

FAITH & FREEDOM

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STEM and the Lordship of Christ

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DR. MITCH STOKES

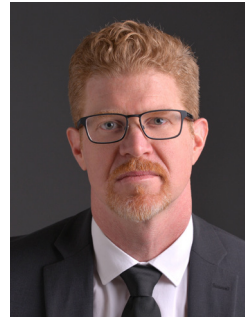
Author of "How to Be an Atheist" (Crossway, 2019).

Dr. Mitch Stokes delivered the Albert A. Hopeman Memorial Lecture in Science, Engineering, and Mathematics on October 31, 2018 on the campus of Grove City College. The article below is a condensed and edited version of Dr. Stokes' remarks.

SCIENCE AND ATHEISM

Stephen Hawking, who recently passed away, was the most famous physicist since Albert Einstein. And rightly so: he held the same Cambridge professorship that Sir Isaac Newton held, the Lucasian Chair of Mathematics. But, unlike Newton, Hawking was an atheist. Similarly, Richard Dawkins, an emeritus fellow at Oxford and the world's most famous biologist, is an outspoken opponent of religion. Hawking and Dawkins both say that their respective science shows that there is no God. To many people, this seems like pretty good evidence for atheism.

Of course the conclusion that science provides evidence against God is a philosophical claim. Ironically, however, these scientists—and many other popular scientists today—are stridently against philosophy. Hawking famously said that "philosophy is dead...Scientists have become the bearers of the torch of discovery in our quest for knowledge." He then goes on to do a lot of philosophy. In his last book, *Brief Answers to the Big Questions*, which NPR called "Hawking's parting gift to humanity," he answers questions like Why is there something rather than nothing? and Why do we exist? And he does this using one of the very latest theories in physics: M-theory. (No one knows what the "M" stands for—seriously.)



Dr. Stokes

People like Hawking and Dawkins are extremely influential in our society today and we lose a lot of Christians because of their influence. And they can get away with their attacks on Christianity because most of us have no way of evaluating their claims about science. But that's not the only reason. We actually don't need to know all the ins and outs of science to evaluate its

alleged philosophical implications about God, although we do need to know more science than we typically do (but that's a different article). Yet we do need to know a healthy bit about the history and philosophy of science. In fact, if Hawking himself knew a bit more philosophy of science, he would have done a better job at evaluating his own conclusions about God. Dawkins can be similarly criticized.

This problem is part of a more general problem. In education today—from K-12 to graduate school—knowledge is highly specialized and compartmentalized.

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Of course much of this specialization is good and necessary. But taken too far, it can also be insidious and actually hinder specialization. If you don't know how your specialty relates to other subjects, then you don't really understand your own specialty. Suppose, for example, I knew a lot about contemporary Chinese society but didn't know China's history or where it is on a map. Would I really know about contemporary Chinese sociology? Obviously not.

Yet it's all-too easy and tempting to disconnect the disciplines. In particular, it's essentially a truism in education today that the STEM disciplines ("STEM" stands for "Science, Technology, Engineering, and Mathematics") are entirely disconnected from the humanities like philosophy, theology, literature, and history.

STEM AND THE LIBERAL ARTS

Now what does all this have to do with the relevance of Jesus Christ to STEM disciplines? Well, an important first step to seeing how the Christian faith is relevant to STEM is by looking at the nature of a genuine liberal arts education, a type of education that can be particularly effective at unifying knowledge and producing well-rounded thinkers. Grove City College has always recognized this and indeed was founded on the belief that "Those classically educated in the liberal arts were uniquely equipped to preserve and advance the values of faith and freedom." Now, the very word 'liberal' in 'liberal arts' means 'to be free or liberated.' In ancient Greece, a liberal arts education was not for the slave but for the free person. Moreover, it wasn't merely for the free; it made people free, free from their ignorance, from their provincial biases, and from the inordinate influence of others' ideas.

But the liberal arts isn't simply a cobbling together of all the major disciplines; it's an integration of these disciplines, showing how all the disciplines and subjects are connected. (The very idea of a "university" is that there is an overall unity to the enormous diversity in the world.) A person who is properly educated won't be surprised that a conversation topic can go from Shakespeare to particle physics without changing the subject.

And this connection certainly shouldn't surprise Christians. After all, Jesus unifies all things, both physically and conceptually:

“ For in him all things were created: things in heaven and on earth, visible and invisible, whether thrones or powers or rulers or authorities; all things have been created through him and for him. He is before all things, and in him all things hold together. (Col. 1:15-17) ”

Abraham Kuyper, the Dutch Reformed theologian and one time Prime Minister of the Netherlands, saw this unifying aspect of Jesus and famously said that “There is not one square inch in the whole domain of our human existence over which Christ who is sovereign over all does not cry, Mine!” And it is here that we begin to see that Jesus and his rule over all—his lordship—is the key to a proper liberal arts education, including STEM education. The liberal arts is not genuinely liberating unless it's a Christian liberal arts.

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Now, this is all well and good to say, but how do we actually do this? Can Christianity really apply to how we teach STEM? Many people think it can't. After all, how would being a Christian possibly make a difference for teaching $1+1=2$ and $F=ma$? Aren't these universal truths the same for Christians and non-Christians alike?

This is a great question, and it reveals one of the most pressing issues in Christian education. But the fact that it's such a natural question for us to ask is itself a symptom of the problem. In any case, it's pretty clear that merely adding Bible verses and chapel to the curriculum—as important as these can be—isn't going to solve the problem of teaching people how STEM and faith are conceptually interwoven.

There are, in fact, no simple answers when it comes to integrating faith and STEM. But there are answers. I will suggest one: every liberal arts curriculum should cover the history and philosophy of science. Many of the major issues that

have interested philosophers throughout the ages have been issues surrounding science and mathematics. Indeed, the intellectual story of the west can be told through the interaction of philosophy, science, and mathematics. Of course, I can't go through all that here so, for now, let me try to whet your appetite. Here are two (of many) examples of how STEM and philosophy—which are disciplines that seem miles apart—are importantly connected.

CAN EVOLUTION ACCOUNT FOR PHYSICS?

Here's the first example. One of the most interesting issues in science, faith, and philosophy is the connection between physics and human biology, namely, the very fact that humans can do physics. The development of modern physics is something close to a miracle. For instance, we now know quite a bit about the counterintuitive behavior of the subatomic realm, despite the fact we can't actually see objects like electrons, protons, neutrons, or quarks. Our sense perception—even aided by our best technology—is simply not capable of directly detecting such things. And so we have arrived at our theories of these subatomic particles by following the mathematics, as if math were our seeing-eye dog. And the mathematics that physicists have used in developing these theories is excruciatingly abstract and complex.

Now, what are the odds that blind, unguided evolution has shaped and molded us so that we have cognitive faculties that can invent mathematics which tells us about the world that our senses cannot detect? To put it differently, imagine that you're an ancient human running around the African savanna being chased by packs of wild dogs. The world is bent on killing you. It seems difficult to believe—at least according to the current neo-Darwinian story—that natural selection would have shaped and fine-tuned your cognitive faculties with the ability to invent quantum physics, which is about phenomena that makes no difference to your immediate survival.

This is an enormously difficult philosophical question; in fact, the atheist philosopher Alexander Rosenberg says it's one of the most pressing issues for anyone who takes both atheism and science seriously. This puzzle is commonly known as the “unreasonable effectiveness of mathematics.”

Interestingly enough, even Richard Dawkins expresses his incredulity at the evolutionary development of our abilities. Recently, he tweeted,

“ An ape brain, evolved for raw survival on the African savanna, is capable, without further evolution, of understanding the expanding universe; of building quantum theory, computers, CERN; of coordinating the pianist's fast fingers; of being moved to tears by Bach & Shakespeare. ”

I agree entirely with his sentiments here: it is difficult to believe that unguided evolution could have produced creatures with our cognitive and creative capabilities. (Whose side is he on, by the way?) In any case, the effectiveness of mathematics does indeed seem unreasonable were there no divine designer who created us and the world. In fact, we might see the very existence of physical theories like quantum mechanics and general relativity as evidence of design. In any case, to ask how science can make sense of itself (e.g., how evolution can make sense of physics) is to plunge us immediately into philosophy. And as nearly every major scientist in history (until the 20th century) has known, understanding science requires understanding philosophy. And this leads directly to my second example of how a liberal arts education is crucial for STEM disciplines.

THE CURRENT CRISIS IN PHYSICS

Our two main theories in physics today—general relativity and quantum theory—are more accurate than seems possible. General relativity, on the one hand, is our current theory of gravity and describes the realm of the very fast and the very large. Quantum theory on the other hand describes the subatomic realm. And yet these two theories aren't consistent with one other; quantum theory cannot take gravity into account. And so physicists have struggled for decades to come up with a quantum theory of gravity, or a theory of everything that unifies physics. Our best attempts at such a theory—for example string theory and its descendent, M-theory—have come up short. As astrophysicist Adam Becker says, “The deep problems at the boundaries of physics—quantum gravity chief among them—have not yielded solutions for decades.” In fact, it isn't even clear that string theory and M-theory are testable, much less true.

Lee Smolin, a prominent physicist who works on quantum gravity says that physics has reached this roadblock because many of today's physicists are familiar only with their small area of expertise. In particular, physicists aren't versed in philosophical issues about the nature of reality and knowledge. Smolin points out that throughout modern science, there have been two main kinds of prominent physicists. One kind is what Smolin calls the “craftspeople,” those physicists who can perform uncanny feats of mathematical daring. The other kind of physicists he calls “seers” or “visionaries,” those who can think almost entirely outside the boundaries of current theories in order to forge new paths. Smolin says that contemporary physics is in desperate need of visionaries, physicists who can see the big picture and evaluate it philosophically. Seers and craftspeople are necessary, but we are currently

lacking visionaries to lead us to the next stage in physics.

Einstein, too, was concerned with the narrow training and interests of his fellow scientists:

“ So many people today — and even professional scientists — seem to me like somebody who has seen thousands of trees but has never seen a forest. A knowledge of the historic and philosophical background gives that kind of independence from prejudices of his generation from which most scientists are suffering. This independence created by philosophical insight is — in my opinion — the mark of distinction between a mere artisan or specialist and a real seeker after truth. ”

And so it's reasonable to think that the proper kind of liberal arts education for STEM students has more than theoretical value; it has substantial practical value for the STEM disciplines themselves. A good liberal arts education makes scientists and engineers better at science and at engineering.

THE NEED FOR UNIFICATION

And though a proper liberal arts STEM education must include a good dose of the history and philosophy of science/mathematics, that alone is insufficient. Students must be shown the proper picture of all the disciplines and their relations. And this is impossible without acknowledging—and showing in detail—the lordship of Jesus Christ over all things. The unity of the diverse disciplines only makes sense in light of Jesus's lordship. His rule over the disciplines assures us that all the subjects fit together—just as it assures us that our minds are fit to understand the unobservable subatomic realm.

Students must be shown the proper picture of all the disciplines and their relations.

Christianity, then, has very practical and fundamental implications for our understanding of STEM. These implications go beyond the obvious truth that STEM practitioners ought to use their skills for the glory of God and the good of humanity. Taken alone, this truth leads to

a truncated and paltry view of how Christianity makes a difference to STEM. That said, fleshing out how Christianity makes a difference isn't easy to do, but it is one of the main duties and privileges of Christian liberal arts education.



Dr. Mitch Stokes is a Senior Fellow of Philosophy and a member of the graduate faculty at New St. Andrews College. He teaches graduate courses in philosophy and undergraduate courses in mathematics and logic.

Dr. Stokes received a B.S. in Mechanical Engineering from the University of Florida in 1992 and an M.S. in Mechanical Engineering from the University of Central Florida in 1994. He worked as an engineer from 1994 to 2001 at Siemens-Westinghouse Power Corp. in Orlando and Precision Combustion, Inc., in New Haven, CT. While serving as an advanced and senior engineer in Florida in the 1990s, Dr. Stokes took theological courses at Reformed Theological Seminary in Orlando.

He went on to complete an M.A. in Religion (Philosophy of Religion) at Yale University under Dr. Nick Wolterstorff in 2001 and an M.A. in Philosophy at University of Notre Dame in 2003. He completed his doctoral studies in Philosophy at Notre Dame under Dr. Alvin Plantinga and Dr. Peter van Inwagen in 2005, prior to joining the New Saint Andrews faculty.

Dr. Stokes' published works include "A Shot of Faith to the Head" and "How to Be an Atheist."

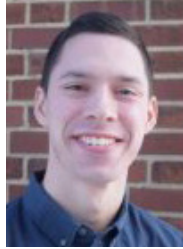
STUDENT FELLOW SPOTLIGHT



Mary Wishing '20 is a junior at Grove City College, majoring in Political Science and minoring in Sociology and Economics. Her research project for this year is writing, editing, and uploading weekly videos

explaining principles of conservatism to the people of her generation. Along with the channel, Mary is a student assistant to President Paul J. McNulty '80, a member of the International Justice Mission chapter on campus, a contributor in the Student Government Association coffeehouse performances, and a member of the Network of Enlightened Women chapter on campus.

Last summer, Mary interned with Young America's Foundation, The Reagan Ranch Center in Santa Barbara, CA where she helped run conferences, introduced speakers, interacted with donors, gave tours, helped with marketing, along with other interpersonal work. The summer of 2017, she worked in Yellowstone National Park through an organization called A Christian Ministry in the National Parks where she worked full time in a restaurant and hosted church services to tourists on the weekends.



Doug Angle '20 is a junior at Grove City College pursuing a degree in Political Science and a minor in Biblical and Religious Studies. His interest in politics began when he worked on the telephone campaign

for a candidate running for state legislature at ages 10 and 12. Since then, Doug's desire to learn and be involved in politics has only grown.

On campus, Doug is a member of the Student Government Association as the junior class Senator for Student Affairs. This role allows him to work towards improving the student body by working directly with the administration to address concerns of students. He also works in the Admissions Office as one of the managers for the call team, tasked with calling prospective students and speaking with them on a variety of topics related to Grove City College.

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Associate Professor of History, Grove City College

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President Emeritus, Grove City College

Freedom Readers

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By Dr. Caleb Fuller '13, Assistant Professor of Economics

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veritasacademy.com/feasting-event

April 25 **"Christian Marriage - What is it and Why is it Important?"**

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