



# History of Science

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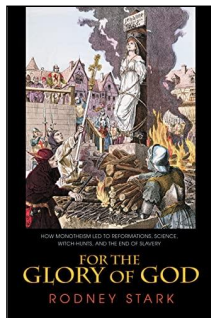
<https://peacefulscience.org/articles/history-of-science/>



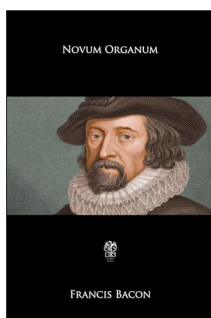
It often seems like science and our faith are in constant conflict. Christians and scientists are often at war, attacking each other's views. However, in the history and philosophy of science, Christians and scientists can find substantial common ground.

Remarkably, scientific education includes almost no exposure to the history and philosophy of science. Most scientists know very little about science's history outside the recent history of their narrow discipline. Scientists, however, are very curious about this history, and we can find common ground in it. Alongside their scientific work, I recommend Christians in science steadily and consistently study the history of science.

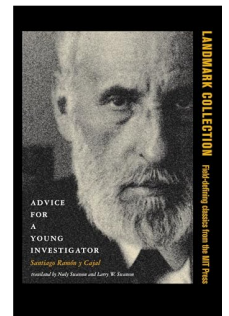
A useful overview of Christians in science history is *For the Glory of God* by Rodney Stark in 2003. My wife and I read it together a few years back. Some historians caution that Stark overstates the case for the Christian roots of science, and this may be true. Nonetheless, the overview is helpful, pointing out several key Scientist Christians and explaining the medieval context in which science was originally forged.



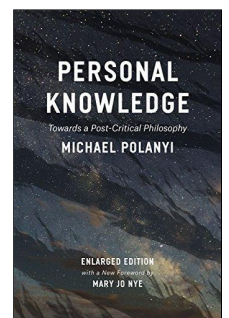
Francis Bacon's *Novum Organum* from 1620 should be required reading for every scientist, and I read it in 1996 as a freshman. Here the entire modern scientific enterprise is founded. All the key components of the scientific method are here, including methodological naturalism, empiricism, reproducibility, falsifiability, and more. Stunningly, at least to me, all these components are explained as efforts to take down intellectual "idols," so that we may see nature clearly. Bacon envisions science as a monastic religious exercise, a discipline devoted to turning from idolatry to see God's work in nature clearly. Modern science, at its foundation, is explained in distinctly Christian terms.



I read *Advice for a Young Investigator* by the great scientist Santiago Ramón y Cajal in 1897 in undergrad as a biology student in 1998. Ramón y Cajal, it seems, left his Catholic upbringing, and was described by historians as "a liberal in politics, an evolutionist in philosophy, an agnostic in religion."<sup>1</sup> He later returned to belief, describing the scientist as a worshiper. "He renders to the Absolute the most pleasing and acceptable homage—studying His prodigious handiwork so as to know, admire, and revere Him through it."<sup>2</sup> *Advice for a Young Investigator*. Translated by Neely Swanson and Larry W. Swanson. Cambridge: MIT Press.] Likewise, "He is devoted entirely to understanding something of that mysterious language that God has written in nature."<sup>3</sup> Just a few years after publishing *Advice for a Young Investigator*, he was awarded a Nobel Prize for his stunningly beautiful work that, essentially, founded the field of neuroscience.



I encountered Michael Polanyi's work in 2001. He was a physician and a chemist, who eventually became most known for his work on the philosophy of science, saying "we know more than we can tell." Polanyi was also a Christian, and explained science's dependence on trust and tacit knowledge. A gentle introduction to his work is available in an audio recording from Mars Hill Audio, *Tacit Knowledge, Truthful Knowing* in 1999.



Currently, there is growing recognition that character is necessary in science. This echoes Bacon's focus on ending idolatry, Ramón y Cajal's mentorship on personal virtues, and Polanyi's articulation of tacit knowledge. A branch of philosophy, "virtue epistemology," is reviving this perspective and finds its

1. John Brande Trend (1965). *The Origins of Modern Spain*. Russell & Russell. Carolyn Sattin-Bajaj (2010). Marcelo Suarez-Orozco, ed. *Educating the Whole Child for the Whole World: The Ross School Model and Education for the Global Era*. NYU Press.
2. Ramón y Cajal, Santiago (1999) [1897]
3. This quote is in both his Nobel lecture and also his book. Ramón y Cajal, Santiago (1999, originally 1897). *Advice for a Young Investigator*. Translated by Neely Swanson and Larry W. Swanson. Cambridge: MIT Press.

scientific expression in Robert T. Pennock and “[The Scientific Virtues Project](#).” Science in its culture silently defines many critical virtues and enforces several rituals to encourage their development. For example, Pennock cites “honesty,” “curiosity”, and “humility to data” as critical to scientific inquiry. Jesus speaks to this too, emphasizing the importance of being a “seeker” on a curious and humble quest for truth. Even when encountering evidence of God in nature, unless we seek, we will not see God. The character of a seeker is required for evidence to be understood. In this recognition of character by Jesus, I find substantial common ground with science.

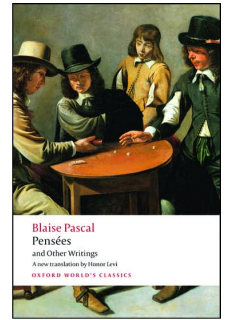
I recently found Robert Boyle’s work. He was a devoted Christian and a scientist in the 1600s. The science historian Ted Davis is the leading expert on Boyle, and writes about him in a series available on the web. I was struck by Boyle’s focused devotion to science but careful thoughtfulness in theology too. In the current debates about methodological naturalism, his role in establishing this rule is important and instructive. The first post in the series is here: [<http://biologos.org/blogs/ted-davis-reading-the-book-of-nature/the-faith-of-a-great-scientist-robert-boyles-religious-life-attitudes-and-vocation-part-1>].

Boyle was one of the first modern scientists. His work on air pumps in 1660 and mercury barometers in 1665 proposed the existence of a true vacuum. Foreshadowing the current creation debate, one of his critics, Francis Line, actually argued that divine intervention explained Boyle’s experimental results, because his theory was clearly wrong: “nature abhors a vacuum.” In his response, Boyle replied that the question is not “[what God can do, but about what can be done by Natural Agents](#).” At the same time, Boyle was a Christian who believed that God has absolute power, could work outside the laws of nature at will, and certainly caused miracles like the Resurrection. Understanding His divine action and exploring theology, however, was completely outside the purpose and scope of science, which instead was narrowly concerned only with natural causes in the physical world.



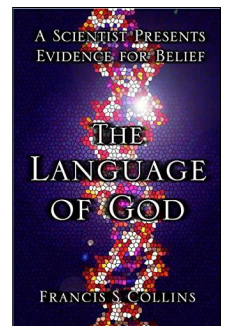
The great scientists and father of Intelligent design, Robert Boyle.

As Christians, we know that human study of nature cannot reliably guide us to God (Romans 1:20-23). Neither human study of nature alone, nor any other human effort, brings us to God because we cannot reach Him on our own. God’s solution to this problem is to reveal Himself to us in the life, death, and resurrection of Jesus. Without God’s revelation, we would have no hope of finding Him. Without the willing sacrifice of the Cross, we would not know that God is good. Without the Resurrection, we would not know that Jesus was really from God. This is why scientists who are believers, just like all of us, come to faith because of the testimony of Jesus in history, not because of any specific understanding of creation.



I first read Blaise Pascal, the great scientist and mathematician, in high school. He was a contemporary of Boyle, and towards the end of his life started writing a book to explain his faith. He died before he finished, but we still get to see his notes, *Pensees*. Inspired by science, Pascal writes, “at the center of every human being is a God-shaped vacuum which can only be filled by Jesus Christ.” He also writes, that God “renders [us] incapable of any other end than Himself. Jesus Christ is the end of all and the center to which all tends.”<sup>4</sup> Pascal’s example for us is important. He did not argue for the existence of an “unknown” god, but explained the world changing significance of the life, death and resurrection of the named “Jesus.” He declared the Gospel in a way that made sense to scientists. Closely connected to this declaration, though, is his emphasis on the weakness of arguments for God in science. Pascal echoes Romans when he writes, “All those who have claimed to know God, and to prove Him without Jesus Christ, have had only weak proofs.” Pascal, like Bacon and Paul, doubted that any human effort to study nature could bring us to God. Only through God’s work in Jesus, not the human study of nature, do we come to confident belief that God exists, is good, and wants to be known.

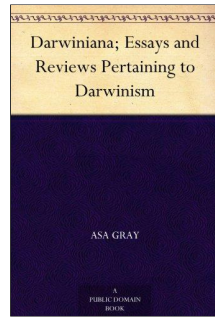
One of the most important books to read is *The Language of God* by Francis Collins, which I read in 2006 when it was published and I was in graduate school. This book is controversial among some Christians, because Collins advocates for evolution. But whether you agree with him or not about evolution, Collins correctly points to Jesus. Importantly, because Collins is so famous and the book was published right after the Dover Trial, many scientists who are not Christians also read this book. To this day, members of the science community curiously discuss his story. Collins confuses many scientists, because they do not understand how a single cancer patient could change the course of Collins’s life. As Christians we believe Collins encountered the living Jesus, and this changed everything. His story is a place Christians can find common ground with scientists who are not believers: a place of mystery where we, as



4. Pascal, Blaise (1958, orig. 1660). Translated by F. W. Trotter. *Pensées*. Christian Classics Ethereal Library.

Christians, clearly see Jesus and scientists who are not Christians can ask questions and explore.

I could go on and on. Even the controversial parts of scientific history, like the history of evolution and Galileo's experience with the Catholicism of his day, expose a deep tradition of Christian thought in science (for example, *Darwiniana* by Asa Gray in 1888 and *Astronomia Nova* by Johannes Kepler in 1609). This history is valued in science, even though many scientists forget. It is as if scientists labor in a grand house that someone else built a long time ago. We do not know why walls are placed in their particular ways. We do not know the original names of rooms and hallways. We do not even know our foundation is in theology. Forgetting the house's history, we forget that Christians were among the house's architects, and they have stories to tell about the things that happened here. Christians in science do well to study this history alongside their scientific work. These stories can point us to Jesus.



Scientists are curious about this history, and here we find substantial common ground. History tells us that modern science at its historical foundation—even with the rule of methodological naturalism—was compatible with acknowledging the Creator.

Even with all this common ground, Christians sometimes still find themselves at war with scientists. This is because so much effort is devoted by many Christians to politically attacking evolution, especially how it is taught in public schools. I don't believe that Jesus calls us to fight culture wars to control how scientists teach science. He does, however, send us to declare the "word about Jesus" (Romans 10:13-17); we know an unimaginably good God exists and wants to be known because, according to prophecy, Jesus died, was buried, but then He rose again and was seen by many (1 Corinthians

15:4-5). Christians, especially those in science, should leave political battles over evolution alone, and instead explain Jesus from common ground.

Choosing peace in the creation war is radical, unexpected, and only makes sense in light of confident belief in Jesus. Creation pacifism rightly declares that nothing in science threatens Jesus. Nothing here diminishes Him. We should respect scientists' right to teach science, and welcome everyone to consider Jesus.

## Resources for Further Study

Bacon, Francis [1620]. *Novum Organum*. Project Gutenberg ebook version, edited by Joseph Devey:

Collins, Francis (2006). *The Language of God*. (New York: Free Press, an imprint of Simon & Schuster).

Davis, Ted (2013–2014). *Reading the Book of Nature. The Faith of A Great Scientist: Robert Boyle's Religious Life, Attitudes, and Vocation (blog series)*. Biologos blog.

Mars Hill Audio (1999). *Tacit Knowledge, Truthful Knowing: The Life and Thought of Michael Polanyi* (audio recording).

Pascal, Blaise (1958) [1660]. Translated by F. W. Trotter. *Pensées*. Christian Classics Ethereal Library. Available online here.

Pennock, Robert T. "The Scientific Virtues Project." Website.

Ramón y Cajal, Santiago (1999) [1897]. *Advice for a Young Investigator*. Translated by Neely Swanson and Larry W. Swanson. Cambridge: MIT Press.

Stark, Rodney (2003). *For the Glory of God*. Princeton: Princeton University Press.

## References

<http://www.gutenberg.org/files/45988/45988-h/45988-h.htm>

<http://image.sciencenet.cn/olddata/kexue.com.cn/upload/blog/file/2010/10/2010101216310315728.pdf>

<https://marshillaudio.org/catalog/tacit-knowing-truthful-knowing>

<https://www.nature.com/articles/nj7597-139a>

<http://biologos.org/blogs/ted-davis-reading-the-book-of-nature/the-miraculous-meniscus-of-mercury>

<http://biologos.org/blogs/ted-davis-reading-the-book-of-nature/series/the-faith-of-a-great-scientist-robert-boyles-religious-life-attitudes-and-vocation>

<http://www.ccel.org/ccel/pascal/pensees.html>

<http://bbs.sciencenet.cn/upload/blog/file/2010/10/2010101216310315728.pdf>