



## The Need for a Paradigm Shift in Science Advocacy

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Sixteen years into the twenty-first century, many are dismayed at the resiliency of skepticism about science in the United States. On wide-ranging subjects, such as vaccinations, genetically modified foods, climate change, evolution, and the age and origin of the Earth and universe, a sizable percentage of the population continues to hold and promote views that run counter to common scientific understanding. An oft-cited Gallup poll (2015) illustrates the lack of progress. In 1982, a question was posed regarding beliefs about human evolution. At the time, 44% believed God made humans in their present form. After a quarter century of improved educational materials, upgraded K–12 science standards, and several successful court battles to curb anti-science influences, that number has remained essentially unchanged. The last poll in 2014 pegged the number at 42% (Gallup, 2015).

Other polls tell a similar story. A 2014 poll by the Associated Press found that 4 out of 10 people in the United States have doubts about the validity of a 4.5-billion-year history for the Earth and about the evolution of life forms through a process of natural selection. A 51% majority is skeptical about the “Big Bang” (Borenstein and Agiesta, 2014). The Pew Foundation took a different approach, asking people whether they thought scientists were in agreement on these topics. More than half the people surveyed believe scientists are currently divided on the origin of the universe, and more than a third believe scientists still lack internal consensus on evolution (Funk and Rainie, 2015).

The outlook for the near future is not encouraging. Berkman and Plutzer (2011)

report that nearly three quarters of high-school science teachers are reluctant or unwilling to teach evolution or ancient earth history. According to their survey, 13% of science teachers reject evolution outright, while an additional 60% ride the fence, being uncertain of the veracity of scientific evidence or simply fearful of generating controversy. This not only means that earth history is not being adequately taught, it also means that many young people are being diverted from eventual careers in the earth sciences at a time when it is predicted that available geologist positions will substantially outpace college graduates (Wilson, 2014; LaDue and Manning, 2015).

It should be clear at this juncture that the strategies employed to improve science education and public understanding, while arguably worthwhile, have fallen far short of expectations. It is time for a paradigm shift. We suggest that this shift needs to come in two parts. The first is a more realistic understanding of the opposition. Modern scientific skeptics are often characterized as backward, uneducated, religious and political conservatives, blindly adhering to outdated beliefs, who can be shamed, browbeaten, educated, or outvoted into submission. Yet, in reality, their ranks include successful doctors, engineers, lawyers, business leaders, and politicians (even presidential candidates). If we simplify the discussion to consider just creationists holding to a recent origin of the Earth, up to a third are college educated (Duncan and Geist, 2004). Creationist leaders include individuals like John Baumgardner, a retired Los Alamos engineer with a Ph.D. in geophysics from the

University of California at Los Angeles, and Kurt Wise, a vertebrate paleontologist who earned his Ph.D. from Harvard under the late champion of evolution Steven Jay Gould. Mental deficiency and poor education are not adequate explanations for belief in creationism.

The one stereotype that is justified is religious affiliation. All religions, by definition, disavow purely mechanistic explanations for our existence, though not all are inherently opposed to the findings of modern science. Islam, Judaism, and Christianity share a common story of the universe brought into being by a singular deity. Within these traditions, beliefs vary whether the story is to be properly considered as a literal telling of six days of creation, or a poetic rendering of God’s action that leaves room for deep time and evolutionary development of life (e.g., Haarsma and Haarsma, 2011; Kaya 2012). Other world religions, such as Hinduism and Buddhism, while adhering to spiritual or mystical dimensions of this or other worlds, are generally comfortable with the descriptions of modern science as the visible workings of the natural realm and are not at the forefront of anti-science rhetoric.

For those who have been convinced that science is antithetical to the Bible, the Torah, or the Quran, improved secular educational materials serve no purpose because they go unread. Contrary to popular perception, it is not simply a willful blindness. There is a measure of practicality. With all the material competing for attention, few will take the time to read or study material that advocates for something they believe is based on inherently false assumptions, or that attacks their fundamental beliefs.

This brings us to a second essential element of a paradigm shift, one that recognizes the importance of trust when challenging entrenched beliefs. According to a study by Kahan et al. (2011) on why “scientific consensus” fails to persuade, the degree to which “experts” are trusted depends on how well they align with the cultural values of the audience. Put bluntly, if the scientists arguing a case are avowed atheists or promote views openly antagonistic to all forms of religious belief, the message is effectively dead on arrival. Ironically, books and speaking tours of touted atheists striving to advance science education can actually make the situation worse. The science-against-religion message effectively vaccinates the science-skeptical public against ever considering the evidence and deepens the divide.

If we are serious about science advocacy, it is time to recognize the important role that scientists of faith can play as liaisons and resources for outreach. A scientist who affirms the basic religious views of an audience is much more likely to be listened to when arguing for the legitimacy of modern scientific understanding. One has only to peruse the websites sponsored by BioLogos, the American Scientific Affiliation, and AAAS’s Dialogue on Science, Ethics, and Religion program, to see that there are many religious scientists interested in bridging this gap. Our own experience in visiting Christian seminars, colleges, and churches has been very encouraging. Once the requisite trust is established, minds become much more open to considering the veracity of natural evidence. We have seen former skeptics become excited even on subjects like evolution when presented by someone who affirms their own faith and who can

explain how they themselves have wrestled through the apparent conflicts.

This in no way suggests that the scientific community must *affirm* religious belief. The argument is more in keeping with the successes achieved by scientists such as E.O. Wilson in finding ways to cooperate with those of differing belief systems toward a common objective. For Wilson, a self-professed secular-humanist, it has been finding common ground between religious and non-religious communities to promote the care and stewardship of nature (Wilson, 2006).

So what does this mean in terms of practical science advocacy? This could be as simple as keeping a short list of sources (websites, blogs, or books) that promote good science from a religious perspective that can be recommended to someone struggling between faith and science. For our part, we are excited about the recent release of a multi-author project aimed principally at the educated, religious public—*The Grand Canyon, Monument to an Ancient Earth*—an irenic, full-color book, describing why Noah’s flood cannot explain the geology of the Grand Canyon or the Earth’s fossil-bearing layers (Hill et al., 2016). Eight of the authors are Christians; three are not. All are committed to the advancement of good science.

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