

invoked because the deployment of genes had contradicted evolutionistic expectations of nested hierarchies.

Throughout this work, Smith makes vague claims, such as mention of embryology. What he does not tell the reader is that embryological stages are deemed to ‘skip’ evolutionary stages when they do not agree with phylogenies. He also claims agreement between molecular clocks and the fossil record (p. 215). This, at best, is an exaggeration. Molecular clocks often have to be ‘massaged’ in order to get them to agree with the fossil record. Otherwise, ‘ghost lineages’, sometimes tens of millions of years long, have to be invoked to explain away discrepancies between the two systems.⁴

Conclusions

This is certainly a good biology book. However, it is not difficult to see that this book is nothing of the sort as claimed by its title. It provides no evidence for the factuality of evolution. Instead, it *assumes* evolution and then looks at every living thing and process through that lens.

References

1. Theologians claiming “Evolution works because God is directing it” is like a farmer claiming “My tractor works because my horse still invisibly pulls it”, although rational people would realize that the tractor has *replaced* the horse. See Woodmorappe, J., The horse and the tractor, *Creation* 22(4):53, 2000; creation.com/horsetractor.
2. James Hannam, who earned a doctorate in the history of science from Cambridge University, UK, documented this in his book *God’s Philosophers: How the Medieval World Laid the Foundations of Modern Science*, Icon, London, 2009. See also the even-handed review by Statham, D., *J. Creation* 24(2):31–34, 2010.
3. For just one example, see Sarfati, J., Christopher Hitchens—blind to salamander reality, creation.com/hitchens, 26 July 2008. Indeed, as noted, a shrivelled eye might be an advantage in the dark, since ordinary eyes would be prone to damage. There is also a pleiotropic effect in some cases.
4. Doyle, S. and Nethercott, P., Ghosts in the rocks, creation.com/ghost-lineages, 14 July 2011.

Scientific orthodoxy, theological innovation

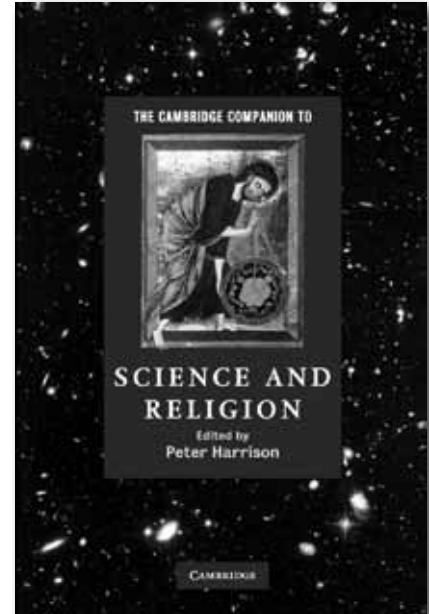
A review of
*The Cambridge
Companion to Science and
Religion*
by Peter Harrison (Ed.)
Cambridge University Press,
Cambridge, 2010

Daniel Davidson

This book is divided into three parts, each containing four to five chapters. The first part addresses the historical interactions between science and religion. The second part examines selected contemporary issues in science and religion. The third part contains philosophical perspectives on the relationship between science and religion. Peter Harrison notes in the introduction that the book focuses almost exclusively on Western monotheistic perspectives (meaning primarily Christianity).

The book’s contributors all represent what might be classed as middle-of-the-road perspectives on science and religion: sympathetic to religion and deferential to scientific orthodoxy. No contributors represent creationist or design perspectives, which would challenge the scientific orthodoxy. Neither are there any contributors of the Richard Dawkins variety, who actively oppose religion in the name of science.

It would be fair to say that scientific ‘orthodoxy’, when it comes to evolutionary uniformitarianism, is the non-negotiable for the contributors, while theological orthodoxy is not.¹ Particularly in dealing with contemporary issues, the contributors clearly want to find ways for peaceful coexistence between modern science and religion. But coexistence is usually



a one-way affair. Where religious orthodoxy clashes with scientific orthodoxy, it is the religious perspective that is creatively reinterpreted (as in ‘creative accounting’). Creation or design perspectives are distinctly unorthodox and are repeatedly mentioned as virtually the touchstones of bad (unorthodox) science.

Historical perspectives

The historical chapters are primarily focused on debunking the idea that religion and science have been adversaries (often referred to as the ‘conflict thesis’). American historian of science David Lindberg opens by covering science and religion in the patristic and medieval periods. According to the conflict thesis, the church fathers attacked science and scientific learning as a pagan pursuit, or at least a waste of time. Paul’s warning against ‘philosophy’ in Colossians 2:8 and his critique of worldly wisdom in 1 Corinthians 1 are examples often trotted out (out of context) as evidence

of early Christian anti-intellectualism. But in context, he was talking about *so-called* philosophy and wisdom—he might have used scare quotes if they had been available just to reinforce the context. Unfortunately, Lindberg does not correct the anti-intellectual interpretation of Paul’s statements.

Tertullian’s scathing criticisms of the classical pagan tradition are usually the other focus for those who claim that early Christianity was anti-intellectual.

Lindberg argues that the idea that the early church was antiscience or anti-intellectual is a myth. Tertullian’s broad critique of science was the exception rather than the rule among the early Church Fathers. Augustine was more representative. He believed that the study of God, Scripture, and theology had priority over the study of nature, but that is a far different thing from opposing the study of science. Lindberg also briefly debunks the myth that an anti-science Christian mob killed the pagan mathematician Hypatia of Alexandria in AD 415. The truth is that Hypatia was killed by a mob, but for political reasons unrelated to science² (Lindberg could have added that her rough contemporary, Christian historian Socrates Scholasticus, was quite an admirer of hers, and bitterly denounced her murder as “nothing can be farther from the spirit of Christianity”).³

Lindberg argues that the medieval church largely reflected Augustine’s attitude toward science: it was certainly not a priority of the church, but neither did the church oppose those who pursued science. By fostering the creation of educational institutions and universities, the church indirectly became the major promoter of scientific knowledge.

Yet Lindberg is uncomfortable with the claim advanced by some scholars (such as Stanley Jaki and Rodney Stark) that science arose due to the Christianity of medieval Europe. This is problematic, Lindberg says, because the church was not trying to

advance science and there were the occasional conflicts between church and scientists. It seems, though, that Lindberg confuses two distinct issues here. First, there is a historical claim that the relationship between science and organized religion was uniformly harmonious in this period. Second, there is the claim that Christianity provided a set of theologically rooted presuppositions about how the world worked that were an indispensable component in the development of science.⁴ Lindberg rejects the first claim, which is fair enough; history is rarely so clear-cut. But in doing so, he seems to think he has rejected the major argument offered by those who believe that science arose due to Christianity. In fact, the more important argument is contained in the second claim. Lindberg unfortunately does not engage with that claim.

Lindberg’s essay is followed by chapters that continue in chronological fashion. British historian of science John Henry picks up the history where Lindberg left off, describing the role of religion in the scientific revolution. He easily demonstrates that the scientific revolution was suffused with religiosity and explains that the stories of Copernicus and Galileo do not actually fit the conflict thesis. The more difficult issue is to untangle exactly how various religious perspectives (Protestantism, Catholicism, and Puritanism) affected the way their adherents approached science. Henry summarizes some of the literature on this subject. In particular, he favourably cites the work of Peter Harrison, who suggested in several well-regarded books (previously reviewed in this *Journal*)⁵ that Protestant views of Scripture and of the Fall of man both helped to provide impetus for the scientific enterprise.

Jonathan Topham, a specialist in the cultural history of science in late Georgian Britain, turns to natural theology, the idea that religious truths can be learned from natural sources. He describes the origin of natural theology in the medieval scholastics and then its rise to prominence in the scientific revolution. Natural theology was a major interest of the many religious scientists who made up the scientific revolution and it served as an apologetic defence of Christianity against skepticism. Natural theology was widely accepted by the era of the Enlightenment, but Topham suggests that it began to decline in popularity in the 19th century. By the time of Darwin, many of the prominent intellectuals who engaged in natural theology had already moved to an almost naturalistic emphasis on natural laws. God was the lawgiver and did little else. As a result, Topham suggests that Darwin arrived at a point when England, in



Figure 1. Tertullian, early Church Father and critic of Greek philosophers. In the first chapter of *The Cambridge Companion to Science and Religion*, historian David Lindberg examines the views of the early and medieval church on science and the study of nature.

particular, was ready for a naturalistic, law-based mechanism to explain life. Jon Roberts then looks at the religious reactions to Darwinian evolution. Initially, most of the religious critics focused on making scientific arguments against evolutionary theory, while the scientists who accepted Darwin's ideas did so less because of scientific evidence but more because of a philosophical commitment to naturalistic mechanisms in science.

Rounding out the historical section, John Hedley Brooke, a British historian of science, argues that there is no simple relationship between science and secularization. Brooke notes that science has been used by both apologists for religion as well as by skeptics of religion. But he suggests that, even then, science by itself has not been a particularly potent tool for secularizing people on an individual level. He cites studies that found that professed unbelievers almost never named science as the major reason for their unbelief. Social, political, and economic changes have been more important cultural factors for weakening religion than has science, he says. And where science has contributed to the decline in the plausibility of religious doctrines, it is because religion paved the way, Brook argues in an ironic twist. The religious apologists who developed natural theology and eventually fell into deism laid the foundations by which science could be perceived as an alternative to religious revelation.

Contemporary issues

The section on contemporary issues begins with a chapter on creationism and intelligent design. It is written by Ronald Numbers, the American historian of science best known for his book *The Creationists*. In this chapter, Numbers repeats the basic thesis from that book—namely, that ‘creationism’ (by which he means a belief in the historicity of Genesis, including a young earth chronology)

is not a traditional Christian belief. Instead, Numbers argues that modern creationism began with Seventh-Day Adventists in the early 20th century. Their ideas were then popularized to a wider audience of conservative and fundamentalist Christians by John Whitcomb and Henry Morris. The Intelligent Design (ID) movement comes across as little more than warmed-over creationism.

There are problems with this account. Most fundamentally, Christians have traditionally understood the Genesis creation account as real history for most of church history,⁶ so it is hardly fair to attribute what Numbers calls ‘creationism’ to fringe Adventist theorists. It is really the historic understanding of most Christians.

Another problem is that Numbers makes only a cursory attempt to chronicle the intellectual development of the creationist movement. A more thorough treatment here would present the movement as considerably more sophisticated than Numbers’ one-dimensional portrait and would also allow him to more accurately explain both the differences and the points of convergence between young-earth creationism and ID. These problems aside, Numbers’ account is perhaps most interesting for its gloomy conclusion (gloomy to him, anyway), in which he says that there is little prospect that the Darwin doubters will be won over to “evolutionary orthodoxy” anytime soon (p. 144). With that, I have little to quibble with.

Numbers’ chapter is primarily descriptive, but following chapters wrestle with some of the normative issues of science and religion. English paleontologist Simon Conway Morris tackles the issue of whether Darwinism is compatible with purpose, and William Stoeger, staff scientist for the Vatican Observatory, looks at the big bang and the doctrine of creation. Both grapple with the question of how directly God can interact with the

created order. Neither wants to be seen as advocating a design position but both want to find some place for God in nature. Stoeger sketches a theology of nature that essentially does away with any doctrine of creation. He is content for theology to be concerned with understanding a kind of abstract purpose underlying nature.

Conway Morris has the difficult job of trying to reconcile purpose of any sort with Darwinian evolution. He does this by arguing that organisms have some sort of tendency to evolve in a particular direction, and often biological forms converge by “navigating repeatedly to the same solution” (p. 150).⁷ This tendency, he says, indicates that if we re-ran the tape, evolution would still give us the same result. By making the evolution of consciousness inevitable, Conway Morris believes he has a rebuttal to those who believe that Darwinism is a completely chance, meaningless process. By accepting his proposal that “evolution can be seen as a mechanism that ultimately allows at least one part of the universe to become self-aware”, Morris hopes that “we may find fertile new ground for a dialogue between science and religion” (p. 166).

Conway Morris spends much of the chapter sketching out the evidence that the path to “human-ness” is inevitable. He gives a quick overview of key transitions in the phylogenetic lineage of humans: the origin of eukaryotes, of animals, of the nervous system, and of intelligence. At each stage, Conway Morris acknowledges a lack of evidence about the details of the transition. Nonetheless, he is quite convinced that each transition also supports his inevitability thesis. The choanoflagellates have various molecular systems necessary for cell signaling and cell adhesion, among other things, and this leads Conway Morris to characterize them as metazoans-in-waiting. About the nervous system, Conway Morris again emphasizes the early origin of

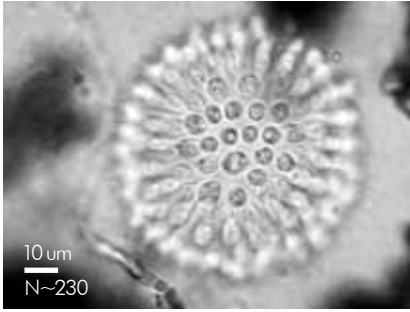


Figure 2. A colony of choanoflagellates, single-celled organisms considered to be the closest relative to sponges. Simon Conway Morris focuses on these and similar organisms at the transition points in the evolutionary story, arguing that each transition was likely to occur and that intelligent life was ultimately inevitable.

molecules necessary for a nervous system, long before the nervous system originated. With all of this groundwork already in place, the origin of nervous systems does not seem so surprising, Conway Morris says, “We can similarly argue that not only is the evolution of a nervous system very probable, but so too are complex brains”, he writes (p. 160). Conway Morris compares evolution to a search engine which repeatedly discovers what works. Since life is so finely tuned, there are very limited numbers of possible biological systems that work, so evolution will more or less inevitably find those particular arrangements. (But surely then life is more likely to become extinct if it doesn’t chance on these few working systems.) Consciousness is discovered when “neural matter ... encounters mind” (p. 165). We as humans are thus totally natural yet unique and special—the only creature in which evolution discovered consciousness.

The broad outlines of Morris’s argument are not particularly original. Most of it sounds, ironically, very much like the old debate between Richard Dawkins and Stephen Jay Gould about whether evolution was progressive. Gould argued that evolution would turn out completely differently if the tape were rewound and replayed and that there was

no tendency toward increasing complexity. Dawkins argued that evolution was progressive.⁸ The main difference between Dawkins’ position and Conway Morris’s is that Conway Morris is willing to leave room for God and religion in the planning stages.

But if God *is* the one who plans evolution, then it would seem that Conway Morris should be less shy about addressing the implications. As it is, Conway Morris wants evolution to be purposeful, but he does not want to invoke direct divine action at any particular point in the process. (That would disturb the naturalistic scenario and expose Conway Morris to ‘God of the gaps’ accusations.⁹) But Conway Morris’s suggestion about purpose implies that God acted *somehow*. If Conway Morris really wants this account of evolution to be taken seriously by theologians and scientists alike, his challenge is to provide some account of the naturalistic mechanism that underlies the template guiding evolution, and to explain something about just how he understands God’s providence to work.

The next two chapters cover psychology and bioethics. Both chapter authors believe that the dialogue between science and religion should be a two-way conversation. They clearly believe that theology should be informed by science; but how much can science be informed by theology? Fraser Watts, clinical psychologist and Anglican minister, suggests that Christian theology can “enrich” psychology by encouraging more study on the subject of forgiveness. But he spends more time considering ways that mainstream psychological science can contribute to religious understandings (of human anthropology and of prayer, among other things). The conversation may not be one way, but from Watts’s chapter, it does seem that science does *most* of the talking.

John Evans, Professor and Chair of Sociology at UC San Diego, writing on bioethics, provides a historical perspective on the rise and decline of religious voices in bioethics debates. Religious voices played an important role in establishing bioethics as a field in the mid-twentieth century. At this level, the debate focused on ends—what should the ethical guidelines be? But as the field became more established, medical and scientific decision makers came to some level of agreement about basic ethical guidelines (autonomy, beneficence, non-maleficence, justice). The debate then began to centre more on means—how do we act so as to comply with the (rudimentary) ethical guidelines we have agreed upon? The major religious contribution came in the debates over ends rather than means, Evans suggests. And as a result, religious voices seem to be comparatively less important to scientists and medical professionals who make bioethical judgments on a day-to-day basis. Evans, more than Watts, is descriptive rather than prescriptive. As a result, Evans does not explicitly take a position as to how science and religion should dialogue over bioethics. He does implicitly leave room for more two-way conversation between scientists and theologians in the future.

Philosophical perspectives

Michael Ruse, well known evolutionary philosopher, opens the section on philosophical perspectives with an essay on naturalism. He distinguishes methodological naturalism (meaning that “in doing science one assumes that there are no God-directed supernatural causes like miracles”) and metaphysical naturalism (meaning that “there are no supernatural factors or entities”) (p. 229). Ruse goes on to argue that methodological naturalism need not slide into metaphysical naturalism and that it is completely possible for one to subscribe to methodological

naturalism while also holding to Christian beliefs. In the process, Ruse informs us, one might have to give up beliefs in the miracles in the Bible, including the Resurrection, but he dismisses it, saying that those miracles are “a bit iffy theologically” anyway (p. 236). Ruse, a friendly and genial agnostic, does not seem to fully realize that he is asking Christians to abandon the central tenets of their faith in the process of accepting methodological naturalism—hardly a satisfying result! Evidently nothing much has changed since his 2001 book *Can a Darwinian Be a Christian?*¹⁰

Nancey Murphy, Professor of Christian Philosophy at Fuller Theological Seminary, writes about the subject of causality. She criticizes the reductionist approach that assumes that “all causation occurs at the bottom of the hierarchy of complexity” (p. 244). Building on the work of philosopher Robert Van Gulick of Syracuse University, Murphy explains that events and objects are determined not just by their physical constituents, but also by the location of those constituents within the composite. Causation is not just bottom-up, but it is also top-down. In this, Murphy believes that we can find space for the action of God in nature. She is unwilling to suggest that God might directly intervene in nature at any level higher than that of quantum indeterminacy. She would have little room for biblical interpretation that takes seriously miracles, such as special creation, multiplying loaves and fishes, or turning water to wine. But her analysis of the distinctions between various kinds of causes would nonetheless be helpful to those who do take the biblical accounts seriously and want to develop a theoretically sophisticated understanding of God’s providence.

Roman Catholic theologian and theistic evolutionist John Haught next writes on the subject of cosmic purpose. He suggests that purpose in

the universe can be discerned from the universe’s fine tuning for intelligent life and even for beauty. Purpose and beauty are components that could not be detected by science alone and cannot be disproved by science alone. Haught denies that this interpretation is based on a divine design directly imposed on the universe—in other words, that this is a design argument *per se*.

For the final chapter, Mikael Stenmark, Dean of the Faculty of Theology, Uppsala University, Sweden, presents a framework for analyzing the possible relationships between science and religion. In Stenmark’s framework, there are four major models for relating the two:

1. science and religion are *irreconcilable*
2. *reconciliation* is possible between science and religion (by adapting the science to the theology or the theology to the science)
3. science and religion occupy *independent* spheres (Stephen Gould was a notable advocate for this perspective, which he called NOMA or Non-Overlapping Magisteria); or
4. science will *replace* religion (Edward O. Wilson advocates this perspective).

Stenmark fleshes out these perspectives with many shades of nuance. This approach can be a helpful tool for understanding and classifying different perspectives historically and in our own time.

Conclusion

Theologically conservative readers of this *Cambridge Companion* will find plenty to criticize in the unquestioning adherence to scientific orthodoxy displayed by all the contributors. But they will find this book to be a helpful resource that summarizes current mainstream secular scholarship on historical, scientific, and philosophical topics related to science and religion.

They might also be encouraged to see that design arguments have gained enough traction that many contributors to this book feel the need to address them.

References

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3. Socrates Scholasticus, *Historia Ecclesiastica (Ecclesiastical History)* 4(15).
4. See e.g. Stark, R., *For the Glory of God*, Princeton University Press, Princeton, 2004, and review by Williams, A., The biblical origins of science, *J. Creation* 18(2):49–52, 2004.
5. See Weinberger, L., Reading the Bible and understanding nature, *J. Creation* 23(3):21–25, 2009, and Weinberger, L., The Fall and the inspiration for science, *J. Creation* 24(3):18–21, 2010.
6. See for example Sarfati, J., *Refuting Compromise*, ch. 3, CPB, 2004/2011; creation.com/genesis#fathers.
7. Conway Morris presented this argument in more detail in his book, *Life’s Solution: Inevitable Humans in a Lonely Universe*, Cambridge University Press, 2003. See review by ReMine, W., Evidence for Message Theory, *J. Creation* 20(2): 29–35, 2006.
8. Dawkins, R., Human chauvinism: A review of *Full House* by Stephen Jay Gould, *Evolution* 51(3):1015–1020, 1997.
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