier species of animals (Is this true or false?)”, broken down by church attendance and attitudes towards the Bible. The dramatic step distribution of this graph, representing the very different attitudes between the church and the unchurched, the bible literalists and the bible skeptics, is the shape of a culture war. These variables almost completely divide the Darwinists from the anti-Darwinists.

TABLE 1.1 – Evolution Denial by Church Attendance by College Science



Notes: The numbers within the bars represent the percentage of respondents choosing that response category. The top graph shows respondents who have completed college-level science, the bottom graph those who have not. Thus to interpret the top line: 11.5% of college-science educated respondents who never attend church also deny evolution. 77.6% of college-science educated respondents who never attend church believe in it. These percentages do not sum to 100% as these graphs excluded “Don’t Knows.” For this first graph, I included the raw counts to the right of the graphs. Again looking at the top line, these numbers indicate that the 2006 GSS includes 135 college-science educated respondents who never attend church and believe in evolution.

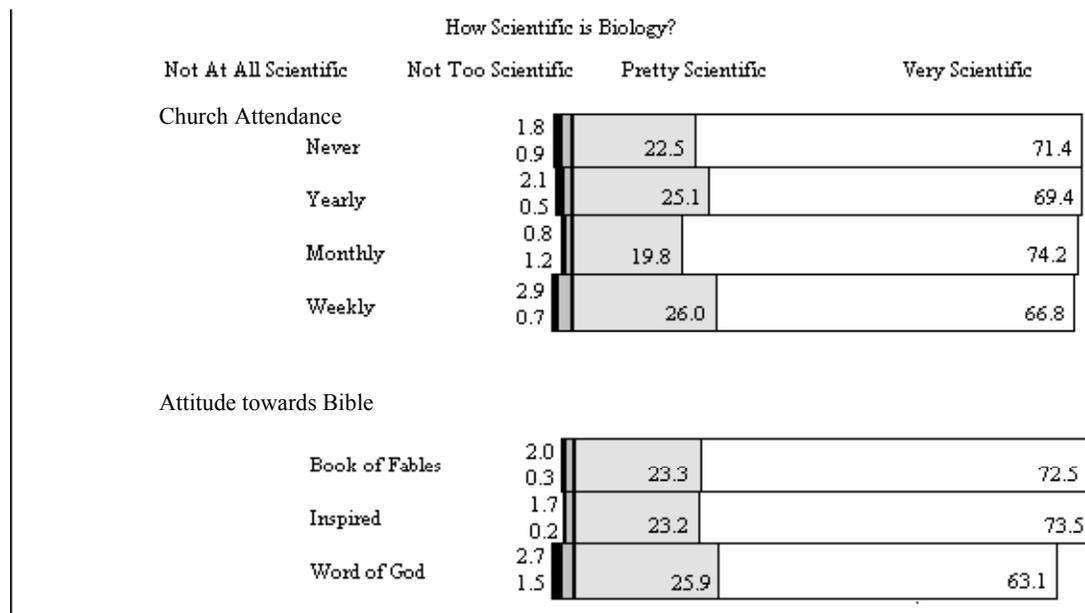
Table 1.2 – Evolution Denial by Attitudes towards Bible by College Science



Notes: Just as with the previous graph, the top bar should be interpreted as saying 5.1% of college-science educated respondents who view the Bible as a “book of fables” also deny evolution, whereas 85.1% of the same category believe in it. The other categories are “The Bible is divinely inspired but is not to be taken literally” and “The Bible is the Word of God.” See the appendix for exact wordings.

One could interpret this graph as saying this: the churched and the literalists have no regard for rational scientific thought, nor do they care about the consensus of the biological science community. Yet when we view this graph in conjunction with the following graph, which displays responses to the question, “How scientific is biology?”, we must pause.

Table 1.3 – How Scientific is Biology? by Church Attendance, Attitudes to Bible

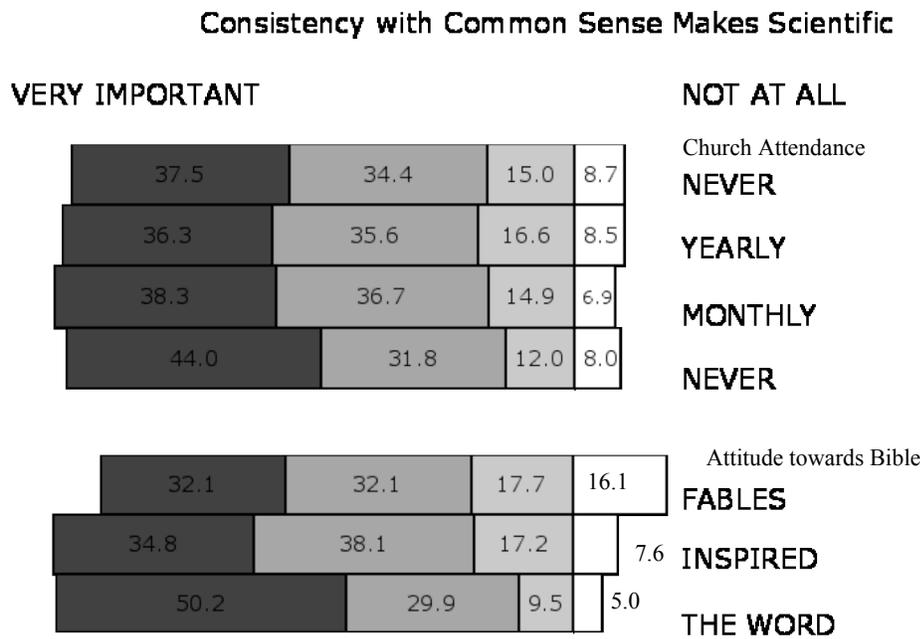


Note: These graphs include both science-educated and uneducated respondents. The controlled graphs in this instance did not change enough to justify displaying. Note that the center-anchor line is always at the center of the sheet of paper. Thus this graph shows a heavy skewing towards the scientifically-sound response. The two scientifically unsound responses (black and dark gray boxes) are so miniscule as to be hard to see at this scale.

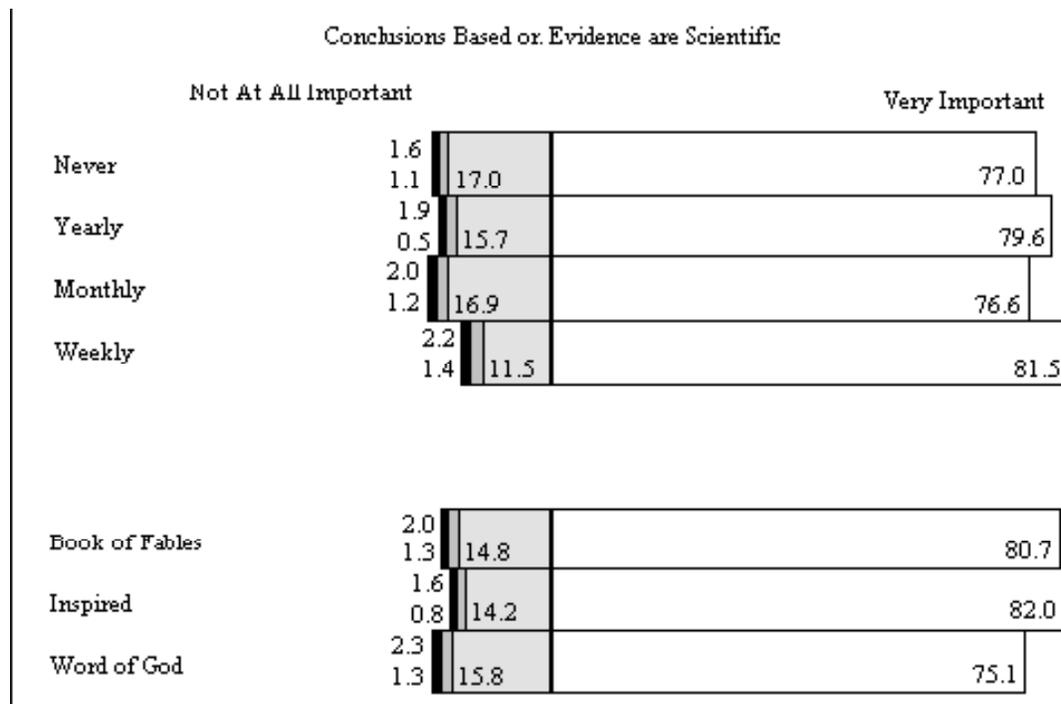
This graph is a near-perfect box. Note that the vast majority of all categories see biology as a very scientific discipline. This forces us to ask: if bible literalists think biology is very scientific, then why do they not believe in evolution? It seems that there are two possible explanations. Either they understand “scientific” to mean something different from their secular counterparts, or their responses are not coherent, their worldview inconsistent.

To examine the first possibility, we look at responses to three questions that ask, “What makes findings scientific?” As it turns out, the religious and the secular mostly agree on what makes something scientific, whether agreeing correctly (a majority of each agree that it is important that conclusions are based on evidence) or incorrectly (a majority of each agree that it is important that conclusions are consistent with common sense).

Table 1.4 – Does Consistency with Common Sense Make Findings Scientific? and Does Evidence Make Findings Scientific? by Church Attendance and Attitudes towards the Bible



NOTES: Categories from left to right are “Very Important, Somewhat Important, Not too Important, Not at All Important.”



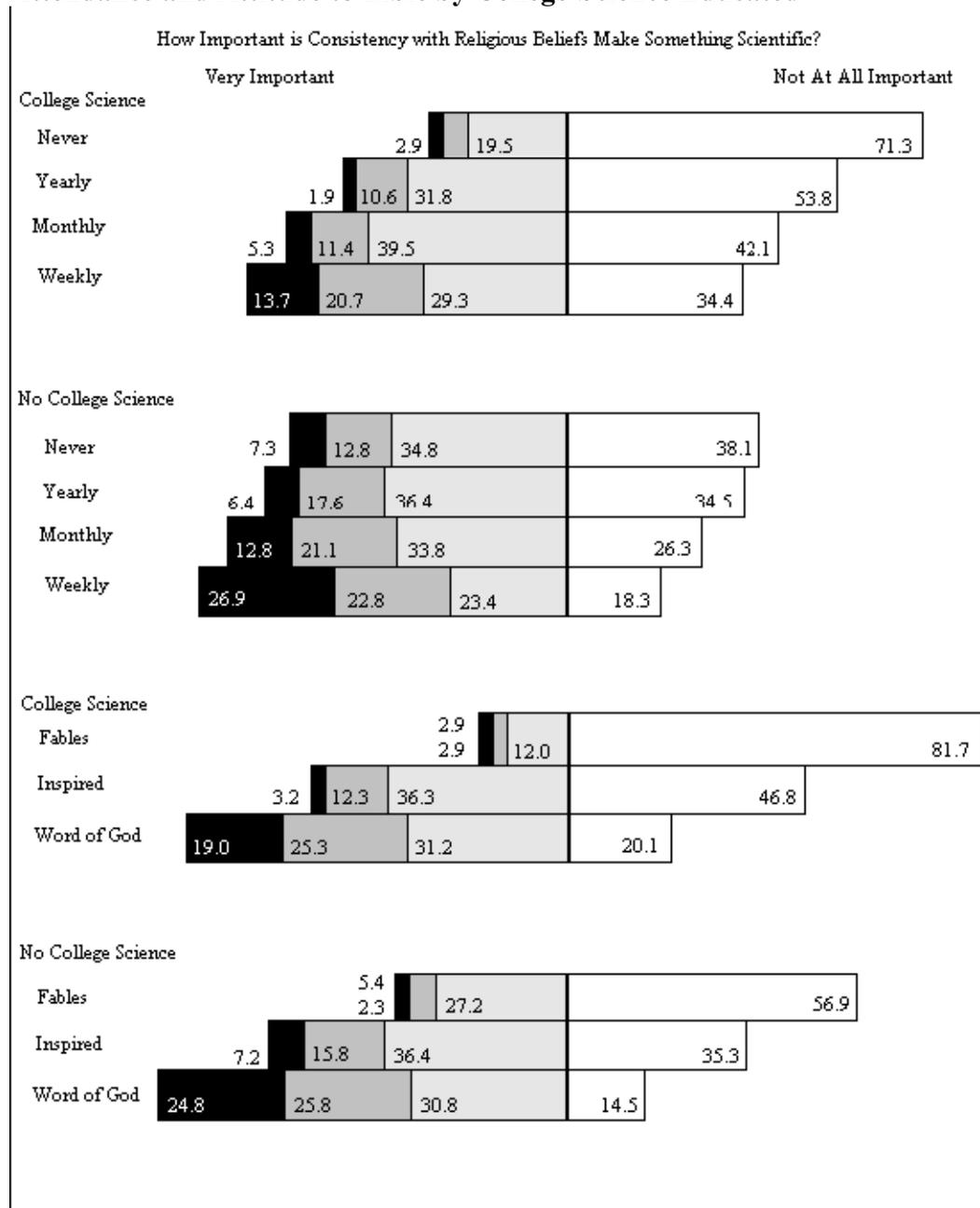
Both of these graphs are box-shaped, indicating broad agreement amongst the different religiosity groupings. As these questions are not religiously sensitive, they can do little to explain the dramatic step-shape of evolution denial. We do not see this step-shape of the culture war again until we look at responses to the question, “How important is it that findings are consistent with religious beliefs?” (See Table 1.5 on next page).

Here we see how much the two “cultures” disagree with one another. However, it is worth noting that even among the college-educated weekly church-goers, a significant 34% choose “Not important at all,” with an additional 30% choosing, “Not too important.” So how do we reconcile the fact that only 34% of college-educated weekly churchgoers chose “Pretty Important” or “Very Important” whereas 60% believe in evolution?

We are left with this quandary: a large majority of Americans see science as something based on evidence and consistency with common-sense, and an even greater majority see biology as “very scientific.” Where does evolution denial come from then? While some say that science

is also based on compatibility with religious beliefs, not enough say this to explain the large numbers denying evolution. It seems, then, that religiously skewed perceptions of the nature of science alone are not enough to explain the step distribution of evolution belief. This leaves us searching for some other variable to explain this phenomenon.

Table 1.5 – Does Consistency with Religious Beliefs Make Findings Scientific? by Church Attendance and Attitude to Bible by College-Science Educated



Steps and Boxes: The Rest of Science

If we believe that the step distribution of evolution is the shape of the Culture Wars, it then follows that we should test other attitudes towards science for such a distribution. By establishing which attitudes are affected by religion and which are not, we can later try to discern which characteristics are shared by both groups and which are not. However, at this point my aim is merely to classify the several science items into the two groups, leaving the analysis for later.

It is useful to first note some items that have more or less “boxy” distributions. These items are all straightforward questions regarding scientific facts. Some questions on which religiosity has little to no effect are “All radioactivity is man-made (Is that true or false?)”, “Does the Earth go around the Sun or does the Sun go around the Earth?”, “In the last decade have the polar ice caps shrunk or grown?”, and “The center of the earth is very hot (True or false?)”. I will only display the Sun-Earth question, as this is the one I will come back to later.

The broad conclusion taken from Table 2.1 is that the majority of people of all religiosities are of one mind when it comes to the heliocentric nature of our solar system. Disagreement here is mainly between the educated and uneducated (about a quarter of those without a college-science education think the Sun goes around the Earth!). There are many other GSS questions that we could test here which would end with the same results.

Table 2.1 – Belief in Heliocentrism by Church Attendance and Attitudes to Bible by College-Science Educated

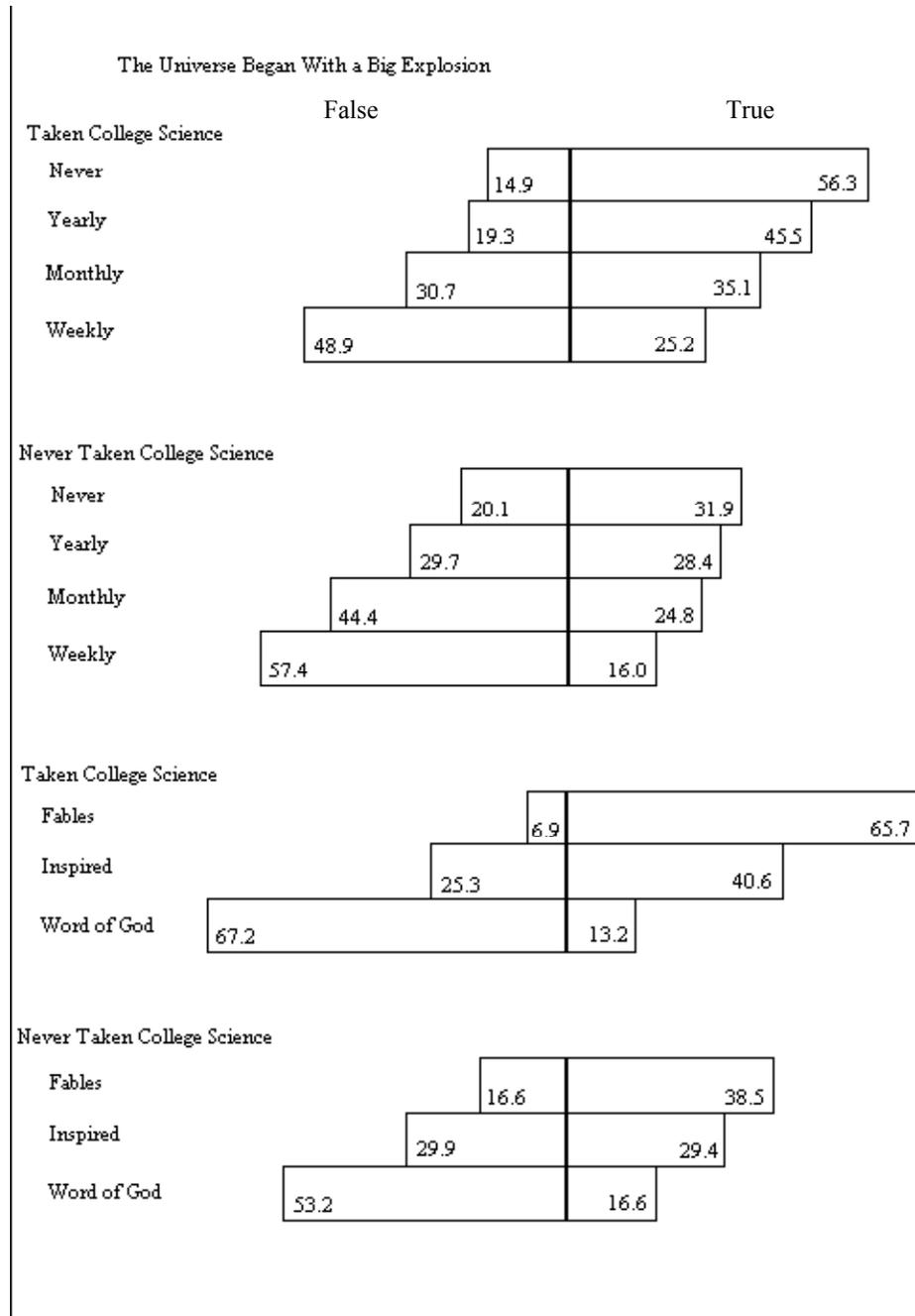
Does the Earth Go Around the Sun or Vice Versa?

	Sun Around Earth	Earth Around Sun
College Science		
Never	7.5	89.1
Yearly	9.5	87.1
Monthly	12.3	81.6
Weekly	11.1	84.9
No College Science		
Never	26.7	62.6
Yearly	25.9	63.9
Monthly	21.1	68.4
Weekly	24.7	63.5
College Science		
Book of Fables	8.0	88.6
Inspired	8.7	87.9
Word of God	15.5	77.6
No College Science		
Book of Fables	22.3	71.5
Inspired	22.4	68.6
Word of God	29.0	57.4

In fact, the only questions for which the step distribution of the Culture Wars reproduces itself are “The universe began with a huge explosion (Is that true or false?)” and (not displayed)

“The continents on which we live have been shifting their locations for millions of years and will continue to move in the future (Is that true or false?)”.

Table 2.2 – Big Bang? By Church Attendance and Attitudes towards the Bible by College-Science Educated



Unfortunately, we cannot separate out exactly which parts of the above true or false statements cause the religious to select “False.” Would the omission of “for millions of years” from the plate tectonics question satisfy those who believe the Earth to have existed for roughly 7,000 years³? And what if we could rephrase the question for the most religious as “God created the universe with a huge explosion”?

As this is impossible, we are now left with the task of analyzing two groups of items. One group of items is controversial, implicated in the Culture Wars, and affected by measures of religiosity. The other group consists of items on which Americans (the educated, at least) have reached a broad consensus with the scientific community. If we cannot play around with question wording to determine where exactly the religious part ways with the rational scientific, we can perhaps tease out these reasons through careful comparing and contrasting.

Compare and Contrast

To start with the most obvious conclusion we can draw, when the existence of some concept (here I am thinking radioactivity) was so far from being conceived of by the ancient Hebrews, religion can have very little effect on belief in it. In lieu of any biblical interpretations, *all* Americans turn to the scientific consensus. From this we can infer one very simple principle: in the competition between the scientific and religious worldviews, it is nearly impossible to favor the religious worldview exclusively. Tension can only exist when there are two competing accounts for a phenomenon. No one is waiting for someone to cook up a convincing theory of

³ Religiosity has no effect on a similar question in the science module, “The center of the earth is very hot (True or false?)”. One might expect (wrongly, as it seems) uneducated Christians to be more likely to get this correct than their uneducated counterparts due to notions of Hell.

radioactive decay from patched together Bible verses. In this light, no one is completely and truly “anti-science.”

Another obvious theme links all three of our disputed items: they appear to contradict accounts of creation as chronicled in Genesis. Interpreted literally, Genesis tells us that the universe, Earth and everything on it were created in a matter of days through God’s creative speech. There is no room, it seems, in such an account for the millions of years required for evolution and plate tectonics theory. Similarly, the Big Bang is a much less romantic, much less human-centric account of the creation of the universe than the elegant simplicity of, “In the beginning, God created the heaven and the earth.” But are these disputed items really so distinct from the uncontroversial items that we can accept this explanation uncritically, that some issues just inherently lend themselves to religious controversy more than others?

If there is some one-to-one correspondence between verses in the Bible and anti-science attitudes, then my research problem has been resolved – the Bible is responsible for our step-shaped graphs. However, if I show that a large majority of the most religious actually prefer scientific explanations to the Biblical explanation for some natural phenomena, then my research problem only deepens. To do this, I have tried to put myself in the state of mind of the most ardent bible literalist: I am attempting to look at the words only, without the help of any historically-supported interpretations of the text. In doing so, I hope to be in the spirit of AiG President Ken Ham (1998) when he writes:

I want to make it VERY clear that we don’t want to be known primarily as ‘young-Earth creationists.’ AiG’s main thrust is NOT ‘young Earth’ as such; our emphasis is on Biblical authority. Believing in a relatively ‘young Earth’ (i.e., only a few thousands of years old, which we accept) is a consequence of accepting the authority of the Word of God as an infallible revelation from our omniscient Creator.

Recently, one of our associates sat down with a highly respected world-class Hebrew scholar and asked him this question: ‘If you started with the Bible alone, without considering any outside influences whatsoever, could you ever come up with millions or billions of years of history for the Earth and universe?’ The answer from this scholar? ‘Absolutely not!’

Reading Genesis “without considering any outside influences whatsoever,” I find that if I were *literally* a bible literalist, a mere reading of the book of Genesis would provide insufficient information to prove or disprove most tenets of modern science. It turns out that Genesis is least ambiguous regarding an issue for which not even the most religious adopt the biblical account: the modern solar system. This all leads to me believe that there is, so to speak, a missing link between literal interpretations of Genesis and the rejection of certain scientific tenets.

This point is made all the more feasible when we realize that one searching for textual support for anti-scientific attitudes is mostly limited to the thirty-one verses of Genesis 1. By Genesis 2, God is resting⁴. Thus the few lines devoted to creation in Genesis 1 necessarily cover a lot of ground in little time at all. The result is an understandable amount of ambiguity, especially when we consider the troubles of translating verses into English from an ancient, imperfectly understood language.

For example, why would the religious disbelieve in the Big Bang? All Genesis has to say on the matter is this: “In the beginning God created the heaven and the earth” (Genesis 1:1). Pope Pius XII (1952) found this verse consistent enough with scientific explanations of the universe that the Catholic Church has been an advocate of Big Bang theory for half a century. Thus, if the religious overwhelmingly interpret Genesis 1:1 as incompatible with the Big Bang, this means that the religious are part of a historically-particular interpretative tradition and are

⁴ In a few verses, though, God creates humanity all over again.

not responding merely to the words on the page. After all, Pius XII believed that Genesis 1:1 could just as reasonably be interpreted to support Big Bang theory as clash with it.

Another example: if bible literalists were truly interpreting for themselves every word in Genesis, it would seem that the second and fourth days of creation would require them to rethink their stance on the nature of the solar system, an issue on which I have already shown nearly all educated Americans agree. On the second day of creation

God said, Let there be a firmament in the midst of the waters, and let it divide water from water. And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so. And God called the firmament Heaven. (Genesis 1:6-8).

Here we see that the ancient Hebrews thought that the sky was a barrier dividing the terrestrial oceans from the celestial oceans (presumably from which comes rain). Now, one could choose to interpret the heavenly waters as merely referring to clouds, but this interpretation would then be challenged by the fourth day, on which

God said, Let there be lights in the firmament of heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years: and let them be for lights in the firmament of heaven to give light upon the earth: and it was so. And God made the two great lights; the greater light to rule the day, and the lesser light to rule the night: and the stars also. And God set them in the firmament of heaven to give light upon the earth, and to rule over the day and over the night, and to divide the light from darkness. (Genesis 1:14-18)

It is a rare person who, in this day, would believe every word in the above account. For here the Bible states that the sun, moon, and stars are in the very same firmament which God placed between the two waters. Thus if we were interpreting “the waters above” as clouds, we need only point out that the sun is definitely not in between the earth and the clouds. If we interpret “the waters above” as being somewhere beyond the sun, then we obviously cannot subscribe to any modern theories of the solar system. And yet, as shown earlier, nearly as many

bible literalists and weekly churchgoers subscribe to the modern model of the solar system as do their most secular countrymen.

To my mind, this disproves any textually based explanations for why religiosity has such an effect on some science items that seek support from particular phrases in the Bible and not others. Genesis 1 can go either way on most any issue of which the ancients were aware (the Bible is only completely silent on items like radioactivity). Thus I cannot believe that the route to anti-scientific attitudes is the straightforward story: The bible literalist reads the Bible > The bible literalist rejects science.

In this light, I find any literal interpretation of the term “bible literalist” to be problematic. Common sense tells us that the Bible is too vast, too complex, and on certain points too ambiguous of a document for there to be a one-to-one correspondence between bible literalism and most beliefs. Rather, there must be some particular interpretation of the text to which bible literalists and weekly churchgoers are particularly inclined. As any such interpretive framework is by nature a historical-social construct, we must look for actors who create and perpetuate them. And as the maintenance of these framings presuppose a certain amount of resources (time, influence, etc.), it is not at all surprising that not *all* scientific issues can be framed as issues which could legitimately be referred to religious authorities.

By the same nature, if we turn to framing as our explanatory phenomenon, we can now account for why attitudes towards specific science items change with time despite a constant Genesis. The heliocentric model of the solar system was indeed not long ago an issue of great contention, and those who subscribed to it considered heretics. Now few bother themselves with it – “The Bible was written to show us how to go to heaven, not how the heavens go,” as Cardinal Baronius put it in 1598 (ChristianAnswers 2007). Once again, this shows that no

question – not even evolution – self-evidently lends itself to being a central issue in the Culture Wars. If neither conceptions of science nor the Bible itself can explain why our science items are divided between step-shapes and boxes, we must once again ask: why do Americans of all levels of religiosity agree on most science questions, and why do they part ways on a relatively small subset of controversial issues?

Discussion

The majority of my paper has been devoted to describing a state of affairs that I believe does *not* exist. If I have succeeded in tearing down any faulty constructions of the problem, I have not put forward any other feasible replacement. With this aim, this discussion takes a stab at the issue of what *does* account for the apparent anti-science attitude taken up by one side of the Culture Wars.

If there is one common thread that unites all of the survey items showing religiosity to have an effect, it is that they were “religiously marked”. Inasmuch as this is an ambiguous term of my own making, I will define an issue as religiously marked as an issue on which the religious are not only aware that they should have an opinion, but for which they are aware that there is a *right* opinion⁵. What exactly does this marking can be a number of things.

The Implicitly Marked

Most obviously, and most uninteresting, is a verbal cue in a survey question. However, as one stray word can have such a prominent effect on response distributions, implicit marking is worth elaborating on. For example, one can question what exactly the average bible literalist

⁵ I don't mean to imply that this works only one way. I could also talk of issues being “secular-progressively marked” or “rational-scientifically marked”.

respondent means by stating that it is ‘very important’ that empirical findings agree with religious beliefs to be considered scientific. Perhaps some of these people have spun whole philosophies around their own meaning of the word ‘scientific.’ However, as a research assistant at NORC, I was able to read the responses to the open-ended prompt, “What does it mean to study something scientifically?” If I could summarize all of the responses in one sentence, I would say that most people view science as something *other* people do, and they don’t bother themselves with conceptualizing the particulars.

More likely then is that most of these people responded to a cue very near to their hearts, and upon seeing the word “religious” chose “very important”. This likely explains the step-distribution for the question, “How important is consistency with religious beliefs to making findings scientific?” After all, nearly no one mentioned religion in response to the open-ended version, “What does it mean to study something scientifically?” If the religious truly had highly-developed but different-from-the-mainstream conceptions of science, then shouldn’t they have shown some variance on the other “What is science?” or “How scientific is . . .” questions?

The “markings” in other questions may be harder to discern, though the religious would have no problem picking up on them. As already mentioned, the use of the phrase “for millions of years” in the plate tectonics question signals to the most religious that this item is (as far as they are concerned) false. In this case, people are not rejecting the idea that continents drift (which is unobjectionable from a Biblical perspective), but merely the idea that they have been drifting for a long time. As the step-distribution in this case is a result of an errant phrase and not a national movement to discredit plate tectonics, I consider this question to be implicitly marked.

The Externally Marked

This leaves us with two more religiously marked items, evolution and the Big Bang. Any American who regularly reads the news is, of course, aware that these items are religiously marked. We all know exactly what a fundamentalist and what a secular-progressive believes on the former, and the latter, while not receiving as much face time in the national media, is the subject of perhaps the most memorable line of the Bible and receives a fair amount of attention in forums such as *Answers in Genesis*. As I mentioned earlier, perhaps the religious would actually respond better to a Big Bang question if it allowed for God as a possible first cause. In any case, America's religious seem to be aware that Big Bang theory has potentially negative consequences for religion by presenting an explanation for the existence of the universe that does not necessitate the existence of God.

Meanwhile the modern model of the solar system seems to have escaped the anti-science denial leveled at these other two issues, which is no doubt to some extent attributable to the preponderance of easily-grasped evidence – we sent men to the moon, they took pictures of earth from space (refer back to table 1.5 to see how much emphasis people put on “consistency with common sense” when asked what makes a finding scientific). However, it is also worth noting that anti-solar system sentiment is not only absent in the national aggregate data, but as far as I know there hasn't been a national organization of any prominence championing an alternative view since the Catholic Church ceded authority on this issue to astronomers several centuries ago. The AiG website's astronomy section⁶, for example, does not draw attention to the nature of the “firmament” I pointed out earlier, and instead takes pains to show that the Bible supports heliocentrism and round-earth “theory”. In the absence of any organization to counter the

⁶ <http://www.answersingenesis.org/home/area/faq/astronomy.asp>

educational system's monopoly on proliferating worldviews on the solar system, how many bible literalists wrestling with the loose applicability of the relevant passages in Genesis will come to the conclusion that the sun must be in between the earth and the clouds?

It is the existence of prominent organizations that champion anti-science explanations regarding evolution and the Big Bang which make these items what I call "explicitly marked". Matthew Nisbet (2005) offers an explanation of the mechanism responsible for "marking" an issue in his concept of a "miserly public." We might like to believe that public opinion on science or political issues is the result of informed individuals consciously deliberating on scientific research or otherwise-gathered information. Most studies, however, present a "miserly" public which forms opinions based only on the information which is most readily accessible from memory (i.e., that information which receives the most media coverage) and which passes through ideological screening processes. Nisbet calls this the memory-based model of opinion formation.

With a miserly public in mind, we can ask ourselves what national opinion towards evolution would be in the absence of powerful organizations which present alternative worldviews. Imagine a bible literalist educated in the basics of Darwin's theory in high school (in a world where anti-Darwin arguments are not readily accessible from the media) reading these words about day six of creation:

And God said, Let the earth bring forth living creatures after their kind, cattle, and creeping things, and beasts of the earth after their kind and it was so. And God made the beasts of the earth after their kind, and cattle after their kind, and everything that creeps on the earth after its kind: and God saw that it was good.
(Genesis 1:24-45)

It is easy to imagine our hypothetical Christian skimming over this text with as little trouble as our real Christians read over days two and four without worrying about the nature of the solar

system. Even that peculiar choice of subject in God's sentence structure, "Let the *earth* bring forth," seems to presage Darwin.

Let our imagined Christian now turn to the creation of man: "And God said, Let us make Mankind in our image, after our likeness . . ." (Genesis 1:26). Or from the other Genesis creation story: "And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul" (Genesis 2:7). If interpreted allegorically, the naturalistic language of the second account of man's origins lends itself to a Darwinistic interpretation more easily than the first. Indeed, it almost seems that anyone wanting to accept both of these passages *must* do so allegorically, or else he is forced to posit that God – in whose image and after whose likeness man was made – was also formed from the dust of the ground. Thus my only point here, once again, is that there can be no definitive literal interpretation of these early passages (and one doubts in this case if there can be *any* literal interpretations without the help of a well-developed, scholastic tradition). As such, we also suspect that there could be very many reasonable interpretations of Genesis that do not contradict Darwin's account of evolution. Denying evolution is no more a necessary trait of even the most fundamentalist, bible literalist traditions of Christianity than is denial of the heliocentric solar system. Its existence, then, must be explained by something other than the text itself.

It is perhaps here worth revisiting what exactly it means to be a bible literalist, especially within the context of our survey questions. As noted earlier, the Bible is too vast, too complex, and on certain points too ambiguous of a document for there to be a one-to-one correspondence between bible literalism and most beliefs. Furthermore, are we to assume that those who call themselves bible literalists *literally* know every word of the Bible, meditate on the full implications of every word of the Bible, follow these implications to their logical conclusions,

and then carry these implications into every sphere of their lives? This seems impossible for all but the most mentally keen and secluded of monks living a life of holy meditation. The rest of Christianity must necessarily be – and excuse the vulgarity of the phrase – a miserly public even when it comes to forming opinions on religion. Thus identifying oneself as a bible literalist means identifying oneself as a deeply religious person who will always take their religion's side on all issues which are *shown* to them to be important to one who is religious. For this reason we hear so often of debates centered around the sixth day of creation, but (I at least) am yet to hear of days two or four from any national media source⁷.

What Kind of Phenomenon is Evolution Denial?

Having wrestled with nationally representative data to find some support for the existence of an epic Culture Wars in which one camp defines itself by replacing science with belief, I find myself coming to the opposite conclusion. The religious have no consistent attitude towards science. If we were to posit one, it would be that the religious *have faith in science most of the time*. It is the *exception* such as evolution or the Big Bang when they veer from the mainstream. It may seem strange that I say “veer from the mainstream” when most Americans embrace an alternative explanation to evolution, but my intent is to stress the fact that if we look at evolution as only one out of many possible conflicts between science and religion, the current distribution for evolution *is* in fact out of the mainstream. Thus I find it very implausible to speak of worldviews in this situation. A consistent worldview would direct all belief in a certain direction,

⁷ For one such example of this, see the works cited list for Patricia Cohen's article “A Split Emerges as Conservatives Discuss Darwin,” in which she discusses the role Darwin has taken in the debates between the 2008 Republican presidential nominees.

say towards the religious or towards the scientific. But whatever lens is in front of the eyes of our nation's most religious citizens directs their gaze first one way, next the other.

To carry this metaphor further, it seems to me that there must be some actor which convinces our nation's churched bible literalists to switch out their usual lens for that of a religious lens when looking at certain issues. In less figurative language, I believe evolution denial to be a phenomenon best addressed by the social movements literature, as well as the literature regarding the sociology of the media. This conclusion sits well with much research done on other facets of the Culture Wars, such as Himmelstein's *To the Right* (1990), which finds the rise of the Christian Right to be a function of the strength of their organizational infrastructure, and not some sudden demographic swelling of the religious element.

One could write at length on how the Christian Right has used its considerable infrastructure to turn the spotlight onto evolution. In the interest of space, I will mention just one example: the Thomas More Law Center (TMLC), by representing the defendants in the 2005 trial in Dover, Pennsylvania, provided the resources to raise a local struggle onto the national stage⁸. Thus resource-rich organizations like the TMLC help to create media circuses around these local struggles, a phenomenon explored in the sociology of the media in works such as Todd Gitlin's (2003) *The Whole World was Watching*. In this study, Gitlin demonstrates the power of the media in shaping our conception of reality - just as the extreme elements of the student left came to dominate the media in the 70s, leaving later generations with the idea that these extremists were representative of the majority of students, today it is the most "interesting" fundamentalists who dominate our TV screens, giving us an unrealistic image of their true

⁸ Of course, we can't forget that it takes two to tango, and the ACLU was just as instrumental in representing the plaintiffs.

numbers (cf. Himmelstein 1990: 123 for a similar point on widespread misconceptions of the popularity of Jerry Falwell et al.).

The strength of this organizational infrastructure combined with its access to the media explains the success of the anti-evolution crusade as a crusade behind which all good Christians should rally. Thus evolution emerges as an issue of our times and public struggles erupt between those passionately devoted to fundamentalist religion and the most faith-denying elements of secular society. The regular appearance of high profile conflicts create the appearance of an epic Culture Wars, which only serves to perpetuate itself: evolution is now an issue on which everyone not only has an opinion, but an issue for which everyone knows which is the *right* opinion for someone like themselves to hold. Thus among the religious, it is the most educated (most aware of what opinion they should have, most aware of what they are denying) who show the strongest denial of evolution (look closely at Table 1.2 and note that the step distribution of the college-educated is more pronounced). Meanwhile, despite equally contentious verses in the Bible, no one asks whether the sky actually keeps the great celestial ocean from pouring down on us.

CONCLUSION

In any case, every instance of a survey item displaying the distribution of a Culture War can be explained without positing an actual Culture War. To be sure, Americans are dramatically divided on the issue of evolution, but this issue remains an exception. Taken as a whole, the data seems to indicate that *all* Americans have faith in *most* of science, meaning that it is hard to conceptualize an all-encompassing anti-scientific attitude, and therefore such an anti-scientific attitude cannot be a defining characteristic of one of the warring camps in the Culture Wars.

How much more ridiculous does it sound to claim that the religious Americans are anti-scientific when one of the most prominent trends in fundamentalism is to try to marshal scientific facts and theories in support of Christian doctrine instead of the straight-forward back-to-the-sources *sola scriptura* approach which seemed to work so well for Martin Luther⁹? Our public intellectuals should breath a sigh of relief: Americans have faith in science.

The dispute over evolution is no doubt a noisy one, but at heart it seems to be an issue of declaring allegiance. Media-friendly Christian groups have kept the evolution debate front and center in our nation's attention, allowing a declaration of oneself as an anti-Darwinist to become a very unambiguous identification of oneself as a church-going God-fearing Christian who upholds traditionalist morals. It does *not* mean that one questions all the findings of Western science, doubts the intelligence or honesty of scientists, nor opens up the Bible when wanting an explanation of the forces behind the tides. Thus without questioning the sincerity of anti-Darwinists' claims, we can still call the scientific aspect of the Culture Wars a shallow one, a superficial one limited to a small set of issues. Worldviews are not at stake here, but only this one question of the origins of mankind.

⁹ See the "Dissent List" of Creationist PhDs. Also see Professor Michael Behe's and others' writings on Intelligent Design, a movement which attempts to make Creationism scientific through analysis of molecular biology, fundamental physical constants, and so forth.

APPENDIX – GSS VARIABLES

Dependent Variables

Now, I would like to ask you a few short questions like those you might see on a television game show. For each statement that I read, please tell me if it is true or false. If you don't know or aren't sure, just tell me so, and we will skip to the next question. Remember true, false, or don't know.

<i>HOTCORE</i>	First, the center of the Earth is very hot. Is that true or false?
<i>RADIOACT</i>	All radioactivity is man-made. (Is that true or false?)
<i>BIGBANG</i>	The universe began with a huge explosion. (Is that true or false?)
<i>CONDRIFT</i>	The continents on which we live have been moving their locations for millions of years and will continue to move in the future. (Is that true or false?)
<i>EVOLVED</i>	Human beings, as we know them today, developed from earlier species of animals. (Is that true or false?)
<i>EARTHSUN</i>	Now, does the Earth go around the Sun, or does the Sun go around the Earth?
<i>ICECAPS</i>	Would you say the polar ice caps have gotten larger or smaller over the last 25 years?
<i>SCIIMP3</i>	The conclusions are based on solid evidence. (Would you say this is very important, pretty important, not too important, or not important at all in making something scientific?)
<i>SCIIMP5</i>	The results of the research are consistent with religious beliefs. (Would you say this is very important, pretty important, not too important, or not important at all in making something scientific?)
<i>SCIIMP6</i>	The results of the research are consistent with common sense. (Would you say this is very important, pretty important, not too important, or not important at all in making something scientific?)
<i>BIOSCI</i>	Biology. (Is biology...) Very scientific, Pretty scientific, Not too scientific, Not scientific at all

Independent Variables

RELITEN Would you call yourself a strong (PREFERENCE NAMED) or not a very strong (PREFERENCE NAMED)?

ATTEND How often do you attend religious services?

BIBLE Which one of these statements comes closest to describing your feelings about the Bible?

1. The Bible is the actual word of God and is to be taken literally, word for word
2. The Bible is the inspired word of God but not everything should be taken literally, word for word
3. The Bible is an ancient book of fables, legends, history and moral precepts recorded by man

RELPERSN To what extent do you consider yourself a religious person? Are you very religious, moderately religious, slightly religious, or not religious at all?

RELLIFE Please tell me whether you strongly agree, agree, disagree, or strongly disagree with the following statement: I try hard to carry my religious beliefs over into all my other dealings in life?

SAVESOUL Have you ever tried to encourage someone to believe in Jesus Christ or accept Jesus Christ as his or her savior?

Control Variables

COLSCI Have you ever taken any college-level science courses?

HSBIO Did you take a high school biology course?

HSCHEM Did you take a high school chemistry course?

HSPHYICS Did you take a high school physics course?

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