

The best way to think differently about science and religion is first to realize that the personal beliefs and religious convictions of scientists have never been the root cause of those historical conflicts. The conflicts were—and still are—the result of a clash over the social authority of two important institutions: organized religions that want to control the behavior of citizens in the name of a creator and science as a collective organization that pursues the empirical and naturalistic explanation of nature. Negating a reality that one dislikes is not the best way to change it for a better one.

Reference

1. For more about books censored by the Catholic Church between the 17th and 20th centuries and other limits on scientific thought, see Y. Gingras, *Science and Religion: An Impossible Dialogue*, P. Keating, trans., Polity Press (2017).

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► **McLeish replies:** I am grateful for the invitation to respond to these letters. I should remark, first, on the overall nature of additional responses sent directly to me. Colleagues had suggested that I be prepared for much negative feedback. Of the more than 100 readers—from high school students to emeritus professors—who emailed me, all were positive; they agreed that moving beyond a narrative of conflict was important in the public understanding of science. Many physicists with a faith commitment wrote of their experience that science and faith are mutually coherent and reported that the article had stimulated ways of expanding their thinking and had affirmed the necessity of doing so.

Of the letter writers to PHYSICS TODAY, Gregory Baker and Kenell Touryan represent the voice of the wider personal correspondence. Baker is also surely right about a “silent minority” who could and ought to be less silent about constructive engagement between science and religious communities.

Ray Stefanski’s letter, on the other hand, is an excellent example of the asserted but repeatedly unevicenced narrative of conflict that I suggest has long had its day. His point that theology is “sacrosanct” and “resists innovative ideas,” in stark contrast to science, is one I have heard many times—despite its

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being simply wrong. The Reformation in the 16th century, the explicit theological motivation for experimental science in the 17th, and the radicalism of liberation theology in the 20th are just three examples of the historical development of the theological ideas. The data are inconsistent with a "frozen theology" theory.

Stefanski then catalogs the alternative facts, largely invented by John William Draper and Andrew Dickson White in their 19th-century polemical works, that shape much of the misinformed narrative of the relationship of science and theology today. I address those arguments with references to real historical scholarship: The Vatican actually encouraged Copernicus to publish¹ and found *De revolutionibus orbium coelestium* largely unproblematic; the Galileo affair is much richer and more complex than the standard one-liner—and it is essential to understand that all the personalities involved were believers;² Bruno was not executed for his scientific ideas;³ and Newton's unorthodox theological ideas refute Stefanski's first point.⁴ His final comment is well taken: No one is claiming that theology can be "made into a science"; however, I suggest that it informs

the narratives we live by and the values and virtues by which we do science.

Abdul Naseer Malmi Kakkada is right to remind us of the need to move from claims based on authority to those evidenced by experiment and observation; he also rightly highlights the essential role of Islamic natural philosophers in the development of science in the medieval period. He makes a helpful point, as well, about the way scientific ideas are conceived and developed. When a scientific idea is new, it is usually half-formed and formally contradicts at least some data. Nurturing our infant scientific ideas and having faith in them is important if they are to develop to maturity and withstand the robust criticism of our peers.

In terms of Kakkada's notion of a "shared intellectual tradition," I have found it helpful to compare the Christian life (in my own case) with the early stages of a scientific investigation—that is, gathering evidence and adjusting the hypothesis—rather than with the later stage of resolving the hypothesis into a set of established theories. For further discussion, see my 2014 book *Faith and Wisdom in Science*.

Philip Stahl points out that science re-

stricts its inquiries to topics for which its tools are effective. It isn't clear whether he is advocating the logical-positivist position that scientific statements are the only meaningful ones, but he comes close; I don't know how my personal experience of love could be "approached in any scientific or objective way," but I would not deduce in consequence that it doesn't exist. The real fallacy that Stahl brings up, however, is the characterization of religion as fundamentally embracing a supernatural order and thus being irreconcilable to science. Allow me to unravel some reverse logic here.

Although religious tradition naturally requires discourse about personal and corporate encounters with divinity in order to make sense of history and experience, it is far less concerned with the supernatural than with life, hope, and justice here on Earth. So it is not right to declare a parting of the ways at the start. Nor is it appropriate to complain that experience and exploration of God is devoid of rationality. Stahl's presentation of two alternative and fundamentally competing worldviews derives not from a knowledge of history or theology, but ultimately from the Draper and White



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polemics, whose alternative history introduced that perspective. For a more nuanced reading of history, see reference 5.

Stahl's letter also manages to capture the misinformed philosophy of most late-modern confusions, especially neo-atheist ones, about the nature of deity.⁶ "Everything has a cause," says Stahl, quoting Paulos, quoting Thomas Aquinas, quoting Aristotle. He omits the reminder that the argument of no infinite causal recursion was used by Aquinas, who ran it in reverse as an argument for theism.

As for "superstition," 8th-century English Christian scholar Bede advocated the study of science as a God-given faculty to counter superstition!⁷ Let's let that sink in. That science can set a person free from some types of fear was a favored insight of Marie Curie, yet it finds its roots in Christian tradition.

I am grateful for the corrective words of Yves Gingras. I did not mean to convey that there is no conflict ever in practice between religious and scientific institutions and individuals. Far from it—conflicts can and have been created by both. I don't apologize for stressing the narrative evidence that conflict is not necessary, since the vast majority of written and broad-

cast material we encounter leans the other way and enlists a good deal of the falsehood repeated from Draper and White.

Church authorities do accrue power and have at times very sadly sought to use it to suppress truth and discovery. For example, Copernicus's book was indeed eventually "provisionally-banned" pending corrections, albeit more than 70 years later. Such suppression also happens today, tragically and unacceptably, in churches that insist that their young people disbelieve the evolutionary biology that they learn in school. Gingras is correct that the word "religion" has now, and has had in the past, several meanings, which tend to confuse the discussion. The same, of course, is true of the word "science."⁵

It's essential, especially for young people and students, that we drop false stories that unnecessarily create obstacles to the enjoyment and understanding of science. In our book *Let There Be Science: Why God Loves Science, and Science Needs God* (2017), leading UK high school physics teacher David Hutchings and I have attempted to put some of the scholarship I've referred to above into a readable form. The message is not to urge either a theist or atheist position. In the

modern world, those positions clearly represent individuals' choices based on their experience, investigation, and reflection. But two points are essential: First, one's choice in that matter is not tied to the activity and findings of science; and second, churches and communities of faith can and must recognize and celebrate science as a gift, not a threat.

References

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4. R. Iliffe, *Priest of Nature: The Religious Worlds of Isaac Newton*, Oxford U. Press (2017).
5. P. Harrison, *The Territories of Science and Religion*, U. Chicago Press (2015).
6. D. B. Hart, *Atheist Delusions: The Christian Revolution and Its Fashionable Enemies*, Yale U. Press (2010).
7. Bede, "On the Nature of Things" and "On Times," C. B. Kendall, F. Wallis, trans., Liverpool U. Press (2010).

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