

The Chasm Between Science and Religion

(First in a series of four sermons on heeding the guidance of reason and the results of science)

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Readings

We, the member congregations of the Unitarian Universalist Association, covenant to affirm and promote, *inter alia*, a free and responsible search for truth and meaning. The living tradition we share draws from many sources, including Humanist teachings which (sic) counsel us to heed the guidance of reason and the results of science and warn us against idolatries of the mind and spirit.

From Michael Shermer's "Skeptic" feature in "Scientific American", where he writes about the difference between science and pseudoscience:

"Here, perhaps, is a practical criterion for resolving the demarcation problem: the conduct of scientists as reflected in the pragmatic usefulness of an idea. That is, does the revolutionary new idea generate any interest on the part of working scientists for adoption in their research programs, produce any new lines of research, lead to any new discoveries, or influence any existing hypotheses, models, paradigms, or worldviews? If not, chances are it is pseudoscience."

Science and the Scientific Method

Science, which comes from a Latin root meaning “to know” or “knowledge”, usually connotes the gathering of knowledge or facts through a rigorous process referred to as the “scientific method”. There are key features of the scientific method, which are worth reviewing. First and foremost, there is the design and execution of experiments followed by the interpretation of the results. If these experiments are rigorously executed and documented, other scientists must be able to reproduce the results. One example of where this was not the case was the fiasco of “cold fusion” some ten or more years ago where a researcher claimed to have observed the fusion of light elements into heavier ones under relatively benign conditions, rather than in a magnetically-confined plasma at temperatures of millions of degrees. No one else was able to observe this phenomenon, and the claim died a quiet death. That it captured any public attention at all was due to the tremendous impact that it would have had if it proved true. As an aside, think for a moment of the parallel with religion – some are quick to embrace a proposition or hypothesis just because of its purported benefits, disregarding, some for a short while and some forever, whether or not the proposition can withstand all the rigors of validation.

Whereas the fact that cold fusion did not pan out caused no real harm, a more egregious and decidedly harmful example of research gone awry occurred with the publication in a 1998 issue of the journal *Lancet* of an article by Andrew J. Wakefield and 12 colleagues claiming that the measles vaccine could cause autism in susceptible children. This article was ultimately retracted 12 years later, but not before it did serious damage by increasing public skepticism about vaccination, thus contributing to a growing public health problem in the US.

Getting back to the scientific method and hoping to persuade you that much more science is good than is bad, the step that follows the collection of data is their interpretation. Here, there

is the opportunity for a variety of outcomes, with some later proving to be incorrect. As an example, drawn from a recent article in “Scientific American”, it was long thought that the proteins manufactured in cells, as directed by genes, would each fold into a fixed shape and then proceed to carry out its specified function. Great amounts of computational research went into predicting just what shape a given protein would take – the so-called “protein-folding” problem. Well, more recent research has now shown that 30% or more of these proteins have at least a partial “floppy” or “squishy” part that can envelope a target molecule, much like hugging it, rather than hooking up to it in the traditional “key-in-the-lock” manner previously assumed. So scientists have to be open to new interpretations of their data.

To help ensure that this occurs, there is a third element of the scientific approach, which is peer review. Customarily, scientific findings are considered valid (or at least provisionally so) only when they are published in a reputable scientific journal, and for this to occur, they must pass muster in the hands of knowledgeable, competitive reviewers. Scientific research is indeed a highly competitive process, and one researcher is not about to excuse poor work on the part of another in the same field and allow him or her to gain undeserved credit and mislead future efforts. The one word that jumps into my mind as I think about science and the scientific method is “rigor”. It is this rigor that has established that the earth is 4.5 billion years old, for example, and that our universe is 13.7 billion years old.

Religion Writ Large

Having briefly characterized science, let’s look at religion writ large. I have never studied religion in any formal sense, but I have attended many different Protestant, Catholic and Jewish services, besides the UU ones here at High Plains and earlier in Reston, VA, and I have read numerous books that deal in one way or another with the subject. And, like all of you I suspect, I have witnessed religious behaviors and beliefs as portrayed by the media.

On the other hand, I have never attended an Islamic service or a Buddhist one. Still, I have made some observations that I'm willing to share, whether or not they will gain your agreement.

While I prefer to characterize science with the term "rigor", the single word I would use to capture the essence of religion is "belief." While science also leads to belief, the rigor comes first. To me, religion is belief that skips the rigor part. (I'm trying to stay neutral here, so don't take offense at that phrasing.) Closely akin to "belief" is "faith", and religion puts a lot of stock in faith, which I claim is simply another form of belief – belief focused on the future.

Now just because religion is light on rigor doesn't mean it has no value. This is a very important point. Many valuable elements of human culture cannot be subjected to scientific rigor. Key examples include ethical principles and British common law, and, importantly, some, but not all, of the teachings of religion. "Do unto others as you would have them do unto you" cannot be derived from the laws of nature, yet it has a profound impact on societies that attempt to practice it, and succeed to an enviable extent. (I'm thinking here of small, tightly-knit tribes in the Amazon or Borneo that don't deal with the aggravations of red-light runners and tailgaters!) And some scientists and others can get carried away with science, believing that it is the only path to wisdom, a pitfall referred to as "scientism".

But there are other aspects of religion that have been and can be subjected to scientific scrutiny and without exception, as far as I am aware, science wins, again because of the rigor. This is not all that surprising when you think about the earliest forms of religion, predating science, that arguably arose to explain a myriad of natural phenomena – night and day, the four seasons, thunder and lightning, floods and plagues, and on and on. How could the earliest humans know about gravitational attraction leading to the formation of stars and the conversion of hydrogen into helium and other elements with the release of tremendous

amounts of energy through fusion? But thousands of years later, this process has been proven as scientific fact, and the sun god has fallen from his throne in the sky, at least in the eyes of those with a rudimentary education.

But other religious beliefs have held on. The deities or deity that were believed to control the natural world were also, in time, seen as having an interest in and power over the humans in it. Humans found it very beneficial -- read reassuring and comforting -- to imagine a higher power of some sort who could and might and sometimes would protect them from harm, cure their illnesses, and offer them an eternity of bliss, provided they followed the rules. The appeal of these magnificent benefits has been so strong that many choose to set aside the matters of rigor and proof, which, as we have noted, are the mainstays of science. And so we have a chasm of sorts between science and religion.

At this point, I think it apropos to quote David Brooks, the well-known NY Times journalist and PBS commentator, from his recent book, "The Social Animal". He offers a succinct way of looking at the flow of knowledge through the course of human history. Brooks observes the following: "We inherit a great river of knowledge, a great flow of patterns coming from many ages and many sources. The information that comes from deep in the evolutionary past, we call genetics. The information revealed thousands of years ago, we call religion. (Brooks says "information revealed"; I would say "beliefs developed".) The information passed along from hundreds of years ago, we call culture. The information passed along from decades ago, we call family, and the information offered years, months, days, or hours ago, we call education and advice." I would offer another amendment to the quote to acknowledge that education, which encompasses science, goes back further than simply "years", and thus overlaps with culture and family, but it remains clear that religion largely came before science. Said another way, belief came before rigor.

Why Does the Chasm Persist?

I would like to devote the remainder of my time with you this morning offering a few thoughts as to why the chasm between science and religion seems to persist and what, if anything, the two communities should do about it.

It seems to me that few theologians appear to have an interest in science and thus are largely unaware of what science has been revealing at an exponential rate over the course of history. (The exponential rate means knowledge grows like a sum of money subjected to compound interest rather than simple interest. Given a decent interest rate and a short compounding period, the sum will grow to a very large value in a relatively short time.) On top of knowledge feeding knowledge, it is truly astounding the degree to which rapid computation, data mining, and worldwide communications via the Internet, to name just a few factors, have accelerated the pace of scientific discovery even beyond the exponential curve of the past. There are so many new findings spurting out that scientists have to specialize more and more just to stay on top of one topic. So if scientists themselves have trouble keeping up, non-scientists almost don't have a chance! And yet, there are many scientific revelations that have implications for religion, but they go largely unnoticed by those who study religion and lead religious communities.

On the scientists' side of things, I would opine that an individual who is drawn to science respects the processes it entails and the assurances these processes lead to. This type of individual resists beliefs that are based on less than rigorous and reproducible research and more on assertions born in an era of limited knowledge and superstition thousands of years ago. In her book, "Science versus Religion: What Scientists Really Think", published just last year, author Elaine Howard Ecklund presents the results of a sampling of 1,700 scientists at 12 highly selective universities across the country about their views on religion, including one-

on-one interviews with 275 of them. She reports that 64% of the elite scientists are either atheists (34%) or agnostics (30%) compared to 2% and 4% respectively in the US population. Only 9% of the scientists say they have no doubt about God's existence, while 63% -- nearly two-thirds -- of the overall population hold this view. (Incidentally, in talking more about the US population in the introductory section of her book, Ecklund notes that about 40% of Americans believe that creationist accounts of earth origins should be taught in public schools instead of evolution, that more than 50% of Americans agree that "we depend too much on science and not enough on faith" and that about 65% think that some form of the Old Testament creation story should be taught side by side with evolution.) To me, these latter statistics are alarming and make me wonder – do church leaders really instill these views in their flocks, or do their flocks pick them up somewhere else and the leaders go along to keep their jobs?

So what is to be made of this state of affairs? Live and let live? Don't make waves, your next research grant could get washed out to sea? What's wrong with parallel universes anyway? (That, by the way, will be the subject of my talk in early February.) Elaine Ecklund fervently hopes for reconciliation of some kind. She praises what she calls "boundary pioneers", which she defines as scientists who maintain institutional legitimacy and harbor a deep commitment to religious ideals and thus cross the picket lines of science and religion. And she acknowledges, without derision, scientists who are "spiritual atheists", described as those who practice a new kind of individual spirituality – one that has no need for God or a god – that flows from and leads into science.

For me, as a scientist, the issue is, How much effort should I and other scientists exert to challenge others' views that are clearly at odds with scientific evidence? To answer this, one must assess how much harm is done by those harboring these contrary views. More boldly and more broadly, does religion in some ways do so much harm that focused efforts must be

made not to eradicate it but to reshape it in ways that increase the good it does – for me, emphasizing morality and deemphasizing belief in and reliance on the supernatural. This is a tall order for scientists who would be taking time away from their research and perhaps ceding advantages to their competitors and at the same time garnering hostility and perhaps loss of funding as well. Perhaps the task falls mainly to those like myself who have reached “emeritus” status and can speak out largely without fear of retribution. Maybe this is exactly what I’m doing standing before you today. And I look forward to coming back!

Thank you.