Did God Break the Sabbath? Astrosociology and Christian Fundamentalism in the United States

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Abstract. The modern era has witnessed many progressive religious traditions liberally accommodating scientific explanations and incorporating them into their interpretation of religious texts. For most religions, and their adherents, a similar acceptance of astrobiology and the search for life elsewhere in the universe can be expected. Not all faith traditions are likely to be so accepting however, and Christian fundamentalism in the United States, animated by biblical literalism, promises to be one particularly potent exception. The outspoken and politically powerful opposition Christian fundamentalists have mounted against some of the cornerstones of modern science, including evolution and the age of the Earth, ominously project another information battleground looming in the future of astrosociology. Specifically, any evidence of a "second genesis" could be seen as threatening to the belief that humans are the center of God's attention and as a validation of the theory of evolution. Consequently, the "alternative science apparatus" of the fundamentalist movement could be expected to argue in favor of one-way panspermia, originating from Earth, whenever and wherever evidence of life beyond Earth is found. To prevent astrobiology from becoming the next hotly contested information battleground between science and religion, more attention should be paid to the particular segments of the faithful in society that are likely to react negatively to any new evidence that astrobiology may produce.

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INTRODUCTION

A uniting tie that binds the ages of humanity is the shared experience of feeling trapped in the tragic position of not being able to fully understand the universe in which we find ourselves. Not surprisingly, then, we find that throughout history humans have searched for a sense of self and purpose from both natural explanations and from more abstract supernatural and metaphysical methods of inquiry. While many of our first and worst guesses at cause and effect animating the natural world have through time systematically given way to scientific explanations, religion continues to play a major role in society by providing a philosophical supplement to natural explanations on the big ticket questions of where did we come from, what are we doing here, and where are we going.

Astrobiology currently represents one of the most promising new steps on our Sisyphean task of understanding the cosmos. From the discovery of thought provoking extremophiles here on Earth to evidence of biosignatures on Mars and a multitude of newly discovered planets, the possibility of discovering life elsewhere in the universe has rekindled interest in how society will react to evidence that Earth is not the sole incubator of life in the universe (Payne, 1999). But despite the virtually unlimited potential for discovery, most scientists do not currently believe that the discovery of *intelligent* life elsewhere in the universe is imminent. Rather, in all likelihood, society will have time to incrementally adapt to the idea of life beyond Earth through contemplation of biosignatures and, possibly, evidence of microbial life past or present.

If history is any guide, it is very unlikely that evidence of life beyond Earth will have a pernicious effect on the inclination towards religious belief in the main. On the contrary, evidence of life elsewhere could galvanize the role of religion in society through its potential for consolation as people the world over search for the larger meaning of

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such revolutionary discoveries. To date, however, much of the inquiry into potential religious reaction to astrobiology has painted with too broad a brush by focusing mainly on the wide-ranging potential for progressive major world religions to adapt to the discovery of intelligent extraterrestrial life. The reality of modern religion is that with over 4,200 contemporary faith groups on Earth, according to http://www.adherents.com/, and an unquantifiable number of fragmented views among their adherents, it may be impossible to ascertain how all of the world's faithful will respond to astrobiological evidence.

It may very well be the case that for every one thousand religious adherents within one faith tradition you have ten thousand different beliefs and trying to speak for any one religion has much the same amorphous effect as squeezing jelly in your hand. Thus, for the purposes of this paper suffice it to say that there is a very notable difference between the countless forms of *progressive* religious belief and Christian *fundamentalism*. The essence of a "progressive" religion is a belief system that is willing to *reinterpret religious beliefs in light of new evidence*. The antithesis of a progressive religion is a "fundamentalist" one, or one that will *reinterpret new evidence in light of religious beliefs*.

Despite the promising flexibility of most progressive religious beliefs, the track record would suggest that Christian fundamentalism in the United States is poised to present a challenge to at least some of the evidence that astrobiology could produce, namely any evidence of life arising from a "second genesis". Similar to evolution, a literal reading of the bible leaves no room for a second genesis in the panoply of creation explicitly enumerated in the Book of Genesis; that is unless of course the creator broke the Sabbath by working on the seventh day. Christian fundamentalism represents a consistently underestimated force in American society, and given the robust nature of religious belief, the largest concern for astrosociology might not be the impact of astrobiological evidence on religious belief, but rather the impact of religious belief on astrobiology in society.

RELIGION V. SCIENCE: A MATTER OF INTERPRETATION?

While most contemporary scientists and progressive theologians see science and religion as being able to coexist peacefully and harmoniously in society, few need to be reminded that historically much of the advancement of astronomy was won in the teeth of religious opposition. While religion has played the role of a progenitor and patron of science, as well as its arch-antagonist, historically religion has reserved its most extreme prejudice for inquiry into where humans factor into the grander scheme of reality. Arguably, the most famous conflict between religion and science was the persecution of Galileo for his defense of the Copernican heliocentric model of the solar system. Similarly, the case of Giordano Bruno being burned at the stake by the Church for postulating a plurality of inhabited worlds, although perhaps slightly less well known, is at least as germane to astrosociology.

Recognizing an inherent impasse between literal interpretations of religious texts and an insuppressible public appetite for science as both a system of factual inquiry and as a solution to practical problems, most progressive religions have reinterpreted their religious texts in a more liberal fashion. Further, studies seem to indicate that today most people in the United States further decentralize and liberalize their faith taking religion and science ala carte in a nonchalant laissez faire manner that allows them to reconcile certain core religious beliefs with the scientific precepts of modernity (Shindell, 2007). Prophetically foreshadowing this kind of reconciliation of religion with science, Galileo himself, say nothing of his motives, quoted Cardinal Baronius, a Vatican librarian, as famously stating, "the purpose of the holy ghost is to teach us how to go to heaven, not how heaven goes." (Galileo, 1964)

The welcoming in of Darwinian evolution into the religious fold points up the extent to which modern progressive religions are willing to go in accepting new scientific evidence as the pivot point from which to conform their religious interpretations. Thus, if the theory of evolution has not proved to be the harbinger of the siren song of atheism, the outlook for the acceptance of astrobiology appears promising indeed among religious progressives. In fact, most progressive religions are likely to interpret astrobiological evidence as further proof for how magnificent and creative God is (Davies, 2003). Further still, society may actual serve to benefit if progressive religion naturally and internally adapts itself to the implications of astrobiological evidence allowing religion to act as a meaningful buffer between society and science.

Not all religions have been so willing to share center stage with science, however, and currently in the most powerful nation on Earth the historical remnants of knowledge-monopolizing religion finds itself reincarnated in the contemporary form of Christian fundamentalism in the United States. Evidenced by their prolific public pushback to the theory of evolution, fundamentalist Christians represent one particularly uncompromising strain of religion that might very well have a powerful negative reaction to any astrobiological evidence that ostensibly jeopardizes their literal reading of the bible. Reminiscent of the religious persecution of Galileo and Bruno, fundamentalists appear poised to challenge any scientific evidence that threatens to displace humans from the central focus of God's attentive affection. Specifically, any evidence of microbial life arising from a "second genesis" independent of life on Earth would be unpalatable and repugnant to fundamentalists who believe the story of creation in the Book of Genesis captures an exhaustive, not illustrative, inerrant treatise enumerating all life in the universe (Lisle, 2006; Whitcomb, 1984).

Despite the dilatory effect the anti-evolution movement has had on the public's understanding of science, many rational people at the dawn of the twenty-first century continue to complacently view Christian fundamentalism as a marginalized threat from the fringe of society, and with respect to most developed nations, they would largely be correct. In the United States, however, polls consistently show that 31%, or roughly one third, of adult Americans believe the bible should be taken as the "actual word of God, to be taken literally" opposed to "inspired by word of God" or as "ancient fables, history, legends recorded by man." Even among those Americans having earned a college degree, 20% still believe that the bible should be taken word for word as *literally* true, according to a Gallop poll available at http://www.gallup.com/poll/27682/OneThird-Americans-Believe-Bible-Literally-True.aspx (Newport, 2007a).

While many people are quick to reject such a hard line on biblical interpretation as being out of touch with modernity, there is actually a very logical basis for biblical literalism. To fundamentalists, "six days" means *six days*, period, and end of story. Admittedly, it seems a fair point to interpret "six days" as meaning six 24-hour revolutions of the Earth on its axis, as opposed to some elaborate and convoluted extrapolation of "God's time" where six days really meant 13.7 billion years after all. There was a time when all Christians believed the "six days" of creation in Genesis meant six days, and it is plain to see that without science that is what everyone would still believe.

While religious progressives have demoted large swaths of biblical text to the realm of metaphor, some still believe that the bible was originally intended to mean what it says, not for it to say whatever it is future generations want it to mean. As a matter of interpretation, fundamentalists have perhaps correctly seen that once you begin to give up ground on the literalism and inerrancy of the bible, the entire religious paradigm becomes a house of cards gradually capitulating to the slow march of science acting as a malignant corrosive agent. Therefore, by accepting the bible as literally true, fundamentalists approach the search for truth in a top down manner starting with biblical conclusions and then working backwards to puzzle out supportive evidence through alternative "science." Ultimately, both fundamentalists and religious progressives would agree with Arthur C. Clarke that "a faith which cannot survive collision with the truth is not worth many regrets", the critical difference being that religious progressives steer their faith to avoid the collision while fundamentalists steer the evidence.

CHRISTIAN FUNDAMENTALISM: EVIDENCE IN LIGHT OF THE BIBLE, NOT THE BIBLE IN LIGHT OF THE EVIDENCE

It might very well be harmless enough if the fundamentalist wing of Christianity simply did not *believe*, if that is even the right word, in scientific evidence that contradicted a literal reading of the bible. It is wholly another matter entirely when fundamentalists expect all of society to agree as well. Not content to keep their beliefs to themselves, members of the fundamentalist movement have manufactured an "alternative science apparatus" (Kaplan, 2004) to combat science in mainstream society that they deem incompatible with their literal reading of the bible. Taking a strategy from the playbook of corporate industry, the fundamentalists have learned how to start with a conclusion they want to reach and then engineer outcome determinative "science" in efforts to legitimize those conclusions. Just some of the institutions comprising this alternative science movement include the *Discovery Institute* (the nerve center for the Intelligent Design crowd), the *Institute for Creation Research*, *Answers in Genesis*, *Creation*

Ministries International, and *Christian Answers*. In fact, a whole subculture of alternative sources of knowledge has sprung up around the "creation science" fundamentalist movement complete with publishing houses and an online encyclopedia alternative to the secular Wikipedia called CreationWiki, which can be found at http://creationwiki.org/Main_Page.

The very public, and very litigious, evolution "controversy" is merely the most well known example of the fundamentalist pushback to science that does not comport with the literal text of the bible. Other areas of knowledge deemed to be in need of "creation science" substitutes range from the formation of the Grand Canyon to virtually the entire fields of astronomy, astrophysics, and cosmology whose operations speak to the order of millions and billions, not thousands, of years. Again, it is not that these kinds of thoughts exist that is worrisome; it is the extent to which they are accepted that foretells an ominous future for astrosociology. The idea of state of the art "creation museums" complete with dinosaurs walking with humans might be novel and refreshing in some ways if school children were not being indoctrinated by the bus load in the dark arts of pseudo-science. The book "Grand Canyon: A Different View", carefully detailing how the Grand Canyon was formed by a single flood just a few thousand years ago, might be jocular and innocuous were it not approved for sale in The Grand Canyon National Park's bookstore, which operates under a Congressional mandate to promote the public understanding of science (Kaplan, 2004). Similarly, elaborate attempts to retrofit Noah's Ark with the whole cornucopia of biodiversity metaphorically depict the attempts to fit the square peg of tortured science into the round hole of biblical literalism.

While there is virtually no limit to how expansive the list of targets may grow, the most notorious machination of fundamentalist alternative science has without a doubt been directed at the theory of evolution. Despite the fact that there is no meaningful scientific debate between evolution and creationism, the teaching of evolution in public schools has been an issue of national prominence since the famous Scopes "Monkey Trial" in 1927 (*Scopes v. State*, 1927), in which Scopes was convicted of teaching evolution. Since that time, the U.S. Supreme Court has consistently struck down state statutes banning the teaching of evolution as violative of the Establishment Clause of the First Amendment of the U.S. Constitution (*Epperson v. Arkansas*, 1968). Undeterred by the banishment of Genesis from public schools, the fundamentalist movement ironically "evolved" their argument to get creation back in schools, first by repackaging biblical creationism under the well-balanced label of "creation science" (*Edwards v. Aguillard*, 1987). When this attempt failed, the movement resiliently began "pouring old wine into new skins" again, this time under the guise of the "Intelligent Design (ID)" movement, which is still alive and well today.

Despite the scientific sounding title, the ID movement's attempt to infiltrate public schools was publicly exposed as nothing more than a rehashed version of creationism in a 2005 lower court opinion styled *Kitzmiller v. Dover Area School District* (*Kitzmiller v. Dover*, 2005). The lynch pin of the case was an ID book made available to students as a supplement entitled *Of Pandas and People*, which was published by an organization entitled FTE, whose articles of incorporation and filings with the Internal Revenue Service list as a Christian religious organization. The original manuscript of the book in question was entitled *Creation Biology* and terminology in the book explicitly used variations of the word "creation" that were changed only after a 1987 Supreme Court Case banned the teaching of creationism (*Edwards v. Aguillard*, 1987). None of the subsequent alterations revised the subject matter or content of the book, only the terminology. For example, the early 1987 version of the book stated that the term "*Creation*" is defined as "various forms of life that began abruptly through an intelligent agency with their distinctive features intact-fish with fins and scales, birds with feathers, beaks, and wings, etc." Later that same year the revised version of the book stated that the term "*Intelligent Design*" is defined as "various forms of life that began abruptly through an intelligent agency with their distinctive features intact-fish with fins and scales, birds with feathers, beaks, and wings, etc." (*Kitzmiller v. Dover*, 2005) Although the Court in *Kitzmiller* found no constitutional secular purpose for the instruction of ID in public classrooms, the legal effect of this lower court decision is not binding on the rest of the nation, thus leaving the ID movement bruised but not defeated.

Rather than reduce the influence of fundamentalist alternative science, the legal setbacks suffered in the realm of public education actually served as a rallying point to galvanize Christian conservatives. A 2005 study conducted by the Pew Research Center shows that 64% percent of Americans say they are "open to the idea of teaching creationism along with evolution in the public schools" and 38% percent "favors replacing evolution with creationism in public school curricula." (Kohut and Lugo, 2005) Unsatisfied with the progress of teaching creation in place of, or along side, evolution, many fundamentalists have resorted to homeschooling. Figures available at http://nces.ed.gov/nhes/homeschool/ show that home schooling has been on the rise in recent years with well over one million children receiving their education at home (IES, 2003). When parents were queried as to what

motivated them to homeschool their children, 72% cited "religious or moral instruction" as *among* their motivations. Thirty percent of these respondents cited the same as the *primary* reason, which was the second most cited primary justification just behind "concern for the safety of the learning environment," receiving 31% of the vote; these results are available at http://nces.ed.gov/pubs2006/homeschool/parentsreasons.asp (IES, 2003).

While it may be hard to empirically quantify the impact of the fundamentalist movement, by asking questions about creation and evolution in different ways in efforts to isolate motivation, a Gallup study, available at http://www.gallup.com/poll/27847/Majority-Republicans-Doubt-Theory-Evolution.aspx, concluded that "Americans who say they do not believe in the theory of evolution are highly likely to justify this belief by reference to religion, Jesus Christ, or the Bible." (Newport, 2007b) In any event, there is little doubt that an extreme disconnect exists between the scientific community in the United States and the 48% of the American public that rejects the scientific theory of evolution. To put this in perspective, a 2005 international survey published by *Science* magazine found that out of 34 nations surveyed, the United States came in 33rd, just ahead of last place Turkey, in terms of public understanding of evolution (Miller, Scott, and Okamoto, 2006). The authors of the *Science* magazine article concluded that the poor showing of the United States was largely the result of "widespread fundamentalism and the politicization of science in the United States." (Miller, Scott, and Okamoto, 2006)

RELIGIOUS REACTION TO ASTROBIOLOGICAL EVIDENCE

In 1994, Victoria Alexander of The Bigelow Foundation conducted the *Alexander UFO Religious Crisis Survey* which explored the question of "how would organized religions in the United States react to confirmation of contact with an advanced extraterrestrial civilization" (Alexander, 1994). The 230 respondents to the survey represented a cross section of Protestant, Catholic, and Jewish church and synagogue leaders from across the United States. While the study dealt only with the religious implications of contact with advanced extraterrestrial civilization, the results show that for the most part religious leaders "would not feel their faith and the faith of their congregation would be threatened" should we come across advanced extraterrestrial civilizations.

The design of the Alexander study gauges religious reaction to concerns raised by UFO enthusiasts and thus fails to determine the extent to which the respondents are aware of current astrobiological research. Other studies have indicated that many Americans may lack the requisite awareness of astrobiological issues to be able to give an informed response as to the potential meaningfulness of evidence of a second genesis of microbial life distinguished from the much-ridiculed UFOs of popular culture (Shindell, 2007). Additionally, caution should be used in interpreting these survey results due to the fact that there was a great deal of variance among the comments of the respondents even within faiths, none of which could begin to account for the multitude of individual responses extraterrestrial life would elicit in the laity.

While the Alexander study is certainly relevant to societal reaction to astrobiological evidence, it is important to caution that the respondents only represented a very small number of religious leaders whose job it is to profess the faith. Furthermore, the survey did not delineate between the numerous sects of each faith, which vary a great deal in how progressive they are. As a Brookings Report pointed out with respect to the Alexander Survey, "[t]here is no way to tell how theologically conservative the individual minister/priest/rabbi was who answered the survey. The more conservative (taking the Bible as the every-word inspired word of God) a minister/priest/rabbi, the more likely they are to feel troubled by the questions on the survey." (Brookings Institute, 2001) By casting a similarly broad net, even a survey polling religious acceptance of evolution could look quite promising if it failed to seize on the fundamentalist sects of religion that reject the theory.

While the general responses to the Alexander survey seem to suggest that the knowledge of advanced extraterrestrial civilization would not threaten faith in the main, the individualized comments of respondents reveals a whole host of varying opinions on the matter. For example, several of the respondents went out of their way to mention how silly and inane the whole inquiry was. This could be indicative of religious chauvinism on behalf of religious leaders skewing the findings of the survey toward an overly-optimistic projection. In the same vein, one must raise the caveat that such comments could be the product of circular reasoning taking the following form: "of course my faith would not be threatened, precisely because my faith informs me that no extraterrestrial life exists." In any event, it would simply be a poor career choice to disclose against your self-interest that scientific evidence of *any* kind should put you out of business. Ultimately, individual religious reactions might prove quite difficult to quantify

accurately prospectively, other than to predict that progressive religions, and their adherents, will adapt, reform, and move on.

Despite inherent problems in polling religion, the reaction of the very segment of society that is likely to be hostile to astrobiology is actually relatively easy to predict. What seems more difficult to explain is why the prospective reaction of Christian fundamentalism appears to have largely sailed under the radar at previous conferences addressing the theological implications of astrobiology (Payne, 1999; Bertka, C., Roth, N., and Shindell, M., 2007). Past conferences addressing the topic have focused on sophisticated theologians which, in this context, look more like philosophers and bioethicists than staunch and steadfast believers in the good Book. While it is comforting that cutting-edge religion will not have any trouble digesting cutting-edge science, concentrating primarily on progressive religious belief runs the risk of setting up a positive feedback loop that overlooks the powder keg of Christian fundamentalism in the United States.

In light of the paucity of reliable empirical evidence, perhaps the greatest diagnostic tool for astrosociology is the examination of how Christian fundamentalism responded to the theory evolution. Evolution is after all perhaps astrobiology's only equal in terms of its capacity to humble our perception of ourselves. It is not hard to see how evidence of life elsewhere in the universe could be every bit as threatening as evolution is to some of the central tenets of the traditional Christian faith. Of important note, however, is that the bible never explicitly denounces the idea of extraterrestrial life any more than it does evolution. Nevertheless, many from the fundamentalist perspective argue that both are heavily implied to be untrue. That is because, taken literally, most of the core doctrines of Christianity depict humans and the Earth as unique among the great cosmic expanse. As Dr. Jason Lisle's explains in his book *Taking Back Astronomy* promoted by *Answers in Genesis*:

> "[i]t is the earth that was designed for life (Isaiah 45:18), not the heavens. The other planets have an entirely different purpose than does the earth, and thus they are designed differently. In Genesis 1, we read that God created plants on the earth on day 3, birds to fly in the atmosphere and marine life to swim in the ocean on day 5, and animals to inhabit the land on day 6. Human beings are also made on day 6 and are given dominion over the animals, but where does the Bible discuss the creation of life on the 'lights in the expanse of the heavens?' There is no such description, because the lights in the expanse were not designed to accommodate life. God gave care of the earth to man, but the heavens are the Lord's (Psalms 115:16). From a biblical perspective, extraterrestrial life does not seem reasonable." (Lisle, 2006)

Central among the Christian teachings suggesting the uniqueness of intelligent life, is the concept of God being "incarnated" in the human form of his son, Jesus, so that he may die for the sins of human beings who will then be saved through vicarious redemption (The Bible, Hebrews 9:24-28, 10:12). From a literalist perspective, "incarnation" only happened *one* time *for humans*. The doctrine of incarnation dovetails with the doctrine of redemption/salvation (The Bible, Romans 3:24-26; John 3:16) implying that if there were intelligent life on other planets they could not be saved, and this simply does not comport with a benevolent creator.

In this respect, Christianity is the most "species-specific" major religion in the world, placing heavy emphasis on God's *only* son being the savior of *human beings on Earth* (Davies, 2003). While this would appear to present a problem if taken literally, these doctrinal obstacles may only be stumbling blocks for the most dyed-in-the-wool Christian fundamentalists. Prominent progressive theologians such as Paul Tillich, Ted Peters, and Robert Russell have explored the questions of whether Christ has performed multiple "incarnations" wherever life exists or if life elsewhere would even be in need of redemption in the first place. That is to say, if extraterrestrial life did not commit an "original sin" there might not be a need for redemption through Christ as there was on Earth. Alternatively, Christ's one act of redemption here on Earth could have sufficed to redeem all of God's children regardless of what form they may take.

Ultimately, as Ernan McMullin, a professor emeritus of philosophy at Notre Dame University, rightly observed, "concepts such as original sin, incarnation, and salvation are open to a variety of interpretations." (Davies, 2003). For example, Vatican chief astronomer José Gabriel Funes has been quoted as saying the Catholic Church sees no theological problems arising from the possibility of life beyond Earth, a view supported by the former head of the Vatican Observatory, George Coyne (Kaufman, 2008; Wertheim, 1996). As this paper has stressed, most religions, and indeed most Christians, should have no problem accepting that with God all things are possible and that evidence of extraterrestrial life would only serve to increase the providence of God.

While it is conceivable that contact with intelligent extraterrestrial life could occur at any time without warning, the sheer cosmic odds at play suggest that it is much more likely that we will continue to grind out progressively more provocative astrobiological evidence in a methodical manner in the meantime. Seen as far less threatening to the significance of our role in the universe, the discovery of microbial life is not likely to be rejected outright by the fundamentalist movement as incompatible with the bible. Rather, there is reason to believe that fundamentalists are already setting up the pseudo-scientific vanguard to spin this far more imminent variety of astrobiological evidence to conform to their worldview. Specifically, the anthropocentric view of the world held by the fundamentalists will likely result in them championing one-way panspermia whenever and wherever evidence of microbial life is found.

For instance, if we discover microbial life on Mars, the position of the fundamentalists would likely be that Mars was simply seeded by the Earth. Starting with the conclusion that the bible only leaves room for one genesis, the fundamentalist alternative science apparatus would likely work backwards to construct "science" to reach that conclusion. To illustrate how this may already be occurring, according to the "Extraterrestrial Life" entry on *CreationWiki*, available at http://creationwiki.org/Extraterrestrial_life, "The Hydroplate Theory of the Global Flood suggests that large quantities of water, including muddy slurries, were ejected into space during the initial fissure of the original earth's crust, and that these ejecta persist today as comets, asteroids, and meteoroids. If such ejected water and mud fell to Mars from above, then they might have held microbes--and therefore any microbes found on Mars are far more likely to have come from earth during the Noachic Flood than to have originated on Mars."

It is on these kinds of grounds that the fundamentalist movement will make its stand; trumpeting any ostensible weakness in scientific evidence to dispute a second independent origin of life. If science discovers that in fact panspermia did take place with Earth as the origin, fundamentalists will view this as confirmation of their beliefs. If not, and in the meantime, fundamentalists are likely to create an informational stalemate among the broader populace similar to what has occurred with evolution.

CONCLUSION

Currently, most fundamentalists are likely to believe that the search for life is predicated upon the errant assumption of evolution and denial of God the creator and is therefore a waste of time and resources (Ecker, 1990). While there has not been a major reaction in the fundamentalist community to the exploration of Mars thus far, it is very unlikely that fundamentalists seriously contemplated the potential for the Viking missions to Mars to discover a second genesis of life. Similarly, the fundamentalist response to the so-called "Mars Rock" was also rather subdued, probably because had microbial life been confirmed the argument would simply be that it was the result of panspermia. Of course, the fact that scientists found no microbial life was seen as vindication of creationist predictions (Morris, 1985). These occurrences should not create a false sense of security in the science community, though, because unfortunately, if and when evidence of microbial life is found then an unsuspecting public might lack the scientific acumen to discern real science from the pseudo "creation science" that fundamentalists are likely to disseminate in the unregulated market place of ideas.

Categorical rejection of any search for independent origins of life is likely to dovetail with the rejection of the scientific postulation of life and evolution both being emergent properties in the universe. Evidence of extraterrestrial life that developed independent of the Earth could be viewed as validation of evolution and therefore a very significant threat to the worldview of the fundamentalist movement. In the event microbial life was found, fundamentalists would likely incorporate panspermia into the ID movement, if they have not already, viewing a "second genesis" as unequivocally unpalatable to biblical literalism. Given that the ID movement is already up and running and unrestrained by the strictures of objective peer review, fundamentalists are in a position to churn out alternative science advocating panspermia well before orthodox science could confirm an independent origin.

Nonetheless, the projection of a negative reaction in the most fundamentalist segments of Christianity should by no means be construed as a shortcoming of Christianity or religion on the whole. As with evolution, most theologians and Christians will not only accept new astrobiological evidence, but will welcome it as validation of the boundless glory and greatness of God. At the same time though, one must take sober account of the fact that the most advanced nation on Earth is also home to the most disproportionate amount of fundamentalists with respect to other industrialized nations. Judging from the degree of disconnect between the American scientific community and the

broader public on matters of evolution, it would serve astrosociology well to not gain a false sense of security by only taking religious progressives into account.

Astrobiology is a "rapidly evolving area of knowledge, with a truly multi and trans-disciplinary nature, should be public widespread and ultimately integrated into the curricular domain, as well as into public and private scientific policies" (Rodrigues and Carrapico, 2006). Most experts agree that soon astrosociology will reach a critical juncture where "[u]ltimately, astrobiology's success or failure will depend on public support."(Payne, 1999) The fundamentalist movement may have the head start in forming a subconscious resistance in students to the notion of life beyond Earth just as it has with evolution (Rodrigues and Carrapico, 2006). To ensure that astrobiology does not have to endure growing pains similar to those experienced with teaching evolution in the classroom, the scientific community should focus more on the public education arena rather than on broad public response that will largely be individualized and absorbent of the evidence. NASA and astrobiology can learn a great deal from the intellectual honesty required of the theory of evolution when bringing the resources of the space program to schools. While it may behoove astrosociology to downplay nomenclature that connotes such vivid religious imagery as a "second genesis", making astrobiology in the classroom too "religion friendly" could be counterproductive in the long run. Ultimately, more studies are needed to focus on how to preempt the potential reaction of Christian fundamentalism to astrobiology, which should by no means be underestimated.

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