

Science and Religion: A Dialogue Sermon  
University Public Worship  
Stanford Memorial Church  
February 5, 2012

**Professor Douglas Osheroff:** I grew up in the Lutheran Church in Aberdeen, Washington, a logging town in the Pacific Northwest. My mother was the daughter of a Lutheran minister. She had grown up in Virginia and married my father who was a medical doctor when she was a nurse, and this was, I think, the beginning of World War II they got married. I should say that I grew up in the Lutheran Church, but I am afraid I can't say that I am a very deeply religious person. It'll be interesting to see how this goes today.

**Dean Scotty McLennan:** Now I believe your father also had some interest in religion. As I understand, he was Jewish, but that was not practiced in your house, but he studied religion or was interested in religion and perhaps didn't subscribe to any but had a deep interest in study of them.

**Doug:** Well, my father actually was a student of all religions, I think. I must say we would go to Sunday school on Sunday mornings. Sunday afternoons my father would give us a very different education about different religions. He wanted us to understand very broadly what religion was all about. I dare say I don't think that, while he was a student of all religions, he was particularly a religious person.

**Scotty:** Now I grew up in a quite conservative Midwestern Presbyterian family. We went to Church every Sunday and learned my science in elementary school at a time when it was quite clear that when we learned science we learned science, and when we went to church we went to church. It wasn't as if there was any mix between the two that somehow we were confused about evolution, because we'd read the book of Genesis and so on. But I am interested in where you and I might find points of agreement, but also points of disagreement as we think about the relationship of science and religion. Do you think that these two traditions are irreconcilable, or where do you think these two traditions have some relationship to each other?

**Doug:** Well, I must say that I think that science is based on repeatable experiments and a body of theory which has evolved as a result of mostly experimental work that's been done. Religion is, I think, a matter of faith. I think it's very difficult. As we just heard [in a verse from today's gospel reading, Luke 4:12], one doesn't test God. I think that faith is a matter of choice amongst people. I dare say I don't know where I fit in that. As you know, I did grow up in the Church. I think that it is a comfort to everyone to think that there is a God that has given us all the things that we enjoy today. Yet, I think at the same time, we cannot prove that there is a God other than in our own hearts.

**Scotty:** Now you mentioned science, the scientific method, and how it operates through experimentation, through generating hypotheses and then testing them and knowing that those have to be repeatable, that some other person needs to be able to come in and repeat those experiments and findings. For me, the religious affirmation

that lies behind that is that there is some sense of order, a natural law in the universe; that is, the universe isn't entirely awry or askew or meaningless in the sense of being absurd. There actually is some order in the universe that we can test, and both science and religion, it seems to me, are based on the assumption that we live in an ordered universe. I am wondering what your thoughts are on looking at it that way.

**Doug:** Well, I think it is quite interesting that we continue to learn more and more about the order that exists. Only recently, I think, we realized that, in fact, the universe is expanding. We've known it has been expanding for a long time but it's expanding at an accelerating rate. I think, as a scientist, what I think I do and what I think most scientists do is to study the laws of nature. You can say the laws of God if you want, and understand them. I think we are learning things, even to this day, that people simply would not have ever expected to actually occur as little as 25 years ago, for instance.

**Scotty:** You mentioned, as Joanne read in this passage from the Gospels, of Jesus being tempted by the devil. There is this wonderful moment where the devil says, "Let me take you up to the top of the temple in Jerusalem and just throw yourself off and obviously the angels will bear you up." Jesus says "Do not put the Lord your God to the test." To me, Jesus is being a good scientist there. He recognizes that the law of gravity actually operates, and that it might not have a really good result if he were to throw himself off the temple in Jerusalem. To me the beauty of that story is again the regularity and order in the universe. We can find the law of gravity to be trustworthy and constant. If we imagine God as an interventionist, miracle-producing God that would break the laws of nature, break into what we know to be true, break into that which we affirm in order to do science at all.

I personally--and maybe this would be a point of agreement between us--have trouble with thinking of a supernatural interventionist miracle-producing God, and instead see as a religious affirmation the regularity and consistency of the order in the universe as the miracle, if you will.

**Doug:** Yeah, well I think that the laws we, as scientists, study in fact appear to explain what we see, and I dare say that when we discover something new, then in fact we have to change the laws. I must say that I think that the laws as we describe them are testable. In fact, I think we know quite well and feel quite confident in our knowledge of the universe. I like to ask, "Where did the universe come from?" Of course that's where I think one has to say that there was a God that created it. I don't know where it came from otherwise. The laws that govern the universe are presumably laws that allowed all of what we see to evolve over time.

Now, you may say that's due to the anthropic principle that says that if they had evolved differently that we wouldn't be here, I suppose that people will in fact conclude that is the case. But it is certainly true that the universe and even life on earth is rich and beautiful, and it sustains us. I think that it's certainly a comfort to be able to think that this has not been a random event, that it has been developed in some way that we can enjoy and, as a scientist, that I can study, and a scientist in general can study.

**Scotty:** I am struck by how you say that as a scientist you are obviously from time to time needing to change what you thought was the law of the universe, because, in fact, science develops. What may have been a perfectly good Newtonian law in physics, Einstein comes along and helps us refine that and realize that there is a different way of thinking about that which we considered to be the eternal law, if you will, or natural law. I think religion at its best needs to do the same. I was struck by the Dalai Lama's visit to campus a couple of years ago when he was asked what would happen, since he has given a lot of money to the medical school from his book proceeds to fund the new Center for Compassion and Altruism Research and Education, where they are doing neurological research on what happens during meditation and other spiritual practices.

He was asked, "Well, what happens if your Buddhist way of thinking, your Buddhist science, if you will, is contradicted by findings of modern science?" His answer was very quick. It was, "Well, obviously we need to change the Buddhist principles then. You can't have Buddhist principles contradicting scientific principles," which brings us back from my perspective to the question of faith.

You were distinguishing between faith as something that -- maybe you didn't say these words but others do -- is "blind," "blind faith" or "a leap of faith" or something that takes us away from what we know to be logically and scientifically true. For me faith at its best should include all that we know.

It should be that which ties together all forms of knowledge and experience in a way that makes sense and gives meaning to our lives. I am always uncomfortable with the notion of faith that is apart from that we know to be true scientifically and rationally, not to say that faith doesn't include other aspects like aesthetics and the poetic and other kinds of experiences in our lives, but it seems to me faith at its best needs to be all-inclusive. I'm wondering what your thoughts might be on that?

**Doug:** I have to say I think that faith is something that all of us--I don't know if one can believe in faith--but faith is part of the way I think most people here would think about the Universe and our parts in it. An interesting question is what happens when you have a faith in something and suddenly you realize that faith is not complete. That certainly happens a lot, and then as a scientist I would not be unhappy at that at all. I mean I suppose I have faith in my understanding of the physical law, and yet if we find, for some reason that physical law is incomplete. I think we're very happy to modify that law and scientists do that all the time.

**Scotty:** What do you think the two of us, from our differing perspectives, from a religious and scientific perspective, don't know, that is, where are the limitations, do you think, in each of our realms that might be aided by the other?

**Doug:** Well, certainly I don't think we really understand where the universe came from. I mean, where all the matter and the energy in the universe came from. Given that it exists we can understand its behavior. We can understand how to some level the matter and energy in the universe coalesce to form the planets and the stars, the suns. I think we can understand all of that but we can't go back and say where does all of this matter and energy come from? Where do the laws of physics come from?

**Scotty:** Sometimes I feel people in religion don't give science enough due. That is, science explains a lot of what we know to be true. It helps us medically. It helps us build bridges. It helps us live our lives. Without it, it would be a very different world. Do you think there are things that science doesn't do for us? Or why don't we take, in a sense, a new theology that's basically a science-oriented theology that says we have a methodology for discovering the orderliness of the universe, and we may not have figured everything out now, but just wait, because some day we will. Therefore science really should replace religion as a totalistic understanding of the universe.

**Doug:** Now I'm going to get myself in trouble, I think. A lot of faith is simply a matter of faith. That's almost the definition. There are things that you believe that you cannot prove. I think that's faith. I think that on the other side, scientists try to understand the nature of the universe, the behavior of it, why certain kinds of properties are exhibited by certain systems. "Why is gold different from lead?" et cetera, et cetera. You know that's all contained within the physical laws. What scientists spend most of their time doing is understanding the implications of those laws and understanding the laws themselves better.

I think that's very separate from the laws that govern the behavior, for instance, of us as human beings. Again you come to a matter of faith that, in fact, those laws are given to us by God.

**Scotty:** Even if we don't go quite that far--to say they're given to us by God--there are aspects of human life like love, pursuit of justice, our ethics, and so on, that at least are better expressed, or should be expressed, along with scientific understandings of those phenomena. To understand, say, this incredible choir we have today by saying it's all sound waves, and be able to trace the sound waves scientifically and so on. Well, that's true. But it's a lot more than sound waves. I think there's some value there to saying there's something beyond just science to help us understand the universe.

**Doug:** I think that, for instance, my reaction to that beautiful music we heard earlier this morning is very difficult to describe in terms of science, in terms of physics, or something like that. But, in terms of psychology, which I think we all think of as being part of science, I think that certainly the feelings that I get from listening to wonderful choir music can probably be very well described as a psychological response.

**Scotty:** Einstein, obviously a great physicist, talked about God revealing himself in the orderly harmony of what exists, somewhat similar to what I think you've just said, but also he said that "to sense that behind anything that can be experienced, there is something that our mind cannot grasp, and whose beauty and sublimity reaches us only indirectly and as a feeble reflection, this is religiousness, and in this sense, I am religious." Any thoughts on that comment by Einstein?

**Doug:** I guess I would agree with him fairly much. Of course, I do not claim to be a studier of... Who are we...?

**Scotty:** ...of Einstein.

**Doug:** ... of Einstein or any of the great scientists. I'm a studier of science itself. I think that Einstein was actually explaining his reaction to things that are happening in his mind. This is not very different from what I was talking about.

**Scotty:** Right. Right. I was struck by that. We have just another minute or two. Let me help us conclude by asking, what do you think the areas of cooperation between scientists and religionists should be now? Where are the greatest risks, for example, to science from religion, and how can we work, people like us, most carefully to resist the negative impact of religion on science?

**Doug:** I don't, per se, think that it's the religion that's having a negative impact, but people are using religion because they probably don't understand science, and maybe they fear science. They will use religion as a way to protect themselves, or maybe they feel that they're protecting others as well. I, as a scientist, feel very differently. My feeling is that God has given us this wonderful universe that we're a part of, and it is our responsibility--it's certainly my responsibility, I feel, as a scientist--to understand the laws that result in all of this wonderful behavior in the properties we see, and the systems that we study. I think that for us to not do that is basically negating something which God has given us for our pleasure and our benefit.

**Scotty:** It's both a religious and a scientific obligation, if you will, to explore fully with the capabilities we have, through modern science and scientific method, the very laws of the universe of which we've been speaking. The risk, of course, is that a lot of religionists use the Bible as a source of science. This was written 2000 to 3000 years ago, depending which books you're looking at in the Bible. It seems to me to be critical that we use the Bible as a source of wisdom, of poetry, of stories, of metaphors about the meaning of life, and not as science. To the extent that we do, we belie the very point that you make about really exploring the natural laws of the universe that may well have come from God, originally.

**Doug:** Yeah. There is, of course, a lot in the Bible that tells us what our behavior should be toward one another, et cetera. But, in fact, it doesn't tell us very much about the behavior of the universe, of even very simple systems that we understand today. But, these are facts which surely were not understood when the material which has now been collected into a form which we call the Bible was actually being produced. Science didn't exist at that time. A lot of what's in the Bible provides us with a continuity in terms of culture that goes back a long time. But the Bible was not intended as a scientific document. I can't believe that someone would actually use the Bible against science. I feel that's completely wrong, because the God that created everything that we see would want us to understand it as deeply as we can.

**Scotty:** It's a wonderful way for us to end this conversation. We're very appreciative of your being here, and being able to have this conversation. I know for those of you who can stay later, we'll have a talkback too. Joanne will explain that in more detail in the announcements, but we'll have an opportunity to continue this discussion, for those of you who would like to, in the Round Room later. Thank you very, very much. Let's join

now in the next hymn in your order of service, "God Who Stretched the Spangled Heavens."

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