



*Science and
Theological
Education: Reports
from the Field*

*Spotlight on Theological
Education*

Scott C. Alexander, Editor

Spotlight on Theological Education is a major initiative of the AAR and its Theological Education Committee. Spotlight has become an important venue for exploring opportunities and challenges in theological education. Each issue focuses on a particular theme, setting, or concern of theological education.

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Image: Prefatory miniature from a moralized Bible of "God as architect of the world", folio I verso, Paris ca. 1220–1230. Ink, tempera, and gold leaf on vellum 1' 1½" × 8¾". Public Domain.

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Science and Theological Education: Reports from the Field

Scott C. Alexander, Catholic Theological Union

Although not trained as a “theologian,” for years I’ve written and taught *about* theology. I’ve done this primarily as a student of Islamic history and societies, and I have committed to communicating to my own students some of the intricate subtleties and deep wisdom of the medieval *kalām* tradition (dialectical or “scholastic” theology)—the intellectual stock-and-trade of such famous practitioners as al-Ghazali, Maimonides, and Aquinas.

One of the topics in teaching about medieval *kalām* that had me in a seemingly endless search for just the right explanatory metaphor centered on what the earliest Muslim theologians referred to as the doctrine of *al-qaḍā’ wa l-qadar* or “the decree and the power” of God. This doctrine is basically an analogue for what the Christian tradition typically refers to as the doctrine of “predestination.” The challenge was how to explain the “logic” of what appears to be fundamentally “illogical”—namely, the paradoxical claim that, on one level, the destiny of every human being is set by the radical and inescapable force of divine determination, while, on another level, human beings are meaningfully responsible for the moral choices they make.

One Mother’s Day Eve in the mid-nineties, my seven-year-old and the gift he wanted to buy for my wife inspired a rare pedagogical epiphany. I was able to convert a relatable experience of enormously disparate agency in the execution of a single task into a metaphor that I have happily used ever since to help explain what became the dominant doctrine in Sunni *kalām* regarding the coherence of human moral responsibility and the divine power of radical determination over all occurrences.

Needless to say, for the past twenty years or so, I have been quite pleased with my cherished metaphor—not to mention my own cleverness in having devised it. I have also been so subconsciously convinced by the misleading cliché that science and theology are essentially “separate but equal” realms of explanatory discourse, that I never imagined that one day I might be able to use modern neuroscience to help convey the insights of medieval *kalām*. And yet that is what has happened.

A little more than a year ago, I read Robert Sapolsky’s masterful *Behave: Human Biology at Our Best and Our Worst* (Penguin, 2017) and encountered, among other things, the soulful determinism of an accomplished Stanford neuroendocrinologist. In a move that would likely surprise, and perhaps even offend this brilliant and staunchly areligious philanthrope, I began to perceive some of the profound structural affinities between what otherwise might appear to be two radically incommensurate ways of interpreting human experience. One is the fairly recent understanding of the human brain as a beautiful and complex organic machine, the function of which is radically conditioned by its own ontogenic and phylogenic history. The other is at least a millennium-old Sunni Muslim understanding of the human

person (*nafs*) as a creature whose agency and ultimate destiny is radically conditioned by the will of their creator.

There was just one problem. As incredibly rich as his work in *Behave* is, Sapolsky's insights were not sufficient to account for the distinctly holistic viewpoint of Sunni *kalām*. On the one hand, I was deeply impressed by Sapolsky's brilliantly provocative and theologically suggestive critique of the legal applications of the Christian doctrine of "mitigated free will." Of particular note in this regard is Sapolsky's indictment of the pernicious ways in which this scientifically suspect doctrine has been manipulated to become the basis for so much of the cruelty of a secular system of "justice" that is largely and irrationally retributive when the science increasingly indicates it ought to be far more restorative. On the other hand, however, I was disappointed by the degree to which Sapolsky's radical determinism appeared to leave almost no room for considering the concepts of moral choice and responsibility as anything more than illusory epiphenomena of the activity of our wondrously complex, but ultimately mechanistic brains.¹

Enter Michael Gazzaniga and his enormously intriguing *Who's in Charge: Free Will and the Science of the Brain* (Ecco, 2012). I was led to Gazzaniga by a reference in *Behave* where Sapolsky juxtaposes his genuine respect for Gazzaniga as "one of the leading lights and elders" of neuroscience with a strikingly glib dismissal of the latter's attempt to argue, from a scientific perspective, that moral choice is more than just an illusion (Sapolsky, 591). So I decided to read Gazzaniga for myself and concluded that his thesis is far more than the exercise in mental gymnastics and/or intellectual legerdemain Sapolsky would have us think.

At the core of Gazzaniga's thesis is his turn to recent developments in emergence theory (primarily from the field of theoretical physics and quantum mechanics)² in order to argue that the reason neuroscientists, like Sapolsky, cannot account for "free will" is because of the limiting horizons of most current neuroscientific research. According to Gazzaniga, the vast majority of neuroscience focuses almost exclusively on how individual human brains function along a contextual spectrum ranging from the biology of the discrete organism of which the brain is a part, to the broader environment in which the organism exists and with which it interacts. Instead, Gazzaniga calls for expanding the horizon of neuroscientific research to allow for an emergence-based understanding of how human brains interact with one another. He argues that were neuroscience to begin to account for the dynamics of both "bottom-up" and "top-down" causality within an emergence-based framework of multiple brains in relationship with one another, the notion of moral choice would begin to look less like an epiphenomenal illusion and more like a verifiable property of brain function. Suffice to say that Gazzaniga's more expansive neuroscientific paradigm offers a terribly evocative scientific analogue for the holistic paradox of *both* determination *and* moral responsibility embraced by the practitioners of medieval Sunni Muslim *kalām*.

My recent foray into the terra incognita (for me) of neuroscience—and eventually evolutionary biology—is what originally stirred my interest in developing the "Neuroscience, Evolution, and Theology" course I plan to offer for the first time in the late Spring of 2020 at my home institution,

¹ A skeptical reaction to Sapolsky's argument is articulated in a clip of the radio show and podcast, *This American Life*. "Act Two: Life is a Coin With One Side," of Episode 662 "Where There is a Will," November 16, 2018, in *This American Life*, produced by David Kestenbaum, podcast, <https://www.thisamericanlife.org/662/where-there-is-a-will/act-two-7>.

² "Emergence Theory: A Layperson's Guide," Quantum Gravity Research, September 14, 2017, video, 29:40, <https://www.youtube.com/watch?v=Qa4JkgKDaRQ>.

Catholic Theological Union (CTU) in Chicago. At about the same time I began developing this course, I learned that two of my CTU colleagues were in the process of submitting a proposal for participation in Phase II of the Science for Seminaries initiative funded by the John Templeton Foundation, sponsored and facilitated by the Dialogue on Science, Ethics, and Religion (DoSER) project of the American Association for the Advancement of Science (AAAS), and cosponsored by the Association of Theological Schools (ATS).³ As I learned more about the initiative—discussed below in programmatic detail in the essay by Curtis Baxter—I proposed to my colleagues on the Theological Education Committee of AAR that we consider dedicating the Committee’s Special Topics Forum at the 2018 Annual Meeting in Denver to a panel focused on “reports from the field” whereby the sponsors and a select sample of lead faculty participants could share what they learned from Phase I of Science for Seminaries. They liked the idea and agreed that it would be a way of stimulating an important conversation about the challenges and opportunities involved in this and, by implication, other possible efforts to integrate leading-edge science into leading-edge graduate theological curricula.

It is my privilege to present, in this edition of *Spotlight*, five reports from the field—five insightful essays that together embody the rich and multifaceted nature of the conversation that took place last November at AAR.

The first two are by Curtis Baxter of AAAS/DoSER and Deborah Gin of ATS. What both of these essays have in common is the relative altitude of their perspectives. Both Curtis and Deborah give us a bird’s-eye view of the initiative from the perspective of the two national sponsoring organizations. Curtis provides a concise summary of the vision behind the Science for Seminaries initiative, an informative overview of its national scope, and an invitation to readers who may be interested in participating. Deborah’s piece is an ideal complement. Among other things, Deborah deftly summarizes and synthesizes the data ATS collected from graduating student questionnaires, revealing not only key aspects of the initiative’s impact on students, but also raising vitally important questions of pedagogical ethics.

These two essays are followed by perspectives from three faculty, each of whom helped lead a Science for Seminaries initiative at their home institutions and each of whom teaches at one of three distinct types of graduate schools of theology and ministry.

In his essay, Paul Metzger offers a nuanced portrait of the sensitivities, challenges, and measurable successes of the initiative at Multnomah Biblical Seminary, an Evangelical Protestant school in Portland, Oregon. In many ways, Paul’s contribution is a story of the resilience of a leading Evangelical institution as it both authentically and critically embraces the importance of an initiative sponsored by AAAS—an organization which eagerly participated in drawing the battle lines of a national culture war between the scientific and Evangelical communities when, in the summer of 1925, it played a leading role in resourcing the defense in the legendary Scopes Trial.⁴

With Fred Ware’s piece, we move from the context of an Evangelical seminary connected to a west coast university founded in the 1930s, to an east coast Mainline school that, tracing its origins back to advocacy on behalf of the captive West Africans of the schooner *Amistad*, is part of a historically black university founded in the immediate aftermath of the Civil War. In his thoughtful retrospective on Science for Seminaries at Howard University School of Divinity, Fred integrates elements of his own

³ www.ScienceforSeminaries.org

⁴ Edward J. Larson, *Summer for the Gods: The Scopes Trial and America’s Continuing Debate over Science and Religion* (New York: Basic Books, 1997), 114ff.

personal journey as a theological educator with keen observations about ministerial competency, the structures of academic institutions, and the problematic lack of reciprocity, balance, and mutuality in what often amounts to unidirectional rather than bidirectional conversations between scientists and theologians.

The final essay in this edition of *Spotlight* is a set of clear-eyed, astute, and hopeful reflections by M. T. Davila who helped lead a Science for Seminaries initiative at Andover Newton Theological Seminary. In addition to a helpful discussion of some of the particulars of how she went about integrating science into her own teaching of Christian ethics, M.T. recounts some of the more neuralgic moments in the implementation of the initiative and, in so doing, is able to articulate invaluable lessons about the dynamics of epistemology and power that lie at the heart of so many of the tensions in the science-theology dialogue.

I hope you enjoy and benefit from reading these excellent contributions to the broader conversation about contemporary theological education as much as I undoubtedly have.

The Science for Seminaries Initiative: Bringing Leading-Edge Science to the Theology Classroom

Curtis L. Baxter III, American Association for the Advancement of Science

For the past five years, I have been involved in helping to administer the Science for Seminaries initiative through the Dialogue on Science, Ethics, and Religion (DoSER) program at the American Association for the Advancement of Science (AAAS). I work to connect scientists with seminary faculty in order to bring leading-edge science to seminaries to prepare future religious leaders to engage with science in their own contexts. As a seminary graduate myself, I think it is of paramount importance that, in a rapidly advancing scientific and technological world, religious leaders be prepared to grapple with the issues and concerns such advances bring. What better place to have this engagement than in theological education institutions, where students can explore science as they learn how to think theologically, ethically, and pastorally. The objective of this essay is to offer an overview of the Science for Seminaries initiative from the perspective of AAAS, its principal sponsor and facilitator.

An Imperative for Theological Education

There is little debate that discoveries and advances in science and technology continue to have significant impacts on our lives. In addition to shaping and informing our understanding of the universe and our place within it, science and technology have a profound effect on health and wellness, education, economic opportunity, media access, and the environment. Theologians, ministers, and those who exercise other forms of faith-based communal leadership are important interpreters and mediators of changing technological realities and the ethical issues that arise from those shifts. For example, with the development of gene-editing techniques comes the exciting possibility of curing genetic diseases and easing significant suffering. This excitement, however, also generates important ethical concerns, ranging from questions of equal access to the fruits of this science, to judgments about which traits are “problematic” and thus appropriate objects of this research and whether or not such technologies should be used to develop new kinds of life. Other scientific advances—such as in the areas of artificial intelligence and the discovery of exoplanets—raise new and equally complicated ethical issues. All of this suggests that how well equipped future religious leaders will be to address these and other issues raised by science is contingent upon how well their own theological and ministerial education has prepared them to do so. Simply put, the very realities of scientific and technological advancement place a demand on graduate theological education to afford ordination candidates and other students opportunities to integrate into their own ministerial identities an ability to engage scientific issues and to accompany congregants in such an engagement.

The statistics strongly support the claim that preparing theological students and professors to effectively engage issues related to science and technology is essential in their developing the competencies they need to have meaningful conversations about such issues with their constituents. Roughly 84% of the US

population is religiously affiliated,¹ and a 2014 survey conducted by the AAAS and Elaine Howard Ecklund of Rice University found that religious Americans, in particular Evangelical Christians, often consult their pastors when they have questions regarding science.² Although the data reveal the crucial role faith leaders play in framing new discoveries in science and technology for those they lead, they also show that a large percentage of faith leaders receive little or no training in how to grapple with science and technology from a theological perspective.

In her essay for this edition of *Spotlight*, my colleague from the Association of Theological Schools (ATS), Dr. Deborah Gin, breaks down the data collected from student surveys in a way that makes abundantly clear the need for a more robust and intentional integration of science into graduate theological curricula. One of the major takeaways from these data is the lack of any formal science education in the higher education portfolios of most students studying for careers in theology and ministry.

Bridging the Gap: The Science for Seminaries Initiative

In 2014, the AAAS's Dialogue on Science, Ethics, and Religion (DoSER) program, in partnership with ATS, launched the Science for Seminaries initiative, a three-year project designed to be part of a broader AAAS effort to work with graduate schools of theology and ministry to integrate science into their curricula. This initiative has two principal goals that embody an outworking of AAAS's mission of "advancing science, serving society." The first is to provide resources to communities that need them—especially groups that are often ignored or underrepresented in science communication and engagement efforts. The second is to improve the science-faith dialogue by resourcing a diverse public with the tools necessary to better understand and benefit from the fruits of science.

The Science for Seminaries initiative is a project funded by the John Templeton Foundation. To date, DoSER has awarded subgrants to twenty-six ATS-accredited seminaries from three ecclesial families: Roman Catholic/Orthodox, Evangelical Protestant, and Mainline Protestant.³ The overarching goal of the project is to prepare future religious leaders to engage with their congregations and surrounding communities on topics and issues related to science and technology.

To accomplish this goal, the initiative pursues a set of carefully integrated objectives. One is to build networks and relationships between seminary faculty specifically committed to a deep and intentional engagement with science in their teaching, on the one hand, and local scientists, on the other. By connecting project faculty with local scientists, seminary faculty gain access to the latest scientific research. Local scientists serve as advisors to the project seminaries, recommending science resources, giving guest lectures in courses and participating in campus-wide events. A second objective is the

¹ Pew Research Center, "U.S. Religious Landscape Survey," 2008. <https://www.pewforum.org/2008/06/01/u-s-religious-landscape-survey-religious-beliefs-and-practices/>

² Elaine H. Ecklund and Christopher Scheitle, "Religious Communities, Science, Scientists, and Perceptions: A Comprehensive Survey" (Paper Presentation, Annual Meetings of the American Association for the Advancement of Science, Chicago, IL, February 16, 2014).

http://www.aaas.org/sites/default/files/content_files/RU_AAASPresentationNotes_2014_0219%20%281%29.pdf

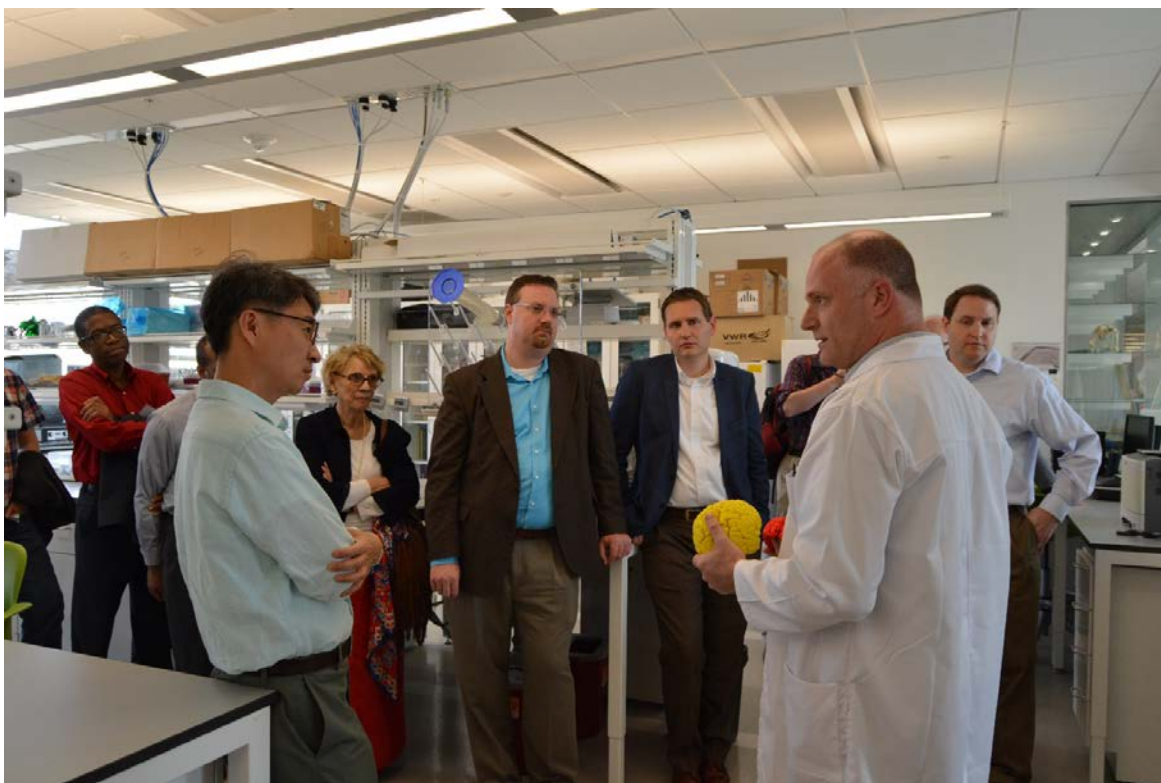
³ These 17 Seminaries were: Andover Newton Theological Seminary, Bethany Theological Seminary, Catholic University of American Washington, DC, Columbia Theological Seminary, Concordia Seminary of St. Louis, MO, Howard University School of Divinity, Kenrick-Glennon Seminary, Jesuit School of Theology at Santa Clara University, Lutheran Theological Seminary at Gettysburg, McCormick Theological Seminary, Multnomah Biblical Seminary, Mundelein Seminary, Regent University School of Divinity, Sacred Heart Seminary and School of Theology, Seventh-day Adventists Theological Seminary of Andrews University, and Wake Forest University School of Divinity.

introduction of science engagement into the culture of the theological education community. To this end, project seminars typically host campus-wide events focused on issues in science that have particular import for graduate theological education. Building on these campus events, AAAS hosts an annual summer retreat that invites seminary faculty not involved in the seminary initiative to learn new pedagogical skills for integrating science into their own coursework. Retreatants participate in sessions on science integration in a variety of courses and are provided with syntheses of the latest science and technology resources relevant for classroom application.

Where We've Been and Where We're Headed

A. Phase I (2014–2016)

Phase I of the initiative began in 2014 and ran until 2016. As mentioned above, the DoSER program partnered with ten seminaries/divinity schools representing a broad range of Evangelical Protestant, Mainline Protestant, and Roman Catholic traditions.⁴ The faculty who led the initiative's efforts at their schools identified novel and fruitful ways to incorporate science into their curricula. Rather than creating new electives, initiative faculty integrated various sciences into a broad range of preexisting core courses in areas ranging from systematics and biblical studies, to church history and ethics.



An interactive science engagement opportunity, Science for Seminaries cohort 1 project faculty visiting Dr. Chet Sherwood's evolutionary neuroscience lab at George Washington University. Credit: Lilah Sloane.

⁴ Those 10 seminaries were: Andover Newton Theological School, Catholic University of America Washington, DC, Columbia Theological Seminary, Concordia Seminary of St. Louis, MO, Howard University School of Divinity, Jesuit School of Theology at Santa Clara University, Lutheran Theological Seminary at Gettysburg, Multnomah Biblical Seminary, Regent University School of Divinity, Wake Forest School of Divinity.

In Phase I, more than seventy courses were revised and integrated with a specific focus on related science. Students studied a wide array of topics running the gamut from cosmology and discussions of the origins of the universe, to neuroscience and how neurodegenerative diseases affect human personhood. The redesign of these courses frequently included visits to science research labs and other science enrichment activities. For example, the project leader at Wake Forest School of Divinity took students to a neuroscience lab that offered seminarians an up-close-and-personal experience of a research laboratory. The students participated in a sheep brain dissection module, learning the anatomy and physiology of the brain. Likewise, a project leader at Columbia Theological Seminary who teaches courses in biblical studies took his students to the Georgia Aquarium to link a scientific understanding of biodiversity to related scriptural passages in the Book of Job. Additionally, faculty brought science directly to their students through field trips to museums and research labs, scientist guest-lectures, supplemental readings, science book clubs and film screenings, and sermon contests.

Complementing these curricular revisions, the seminaries conducted campus-wide science events designed to invite the broader constituencies of their respective institutions into the conversation about the relevance of scientific engagement for theological education. This far-reaching exposure offered diverse opportunities for students to engage with scientific advances both inside and outside of the classroom. The number of campus-wide events that took place through the initiative provides another significant indicator of its success. Instead of the expected ten required events, the partner seminaries hosted at least sixty. These events ranged from conferences that attracted hundreds of attendees to smaller gatherings that focused on specific topics.

In Phase I, DoSER organized three separate faculty enrichment retreats in Maine and Oregon during the summer of 2016. These retreats were broken down by ecclesial family, and featured opportunities for students who participated in initiative-sponsored courses to share presentations of work they did related to the integration of science and theology. Seminary faculty presented on a variety of topics ranging from philosophy of science to biology and neuroscience, while at the same time being careful to include discussion of pedagogy and administration. We also invited faculty members from schools not yet affiliated with the Science for Seminaries initiative to submit applications to attend one of the three retreats in order to facilitate interest in the project beyond the ten schools involved in Phase I. As a result, AAAS received 123 applications and fourteen joint applications to fill thirty-seven participant slots. Applicants were faculty affiliated with 105 ATS-affiliated seminaries, representing approximately 38% of ATS member schools evenly divided among ecclesial families. This high level of interest demonstrates an appetite in the broader theological education community for engagement with science and technology.

Due to the success of the Phase I project, the seminaries project continues to offer seminarians forefront science in the classroom and connect seminary faculty to local scientists and resources.

B. Phase II (2018–2022)

Phase II of the initiative began in 2018 and will continue until 2022. This second phase adheres to the goals, objectives, and requirements established in Phase I, but with a few significant differences. Unlike the first phase, Phase II involves four cohorts of seven to nine seminaries each. Each cohort is expected to conduct eighteen months of programming at their institution in which they will fulfill the requirements of the project. All in all, AAAS plans to support thirty-two seminaries, bringing the total number of participating institutions to forty-two.

This new cohort has integrated a wide range of science topics and methodologies into the courses they have proposed for initiative-related revision. These topics and methodologies include an approach to human uniqueness rooted from the perspective of evolutionary biology, as well as the ways in which a scientifically grounded understanding of archaeology can enrich the methods of biblical exegesis and interpretation. Other topics faculty are planning to integrate into their courses include neuroscience, cosmology, anthropology, and advanced technology and its impact on society.

Achieving Sustainability through State-of-the-Art Resources

In order to ensure a sustained commitment to the goals of the initiative among participating institutions, AAAS is dedicated to providing them with access to appropriate state-of-the-art resources focusing on a wide range of scientific disciplines. For example: AAAS has begun providing all project seminaries and select project seminary libraries with subscriptions to its prestigious journal *Science*. AAAS has also invested considerable energy into an initiative-based website designed to provide faculty from participating institutions with media that can easily be incorporated into any number of pedagogical contexts.⁵ Key among these media is the *Science: The Wide Angle* film series, a cache of high-quality short videos presenting science topics tailored for use either in the graduate theological classroom or any number of related settings such as congregational adult-learning contexts. The series features some of the world's leading scientists who, in conversation with historians and philosophers, explore scientific questions in a way conducive to providing the basis for informed and lively classroom discussions of any number of issues at the intersection of science and religion.

In addition to the film series, the website hosts over fifty seminary course syllabi revised to incorporate content related to science and technology. Tagged and organized by labels such as course area, seminary ecclesial background, and science topic, this collection demonstrates the range of ways theological faculty have facilitated student engagement with a vast array of scientific topics relevant to issues in theology and ministry. This aspect of the website is particularly useful for theology faculty interested in integrating science into their pedagogy. These syllabi provide a superb starting point for reflecting on the praxis of colleagues in theological education who have pioneered the effective integration of science into 21st-century education for careers in theology and ministry.

A Concluding Invitation

In addition to its being a valuable resource for theological educators committed to the science-religion conversation, the AAAS/DoSER website includes information on how to apply for a grant to be part of one of the remaining initiative cohorts, as well as for the annual summer retreats. Both are opportunities for ATS-accredited institutions to increase capacity for bringing science to their campuses and for faculty to enhance their related pedagogical skill sets.

On behalf of AAAS and the entire DoSER family, I invite you to visit the Science for Seminaries website and start, renew, or continue your engagement with science and technology in your own ministry as a theological educator.

⁵ www.ScienceforSeminaries.org

Why the “Science for Seminaries” Initiative?

Deborah H. C. Gin, Association of Theological Schools

The conversation between the Association of Theological Schools (ATS) and the American Association for the Advancement of Science (AAAS) about collaborating on a project like Science for Seminaries has been going on for over a decade. The program took shape three years ago with funding from the John Templeton Foundation. My observations in this essay focus on the overall importance of the project, as well as some of the key findings from its research component.

The Importance of the Science for Seminaries Initiative for ATS

“We live in a time when natural science, social science, engineering, and technology are among the primal shapers of our civilization.”

– interviewee from a mid-sized Evangelical Protestant seminary

Science often touches on the “big” questions of life—questions that require responses from both science and theology. The ATS sees engagement with science as a way to engage the important questions of our current culture.

The mission of ATS is “to promote the improvement and enhancement of theological schools to the benefit of communities of faith and the broader public.” As an organization that accredits schools that are forming religious leaders, ATS helps schools reach their aspirational goals. We want pastors to be informed as they teach, preach, care, and counsel in ways that are both theologically faithful and scientifically informed.

In their current form, the ATS Standards of Accreditation focus on helping students understand “cultural realities and social settings,” including the insights of cognate disciplines such as the natural sciences. An excerpt from the Master of Divinity Degree Standard (A.2.3.1) exemplifies this focus:

The program shall provide for instruction in contemporary cultural and social issues and their significance for diverse linguistic and *cultural contexts of ministry*. Such instruction should draw on the insights of the arts and humanities, *the natural sciences*, and the social sciences [my emphasis].¹

The Standards of Accreditation both hold institutions accountable and support the institutions and the people that serve in them as they educate seminarians in a broad range of areas of capacity. To the degree that the standards explicitly and implicitly recognize the formative role played by the natural

¹ *Degree Program Standards* (The Commission on Accrediting, Association of Theological Schools, approved June 2012; posted January 21, 2015). <https://www.ats.edu/uploads/accrediting/documents/degree-program-standards.pdf>

sciences in shaping and informing any number of cultural contexts, ATS readily endorsed the work of the Science for Seminaries initiative as a valuable resource for its member schools.

Seminary graduates are leaders in their communities, and parishioners look to them for guidance not only in spiritual matters, but also on a whole range of issues that aren't explicitly "spiritual" or "theological" but are culturally anchored—issues that confront them in society and have deep theological implications. We don't imagine that seminarians will or should become scientists, but they must be prepared to address such issues, even in a basic—albeit well-informed and well-nuanced—way. Unless seminarians are *exposed* to these issues and given an opportunity to explore the spiritual and theological implications of these issues for themselves, they may be ill-equipped to accompany their congregants with the excellence and authenticity expected of ministry leaders.

Student Interest and Preparation: What the Data Reveal

In 2017, as part of the larger Science for Seminaries initiative, ATS conducted a baseline study of seminary engagement with science, involving faculty and administrators at ATS schools. We collected perspectives using a fifty-item survey of faculty at ATS Protestant schools, interviews of key informants at thirty Protestant schools, and content analysis of documents collected from the same thirty schools. Complete reports can be found on the ATS website.²

What follows are a few of the findings that I think highlight the importance of the initiative for ATS.

In the survey, we asked faculty how prepared they felt their students were to deal with scientific issues. Only 21% agreed their students were "well prepared" to address questions of science in the latter's future ministries. Very few faculty were overwhelmingly positive about their students' ability to respond adequately to questions related to science or effectively address in a pastoral setting congregants' science-related concerns. We found this perspective to be consistent across the variety of Protestant schools. In addition, faculty were asked to approximate the proportion of students who come to seminary with a science degree. Faculty estimated about 15% come with a natural science degree, 28% with a social science degree, and 59% without any science degree.³

These *faculty* perceptions about student preparedness confirm *student* self-perceptions. In its Graduating Student Questionnaire, ATS annually asks graduating students how effective their education was in facilitating growth in twenty different skill areas, including the ability to integrate science and theology. Over the last five years, this item has consistently ranked second from the bottom, with an average of 3.6 on a five-point scale. So faculty concern for students' lack of preparation to deal with science in their ministries appears to have some foundation.

Faculty perspectives paint a slightly different picture about student *interest* in scientific topics. In response to a question about student receptivity toward the integration of science and theology, interviewees remarked: "Oh, they love it" (from a mid-sized Mainline Protestant school); or "I think our students have really found it meaningful" (from a large Evangelical Protestant school). Indeed, seven out of ten faculty believe students are interested in the topic, though no more than other areas, and almost two out of ten feel their students are particularly interested in scientific topics. Only about 10% say

² <https://www.ats.edu/recent-ats-research-special-topics-theological-education#Science%20in%20seminaries>

³ Jonathan P. Hill and Deborah H. C. Gin, "Engaging Science in Seminaries: A View from Faculty," *Theological Education* Vol. 50, no 2 (2017): 103–122. <https://www.ats.edu/uploads/resources/publications-presentations/theological-education/2017-TE-50-2-research-/103-122%20Gin-Hill%20FINAL.pdf>

students are not interested.

It should be noted, however, that evaluations of student interest in, or willingness to engage the intersection between science and theology were not always positive. One interviewee from a large Evangelical Protestant school stated it this way,

If you don't have a theological system that has a robust creation mythology, you are lost. I've seen that lostness occur to some students. It's a terrible thing to do. The ethics of teaching, where you destroy the naiveté of folks. Man oh man, one has to handle those carefully.

While we found that ecclesial family is not a predictor of a school's engagement with science (i.e., Evangelical and Mainline schools were equally likely to engage), when faculty did face student resistance, it was typically around certain controversial issues. Over 60% of the faculty surveyed identified a range of scientific issues that typically provoke controversy among students (see Fig 1).

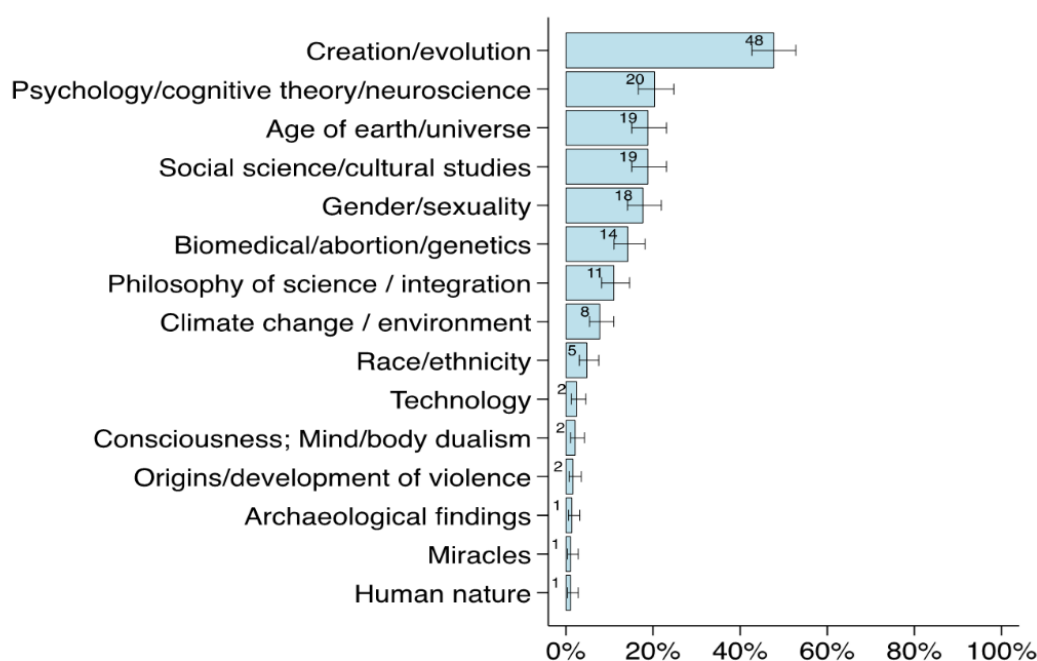


Figure 1 – Scientific Areas Named by Faculty as Causing Controversy among Students

As we see in Figure 1, creation/evolution unsurprisingly dominates the list of issues generating controversy among students, with nearly half of the surveyed faculty including this issue in their list. At the same time, it is not the only area of controversy. The second most common controversial area was coded as psychology/cognitive theory/neuroscience, with 20% of the faculty naming topics in this category. Even the *use* of social sciences in theology (e.g., how appropriate it is to incorporate such disciplines) is an area seen as causing tension for students.

Interestingly, when faculty were later asked in the survey to name what further steps their school could take to advance the engagement of science, about 20% said their school should “advocate more for [a particular] issue,” and very few of these respondents named anything related to creation/evolution. So, while faculty named this as a controversy, they most likely see this as a *student* issue or see it as having far less moral or social justice relevance than issues related to climate change, biomedical ethics, and human sexuality, all of which faculty named more frequently.

A Question of Pedagogical Ethics

The “ethics of teaching” mentioned in the quote above invited a pause in the research project. We paused to think carefully about how engagement with science can be disorienting for seminary students. While undeniably important for accompanying their parishioners, equally undeniable is the fact that, for many students (and faculty?) this engagement can and oftentimes does trigger a process of deconstruction of long-held beliefs and values, or at least long-held interpretations of these beliefs and values. If graduate theological education had its own “Hippocratic oath,” in what ways would instructors teach so that they “first, do no harm”? Would “doing no harm” involve moving forward with deconstruction at all costs? Or would it mean subordinating all deconstructive implications to an imperative to leave preexisting belief systems intact? Perhaps the most helpful approaches to the important questions of pedagogical ethics in this regard are more nuanced and less dichotomous than these extremes. We might ask ourselves, for example: *in what ways is it irresponsible as an instructor to deconstruct such systems without thought to the reconstruction process? Or: how irresponsible is it to deconstruct without attending to historical or socio-political realities?*

An important theme that emerged from the interviews highlights the need for paying close and careful attention to the pedagogical ethics of valuable but potentially sensitive projects like Science for Seminaries. In their report of the interview phase of the research project, Atwaters and Park-Hearn state the following:

A few interviewees share their concern for African American students whose social and historical contexts give ample reason to view science as a threat. This is an all-too-critical issue that must factor into any conversation about the place of science in theological education. This informed and responsible critique of the way that science has been used to oppress and harm must challenge any attempt to make normative a singular construal of science and its place in schools, churches, and in individual and communal lives.⁴

This conclusion was informed by the reflections of several interviewees responding to the following questions: 1) “What areas of science would be considered off-limits at your school?”; 2) “How have students responded to the integration of science?”; and 3) “How is science relevant/irrelevant to theology in ministry?” To the first question, an interviewee from a large Mainline Protestant school offered, “I think our students are—they’re very leery or anxious about the ways in which science can be used as a source of domination....” Responding to the second question, an interviewee from a large Evangelical Protestant school explained, “I suspect that some of our students, especially who are coming from overseas or from outside of the US and Europe, are a little less comfortable with a full-bodied integration with science.” And to the final question, one interviewee from a different large Evangelical Protestant school responded,

Science is still largely an opportunity for the privileged in our country, so this gets back to the social issue....the black community in general in the United States does not perceive science to be their friend. They see the way that science has been used to actually justify their treatment.

Such observations are particularly important as we consider that, by 2025, it is estimated that students of color will comprise the numeric majority of students in ATS schools. This behooves us to keep in mind an important pedagogical question: how will our teaching—especially the engagement with science—

⁴ Sybrina Y. Atwaters and Rebecca Jeney Park-Hearn, “Engaging Science in Seminaries: Report of Interview Findings,” Association of Theological Schools, March 29, 2017, 24–25.
http://www.aaas.org/sites/default/files/content_files/RU_AAASPresentationNotes_2014_0219%20%281%29.pdf

take into account this projection?

Concluding Reflections

According to a report of findings from a 2013 Religious Understandings of Science research project commissioned by AAAS and its Dialogue on Science, Ethics, and Religion (DoSER), Evangelical Protestants are much more likely than the average person to rely on “a religious text, a religious leader, or people at their congregation” for questions about science.⁵ At least some of these religious leaders are being formed in ATS schools, and it is our hope that graduates of theological schools will be better informed about issues related to science and will therefore provide more effective leadership in communities of faith and other places of service.

Interviewees from the ATS 2017 baseline study of seminary engagement with science further indicated the importance of seminary engagement with science. One excerpt (from an interviewee of a large Evangelical Protestant school) illustrates this aptly,

I think I have to rank [science] fairly high for a couple of reasons, in that it touches every area of our life. Who am I as a human being? What is my destiny? What does it mean for me to live? What does it mean for me to die? All of those questions are, at least in part, both theological and scientific questions.

Theological education and science must see each other as important partners, and ATS has appreciated the collaboration with AAAS and DoSER. ATS schools and AAAS have a common interest in the success of such collaborative efforts, including that they be based on both good science and good theology. There is a great need for theological education to engage these conversations, and it is important to continue to build a sense of trust and mutuality between the fields. We want theologians to have a better understanding of science. We also want scientists to have a better understanding of theology. Through the conversation, the Science for Seminaries project is helping to clarify the kinds of questions each is equipped to answer and those each is not. The two fields need to rely on each other to nurture faith leaders who are ready to address society’s current and future important questions.

⁵ Ecklund and Scheitle, 13–14.

Mutual Respect for the Common Good: Faith and Science in Graduate Theological Education

Paul Louis Metzger, Multnomah University

Mutual Respect: An Endangered or Emerging Species?

The Bible instructs us that God is not a “respector of persons” (Acts 10:34–35, KJV). In other words, God does not show partiality or play favorites. If we seek to be like God, we should not be respecters of persons either. However, given how pervasive incivility and tribalism are today, a biblical text like this can easily be distorted to mean we should have no respect for persons, at least not those outside our group or guild. Just as the biological sciences warn us of the perils of driving species to premature extinction, a biblical perspective on the fabric of contemporary American society should alert us to the fact that mutual respect appears to be an endangered species.

This problem of disrespect surfaces time and again in the faith and science conversation, including in Evangelical Christian circles. Multnomah Biblical Seminary (MBS), through the Institute for Cultural Engagement: New Wine, New Wineskins, decided to address this conflict.¹ And so, MBS applied for a grant through the Science for Seminaries project.

MBS’s aim to address the conflict involving disrespect for science, or certain domains of science, was no easy task. After all, the Fundamentalist movement from which Evangelical seminaries like Multnomah emerged viewed Darwinian thought forms with deep suspicion and consternation going all the way back to the Scopes Trial in Dayton, Tennessee, in 1925. MBS made mention of this historic problem in the grant proposal. Many fundamentalist and progressive Christians waged war over science, as highlighted at the trial. George Marsden wrote, “It would be difficult to overestimate the impact” of this trial “in transforming fundamentalism.”²

We at MBS wished to do everything possible in our context to transform the conflict involving faith and science into a constructive enterprise. After all, it was not a problem relegated to the distant past. We at MBS were convinced that the decision made by many millennials to leave their churches was in part the result of this conflict, real or imagined. David Kinnaman, president of the Barna Group, highlighted this perception in a book chronicling why many young people are departing. The following statement says it all: “I knew from church that I couldn’t believe in both science and God, so that was it. I didn’t believe in

¹ <http://www.new-wineskins.org/>

² George Marsden, *Fundamentalism and American Culture: The Shaping of Twentieth-Century Evangelicalism — 1870–1925* (New York: Oxford University Press, 1980), 184.

God anymore.”³ This was especially true for those who wished to pursue careers in the sciences. Indifference or vilification over their envisioned vocation made it difficult for them to remain. If that perception of conflict continues, mutual respect might not be the only endangered species under consideration. So, too, the Evangelical Christian movement in North America might be endangered as well.

As my colleagues Deborah Gin and Curtis Baxter mention in their essays, the research clearly indicates that many people of faith, especially Evangelical Christians, go to their spiritual leaders—such as pastors—with questions regarding science. All too often, however, the latter are ill-equipped to address scientific issues. When the faith community is uninformed on pressing cultural issues, it negatively impacts the church’s witness in a scientific age. The Science for Seminaries project provides a timely opportunity for seminaries like ours to become safe places for equipping students pursuing pastoral ministry to accompany the faithful in their own struggle to sort through both the merely apparent and very real tensions inherent in the faith-science dialectic. In particular, given our context in a very liberal and progressive city, and because Intel, Tektronix, the Oregon Museum of Science and Industry, and Oregon Health and Science University are located nearby, it behooved us to apply for the grant.

Upon receiving news of our successful application, MBS’s faculty and administration began work with our scientific advisors and theological mentors to advance our proposal in the most advantageous way. We developed the project in view of the following aim: *to cultivate informed respect between faith and science and, where possible, to foster integration.*

Challenging the “Conflict Thesis” One Class at a Time

Our approach to the subject was multifaceted, including core courses throughout the master of divinity degree curriculum. We wished to challenge many reigning presuppositions that foster the so-called “conflict thesis” which maintains that post-Enlightenment science and Christian faith are ultimately incompatible. For example, given the way in which some Christians within the Fundamentalist-Evangelical movement approach the creation narratives in Genesis, we thought it important to show in a Pentateuch course how our modern cosmologies often get in the way of what the biblical world envisions in conversation with ancient cosmologies.

Moreover, we deemed it important to show the merits of neurological study for enhancing effective pastoral care. Along with a course in pastoral theology, we hosted several forums at area churches on a variety of related themes. Contrary to the assumption in certain Fundamentalist circles that we were creating atheists through the grant initiative, we assisted pastors and pastors-in-training with retaining and revitalizing their congregants. The training encouraged scientifically minded congregants and brought science to bear on matters of mental and emotional health. Similarly, four courses spanning contemporary theology, ethics, and cultural engagement aimed to show how important and missionally meaningful it is for pastors to become more adept at engaging scientific issues with informed respect. As conservative Christians become more irenic and respectful of scientific exploration and its merits for human flourishing, the church may be viewed increasingly as an ally for cultivating the common good in society at large.

Four courses in historical theology helped to challenge the conflict thesis. The Christian faith through the centuries has demonstrated robust and varied attempts at engaging scientific themes. Far from

³ David Kinnaman, *You Lost Me: Why Young Christians Are Leaving Church...And Rethinking Faith* (Grand Rapids: Baker Books, 2011), 138.

supporting the conflict thesis proclaimed by secular and religious dogmatists respectively, the sweep of history reflects a never-ending process of promoting scientific inquiry while prizing orthodox Christian doctrine. Here it is worth noting that, contrary to the reigning historiography among some young earth creationist groups, the nineteenth-century Christian response to Darwin was far from uniform, with some respondents being quite positive and supportive. Moreover, it was shown that many of the early Fundamentalists were gap theorists, which involved the idea that the universe was actually very old. Students quickly came to realize that, whether we are talking about Draper and White or creation science, those who control the historical terms of debate, no matter how flawed their assessment, also control and shape to a large degree the contemporary discourse on these issues.

Along with the forums at area churches, New Wine, New Wineskins hosted a major conference titled “Church and Science: Partners for the Common Good”.⁴ The conference brought together scientists, historians, biblical scholars, theologians, and philosophers. The conference aim and topics selected for consideration reflected well on MBS’s entire grant enterprise. The aim of the conference was to foster a constructive dialogue involving faith and science in contemporary society. Participants noted that two distinct dimensions of American culture are a keen spiritual intuition on the one hand, and a passionate pursuit of scientific inquiry on the other. We tackled head-on the perception that these two domains are always in conflict with one another. While acknowledging that some conflict is inevitable in any discourse involving very different disciplines, it is important to try and build bridges of respectful understanding between the faith and science communities. We recognized that nothing less than human flourishing and the common good are at stake.

The conference organizers chose to highlight the following themes: a keen awareness of the history of faith and science; hermeneutical humility involving biblical interpretation related to scientific questions; literacy with respect to the scientific method; and a commitment to the art of pursuing common values shared by the faith and science communities in the midst of tension. The long-term goal of the conference was in keeping with the MBS seminary grant as a whole: to foster respectful, informed dialogue between the church and science, and where possible, integration of the two spheres for the common good. Two issues of New Wine’s journal, *Cultural Encounters: A Journal for the Theology of Culture*, were dedicated to the conference themes.⁵

Embracing Difficulties for the Common Good

If one wishes to avoid important but highly sensitive areas of inquiry, one might not suffer any short-term losses. But the long-term costs can be devastating. In our estimation, it was best not to avoid the difficult conversations, but to embrace them in an attempt to transform the narrative involving faith and science. It was important, however, that we did not approach the problem hastily, throwing all caution to the wind. The best way to proceed courageously yet cautiously is in community.

As I alluded to above, the guiding ethos of the Science for Seminaries praxis at MBS was a commitment to cultivate and inhabit a spirit of respect *between* different individuals, groups, and guilds. Equally important was the imperative to cultivate respect and trust *within* one’s own group. Our accrediting body, the Association of Theological Schools (ATS) shows great respect for the respective family trees or “ecclesial families” of Christian seminary education in North America. In no way, shape, or form did ATS or American Association for the Advancement of Science (AAAS) seek to alter MBS’s Protestant

⁴ <http://www.churchandscience.com/>

⁵ *Cultural Encounters* Volume 12, no. 2 (2017) and Volume 13 no. 1 (2017), <http://www.culturalencountersjournal.com/>

Evangelical Christian beliefs and values. Rather, both ATS and AAAS encouraged us to honor our seminary's distinctive doctrinal beliefs and mission, vision, and values. How else could we serve the pastors-in-training who represent our heritage? The focus on incorporating science into our curriculum was not to make us something we are not, but to make us better at who we are and what we do as Evangelical Christians.

In addition to honoring our Evangelical movement and seminary's heritage, we also respected the wisdom of administrators at Multnomah as well as of the institution's outside consultants. These advisors urged us to create and disseminate FAQs at the time of the official press release for our Science for Seminaries initiative. In this way, we were able to alleviate the fears of well-meaning people who were willing to dialogue with us about the grant rather than dismiss it out of hand. Unfortunately, some individuals in the surrounding community refused to reason with us, but instead hastily dismissed the project and made inappropriate demands. Gratefully, our president and board of trustees advocated for us and stayed the course. The old saying "It takes a whole village to raise a child" can be extended here to read "It takes a whole academic institution to raise a grant" to successful completion.

Contrary to what some Evangelicals feared, we were not attempting to turn our Christian seminarians into atheists, thereby confirming a long-standing bias in certain circles that a "seminary is a cemetery." The faculty incorporated science into core classes of the curriculum with the substantial counsel of scientists and theological educators already well-versed in faith and science discourse. Through these various individuals, key institutional stakeholders, and the collaborative endeavors of the faith and science guilds, we were able to complete our Science for Seminaries grant in a very satisfactory manner.

The various criticisms and challenges that we endured paled in comparison with the long-term benefits. Far from losing our faith, the Science for Seminaries grant increased our sense of wonder in the mystery of creation along with intellectual humility. We also learned how to approach misunderstandings generated by the conflict thesis in progressively redemptive and complexifying terms for the sake of historic Evangelical Christian witness.⁶ As we engaged fears and criticisms of the Science for Seminaries initiative with the aim of positive institutional and cultural transformation, we helped model for our student body a meaningful way forward as they serve their church communities. Only as they transform presumed faith and science conflicts in respectful and creative ways will they be able to equip their congregants for effective ministry in a scientific age.

⁶ John Brooke's complexity thesis has gained increasing ground not simply in the professional guild of history of science, but also in our own Evangelical circles. Even so, much more work needs to be done to debunk the conflict thesis in other domains in the surrounding society, "not least in the popular mind." Gary B. Ferngren, ed. *Science & Religion: A Historical Introduction* (Baltimore: Johns Hopkins University Press, 2002), x.

Undercurrents in the Deeper Waters: Reflections on Science, Theology, and Professional Competency

Frederick L. Ware, Howard University School of Divinity

The intersection of science and theology has been an interest of mine for many years. As a young college student majoring in philosophy, on the trek towards theological education for ministry and later doctoral studies in theology, I pondered—and sometimes agonized—over the big questions about the origin and nature of the universe and human life.¹ At the time, I intuited and am now solidly convinced that the ministry to which I was called requires nothing less than the kind of cultural fluency that includes the scientific literacy necessary for participation in the ongoing conversation about meaning and purpose in human life, and especially about the pursuit of just societies.²

The Right Project at the Right Time

As I look back on 2013 and how I first became involved in the Science for Seminaries initiative, I immediately recall a palpable sense of “readiness” for involvement, not to mention an enthusiasm for a chance to participate in a project ideally timed for my intellectual journey. It’s clear to me now that my choice of philosophy as my undergraduate major—and, in particular, my interest in courses in the history and philosophy of science—were reinforced by a somewhat accidental, maybe even providential, discovery of pre-seminary studies. One day, while at the student services and career center, I saw a pamphlet on pre-seminary studies alongside pamphlets on pre-med, pre-dentistry, and pre-law trajectories. I discerned a professionalism in ministry comparable to that of other fields such as law, medicine, dentistry, and engineering, which required “pre-studies.” When I moved on to graduate school for doctoral studies in theology, I had the opportunity, albeit limited, to continue my studies in philosophy, mainly in metaphysics and ontology in my philosophy of religion, process theology, and ecological theology courses. From 2006 to 2008, in the early stages of my teaching career and many years after finishing my doctoral studies, I had the good fortune of participating in a professional development initiative that afforded me the opportunity to engage in focused and intentional

¹ For a formulation of these types of questions, see Keith Ward, *The Big Questions in Science and Religion* (West Conshohocken, PA: Templeton Foundation Press, 2008); Robert C. Solomon and Kathleen M. Higgins, *The Big Questions: A Short Introduction to Philosophy*, 9th Edition (Belmont, CA: Wadsworth Cengage Learning, 2013); and Stephen Hawking, *Brief Answers to the Big Questions* (New York: Bantam Books, 2018).

² By “cultural fluency,” I mean the knowledge and ability to not only participate within one’s culture but also to assess and modify that culture for improved adaptation to the physical and social environment that one shares with other persons.

integration of issues in science and theology³ and that enabled me to offer elective courses in theology and science at Memphis Theological Seminary (summer 2006) and Howard University School of Divinity (fall 2009). At this point, the incipient and implicit convergence of science and theology that had played a key role in my own personal development as an emerging scholar and in my formation for a ministry in theological education had ripened and become explicit to the extent that I knew there would be no turning back. I was certainly ready for more. I was, however, uncertain as to what “more” might actually entail.

Deeper Waters

My journey into the deeper waters of the engagement between science and theological education took the form of playing a leadership role in Howard University School of Divinity’s participation in the Science for Seminaries initiative from 2014 to 2017.⁴ Among the requirements for receiving a Science for Seminaries grant were: the leadership participation of at least two faculty members; the revision of at least two core/required courses in the school’s curriculum; and the organization and convening of at least one campus-wide event. In the allotted three-year period, Howard went well beyond the minimum requirements of the grant. By the project’s end, there were four participating faculty members, eight revised courses,⁵ three campus-wide events,⁶ and numerous resources compiled for a bibliography accessible from a new website⁷ dedicated to the initiative. Each faculty member developed an approach unique to their interests and subject matter. One colleague in biblical studies focused on paleo-climatology and human migration while another in the same field focused on behavioral sciences. The study of ancient climate and the emergence of political systems for control of water provided students with “hard data” on the forces, such as the effects of hydroprojects, influencing the migrations of minority populations such as the Hebrews who preserved memory of their exile in written texts. Psychology proved helpful for exploring the probabilities of how environments affect biblical characters, and how they in turn shaped their environment. Another colleague in ministry studies focused on disability and addiction studies as a way of developing an informed theological anthropology which does not diminish the worth of persons with differently abled bodies nor shame persons whose addiction follows the pattern of disease. My focus was on cosmology, evolution, and genetics. In general, I drew on these scientific disciplines to help students to think critically and creatively about what it means to be human and what represents plausible belief in God and special divine action in light of the scientific studies shaping human understandings of reality. In order to bring coherence to these various approaches, an overarching theme (human identity, community, and purpose) was formulated. This

³ “Science and the Spirit: Pentecostalism and the Sciences,” a research initiative funded by the Templeton Foundation. For the essays published through this project, see James A. K. Smith and Amos Yong, eds., *Science and the Spirit: A Pentecostal Engagement with the Sciences* (Bloomington, IN: Indiana University Press, 2010).

⁴ The project is described in my “Oh So Human, Yet So Divinely Complex: Science and Theology in the Exploration of Human Identity, Community, and Purpose,” *Seminary Ridge Review* 19, no. 1 (Autumn 2016): 44–55.

⁵ John Ahn (Old Testament I, Old Testament II), Michael Willett Newheart (New Testament Critical Introduction), Harold Dean Trulear (Prophetic Ministry, Intro to Church Music & Worship), Frederick L. Ware (Philosophy of Religion, Systematic Theology I, Systematic Theology II).

⁶ Interdisciplinary Mixer (February 2015), Two-Day Conference (April 2016), University Sesquicentennial Event (February 2017).

⁷ www.hureligionandscience.org

theme was aligned with the mission and social justice advocacy of the Divinity School.

“Negative” and “Positive” Outcomes

Like any seafaring journey, Howard’s collective foray into the deeper waters of the science-theology engagement involved our fair share of smooth sailing and turbulence leading to a complex set of both “positive” and “negative” outcomes. Let’s start with the negative.

The initiative brought into bolder relief those aspects of the culture of the academy which reward individual accomplishment over collaboration and specialization over interdisciplinarity. Institutions of higher learning divide into academic units staffed by professors who are subject specialists. After division into units aligned with subject areas, work across disciplinary boundaries is difficult and rare. The academic unit has systems of promotion and compensation which guide the professor to the pinnacle of their academic discipline. Also related to the culture of the academy was the frequently discomfiting realization that the training of theological educators had become so siloed that it precluded interdisciplinarity among the various theological fields, and it had ill-equipped many faculty to give serious consideration to how their own particular disciplines might engage with issues raised by science and technology. And there was the subdued critique on both sides of the relationship between religion and science. There was a strong sense that one of the guiding assumptions of the initiative was the degree to which science ought to play the role of arbiter between “justifiable” and “unjustifiable” religious beliefs and practices. Science was privileged in raising questions for religion. Theologians tended to refrain from asking hard questions about the philosophical presuppositions, the underlying political and economic interests, and social implications of science.

One of my strongest takeaways from the “deeper waters” phase of my own journey into the science-theology engagement is that Science for Seminaries and similar projects will give rise to a genuine sense of “search” and a subsequent apprehension of truth that challenges the convictions in each meta-discourse, with neither attempting to discredit or sanction the other but rather with each pressing us to expand our knowledge of the world.

There were many “positive” outcomes that emerged from Howard’s adoption of the initiative. Expectedly, there were some of the measurable and immeasurable ways that the integration of science into the curriculum encouraged both faculty and students to grow as theologians and ministers. Rather unexpectedly, however, were the remarkably fruitful ways in which the initiative provided Howard Divinity faculty with the opportunity to collaborate with colleagues from other academic units within the university and vice versa. Equally surprising and refreshing was the high level of interest among the sciences faculty in establishing various formal and informal partnerships with the Divinity faculty. For example, at our initiative-sponsored “interdisciplinary mixer,” the science faculty outnumbered the divinity faculty by three to one. Another lasting and very positive outcome of the initiative has been the ongoing cooperative ventures between scientists and Howard Divinity faculty through initiatives such as the Center of Theological Inquiry’s symposia on human migrations and astrobiology and the AAAS DoSER’s Engaging Scientists Event Series.

Conclusion: Enthusiasm Tempered by Significant Concerns

Though I am confident that the impact of the Science for Seminaries initiative will be evident for years to come, I have several sets of concerns. I will discuss two.

One set of concerns has to do with reciprocity and balance. The Science for Seminaries initiative is unidirectional. It is clearly dedicated to the work of educating clergy about science. It has no agenda to

educate scientists in the fields of either religious studies or theology, and this includes the scientists intimately involved in the design and execution of the initiative. The initiative enlists scientists to provide knowledge and insight from their scientific disciplines and to opine on the implications of this data for theology and ministry. The problem is, however, that although the vast majority of these scientists are equipped with the expected degree of sophistication in their various fields, they have astonishingly low levels of competency in philosophy and theology. To be sure, the same is true of the vast majority of theologians and ministers participating in Science for Seminaries initiatives: they exhibit high levels of sophistication in their own disciplines, but a contrastingly low level of scientific and even philosophical literacy. The difference is that, although the project is designed to address this imbalance on the side of the participating theologians and ministers, it does nothing to address the analogous imbalance among participating scientists.

A presupposition of the project is that no theologian and/or minister can claim the cultural fluency necessary for true professional competence without a basic knowledge of science and its implications for the practice of faith. I strongly agree and, as I mention above, I have agreed with this presupposition from my youth. The question is: can we also say that no scientist can claim the cultural fluency necessary for true professional competence without a basic knowledge of religion/theology and its implications for the practice of a scientific vocation? If this is a thoroughly legitimate question—and I am convinced that it is—then it raises immediate concerns regarding what, if anything, is being done or proposed to revise curricula in the sciences. The Science for Seminaries initiative addresses a very real deficiency in theological curricula, but to the exclusion of what I would argue is an ontologically related deficiency in science curricula.

My second set of concerns has to do with the extent to which the Science for Seminaries initiative raises larger issues regarding the opening and closure of the assessment loop in graduate theological education.

In 1966, the American Association of Theological Schools issued a “Statement on Pre-Seminary Studies.”⁸ According to the statement, a person entering theological education should undertake a course of study which will enable them to understand the physical world and to think clearly and critically, with both of these outcomes achieved through the sciences. In the decades following 1966, several theological schools have strayed considerably from the practice of requiring pre-seminary studies for admission. Increasing numbers of students are being admitted to theological schools without bachelor-level majors in the humanities. Those students with undergraduate majors in the humanities may not be better off. In large part because of wide variation, as well as an increasing lack of breadth and depth across undergraduate curricula in the United States, today’s bachelor degrees—even those in the liberal arts—do not necessarily prepare admitted students for master’s level theological study.

In the summer of 2018, AAAS DoSER held a workshop for seminary faculty participating in Phase II of the Science for Seminaries initiative. According to a survey of faculty participating in Phase I of the initiative, only one-in-five seminary faculty felt they were equipping their graduates for the task. Even the students surveyed thought that they were not being prepared for engagement with the sciences. The workshop revealed that one of the stated goals of Phase II was sustainability, that is, how, in the long term, to equip future ministerial leaders to engage science as they minister in a world saturated with

⁸ “Statement on Pre-Seminary Studies, The American Association of Theological Schools,” *Journal of Bible and Religion* 34, no. 2 (April 1966): 171–173.

science and technology.

I would propose that, before attempting to answer the important question of sustainability, theological educators should avoid falling immediately into a crisis of confidence by assuming that faculty participating in Phase I are failing to equip their students to engage science. Instead, we should be asking ourselves: What does it mean to be “equipped to engage science”? This is a learning outcome that begs to be defined and measured. Decisions have to be made about how to assess the courses and curriculum revisions emerging from Phase I in a way that will show what success (or lack thereof) is actually being made in student learning outcomes. With regard to the Science for Seminaries initiative, sooner rather than later we may have to discuss and develop SMART Learning Objectives,⁹ not only for the initiative itself, but also in concert with the larger question of what students upon completion of their seminary studies should know and be able to do.

⁹ The acronym SMART stands for specific, measurable, achievable, relevant, and time-oriented.

Science, Theology, and Epistemology: Lessons from a Liberal Protestant Seminary

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Andover Newton Theological School (ANTS) is a seminary in the liberal Protestant tradition, whose students come mainly from the United Church of Christ, American Baptist, and Unitarian Universalist traditions. For nearly two decades of its history as an independent seminary, our classrooms included rabbinical students from Hebrew College, our neighbors “on the Hill” and interreligious covenant partners. This means that the ANTS classroom has typically been incredibly diverse with regard to the life experience, affiliation with the Christian tradition, age, ethnic background, and educational credentials of our students, varying significantly from class to class.

Over the past two centuries or so of its existence, ANTS has undergone many significant moments of growth in the process of adapting to shifting cultural and economic contexts. One of these more recent moments centered on the school’s commitment to integrate science more explicitly and vigorously into its curriculum by participating in the Science for Seminaries initiative. ANTS recognized the importance of helping ministers-in-training consider the sciences as integral to their theological education, accessible for their future ministerial lives, and necessary for responsible ministry, especially at a time when many public sectors were debating the validity of climate change science. Many of the faculty had already included science in some way in their coursework, which made attracting them to the goals and tasks of the grant more amenable and exciting. I can say with confidence that there was little to no resistance to this challenge.

Making the Initiative Our Own

One of the strengths and defining characteristics of the Science for Seminaries initiative is a certain built-in flexibility designed to accommodate the specific curricular interests and needs of particular schools of theology and their faculties. For example, the grant required that we develop working relationships with scientists who would make themselves available for consultation and would participate as guest speakers in the classroom as well as in special public events. Pursuant to ANTS’s own curricular goals and faculty interests (some of which I will discuss below), the group of scientists with whom we were blessed included an astrophysicist, a molecular biologist working in research and development of pharmaceutical technologies, and a medical doctor who specializes in pain management and the neuropsychology of pain.

There were at least a couple of other ways in which ANTS was able to adapt the initiative to serve its specific needs as well as to draw on the special strengths of existing institutional relationships. One was to ensure that initiative resources could be adapted for use in fully online as well as face-to-face (F2F) teaching formats. My own experiments with the “Introduction to Christian Ethics” course included both online and in-person pedagogies and experiences. Another was to take full advantage of our

connections with some of the world-class colleges and universities of the greater Boston area in order to benefit from the gifts of a significant number of potential partners from the scientific communities of these institutions. Not only were these partners willing to participate, but they openly, genuinely, and generously shared their skills and presence in our classrooms—often free of charge or for minimal honoraria.

Science in the Ethics Curriculum

One of the major goals of the initiative is to integrate science into at least two courses required in the master of divinity curriculum. The ANTS faculty was able to do this: across the Systematics I and II sequence; in select Hebrew Bible and New Testament courses; and in “Introduction to Christian Ethics.” Other courses in which science was added included: a Muslim-Jewish-Christian dialogue course, at least one course in spirituality and one in pastoral care, and in “When Home is a Warzone” (a course focusing on pastoral responses to intimate partner violence).

I myself am an ethicist. Almost all of my ethics courses have two principal components. One is a more conventional assignment centered on student interaction with classical readings in the canon of Christian ethics. The other is what I call a “media component” which is designed to expand the unit’s topic to include student engagement with popular media, art, music, poetry, a personal witness story, or even fiction (usually in the form of literature or film). Prior to my work in the Science for Seminaries initiative, I had regularly included some scientific resources in this media component. For example, during a statewide voter effort in Massachusetts to pass a death with dignity measure, I included materials on the medical aspects of physician-assisted suicide in addition to resources on various legislative, pastoral, ethical, and biblical perspectives.

What the initiative enabled me to do was to revise both the online and F2F versions of my “Introduction to Christian Ethics” course with the goal of incorporating science as a conversation partner in most of the course units. I used the grant as an opportunity to explore science as a companion field for the course, assigning as part of the weekly media component a relatively brief and accessible science reading written for a popular audience. I then selected three specific topics in which the science component would be much more developed, and in which students would have to engage scholarly research articles on the subject. These were discussions on human behavior and how environmental and health factors impact a person’s ability to have full mental capacity to exercise what moral theologians refer to as “free will.” Some of the articles I used in this unit included literature on chronic traumatic encephalopathy (CTE) in athletes and how these brain injuries shed new light on the exercise of “free will” as historically construed in the Christian tradition. These scientific resources allowed students to take a fresh critical look at things such as their own understandings of: evil and questions of theodicy and human responsibility; the Adam and Eve story and the doctrine of Original Sin; the exercise of will by Jesus in “embracing” the cross as a salvific act. Other articles and resources provided students with a scientific basis for opening up new avenues of theological reflection and inquiry on a wide range of ethical issues including: the status of “consciousness” in patients in persistent vegetative states and how this relates to end-of-life challenges such as the pastoral dimensions of families making the tough choices of removing ventilators and other life-sustaining technologies from their loved ones; questions surrounding the morality of assisted suicide; and a whole host of theological and ethical concerns generated by climate change science, with particular attention to ocean acidification and its implications for sea life, food supplies, and an increase in cataclysmic weather events.

Student Response

In general, students were very open to the experience of incorporating science into our discussion of ethical topics. In my classrooms specifically, students felt that the added science component was not superfluous, but an integral part of how to do ethical reflection. For the most part they quickly developed an appreciation for the role of reason/science as one beam in the quadrilateral of scripture, tradition, reason/science, and human experience that is the foundation of all authentic ethical and theological reflection.

It was not uncommon for students to express feeling significantly challenged by what the science was telling them about the particular topic we were discussing. This was especially the case in their ethical evaluation of physician-assisted suicide and other end-of-life questions in light of the science of consciousness. It was also true in the area of climate change and their various churches' approaches to environmental ethics. On both these fronts, my students—most of whom affiliate with fairly liberal expressions of Christianity—reported that before their exposure to the scientific resources, they felt that their respective traditions had some of the most informed conclusions and ethical guidelines on the subjects. But when confronted with the science, they determined that their traditions had not thought complexly enough on these issues. They also felt that the scientific literature they were engaging would be of critical importance in raising awareness among the leadership of their faith communities of the need for more urgent conversations.

In some instances, students were more than just surprised by what the science was teaching them; they were disturbed. This was often the case when ANTS students—who generally consider themselves quite progressive, informed, scientifically literate, and open to new forms of knowledge—were confronted with scientific data that did not support the positions their traditions had adopted on certain issues. In certain contexts, their own assumptions about their traditions clashed with the science to which they were being newly exposed. Luckily, in most cases, they embraced these challenges in the classroom in a way they considered safe and encouraging, where ultimately landing on questions was commonly considered a far better option than prematurely concluding they had reached definitive answers on complicated and crucial ethical concerns.

“Stay in Your Lanes, Please!”

By way of exception to some of the aggregate data discussed by my colleague Deborah Gin in her essay, many ANTS students have solid science backgrounds related to their educational and career experiences in a variety of different fields such as engineering, nursing, environmental policymaking and advocacy, or elder care. So, as one might expect, there was little to no objection to the idea that science was an important resource for any theologian and/or minister. Where resistance, if one can call it that, did arise was when students perceived either that science was being presented as dictating religious belief and truth, or vice versa. This felt more like an entrenched conversation about the separation between church and state, where some students insisted on drawing rather stark boundaries between the appropriate “lanes” of science and religion, boundaries which they tended to rigorously apply both to ANTS faculty as well as our guest experts from the scientific community.

I want to be clear. This was not a case of students' attempting to water down the sciences, or not being amenable to the sciences as tools for theological reflection. This was more a case of students' taking issue with the two fields talking to each other in ways that evidenced an intermingling of established expertise with personal belief. In other words, if, for example, scientific experts came to class to talk about the Big Bang Theory, they had better stay in their lanes of expertise and not inject into their presentation any of their own personal convictions regarding the theological concepts of “creation” or “God.” For many of the students, this kind of opining seemed to violate some unspoken rule that the

scientists were supposed to present completely impartial and unbiased science, not tainted, flavored, or colored with their own personal beliefs.

On one particularly memorable occasion a concern arose when one of the seminary faculty members had a concern that a guest scientific expert was being overly clinical—perhaps staying *too much* in his lane? This faculty colleague had a visceral reaction to the way in which, during a presentation on evolution that entailed a focus on everything from the astronomical all the way to the molecular level, this particular science consultant presented certain elements from his field. The faculty member felt that the scientist failed to exhibit any reverence toward the animal world or even respect toward people whose life experiences included illnesses such as cancer. Some of the important, if somewhat neuralgic, questions raised by this particular faculty member at that particular moment were: to what extent can science be pastoral, in the classroom and elsewhere? Should scientists be responsible for incorporating the value of creation, the inherent worth of a living being, or the experience of suffering into their own explanation of natural phenomena such as cancer cells, climate change, animal research, or mental illness?

The Epistemological Questions

Even as I write this, many of the lessons of this experience are still being distilled for me. Here I will mention two that are very closely related.

First and foremost, never assume anything about your students. In engaging the Science for Seminaries initiative, I had assumed that, teaching at a liberal Protestant seminary with many second- and third-career students representing some of the most progressive Christian traditions in the United States, incorporating more science into my Christian ethics curriculum would be a proverbial “walk in the park.” I had assumed that students would welcome the experience, easily assimilate the literature, and smoothly incorporate this new knowledge into their reflections. My mistake was not taking into consideration the ways in which people compartmentalize knowledge and make assumptions about how different fields ought to relate to each other. Yes, my students represented mainly progressive traditions, but they also had very diverse perspectives on how science and religion relate, and most importantly, how these two realms of inquiry and discourse ought to engage in dialogue with each other.

In order to address some of the tensions that arose around the meta-issue of the science-religion dialogue, I designed two capstone events as part of the initiative.

The first was an informal conversation that would bring together our science consultants, the faculty who had participated in the program, students, and ice cream to discuss how our different fields of expertise claim to know what we know. In hindsight, I’m fairly convinced that this key epistemological conversation ideally should have taken place at the front end of the project. What such an explicitly epistemological approach to our respective fields of work and discourse allowed us to do was to engage the concept of “knowledge” from various angles, and discuss how it is that we all approach different genres of knowledge. Thus, we were able to identify and come to terms with the various unspoken ways of compartmentalizing knowledge that gave rise to confusion and conflict during the implementation of the initiative.

The second capstone event was a conference on pain. Drawing from the deep well of Christian claims about and reflections on human suffering and God’s attention to it, we marshalled various scientific and pastoral resources to discuss the science of pain and how this can inform different kinds of pastoral responses to this elemental aspect of the human experience. Among other things, conference

participants explored the complicated relationship between pain management and spiritual practices such as prayer and meditation. Not only did this well-attended event provide area ministers with continued education units, but it served as a model for how the science-religion dialogue could maximize its impact on a teaching and learning community.

The second lesson relates to the concern with mutuality raised by both my colleagues Fred Ware and Paul Metzger in their essays. I have come to the conclusion that one of the biggest challenges and blessings of the initiative was the way in which it raised concerns—however unnamed at first—over the relationship between knowledge and power. Students, faculty, and science consultants alike eventually had to come to terms with the relational implications of posing questions about the nature of knowledge, truth, and dialogue among different ways of accessing truth. What I learned from this is that how one engages different forms of truth and brings them into dialogue with each other ought to be as important a question in the Science for Seminaries initiative as questions about what kind of scientific literature to incorporate into the curriculum, or which units best engage with scientific material.

Both the problem of compartmentalization and the issues of power connected with the social currency of different sets of expertise and knowledge confront faculty and students with at least two major tasks. The first is identifying hard set boundaries we didn't even know we had, describing them, and dismantling them when and where necessary. The second is addressing specific questions about the pros and cons of these boundaries, as well as to what degree these boundaries themselves represent theological assumptions that we simply haven't identified for ourselves or our traditions. These meta-level questions are important to engage prior, during, and at the end of the grant cycle, and represent a distinct task that ought to be just as central to the project as incorporating specific scientific expertise and literature into required courses in seminary curricula. Ideally, it is a task that ought to be conducted at a school-wide level, but also personally for every faculty member and for students in individual classrooms. The seminary classroom strikes me as just the kind of a safe and productive place where these challenging questions can and should be encouraged.

On a more personal note, my experience in the Science for Seminaries initiative has provided a new and rich dimension for engagement and collaboration with colleagues from other seminaries that extends well beyond my field of Christian ethics. Through the initiative I have been blessed with an entirely new set of conversation partners from very different religious traditions. In addition, the support of the AAAS, the wealth of resources through their websites and available experts, has made the initiative a joyful experience. Through the grant and engagement with the AAAS I have found a tribe that allows me to breathe holy scripture written in the stars and black holes, as well as the microbe, algae, and neuron.

Concluding Reflection

In September 2017, Puerto Rico went through the near misses of hurricanes Harvey and Irma. Many religious leaders on the island described a sense of being blessed, even immune to the devastating effect of the onslaught of category 4 or 5 hurricanes crossing the Atlantic, but mainly missing my beloved island. Then, as the massive hurricane Maria approached, these same religious leaders called on God to once again deliver them. They were sure that, just like in the case of Harvey and Irma, Puerto Rico would be spared in a way that showed God's blessing. The confrontations that ensued between meteorologist Ada Monzón and these faith leaders were painful to watch. Ada respectfully honored their religious assumptions about salvation while, in no uncertain terms, describing that there was no mathematical possibility for Puerto Rico to be spared the brunt force of category 5 hurricane Maria. She tried using pro-life language, insisting that folk needed to prioritize saving lives above property, evacuating and taking shelter where necessary. These faith leaders attacked her as unfaithful,

unbelieving, and blind to God's overwhelming love for the island. Well, we know how this story turned out. A year and a half later, blue tarps continue to litter the bird's eye view of many regions on the island. Water service continues to be both spotty and dangerous. And the very fragile power grid cringes at the thought of being battered by storm winds once again. This experience has conclusively confirmed my sense that the work of the Science for Seminaries project is of utmost importance. It is indeed holy work. And we do well to continue to learn from it as well as support it in strategic and sustainable ways.