



Institute For Theological Encounter With Science and Technology

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Winter 2021 Bulletin

Faith in the Classroom

Mary was startled when an angel suddenly appeared to her and asked her if she would be willing to give birth. It was Mary's trust in God and the angel's reassuring words that helped her to respond "Yes" to God. She would become the mother of our Savior.

All of us experience moments of confusion and fear as we face the unknowns in our lives. During pandemics, the loss of loved ones, and other misfortunes that we face in our lives, the one constant that exists is God. It is our faith that helps us through these difficult times. It is the same fear and disorientation in our own lives that can help us to say, "Yes" as well to God.



This issue of the Winter *ITEST Bulletin* is dedicated to Faith in the Classroom. Mariette Baxendale teaches biology and forensic science in a Catholic high school. In addition to her article, several of her students write about how faith and science are intertwined in their own lives. Ralph Olliges teaches at a non-denominational university and interjects discussions on faith based upon material covered in the classroom. Pat Castle who taught chemistry in a public high school talks about how faith and science are complementary. Finally, Dan Finucane who teaches theology at a Jesuit University speaks on how faith and science are compatible.

We have to trust in God's plan. In order to do this, we need patience, the patience that God gives to each of us. Jesus is the prime example of life-giving patience. He would ultimately die for us and rise from the dead. These events inspired the apostles to preach the Good News, even though many of them would be martyred for it. I challenge you to read all of the essays and reflect where your faith is.

Regarding your faith, what is your goal for 2021?

By Ralph Olliges

ITEST Bulletin Editor and Secretary of ITEST

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Announcements

Just a reminder: Membership renewal notices have been sent and we thank those who have responded generously by adding the “widow’s mite” to the \$80.00 dues. As an ITEST Member, you receive your current benefits of the quarterly *ITEST Bulletin*, monthly email newsletters, webinar and conference discounts, and the opportunity to network with colleagues who are attentive to faith/science issues. You also have access to the many website resources at www.faithscience.org. You may renew by mailing a check or by credit card on our website at <https://faithscience.org/membership-information/>.

If you are receiving a printed copy of this bulletin and you would like to receive emails, please send your email address to our Administrative Assistant, Sheila Roth, at ITEST@archstl.org.

In Memoriam—I TEST Members

We ask your prayers for the following ITEST members who recently died and entered Eternal Life.

John A. Blaschke, MD	11/28/20
Cardinal Zenon Grocholewski	07/17/20
Judith A. Cassilly	07/06/20
Dr. Rocco L. Martino	06/29/20
Dr. Edward Kos	04/06/20
Thomas Blee	10/27/19
Robert P. Lockwood	03/04/19
Rev. P. Gustavo Maldonado, SJ	06/12/18
Rev. Dr. John E. McKenna	05/23/18
Colonel Nelson Kerr	03/13/18
Bishop O.P. Martin	02/16/17
Fr. Fred Bliss, SM	02/15/17

We also ask your prayers for ITEST members who are ill. May they feel the restoring hand of the Lord.

To seamlessly receive emails from ITEST:

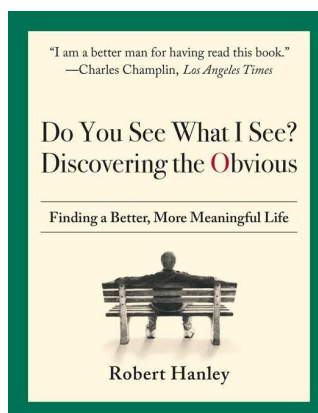
- Add itest@archstl.org to your address book.
- Check your spam filter settings to be sure that itest@archstl.org is not blocked.
- Check your spam or promotions folder and mark anything coming from ITEST as “send to inbox.”
- If you are on a corporate or school mail server, make sure itest@archstl.org is “white-listed.”

Recommended book:

Do You See What I See? Discovering the Obvious

By Robert Hanley

According to *Our Sunday Visitor*, 56 million Americans have self-identified as non-religiously affiliated, largely because they believe that science has all the answers. We can’t engage this group with theological answers because those are already in their empirically-oriented minds, disqualified. We might engage them with scientific answers, but, as Thomas Kuhn explained in *The Structure of Scientific Revolutions*, our training



their minds to think outside their paradigms may have little success if we speak only empirically. So, what to do? Engage them in the transcendent through, what Pope Francis considered to be a good method of engagement in his World Communications Day message of 2020, storytelling. In *Do You See What I See? Discovering the Obvious*, Catholic actor and author Robert Hanley provides exactly the kind of inspirational stories that can open the closed mind when it comes to realizing that there is a whole world out there that transcends empirical verification - a world of struggle, a world of love, a world that understands the spiritual as the form of the material. Order your copy of *Do You See What I See? Discovering the Obvious* today! Now available in Braille and Digital Audio.

<https://www.enroutebooksandmedia.com/doyousee/>



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Announcements

ATTENTION! ITEST Webinar Ideas Needed!

In 2020, ITEST held four compelling webinars in which our speakers truly engaged the audience. Find these webinars at www.faithscience.org under the *Events* tab. As we consider future topics, we would like your input. If you have an idea for a future webinar topic, please send an email to our Administrative Assistant, Sheila Roth, at ITEST@archstl.org.

Future ITEST Bulletins:

Coming in the Spring 2021 *ITEST Bulletin* will be an examination of transhumanism. With Sister Carla Mae Streeter, OP, at the helm on this issue, we think you will enjoy exploring this fascinating topic.

Down the road, we are planning a bulletin primarily focused on pollution. We hope to have contributions from American and overseas ITEST members.

Resources for Integrating Faith and Science in the Classroom

Interviews with school teachers

ITEST, in collaboration with WCAT radio, interviews Catholic school teachers on the various ways they teach their students that there is no conflict between our faith and our science. Find these interviews at <https://faithscience.org/catholicschools/>.

Resources for teachers of Pre-K through 8th grade

ITEST developed *Creation Lens, Exploring the World, Discovering God*, for teachers of children in Pre-K through grade 8. The lessons incorporate the teaching and application of science skills as well as the concepts and practices of the Christian faith. Access free downloads of all modules at <https://faithscience.org/creationlens/>.

Other Resource

Why We Should and How We Can Incorporate "Religious", "Committed to Justice" & "Loving" in a Science Class, by Dr. Mariette Baxendale.

<https://www.educatemagis.org/blogs/why-we-should-and-how-we-can-incorporate-religious-committed-to-justice-loving-in-a-science-class/>

Reader Feedback

ITEST welcomes readers' feedback and occasionally publishes letters to the editor based on space limitations. Letters should address a single topic and must not contradict Catholic teaching. Letters can be emailed to ITEST@archstl.org or mailed to ITEST, 20 Archbishop May Drive, St. Louis, MO 63119.

ITEST member, Jérôme LeJeune, named Venerable

Jérôme Lejeune (1926-1994) made enormously important contributions to the field of genetics. Lejeune discovered the cause of Down syndrome, or trisomy 21: an extra copy of chromosome 21. Dedicating his career to the protection of children with Down syndrome, he grieved that his genetic discoveries were used against the unborn, with a majority of children with a Down syndrome prenatal diagnosis being aborted. He had just received a prestigious award from the American Society of Human Genetics and gave a speech in which he strongly opposed abortion. "Today, I lost my Nobel Prize in Medicine," he wrote in a letter to his wife in 1969. His work was obviously worth the Nobel Prize in Medicine, but that was not to be. Pope John Paul II appointed Dr. Lejeune to the Pontifical Academy of Science in 1981 and later named him the first president of the Pontifical Academy of Life. Lejeune's cause for canonization was opened in 2007. On January 21, 2021, Pope Francis authorized the Congregation for the Causes of Saints to promulgate a decree concerning his heroic virtues. He now will be referred to as Venerable Jérôme Lejeune.

Venerable Jérôme Lejeune, pray for us!



Dr. Jérôme Lejeune is listed in ITEST's *Cloud of Witnesses*

which is the necrology of ITEST members. <https://faithscience.org/our-cloud-of-witnesses/> First on our list of religious communities to pray for our deceased members is the Carmel of St. Joseph. Learn about them at www.thecarmel.ca.

Why We Should and How We Can Incorporate Faith and Justice in a Science Class ¹

By Mariette Baxendale, Ph.D., Science Department Chair, De Smet Jesuit High School

How does Mission look in your classroom? Is your course identifiable by your students as a course offered at a CATHOLIC school? Does your course move students beyond "Intellectual Competence"? Or should non-theology teachers even care, if the student will be getting the "Religious," "Committed to Justice," and "Loving" part through theology, campus ministry, and required service hours? Evangelization of our faith and retention of our shared Catholic identity REQUIRE us to care. Let's use the same pedagogy which strives to teach students 21st century, real-world, cross-curricular, applied and innovative skills BEYOND content delivery to engage students with our Mission, our Catholic identity. Read on to see how we can and why we should talk religion in a non-theology class.

When a student is in my class, is it evident to him that he is in a Catholic school?

We strive to be more than a "good school." We are a Catholic school. What makes our schools "Catholic" is centered around mission and identity. Should mission and identity be left to theology class, campus ministry, and service? Are mission and identity simply *cura personalis*, a subtle way of proceeding through our interactions with our students and each other? Just as we as educators are working to bring our content out of the silos of the walls of our classroom, to bring our students to integrate, assimilate, live and apply it by giving back to the world, mission and identity should not be siloed into only theology, campus ministry and service projects if we truly want our students to live as true Men and Women for and with Others – grounded in faith, working for justice and evangelizing toward the Kingdom of God. Especially in today's secular world, with fewer and fewer practicing their faith, and fewer and fewer religious teaching in our schools, mission and identity should be intentional and evident throughout the curriculum. As teachers and parents know, the more exposure the better. Why think of only course content when it comes to real world, cross-curricular, challenging, and innovative? The delivery of our mission, our Catholic identity, should also be real world, integrative, challenging, and innovative.

Should mission and identity
be left to theology class,
campus ministry, and service?

I'm a high school biology and forensic science teacher with an academic and teaching background in science. I'm also a practicing Catholic who is happily married with 6 sons. The entirety of my educational experience has been with Catholic education: St. Catherine Laboure grade school, St. Joseph's Academy, Rockhurst College (B.S. Biology) and St. Louis University (M.S. Research and Ph.D. Biology). We are active parishioners at St. Clement of Rome and have ensured that our children have had a Catholic education from grade school through college. Propagating the mission and our Catholic faith are important to me, as both a parent and a teacher. But ... I'm not a theology teacher. I'm a science teacher with 25 years of experience teaching biological sciences and forensics to graduate, undergraduate and high school students.

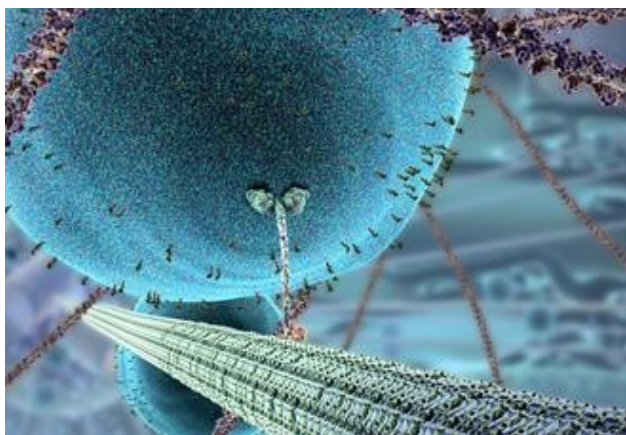
How do faith, justice and evangelization toward the Kingdom of God look in my biology classroom? How do I "sell" it? How do I get students to "buy in"?

When the students enter my room, they see crucifixes at the front and back of the classroom, posters of the Grad-At-Grad, Jesuits in Formation, God in All Things, news clippings on bioethical topics from the *St. Louis Review*, and from *America*, the Jesuits' magazine. We begin class with a daily prayer. What is going on in your life? At school? In St. Louis? In the world today? For whom do we need to pray? Is there a prayer that relates to course content? This helps me to know where my students are and helps to set the context for the day.

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¹ Reprinted with permission from Jesuit Schools Network; original article: *Educate Magis* blog, September 13, 2019 at <https://www.educatemagis.org/blogs/why-we-should-and-how-we-can-incorporate-religious-committed-to-justice-loving-in-a-science-class/>

My primary subject is biology, the study of life. Does life even make sense without God? I call students into a reflection as we move from the nonliving biochemistry to the basic unit of life. (See lesson plan and student reflection below.) We watch the amazing “[The Inner Life of the Cell](#)” YouTube video and wonder how all of these nonliving parts coordinate and organize to allow the cell to exhibit all the characteristics of life. Students are encouraged often to wonder about the beauty of creation. We delve into the lesson, and, for topics that transverse faith or bioethics, we meet it head on – contraception, abortion, stem cells, cloning, eugenics, genetic and reproductive technologies, euthanasia, evolution, environmental stewardship, unequal distribution of resources (food, water, medical care). We talk about the science, perceptions and misconceptions, and Catholic teaching. Because my school is a Jesuit school, I make sure to incorporate the Universal Apostolic Preferences whenever I can, which include Walking with the Poor and Marginalized, and Care for Our Common Home. For ALL students, regardless of whether they are Catholic and wherever they are with religion/spirituality, I ask them to reflect on their own faith/moral compass. I don’t tell them what to think as we all know how that will go over with teenagers. Rather my classroom becomes a safe space to allow “courageous conversations” to occur. Discussion happens either aloud in conversation or in digital forums to reflect on their values with these “hot topics” without preaching or condescension. Is it more important to know information or what to do with that information? The goal is that students not only know the concepts in the unit, but by examining their beliefs, they are confronted with making informed, faith-based decisions on bioethical issues which they may encounter in life.



from “The Inner Life of the Cell”

These classroom conversations helped to develop a rapport with my students who felt comfortable discussing uncomfortable topics outside their class with me and even sought me out when they moved on as upperclassmen or alumni.

... my classroom becomes a safe space to allow “courageous conversations” to occur.

My third year of teaching high school biology, an effervescent junior, Seamus, stopped me in the hallway while I was on my way to the library. Seamus took my freshman biology class, and, as a junior, he was then taking Morality or Faith and Justice. “Hey, Doc!” He blurted out in the crowded hallway. “What do you think about premarital sex?” I, of course, was taken aback. I was looking to get some grading completed! He saw my expression and quickly rephrased, “I mean, you’re a biologist. Right? What would biology say about premarital sex?” Seamus followed me into the library, and we sat down. I figured this conversation required a seat. I thought for a moment (called on the Holy Spirit), and this is what came out: “Well, if you are asking what biology would say, biology says ‘do it.’ Biology is the study of life, including animals. Animals are instinctual. So, if you are thinking of animals and sex, biology says ‘do it’ out of instinct. Think of people who act like animals. They are impulsive, act on every whim without thinking. If you are going to be human and not an animal, you’ll put a brake on it and think ‘is this okay?’ ‘Is this alright?’ ‘Do I respect this other person and myself?’ ‘Does this fit in with my moral code?’” Seamus thought for a moment, then said “Yeah. I don’t believe in it either. I just wanted to hear what you thought.” (Whew!) Notice I never directly answered his question, and he arrived at his own conclusion. That was a defining Holy Spirit at Work moment for me. I use this story in my class when we cover reproduction. Parents appreciate that I don’t simply teach them the way things work, but I also include the “is this okay?” part. At a Catholic, Jesuit school, it’s not enough to say “what” and that “we can” – but we also need to address the “how,” “why,” and “because we can, should we?”

I also teach forensic science (the CSI kind). The subject matter makes it a bit easier to think about Committed to Justice, Loving, and Religious. In the first unit about eyewitness accounts, we talk about the role of bias, how the mind works,

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and the value of understanding different perspectives. When talking about jurisprudence, there ARE at least two sides to every story. Where is the other coming from? Students researched cases listed under the Missouri Innocence Project. Is there any way to compensate? How can this be avoided? What is Catholic teaching on terrorism? War? Gun violence? Capital punishment? Is there a time when killing is “justified”? Where is mercy in crime and punishment?

Many of my seniors are of voting age. Prior to the election, we did a self-examination of where we were on the major issues of the election which cross over biology and forensic science by using the Poll Everywhere survey site. What does our Catholic faith tell us? How does Catholic social teaching call us to respond? All the issues are not weighted the same and no one party aligns with all we believe is right. How are these issues resolved? Is the means to the end okay? How do we prioritize these complex issues when, if we advocate for one issue, it may negatively impact another? What is at the forefront of our minds may not be the same as what others deem important. How can we respectfully enter a conversation, appreciate our varied experience and understand that we alone are not the holders of all Truth? We discussed issues important to Catholics, and students were directed to “Viewing Election Issues Through a Lens of Faith,” Archbishop Rozanski’s interview and resources on <https://www.archstl.org/faithful-citizenship>, as well as the document, *Contemplation and Political Action: An Ignatian Guide to Civic Engagement*. How can we vote, fully-informed, using God as our guide?

Last year at the Jesuit School Network’s Colloquium in Chicago, I attended the session on “Ethics Across The Curriculum,” which was packed. It was invigorating to see so many interested in wanting to incorporate ethics into their schools. At the same time, as we introduced ourselves, it was interesting to see relatively few attendees outside of theology, counseling, and campus ministry. Only two teachers in attendance were science instructors. Later in the week, I gave my own presentation on “Faith and Science: Friends, Not Foes! How Can ‘Religious’ Look in a Science Classroom?” For whatever reason – competition of topics of interest to science faculty, deprioritization, discomfort, or the misconception that faith and science need to be separate - only two were in attendance: two science teachers, one from California and a Jesuit from Canada. (Thank you for helping me not feel like a

total loser!). It was a truly fruitful mission-science discussion with those two science faculty. I’m hoping more will get into the conversation!

Christ calls us to know Him, to love Him, and to serve Him. Innovative evangelization *requires* us to find **novel** ways to reach our kids. Students want to be understood, heard, loved, supported, and challenged (Panozzo 2018; Twenge 2017). How do we model and foster a path to the Kingdom of God? We help our kids understand God, themselves, each other, and the world. We promote an environment of empathy and care. We guide them and challenge them to blend what they know, what they believe in, what they care about, and call them to action in service.

Can you identify mission and identity in your classroom? Can your students? If students can see the Kingdom of God – faith, justice, hope, love – in **every** classroom, we can truly foster our mission to help them lead a life beyond our school walls Grounded in Faith, Open, Loving, and Committed to Justice - all aimed toward the Kingdom of God. How are you forming Men and Women for and with Others in your role at school?

For prayers, topics, lesson ideas, and resources on how to incorporate Mission in a Science classroom, see the Dr. Baxendale’s JSN Colloquium 2019 presentation resources: <https://drive.google.com/drive/folders/13uqQ9SnP8Ayslc1sxnW7n3ykAy42A1UD>

Other Resources:

Podcast of how teachers incorporate faith in science and science in faith in the classroom <https://wcatradio.com/faithscience/> (Dr. Baxendale’s interview is Episode 1.)

Websites:

<https://magiscenter.com/>
<https://faithscience.org/>

Panozzo, P. 2018. *Vanishing Young Catholics: Direct Feedback Supports National Surveys*. Institute For Theological Encounter with Science and Technology (ITEST) Bulletin. 49 (2): pp. 3-6.

Twenge, J.M. 2017. *iGen: Why today’s Super-connected Kids Are Growing Up Less Rebellious, More tolerant, Less happy-and Completely Unprepared for Adulthood (and What That Means for the Rest of Us)*. Atria Books, New York.

<https://www.educatemagis.org/blogs/why-we-should-and-how-we-can-incorporate-religious-committed-to-justice-loving-in-a-science-class/>

***From religion comes a man's purpose;
from science, his power to achieve it.***

— William Henry Bragg

The Power and Depth of Reflection of High School Students

A Compilation of Student Perspectives shared by Mariette P. Baxendale, Ph.D.

When I move from nonlife to life – biochemistry to cells – in my biology class, I show Fr. Spitzer's [*Cosmic Origins*](#) and ask students to thoughtfully and authentically reflect on the accompanying questions which came with the teacher materials. Do the origins of the universe, of life, make sense without God? Here is an amazing example of what resulted from this assignment.

Reflection by De Smet Jesuit senior and AP/ACC Honors Biology student, Cullen Rooney

1. What does the latest thinking in science tell us about the cosmos and its origin?

The latest thinking of science tells us that the universe is almost unintelligibly large with trillions of galaxies, stars, planets, etc. Most of the current scientific thinking points towards the fact that the universe had a definite starting point, or that it has not always existed for all time. The most widely accepted theory of this creation is the Big Bang theory. This is a theory about an event where out of nothing came a huge explosion of energy that would lead to the creation of the many galaxies and formations within our universe today. This theory also gives us one of the other key components of the universe, which is that it appears to be constantly expanding outward. Our modern understanding of the cosmos and its origins comes down to one main idea: the Big Bang created a universe that is on a large scale, non-eternal in nature, and constantly expanding size.

2. Since no human being was around to witness the beginning of the universe, how do scientists know anything about it?

As the universe is trillions of years old, no one witnessed the intricacies of its creation. However, modern scientific tools and processes have been able to prove some of the theories surrounding the formation. For example, the Hubble space telescope found that there are countless other galaxies in our universe; all of the galaxies were expanding away from each other, which supports the part of the Big Bang theory that states the universe is constantly expanding. There is further evidence of this expansion. As sounds and light move further away, they become distorted and shifted. In our own universe, we have observed this in looking at how the light from far away galaxies appears. Scientists have found that the light from many distant galaxies appears red. This process called red shifting shows that the wavelengths of the light have shifted in their travel.

3. What evidence do scientists use to support the idea that the universe had a beginning?

Yes there is evidence. We know that nothing cannot simply appear, so there had to be a catalyst in the form of the Big Bang. We have evidence based on how certain materials and elements need to be created; the age of celestial bodies, the expansion of the universe, as well as the distortion of sound and light waves all point towards a definitive starting point or moment of conception of the universe.

4. It seems as if there are three possibilities regarding the conditions for the universe to sustain life: (1) these conditions are the result of a random accident (chance); (2) the conditions just had to exist somewhere (necessity); or (3) the conditions were deliberately established by a powerful intelligent agent (purpose). Which of the three possibilities makes the most sense to you?

This is a difficult question. First I would say, that the second one which states that conditions had to exist is the least logical and likely in my opinion. Now, deciding between the other two is a little more difficult as there does seem to be evidence within the scientific community for either. I personally do not believe in a creator so it would be difficult for me to say that one is necessary for the creation of the universe in which I live. However, I can recognize that many aspects of our universe, such as its rationality, point towards a conclusion that it was made by intelligent design. However, I also think there is so much randomness and even rational aspects of our universe that are just simply too complicated for our current knowledge to explain. I do not believe that this means some creator with more understanding had to make it, simply that as of now we do not have the tools to understand it, as we previously did not understand evolution or germ theory. I do not think it is impossible or even that improbable, that the universe started as a random event and

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the very mathematical nature of how it functions is simply a necessary part of its existence. I see a clear possibility for either and can recognize that the idea of intelligent design has many points of supporting evidence, but I would not say with any real conviction that the universe was made by a creator.

5. What do you think of the idea that science can't explain everything? Do you agree or disagree with the idea that the limits of science don't correspond to the limits of what can be known? Why?

I would agree with the statement that science can't explain everything, especially not our current conception of science. I think it's obvious that science will always have limits, and while at times those are expanded, there will always be mysteries. We will likely never be able to definitively understand every aspect of life on earth, let alone the truths of the universe. I think there are also many ways in which human life transcends a scientific understanding. We are creatures with cultures, religions, beliefs, emotions, etc. There are parts of being human that necessitate other kinds of knowledge such as religion and philosophy. There are answers like that it means to be a good person, that cannot be answered with methodical data or physics. For these reasons, science is a limited form of understanding.

6. Does the fact that the more we explore the universe, the more intelligible it is discovered to be, suggest anything to you about whether reality is ultimately meaningful?

About whether there is an Intelligence Agent or Supreme Being behind the universe?

I agree with how many of the scientists put it at the end of the video. The final thoughts of the last two scientists especially struck me as ringing true. As they said, I believe that Science can strengthen hope that there is meaning in the world. We should be grateful to be a part of this very special place in the universe, and we should recognize that there should always be meaning to life even if it is hard to see or imagine because the alternative is harsh and possibly

unsupported. The chances of being on this very special rock with all of its perfect conditions for intelligent life are so infinitesimally small and that should tell us that our existence is very special and meaningful. I do not believe it necessarily points towards a divine creator, but it certainly points towards an understanding of the world in which human existence is absolutely unique and meaningful.

7. Sometimes people speak of "inventing meaning" or "giving purpose" to existence. Can "meaning" be "invented"? Can purpose be "given" to existence? Or are meaning and purpose things that must be discovered rather than created? Explain.

I think people can give meaning and purpose to their own lives and try and make the world around them feel meaningful and purposeful. This is why people create and follow religions. Everyone is always trying to find the meaning behind why the world keeps spinning and what everyone is doing on it. So in that way, I do believe purpose can be created. I also believe that in some basic way that meaning is in a way discovered. By this, I mean that the meaning has al-

ways been there and always will be, and it is the task of everyone to discover what that meaning is. I think everyone tries to discover that meaning in a different way. Some become scientists and mathematicians to discover the principles that allow the world to exist and understand how it operates. Some pursue religious life and philosophy as

ways of understanding human nature and its relation with the planet, and some just work to make the world a better place for everyone to live in. So they are simply looking for a meaning that already exists.

8. In order to make sense, do ideas such as right and wrong, justice and compassion, depend on there being meaning or purpose to the universe? What does your answer suggest about whether God exists?

Yes, I do believe that for things like compassion and justice to exist in the world, it

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necessitates an understanding and existence of some form of meaning in the world. If there was no value in human life, if our existences meant nothing, there would be no need for anyone to care about one another. Killing someone would mean nothing. We would not care about giving to the less fortunate. We would not care about bigotry and discrimination. However, we have a criminal justice system to punish those who abuse or take people's lives, and people give millions of dollars and volunteer for thousands of hours every year to serve other people around them. These point towards a reality in which

human life has meaning. If it didn't, our world would not be concerned with the things it is. For many Christians, I think the meaning in the world, and in all people, comes from the fact that God gave people meaning. He created the world and put people on it for a purpose. Each person was made in his image and thus has inherent dignity. He instructed them to love their neighbors and care for one another. This meaning and care for human life and the fact that each person serves a purpose and has a goal to get to heaven, proves that there is meaning in the world for Christians.

Student Perspective on the Relationship of Faith and Science

Mariette Baxendale, Ph.D.

Outside of an assignment, what are high schoolers saying about the relationship between faith and science? How important IS this to them? Is there a way we can more effectively evangelize to this demographic? Over the summer, I put out a request to theology faculty to identify students willing to share their thoughts on the importance of this relationship and how they may have experienced it in the classroom. I also sent out a call to upperclassmen who were in my biology class when they were freshmen. While the sample size is limited to those who felt compelled to write and who are strong in their faith, their perspective is insightful. The following are but a few examples.

Science and Faith

My name is Bryce Pattison and I am a junior at De Smet Jesuit High School. I am involved in Campus Ministry, STUCO, and Admissions. I play soccer and tennis, and am involved in other clubs as well. I attend Holy Spirit Parish in Maryland Heights and went to school there from preschool all the way through 8th grade. I am part of the core team for campus ministry and enjoy helping out as a student at De Smet.

In my experience with science and faith, I have always seen the two being complementary. When you look at Thomas Aquinas's truths, it is hard to argue against the existence of a God. I personally think that it is amazing how God has created this world and made everything so intricate and beautiful. I understand though that other people haven't had the opportunity to expand their faith in the way that I have.

I have been raised Catholic, have gone to Catholic school, and am now at a Jesuit high school where science and faith have been linked together. In multiple classes that I have taken at De Smet, we

have talked about the connection between faith and science, and have been asked our opinions on certain situations. Specifically, in Dr. Baxendale's biology class freshman year, we learned about certain aspects of faith and science that intersect including abortion and genetic engineering of a fetus, as well as evolution and the Big Bang in relation to our faith. In theology classes, we have talked about the truths that Thomas Aquinas has suggested and contemplated those. These ideas that Thomas Aquinas brings forth allow us to be even more confident that there is a God and help people who are questioning God's existence become more confident in a God through science. In science, we believe that matter can't randomly appear or disappear. Because of this common scientific idea, we have to ask the question, "How do we exist?" The only plausible answer in my opinion is that there is a God that created all matter. Atheists argue that the Big Bang caused the world to be the way it is today, but who or what created the Big Bang? The only reasonable explanation in my opinion is once again that a loving God created this world. In a show

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that I watch about God's existence, I learned that the chances that I exist are 1 in $10^{2,685,000}$. Basically the chances that any of us exist is 0 percent. Because of this stat, I started to wonder how and why am I here, and the explanation that I have is that there is a God that wants me here.

I have been blessed with the ability to learn about God and science in school, but I understand why certain teenagers doubt the existence of God. When things aren't going well in life, it is easy to think there isn't a God because God is supposed to make everything good. As I have learned, this isn't how it works and God doesn't magically make things better. Personally, without my faith, I wouldn't be where I am today. For teenagers that haven't had the same opportunities and exposure to talk about their faith, I can see how being an atheist is appealing. It removes going to church and it explains why life isn't perfect. Teenagers need help from teachers, parents, and peers to explain how faith and God work. Public schools can't teach about the relations between God and

science which make it hard for teenagers to connect the two together. We need support from adults to help understand God and science and expand our faith. This support includes being there when we have questions about our faith, encouraging us to practice our faith, and giving us the resources to expand our knowledge of faith and science. I personally think if everyone knew the stat that shows the chances of them being on earth, that they would contemplate God to a greater extent. I have been blessed to be in an environment that teaches the connections between faith and science and wish that more kids had to opportunity to expand their faith. To help more teenagers, it is imperative to put resources in front of them so they have the opportunity to read. We need to "take the horse to the river for a drink" when it comes to faith. We can't force people to read, but we can offer resources to help them expand their faith.

Source:

Numbers from: <https://www.sciencealert.com/what-is-the-likelihood-that-you-exist>

A Reflection by High School Senior, Ben Mueller

I have been a Christian for my entire life. However, like many believers, I have experienced ups and downs throughout my journey of faith. As a child, one tends to believe everything that he or she hears. I was no different than any other child. However, as I grew and learned, I began to question the things around me. I had devoted large amounts of time to my faith on the basis of trust alone. Now, I found myself desiring proof to back up my ideals. Over time, I came to find this proof in science as I learned more about the inner workings of our world.

Many people use science to dispute the possibility of a higher power. "Science can explain everything," they say, "so how could there be a God?" However, to me, science has never appeared as a means to explain away the possibility of a higher power. Rather,

I believe that the beautiful complexity of nature and the world that we live in stands as proof that our universe *must* have been created by a being capable of intelligent design. Humanity has produced many incredible works of art and engineering throughout history, but no work of man comes close to rivaling the awe-inspiring intricacy that can be found on our very own planet.

Ben Mueller is a senior at De Smet Jesuit High School in St. Louis. He attended elementary school and junior high at St. Joseph Manchester. Ben lives in Ballwin, Missouri with his parents and 15-year-old brother. He is involved with Campus Ministry and several other clubs at his school. He is interested in math and coding and plans to study computer science in college.

"Catholic education should be of the same degree as any other scientific education, and nothing should be neglected in the professional formation of teachers or in the renovation of pedagogical means so as we could afford to remain on the top of all progress."

— Fr. George Lemaître
developer of the Big Bang theory

An Interview with High School Junior, Cole Grothoff

I am in the De Smet Jesuit Class of 2022. I went to Holy Spirit Catholic grade school from pre-school all the way to 8th grade. I am the middle child in a family of 5 with an older brother and a younger sister. I play soccer for club and at De Smet. I like to spend time outdoors, like fishing and camping. I love to be involved up at De Smet. I am in the student council homeroom. I do not know what I would like to be when I grow up or where I would I like to go to college yet.

What is your experience with faith and science?

My experience with faith and science is a pretty positive one because I have gone to a Catholic school all my life and normally they try to incorporate faith with science.

How?

In science classes we would talk about how the Bible could be interpreted for how some things are explained with science. We talked about how the things we see are God's creations and his works.

Did you have discussions in grade school?

I did have discussions in grade school.

What did you hear/learn, specifically?

Specifically, I remember talking about evolution and how the Bible talks about the story of creation. We talked about how the Bible, especially the Old Testament, can't be taken literally at parts and that means that science can fit into our religion.

What have you been challenged with?

A lot of people say that, "How could the things in the Bible be possible with all the things science has uncovered?" or "How can you believe in that if we know otherwise?" ***And how did you respond?*** I would respond that the things that are discovered and found out in science can fit into God's plan and I would also respond, saying that we can't take everything in the Bible literally.

What do you see as ways to support your faith?

I see a lot of ways to support my faith like social media and the internet.

Explain. What websites or apps or other help support your faith? Do you use apps that help you pray?

There are so many accounts on places like Instagram, Twitter, and even Facebook that spread positivity and Bible quotes for each day. Also since we are able to get so many people's opinions and research on these apps so easily, this supports my faith. Most people would say this would be bad for your faith, but I like to look at other people's views and see how they compare and contrast to my faith. They may challenge my faith and sometimes let me see in a different perspective. I think another way that supports my faith is the different ways that teachers show us or interpret the Bible and use it in the ways they teach.

How?

Each person sees a Bible story in their own eyes and gets a different message from each story. I like to learn from and use all of these different views to create my own. When teachers incorporate prayer or talk about these messages in their classes, it helps me to understand and strengthen my faith just a little bit more. They may use different things like talking about creation in science classes, younger classes may have used Bible characters to teach math, or something as simple as starting the class off with prayer. It all helps to strengthen my faith.

Have you ever been challenged with "God doesn't exist because science can explain everything?"

Not necessarily, but I have thought about this question.

If so, how did you address this?

I always think, yes we do know a lot about science and the universe and we can explain a lot, but you can always keep asking why. I feel like no matter what, there will always be something we don't understand and I feel like that something is the work of God.

What would you need to help support the compatibility of the two?

I feel like flexibility is something you need. Catholics, in my opinion, are very stubborn and don't want to change anything they have. But no one gets things perfectly right on the first try, and I feel like the more we understand about science, the better we can interpret the Bible. That brings me to my second point of interpretation. I don't believe that we can take the Bible literally; we need to look for the messages. Finally, every person's faith is their own and we can't force a way of thinking on

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someone. The best you can do is explain what you believe to the best of your abilities.

What have you heard in classes that contradict these ideas or helps support these ideas?

I feel like the theory of evolution is brought up a lot when it comes to this debate, but I think that this could support faith and science, not contradict it. We can't take the Bible literally, and I think this evolution shows just how beautiful God's creations can be.

Have you ever heard science talked about in religion or religion talked about in science? (I know you had in my class!) Yes.

In what way? Give particular examples.

The creation and evolution thing has been brought up in both a couple of times. The discussion about "playing God" has also been brought up when we talk about if it is ethical to mess with genetics or keep someone alive or euthanize them.

What did you think?

I think that it is important to talk about in these classes, especially religion. We need to learn how these two can coexist. I think the reason talking about this in these classes is important is because it normally sparks an argument. It is not a bad argument, just a way to get many people's opinions on the matter and a way to spread information you might not have heard before. I think that a lot of people are a little shy or afraid when it comes to talking about science and religion. But I think it should be the opposite because science can help prove religious ideas, and if it has something contradicting, you may have to look at religion through a new light. These both can strengthen your faith and teach you to be open-minded.

Did it change your thinking at all?

I think no matter who you talk to about science and religion, it will always change your faith just a little.

Do you feel faith is unwavering, but perspective and level of empathy changes?

I think that your faith is pretty solid and doesn't change crazily, but I would not say that it is completely unwavering either. I would definitely agree that perspective of certain things and your level of empathy does change quite a bit. Everyone has a little bit different of an understanding on this topic and their views might help you understand your faith a little better or change your views slightly. So, yes,

it did change my thinking.

What would you like to hear from adults?

I would like to hear their opinions on the matter but also that they are willing to be open-minded on the subject. There are many adults that love to tell you how to believe or what to believe, and they don't want to hear what you are thinking about for faith and science.

Is this conversation even important?

I think that this conversation is important, especially now, because we are discovering new things and developing new theories all the time. We need to understand how all these things that science uncovers fit into God's plan.



Above artwork by Austin York, De Smet Jesuit Class of 2022 from his Digital Graphic Design 2 class. His art teacher is Mrs. Laurie Kohler at De Smet Jesuit High School in St. Louis, Missouri.

Incorporating Faith in a Non-Denominational University Classroom

By Ralph Olliges, Ph.D.

Author's Background: I was raised Catholic having attended eight years in a parochial school, Our Lady of Providence (OLP), four years in a Catholic high school, St. John Vianney, and ten years completing several graduate degrees at Saint Louis University (SLU). OLP was staffed by the Sisters of Providence, Vianney by the Society of Mary, and SLU by the Society of Jesus. Thus, while I attended all Catholic institutions, I was nurtured by various religious societies.

I am Catholic and I teach at a medium-sized non-denominational mid-western university. One of the courses that I teach is on critical thinking to a freshman class using the topic of a history of baseball. The class consists of about 15-17 freshmen who selected the history of baseball as a topic from among about thirty various choices.

During the course, the students watch, on their own each week, one inning (one episode) of the Ken Burns series, "Baseball," on the history of baseball. They are required to reflect and write on three questions for each week: (1) what one or more things did you already know? (2) what one or more things did you learn? moreover, (3) reflect upon this episode and how does it or did it affect your life? I learn a lot about my students, especially from their answers to the third question.

In addition to watching the Ken Burns series, I show three movies in class: (1) "Eight Men Out," (2) "42," and (3) "Field of Dreams." This allows us to discuss various topics in relation to baseball. For example, the movie, "Eight Men Out," is a vehicle for discussing the topics: gambling, honesty, and disclosing that when you know something and feel it is wrong, should you tell. The movie, "42," allows the discussion to be on setting goals, racism, and religion. The

movie, "Field of Dreams," allows us to discuss the impact of following your dreams, of going down a road when everyone else thinks you are crazy.

While all of these issues are crucial, this particular article focuses on religion. In the movie, "42," Branch Rickey states, "I am a Methodist, Robinson is a Methodist, and God is a Methodist!" While I am sure that for each of us, we may believe God is a _____. (Please insert your own noun here.) When I bring up this part of the movie, I ask them what their religious/spiritual goals are for themselves. This is an uncomfortable topic for them to discuss. Thus, I do not have them state them aloud. However, it does allow me to query and try to get them to reflect upon what their own religious goals are. I do disclose my own religious upbringing, which is Catholic, and church attendance. I mention that I go to church because it makes me part of a community. Later in the course, when we talk about the mid-1990s until 2015, I review the career of the Hall of Famer, Mariano Rivera. In Mariano's book, *The Closer*, Mariano details how his career was interweaved with his Christian belief system. This allows me to further emphasize the need to set goals not only athletically, but also health wise, spiritually, etc. for one's self. For me, that is the purpose of having my students think critically about their lives.

Teach It – Faith & Science are Complementary

By Patrick Castle, Ph.D., retired Air Force commander, associate professor of chemistry

Faith and science are complementary. Like faith, science is all about God's stuff. Three scientists challenged God to a contest for making the best human. The scientists and God had a pile of elements. Just before the contest started, God swept away the elements from the scientists and said, "get your own stuff." Science has theories, which require belief. Faith has mysteries, which require belief. We ought

to look at science, be amazed, and say, "wow, look what God did" and not "wow, look what I did." Scientists are tempted like a car mechanic that figures out how a car part works and takes credit for the design. Scientists take apart God's creation, figure out how it works, and are tempted to take credit for designing creation. Believing that we don't have a creator God is like finding the space shuttle in the forest

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and considering it a random event. Our bodies are a much more complex system than the space shuttle; we were created.

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As a nano-analytical chemist, I studied God's stuff at the atomic level, 1/10,000 the width of a hair. I have a *Horton Hears a Who* perspective on the reality that "a person's a person no matter how small," which is supported by faith and science. God knit us together in our mother's womb (Psalm 139:13). Although we have been changing every moment since the moment of our conception, our identity, our DNA, hasn't changed. When students think that science and faith are not complementary, they won't believe the science if it supports faith, like God creating us at the moment of conception. I was shocked to discover that most of the public high school biology teachers wouldn't teach when life begins because it was "too controversial." Wow, to not teach the beginning of life in a class on biology, the study of life. After one year of biology, only 5% of my chemistry students knew when life begins, so I took on the responsibility of teaching them. Biology teachers complained and administrators told me to stick to the chemistry curriculum. I informed the administrators that biochemistry covers the beginning of life. Imagine how much easier it is to rationalize abortion if the mother doesn't know when life begins. I received parent complaints about teaching that life begins at conception because this made abortion unthinkable, no longer a possible solution. In two years at the high school, I was blessed to help five girls with crisis pregnancies.

As a medical squadron commander, one of my troops sadly informed me that his wife had a miscarriage at 11 weeks but "at least it wasn't a baby yet." I gently shared weekly baby development information with him - heart beats at 18 days, face appears at 5 weeks, brain activity at 7 weeks, and gender is known at 9 weeks. He was shocked, hadn't learned that in his high school or college biology classes. Later that day, he returned joyfully from the doctor; his wife didn't have a miscarriage. He held up an ultrasound image, "that's our baby."

While studying embryology at the Notre Dame Vita

Institute, I was taken by how our first cell, the zygote, looks like a communion host, the Eucharist, the Body of Christ. The cell's surrounding corona radiata is like a monstrance, the vessel for the Eucharist. The Eucharist doesn't look like Jesus, and the zygote doesn't look like a person. However, the Eucharist is completely Jesus, and your zygote is completely you. If you can't see Jesus in the Eucharist, study John 6:35-69 for clarification. If you can't see your neighbor in the zygote, just wait a few weeks for magnification.

While teaching chemistry at the United States Air Force Academy and Jefferson City High School, both public schools, I was able to present faith and science as complementary, not at odds as our culture presents. I would mention how the zygote cell looked like the Eucharist in a monstrance. If students asked related faith questions, I would answer them. When discussing the Big Bang theory, formulated by astronomer and cosmologist, Fr. Georges Lemaître, I let them know that a Catholic priest came up with the theory. Scientists who believe in the Big Bang theory say an energy started it all. Well, people of faith have a name for that energy — God. Students would think they couldn't believe in God and evolution. I would teach them a theistic evolution, that we are now as God intended, in His image. When presenting quantum mechanics, I shared that the wave function determines the probability that the

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Pat Castle taught chemistry at the United States Air Force Academy, Jefferson City High School, and William Woods University. Pat earned a PhD in nano-analytical chemistry from the University of Illinois at Urbana. He now leads the largest Pro-Life team in the world, [LIFE Runners](http://www.liferunners.org) (www.liferunners.org), with over 15,000 teammates in 2,557 cities across 39 nations. Pat had an encounter with St. Padre Pio that he has shared with thousands of believers. He is a Fourth Degree member of the Knights of Columbus. Pat directed youth retreats, Engaged Encounter, Fellowship of Christian Athletes (FCA), and RCIA. He did ten military assignments, including the Weapons of Mass Destruction defense officer at the base closest to Osama bin Laden on September 11th. While an Air Force Academy professor, Pat developed the ethics curriculum and coached the marathon team. Since retiring as a medical squadron commander, he was an industry executive and now speaks across America. Pat and family live in Nebraska.

All In Christ for Pro-Life! pat@liferunners.org

matter will be found at a certain position, allowing God to steer for answering prayers and working miracles. Again, if students asked related faith questions, I would answer them.

Students observed my strong science identity and my strong faith identity, realizing that faith and science are complementary.

To further connect faith and science as complementary with my students, I would maintain both a strong science identity and a strong faith identity. I would pray during the morning moment of silence, and students would ask me about my prayers. Students would comment and ask questions about the picture of Jesus and the Bible in my office. I volunteered to be the high school Fellowship of Christian Athletes (FCA) faculty representative which allowed me to invite my students to join a faith-based club. My students would often comment that they saw me praying with the FCA group outside the school. I started a LIFE Runners chapter where students would wear

“REMEMBER The Unborn” shirts at school on the first Wednesday of each month. Students would often comment on my faith-based wristband and lanyard. Administrators allowed this because I called the wristband and lanyard my personal jewelry. At the Academy I started a faculty Bible study called Chemists for Christ. For my science identity, I was the chemistry teacher of the year at the Air Force Academy and nominated for teacher of the year at the Jefferson City High School. Students observed my strong science identity and my strong faith identity, realizing that faith and science are complementary.

I speak in schools about the science and sanctity of life. Several times I’ve been asked by teachers if I’m going to use the A-word (abortion) in my presentation. Yes I do. Starting with 5th grade, I define and describe the faith and science surrounding abortion. To save lives, we must teach students the truth about when life begins and the reality of abortion. When faith and science are taught as complementary, students can defend life and embrace eternal life.

What greater chemistry lesson than that?

Discussing faith and science on campus

by Dr. Dan Finucane, Theology Professor at St. Louis University

How do you address the perceptions of the compatibility of faith and science with your students?

With undergraduates, the main thing I try to do is deal with their honest questions. There is a lot of misinformation available, and just having a decent discussion, letting people ask about things they are worried about, goes a long way. Plus, the Catholic tradition has a long record of supporting science. We don’t have to hide from these discussions. There are plenty of Christians and others who say some crazy things, but our track record is much different.

An interesting exercise is to send SLU students to our own Biology Department website, where there is a “Statement on the Teaching of Evolutionary Biology.” <https://www.slu.edu/arts-and-sciences/biology/academics/index.php>

It is funny to me that we have a pretty decent response to the topic, and most students don’t know about it. So the big question: Are faith and science compatible? I tell them I think the answer is yes. That opens up several avenues for further questions.

I have a one-minute thought experiment to try on students (and get the cheap laugh). “Ever heard of something called ‘a Catholic hospital?’” (I point out we have one down the street here on Grand Avenue.) “What do you figure goes on in there? Chanting? Dancing around the bed? Burning incense? Actually, the place is filled with scientists, doing MRIs, lab work, prescribing medicines ... There is a chapel there too, of course. Seems people are comfortable with both elements. The church seems okay with both.”

So why do many people say that faith and science are incompatible? This leads us down several paths. One is dealing with historical material and historical myths. What actually happened and what was at stake with the Galileo case? What was at stake with Darwin’s impact?

What do the churches and especially the Roman Catholic Church actually teach? And what is most recent? This takes us (depending on format and time) to an examination of scriptural exegesis, historical and current.

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I often talk about the “new atheists” (Dawkins, Hitchens, etc.) and some of their interlocutors (Francis Collins, Ken Miller). I try to take the atheists’ arguments seriously. I recommend Dawkins’ *The God Delusion*, telling them not to be afraid to read and think from several angles. There is stuff online too with some classic debates. I especially want to take the students’ questions and arguments seriously. I believe if we force students (or if others think they are forced) to choose between the lab bench and the pew, they will favor the lab bench. I show them through argument and role models that they do not have to choose between these. Often I can sense a sigh of relief in reflection papers when students who genuinely want to see connections between their faith and science, see a way to integrate their worldview. I would push even further to engage the sense of awe in both theology and science. Psalm 104 (and many other texts) can be read by scientists, and get to their deepest instincts.

When I have time to talk about both conflicts and conversations between faith and reason, I find John Haught’s work useful. I use his *Science and Faith* with freshmen. With some students I use *Galileo Goes to Jail and other Myths* (ed, Ronald Numbers).

Another foil for talking about how science and religion are compatible, because they address different sorts of questions, is introducing Aristotle’s “causes”: Material cause (what?) / Formal cause (how?) / Efficient cause (who?) / Teleological cause (why?).

I point out that Galileo and his contemporaries all knew and agreed on the who and why questions. The what and how developments, and the slopping over into the others when using scripture, were where the problems came in. Also, the same happens now when folks like Dawkins use their insights and expertise in what and how categories, to speak to who and why questions; their tools don’t work there.

How do you address students who use science to negate or diminish their faith?

My thoughts on how to respond to students who use science to reject faith would be multifold. First, can we create spaces where honest objections can be heard, understood, and responded to? What specific issues presented by science does a student think requires a rejection of faith? Is the creation (and creation accounts in the bible) the issue? Is evolution the issue? Is the rejection of religion by the “new atheists” at the root of the rejection by this student? (And can we widen out the student’s reading or blog list?) Can we push into the nitty gritty of these topics and

talk about specific details in science and modern biblical exegesis? What sort of version of evolution or Darwinism is the student working with? The spaces for working on these sorts of questions can sometimes be short but helpful; a conversation, a lecture. As an example of programming, at SLU our honors program has sponsored “fireside chats” with students and a professor, where we spend an informal evening working on questions like “Are Faith and Science Enemies?” or “I’m Spiritual but Not Religious.” The personal understanding and connections created in these short conversations can then lead to more interaction. There are also many parishes and adult study groups that are open to these sorts of discussions.

Hopefully, students can be encouraged to read, both to contextualize what they think they know about science and religion conflicts, but also to see where scientists and theologians are working together already in creative ways. The next good place for engaging key questions is in courses or sections in courses where specifics can be discussed with some depth. These sorts of efforts are especially rich when students can interact with each other, and when voices and authors from both the sciences and theology are involved. Just bringing the topic up is a big help for many students. It is probably true that many teachers are not comfortable with the specifics in discussing science and faith, so they avoid the topic. A good reading list and discussions among faculty are also a tremendous resource.

A bottom-line observation: It is frankly very exciting to discuss this material that is so often not presented to students. This can be done in a challenging but inspiring way. It can take some work. But the awe and depth of understanding of God’s work in creation is, hopefully, the deep reason to have a robust discussion of the relationship of faith and science.

Psalm 104:24 – “O Lord, how manifold are your works! In wisdom you have made them all...”

Dan Finucane, Ph.D. is an Associate Professor of Systematic Theology at Saint Louis University with an undergraduate degree in Mathematics. His academic interests include ecclesiology, the sensus fidelium, fundamental theology and the relationship of science and religion. Dan and his wife Laura are members of St Francis Xavier (College Church) parish in St. Louis. They have two adult sons, Dan and Mike.