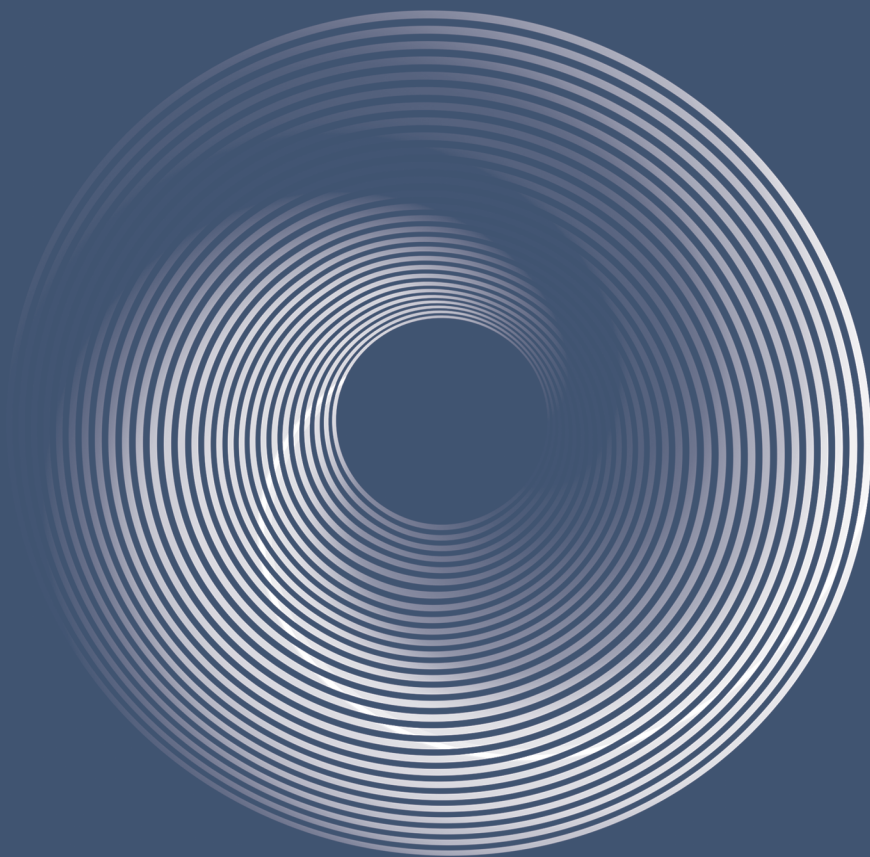


CPOSAT

Christian Perspectives on Science and Technology



*Christian Perspectives
on Science and
Technology*

The ISCAST Journal

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The ISCAST journal, *Christian Perspectives on Science and Technology* (CPOSAT), was relaunched in 2022. Building on a strong publication history (online since 2006 with a rich archive available on the website), the journal is now a world-standard academic resource.

CPOSAT is unique in the Australian landscape and one of the few journals globally that discusses the intersection of science, technology, faith, ethics, and spirituality. In doing so, it advances ISCAST's mission to promote a climate of mutual understanding and constructive dialogue between science and technology practitioners, and people of faith.

The target readership includes academics interested in science and faith, as well as educators, church leaders, and postgraduate and graduate students.

The relaunched journal is an online, open-access resource, inviting original contributions from national and international scholars. It features book reviews, critical notes, and double-blind peer-reviewed articles. As submissions are accepted, they are published on a rolling basis. At the end of each calendar year, the published materials are collected in one downloadable document, which also serves as the journal's printed release.

We invite articles in science/technology that have theological/ethical/spiritual implications, and articles in theology/ethics/spirituality that engage scientific/technological topics. Original studies of the history of science and faith are equally welcome. Authors retain copyright in their respective works, which are published under a Creative Commons licence (see below).

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Editorial

This fourth volume of the ISCAST journal, *Christian Perspectives on Science and Technology*, features seven peer-reviewed articles, as well as nineteen book reviews and one contribution to the Opinion & Response section. We are grateful to our ISCAST colleagues, David Hooker, for curating the book reviews and the Opinion & Response section, and Hannah Felsbourg, who provided editorial assistance.

The seven articles published in this volume hail from various parts of the world. Two articles were written by Australian scholars (Alan Gijsbers and Trevor Rapson), one by a Canadian academic (Alan Dickin), two by a researcher from the United Kingdom (Samuel McKee), another one by a scholar from the United States of America (Walter Huddell), while one was coauthored by a Greek academic and an Australian one (Efthymios Nicolaidis and Doru Costache, respectively). As such, the journal's international reach remains as obvious this year as in the previous ones.

The topics range from contemplating the nature and meaning of the concept of nature as shaped by the modern age of science and technology, the ethical considerations related to engaging nature in respectful ways, and the significance of the theological light cast upon it by the perspective of faith (Gijsbers' "The Nature of Nature") to contributions that examine human nature from a holistic and resurrectional vantage point as a criterion for distinguishing human intelligence from machine intelligence (Huddell's "The Ontological, Temporal, and Teleological Unity") and the outcomes of theological nature contemplation applied to biological phenomena (Rapson's "Examining Photosynthesis") to the exploration of forgotten pages of the modern history of science and religion (McKee's "Religious Minds" and "A Centenary Retrospective") to the search for the origins of the foundational narratives of Genesis 1–11 at the crossing of archaeology, documentary evidence, and reception history, as a prerequisite for understanding the narratives (Dickin's "A Biblical Account of Origins") to an analysis

of the recent Orthodox Christian stances on technological innovation, including artificial intelligence (Nicolaidis and Costache’s “Contemporary Orthodox Views”).

These articles deepen the existing conversations about faith and science, mapping meaningful and constructive ways for the interaction of these vital perspectives on life, reality, and the values. In so doing, they offer a helpful alternative to the misunderstanding of these perspectives within the contemporary culture wars. Indeed, while awareness of current trends and developments is of the essence for understanding things—especially as Christians living in the age of technoscience—exploring the sources of misunderstanding in terms of the specific roles of faith, spirituality, science, and technology is equally important. Also important is to continue retrieving information that completes our grasp of the history of faith and science, information that redresses the imbalance caused by misinformed (and, at times, disinforming) voices that promote the idea of an eternal and inexorable conflict between faith and science. We are grateful to all authors for their contributions—and we include here the writers of book reviews and opinion and response essays.

That said, we would like to make special mention of the articles we grouped under the label of “contemplation,” by Gijsbers, Huddell, and Rapson. All three engage matters of faith and science in substantial fashion, but they also address a topic that in recent years has generated outputs whose significance exceeds the known boundaries of the field—whether we call it science and religion or faith and science or other. What we mean, here, is the neglected contemplative dimension of faith-based perspectives on nature and culture. Indeed, the articles included in this category highlight the importance of interpreting both reality—and the sciences that explore it—within the Christian worldview, by which they align with the recent development known as science-engaged theology. As such, beyond their scholarly value, these contributions suggest practical applications. For example, instead of seeking to ascertain the “correct” rapport of the two perspectives, which usually entails taxonomical ordering, they show how to inter-

pret scientific discovery and technological innovation in the light of faith. This is not the “apologetic” attempt to replace science and technology by faith and spirituality, or vice-versa, depending on what world one inhabits. Instead, it is a matter of equipping believers—whether scientists or not—with important tools for finding meaning and enjoyment within both nature, God’s creation, and culture, that is, human creation. Thus considered, contemplatively, nature becomes meaningful, while discovery and innovation join hands with ethical criteria and theological insight, contributing to the enrichment of our lives. The three contributions relevant here showcase the applicability of this approach to a range of topics, from anthropology to biology to ecology to technology.

We cannot conclude this presentation of the volume without expressing our heartfelt gratitude to the advisory board members, the peer reviewers, and the copyeditors, without whose efforts the journal could not maintain and increase the quality of its offering.

Doru Costache
Mark Worthing
March 2026

A Message from ISCAST's Executive Director

Once again, it is my pleasure to “launch” another issue of the ISCAST journal, *Christian Perspectives on Science and Technology* and to thank those involved in its production.

Following its relaunch in 2022, under the steady hand of managing editor Doru Costache, the ISCAST journal continues to grow its global audience as it publishes articles, reviews, and opinion of scholars in Australia, the region, and indeed the world, generating conversation between people of faith, scientists, and technologists.

I remember many decades ago reading Alvin Toffler's *Future Shock* (1970). One key argument (if I remember correctly!) was that not only is technology developing rapidly but that its rate of development is increasing and that we humans struggle to cope healthily with this acceleration. “Moore's law” proposed five years before the publication of *Future Shock*, is said to describe this effect in the development of microchips. The extraordinary growth of the AI and transhuman frontiers, along with their power to change society in ways that we can only guess at, make the conversation about science, technology, faith and culture ever more important. I thank God for the privilege of being part of ISCAST as we, in our Antipodean corner of the world, wrestle with such issues.

Complementing the work of Doru, my thanks, on behalf of the ISCAST community, also go to David Hooker who manages our book reviews and to both Brittany Spencer and Hannah Felsbourg for their able work in typesetting. Doru is also assisted by his co-editor, Mark Worthing, the advisory board, and by a team of proofreaders; our hearty thanks to them too. And of course we are grateful to all those writers who bravely submit articles for peer scrutiny.

I do hope that *CPOSAT 2025* will be stimulating and encouraging for all who immerse themselves in its (digital or hard-copy) pages.

Chris Mulherin
ISCAST Executive Director

The Nature of Nature

Alan Gijsbers

Abstract: What is nature? Is nature just a social construct or does nature have an objective reality in its own right? The development of the sciences in the 16th and the 17th century led to the mathe-matisation of some sciences and hence to the idea that nature is a mechanism described by set laws. The mechanistic approach led to problems explaining free will and rational thought. The dilemma of the interface between the soul or mind and the body is still with us and has a resonance with the problem of divine action in the physical universe. There are other views of nature, however. What is the role of humans in nature? Are we active participants in shaping its future or helpless bystanders? Can we discover ethics, law, and theology from studying nature or are there other ways of discovering these dimensions? Christians are convinced that encountering God is what shapes the way they view ethics, law, and theology. Finally, can experiencing nature lead people closer to God or can that only happen if they have an appropriate lens through which to see nature?

Keywords: doctrine of creation; natural law; natural theology; naturalism; naturalistic fallacy; nature

Associate Professor Alan Gijsbers (University of Melbourne) is a retired addiction physician and former head of the Addiction Medicine Service, Royal Melbourne Hospital. He is also a past president of ISCAST.

At first glance, the concept of nature seems simple—it is the natural world we observe, mountains, hills, sea, land, forests, wilderness, pastures, gardens, weather, seasons, and so on. But through what lens do we see nature? Is it “red in tooth and claw,” as Tennyson saw it?¹ He was grieving for his 22-year-old friend who had suddenly died of a cerebral event. The whole poem “In Memoriam AHH” is an outpouring of grief at the unfairness of it all. Through Tennyson’s grieving lens, nature was inexplicable and cruel. By contrast, Wordsworth found inspiration in nature. He says in “Lines Composed a Few Miles from Tintern Abbey”:

For I have learned
To look on nature, not as in the hour
Of thoughtless youth; but hearing oftentimes
The still sad music of humanity,
Nor harsh nor grating, though of ample power
To chasten and subdue.—And I have felt
A presence that disturbs me with the joy
Of elevated thoughts; a sense sublime
Of something far more deeply interfused,
Whose dwelling is the light of setting suns,
And the round ocean and the living air,
And the blue sky, and in the mind of man:
A motion and a spirit, that impels
All thinking things, all objects of all thought,
And rolls through all things.²

Those exalted thoughts are not confined to mother nature, however, for elsewhere Wordsworth captures the stillness and beauty of a smokeless London still asleep:

-
- 1 A. Tennyson, “In memoriam A.H.H. obit. MDCCCXXXIII,” in *The Norton Anthology of Poetry*, 3rd ed. (New York and London: Norton, 1983), 706–713.
 - 2 W. Wordsworth, “Lines Composed a Few Miles above Tintern Abbey, On Revisiting the Banks of the Wye During a Tour; July 13, 1798,” in *The Norton Anthology of Poetry*, 523–526.

Earth has not anything to show more fair:
 Dull would he be of soul who could pass by
 A sight so touching in its majesty:
 This City now doth, like a garment, wear
 The beauty of the morning; silent, bare,
 Ships, towers, domes, theatres, and temples lie
 Open unto the fields, and to the sky...³

Steam engines were just starting to be developed and their billowing smoke lay in the future. Perhaps beauty is in the eye of the beholder, and Wordsworth wears very rosy spectacles! Where did that rosy view come from? Andrea Wulf makes a convincing case that the explorer and polymath Alexander von Humboldt's writings of his travels along the Orinoco River and scaling Mount Chimborazo inspired a whole range of romantics from Goethe in now Germany, Wordsworth and Coleridge in England, and Emerson and Thoreau in the USA.⁴ Charles Darwin had a well-thumbed copy of Humboldt's works during his voyage of the Beagle. Did Humboldt invent nature? No, but Humboldt studied nature and developed an approach integrating geography, geology, botany, and climatology. Further, it was his delight in the natural world that inspired romantics and nature lovers around the world. That inspiration included the development of natural parks, through the advocacy of John Muir to Teddy Roosevelt.

Is nature just nature or is it a social construct? Philosopher John Searle cogently argues that even social constructs are reality. He singles out money as a social construct. He moves from commodity money to contract money to fiat money. That is from gold coins to promissory notes to pieces of paper which simply state that this piece of paper is worth so much, without a gold standard to back up that claim. He wrote before the advent of the cashless society. In summarising his argument

3 W. Wordsworth, "Composed upon Westminster Bridge; September 3, 1802," in *The Norton Anthology of Poetry*, 550.

4 A. Wulf, *The Invention of Nature: The Adventures of Alexander von Humboldt, the Lost Hero of Science* (London: John Murray, 2015).

that money is a useful social construct, he points out the following: “I have *money* earned as an *employee* of the *State of California*, and I have it in my *bank account*, which I use to pay *my state and federal taxes* as well as the *bills* owing to the *gas and electricity companies* and the *contractor of my credit cards*.”⁵ All the italicised expressions are institutional terms, referring to institutional realities. These are social constructs but are also conceptual realities by which we function. So, to label something a social construct does not necessarily dismiss it as “not real.” Consider this paragraph:

[According to the volume’s editors, the authors] regard the *self* as a mere construct of western thought ... Consequently, they argue that it is not a natural entity, that it cannot be investigated scientifically, and *self-pathology* [in psychiatry], such as passivity phenomena, are pure metaphors.⁶

Such a loaded quote requires some sorting out. As we have just seen, a social construct is not necessarily unreal, or “mere.” And, just as Searle analysed social constructs like money, we can analyse social constructs like the self by using scientific tools appropriate to the subject. What those tools might be would need to be developed by those psychologists and psychiatrists looking after patients with a distorted sense of self, or an undeveloped sense of self. We might even be able to widen the scientific method to include a study of the self that is not confined to science. For example, philosopher Charles Taylor surveys the understanding of self in history,⁷ and historian Jerrold Seigel considers the

5 J. Searle, *Mind, Language and Society: Philosophy in the Real World* (London: Phoenix, 1999), 126–131.

6 T. Kircher and A. David, “Introduction: The Self and Neuroscience,” in *The Self in Neuroscience and Psychiatry*, ed. T. Kircher and A. David (Cambridge: Cambridge University Press, 2003), 1–6, at 4. The editors refer to the chapter by G. E. Berrios and I. S. Marková, “The Self and Psychiatry: A Conceptual History,” 9–39.

7 C. Taylor, *Sources of the Self: The Making of the Modern Identity* (Cambridge, MA: Harvard University Press, 1989).

richness of our understanding of ourselves and our place in nature.⁸ In turn, Alister McGrath argues that the concept of “nature” is a socially mediated notion, not an objective entity in its own right.⁹ After a very useful study of the different views of nature, McGrath goes on to argue for a robust theology of creation as a corrective to the multiple meanings of nature.

What, then, of nature? Nature exists outside the life of human beings, but we see nature through lenses we have developed. As we saw above, these can be the lenses of grief or romanticism. Both constructs are a partial picture of a greater reality—the world and all there is in it.

Studying Nature

How do we study nature? Peter Harrison makes a convincing case that the Protestant Reformation led to a change in the way the church interpreted Scripture, and that this in turn changed the way we study nature.¹⁰ Prior to John Ray, natural history was an amalgam of “humane learning” which expounded the symbolic meaning of its subject. The literary, allegorical, and moral meanings of a living creature were more important than its actual life in the natural world.

With the advent of Galileo, the “book of nature” was now interpreted mathematically or, better, geometrically. In his words,

Philosophy is written in this grand book, the universe, which stands continually open to our gaze. But the book cannot be understood unless one learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics, and its characters are triangles, circles, and other geometric figures without which it is humanly impossi-

8 J. Seigel, *The Idea of the Self: Thought and Experience in Western Europe Since the Seventeenth Century* (Cambridge: Cambridge University Press, 2005).

9 A. E. McGrath, *A Scientific Theology: Nature* (London: T&T Clark, 2006), 87.

10 P. Harrison, *The Bible, Protestantism, and the Rise of Natural Science* (Cambridge: Cambridge University Press, 1998).

ble to understand a single word of it; without these, one wanders about in a dark labyrinth.¹¹

So, for Galileo the language of nature is not just mathematics, but geometry. Further mathematisation of our scientific understanding of the cosmos was solidified by Isaac Newton's *Principia Mathematica*, where he applied his newly invented calculus to convert geometrical understanding of the solar system into a more algebraic form. This led to the view that nature is a mere mechanism, extrapolating from basic physics to our entire scientific understanding. This stirred Descartes to try and work out how to relate the mind to the mechanical physical body. For not only were we discovering the mathematical laws governing the basic functions in the universe, but we were also exploring a rational approach to the world.

How then does reason and the freedom of reason relate to the deterministic functions of basic laws? Such a mechanistic and mathematical approach to the basic sciences can obscure the discoveries of scientists like Linnaeus in botany, John Ray in ornithology and botany, Charles Lyell in geology, and later von Humboldt. Each developed a more descriptive approach to nature.

Nevertheless, all these scientists saw their sciences through interpretative lenses, now no longer an allegorical lens, or even a mathematical lens; but, nevertheless, lenses through which to interpret what is there. The subject would determine the scientific methodology. Thus, mathematics is appropriate to physics (as it was later called) but not appropriate to descriptive sciences like anatomy or classificatory sciences like botany. Nevertheless, in each situation the scientist (as William Whewell coined the term in the mid-19th century) seeks to discover what is there rather than invent a fantasy world. This discovery of what really is—but mediated through our lens of

11 Galileo, *The Assayer*, 4 (republished by Stanford University). Available at <https://tinyurl.com/5dsfj6ty> (accessed 7 October 2024).

understanding—and our development of theories and models, McGrath describes as a critical-realist approach to nature and to the sciences.¹²

Depicting Nature

How do we depict nature? In art, the transition from symbolic to realist is usually attributed to Florence's Giotto in the 14th century. Perspective, depicting three dimensions on a two-dimensional plane in painting also became more obvious and accurate. Harrison describes this as a transition from describing what is symbolised to what is “actually there.” This last clause is of course the major challenge of art. There is a lovely discussion of the nature of artistic depiction of reality in Chaim Potok's portrait of his character, Asher Lev.¹³ Lev is an orthodox Jewish artist who is exiled from his people in New York because of his controversial crucifixion painting. Years later, he returns when his uncle dies. Lev is invited to give a talk to his daughter's class of eleven-year-olds on the nature of art.

He depicts a ram three ways, in a childish, realist, and abstract style. He discusses how the artist expresses emotion in her depiction and how each is a different interpretation of what is seen. He further draws a subject in the styles of Matisse, Modigliani, and Picasso, as an illustration of the richness of different ways of seeing the world, analogous to the different commentators of the Torah. The whole story is a wonderful illustration of issues in aesthetics—on the nature of beauty and the depiction of the world.¹⁴

Singapore's Gardens by the Bay contains Indian, Malay, Chinese, and colonial gardens. The first three express the different aesthetics of these cultures, but the colonial garden illustrates how the colonists exploited rubber, cocoa, and oil palm for profit. This is a highly biased but understandable view of the colonial world, which ironically

12 A. E. McGrath, *A Scientific Theology: Reality* (London: T&T Clark, 2006), 195–244.

13 C. Potok, *The Gift of Asher Lev* (London: Penguin, 1990), 129ff.

14 See S. L. Feagin, “Aesthetics,” in *The Cambridge Dictionary of Philosophy*, ed. R. Audi, 2nd edn (Cambridge: Cambridge University Press, 1999), 11–13.

is depicted in one of the most built-up cities in Asia. The history of gardens in the west is much richer than that. Gardener Monty Don's informative video series on the history of gardens in Italy, France, and the United Kingdom is much more nuanced. His series starts with the rigid formal gardens of the Italian aristocracy and moves on to the more "natural" approaches of Capability Brown. Once again, we don't just see nature; humans shape it, but this time we actively shape it as gardeners.

To do so is to fulfil humankind's first profession, to till the earth, to subdue it, and to have dominion over it (see Genesis 1:26ff). The word "dominion" has undergone a complete metamorphosis, from ruling the earth like a tyrant, to caring for it as a servant leader and as stewards of creation accountable to God for our care.¹⁵ There is a wonderful *Punch* cartoon of 1934, shared by Colin Russell. The vicar encounters Wilkes the gardener in his garden:

Vicar: "it is wonderful what the hand of man can do to a piece of earth, with the aid of divine providence, Wilkes."

Gardener: "You should 'ave seen this piece, Sir, when Divine Providence 'ad it all to itself."¹⁶

Can nature just be nature or does it need the guiding hand of *Homo sapiens* for it to flourish? I have had many discussions with my forestry brother and fellow ISCASTian, Richard, who has tried to come to terms with the tension between agriculture, silviculture, and eco-romanticism. The current mood of society is to leave forests "in their natural state" and to stop old growth logging. Forests should be replaced by Natural Parks. But can they? Or will we in the future be confronted with uncontrolled wildfires because the forests have not been managed

15 B. R. Reichenbach and V. E. Anderson, *On Behalf of God: A Christian Ethic for Biology* (Grand Rapids, MI: Eerdmans, 1995).

16 C. Russell, *The Earth, Humanity and God*, The Templeton Lectures Cambridge, 1993 (London and New York: Routledge, 2021; first edn 1994), 48.

well? Even eco-romantics may advocate for “cool burning” practiced by First Nations people, though how such a strategy can be applied to the vast swathes of Australia’s forests would be a challenge. Can we just let the natural world be itself? Clearly, Tasmanians relish the natural wilderness of the South-West corner of their island, and it seems to be in a stable equilibrium, but there are other parks around the world which require ongoing human care to maintain their naturalness.

Nor is this always easy. Nature in the British Isles is much more tame than that in fiery Iceland or earthquake-prone Japan. Whereas in Britain Victorian optimism allowed humans to think that wild nature could be tamed, the Japanese on their geological fault lines have had to learn to live with earthquakes, fires, and tsunamis. Even in Australia we have become more modest in our attempts to live with rather than to dominate nature. Nevertheless, as stewards of the earth on behalf of God, on the one hand, and on behalf of future generations, on the other hand, we have a responsibility to care for nature and ensure it is not damaged by thoughtless exploitation.

According to Psalm 19, the heavens declare the glory of God. The psalm focusses on the voiceless proclamation of day and night and the rising and blazing of the sun. It is interesting how the last line of verse 7 is interpreted differently between translations. The KJV’s “and there is nothing hid from the heat thereof” is reflected in the ESV’s “and there is nothing hidden from its heat.” By contrast, the NIV’s rather benign “nothing is deprived of its warmth,” could only have been so interpreted by translators not used to the fierce heat of the mediterranean sun. Jewish translator Robert Alter comments on this passage as follows: “The Hebrew conceals a neat pun, for the word that means ‘heat,’ *hamah*, is also another name for sun. The sun here is a fierce blazing orb, ‘nothing can hide from its heat.’”¹⁷ So, our experience of nature can colour the way we read and interpret Scripture! In short, nature tells us of the flaming glory of God.

17 R. Alter, *The Hebrew Bible*, vol. 3: *The Writings* (New York: Norton, 2019), 61.

But does nature teach morality? C. S. Lewis has some rather caustic comments debunking Wordsworthian romanticism. According to Wordsworth:

One impulse from a vernal wood
May teach you more of man,
Of moral evil and of good,
Than all the sages can.¹⁸

This is not how Lewis learnt moral philosophy. Studying nature does not necessarily lead to a good moral outlook. For Lewis, studying nature can only lead to “the dark gods in the blood”; not although, but because, sex and hunger and sheer power operate without pity or shame.”¹⁹ Lewis goes on to say that nature will teach you exactly what you want to learn. If you want beauty, she will give it, but if you want darkness, it is also there. He further argues, “nature never taught me that there exists a God of glory and of infinite majesty. I had to learn that in other ways. But nature gave the word glory a meaning for me.” Lewis articulates that we do not find God in nature, but that, knowing God, nature illustrates for us what we know. In more theological terms, we articulate nature in the light of a theology of creation through the lens of a theology of redemption.²⁰

Understanding Nature

To understand what nature is a little more clearly, let’s look at some dichotomies. If we contrast natural to artificial, that sounds like nature

18 Wordsworth, “The Tables Turned,” available at <https://www.poetryfoundation.org/poems/45557/the-tables-turned> (accessed 7 October 2024).

19 C. S. Lewis, *The Four Loves*, Signature Classic Edition (London: HarperCollins 2012; first edn 1960), 23ff.

20 See A. J. Gijsbers, “Towards a Theology Integrating Creation, Providence and Redemption in Our Daily Work, Rest and Family,” *Luke’s Journal* (01/03/2021), available at <https://tinyurl.com/5c3s3cb8> (accessed 7 October 2024). See also A. E. McGrath, *The Christian Doctrine of Creation*, chapter 4 in *A Scientific Theology: Nature*, 135–191.

is good and artificial is bad, but if we contrast natural with refined, or purified, good and bad can be understood differently. Refined sugar is allegedly bad for you, but natural sweeteners carry an artificial connotation. Refined medicines are essential to modern pharmacology. For instance, William Withering, a student of the foxglove flower, found he could cure dropsy. One of the causes of dropsy is heart failure, and Withering found by careful observation that while the extract of foxglove could relieve the condition, in toxic doses it could be fatal. The gap between effectiveness and toxicity, the so-called therapeutic window, is small. As student physicians (as the term is used in the United Kingdom and Australia) we gained useful experience in treating heart failure and recognising digitalis' toxicity. Foxglove is now purified into digitalis. Dosing the purified form is much easier than in its native or natural state. That is the difference between naturopathy and pharmacology, though there are those who prefer naturopathy to allopathic medicine.

We encounter similar problems in understanding nature if we contrast natural with civilised. This is the contrast between native and refined, primitive and developed. Each of these polarities could be spun to sound good or bad. Jean-Jacques Rousseau believed that civilisation created masks which obscured the real person and called civilisation back to nature.²¹ He did so not merely in his novels but also in his rather sad, ascetic, withdrawn, and even paranoid life, as recorded in his *Confessions* (well analysed by Seigel, referenced above). The encounter of the vicar and the gardener referred to by Colin Russell above spins the dichotomy in the opposite direction. Untamed nature needs the civilising hand of human beings. Of course, the civilising process also needs to respect the natural world, caring for it, so that nature continues to be sustainable.

21 See B. Russell, *A History of Western Philosophy* (London and New York: Routledge, 2000; first edn 1946), 651ff. Rousseau's views were not unique at that time. For an interesting take on this issue and the role of Genevan Pastor Lambergier, see J. Seigel, *The Idea of the Self* (Cambridge: Cambridge University Press, 2005), 210ff.

Another dimension of interest is the natural versus supernatural, or the natural and the transcendent. We, Christians, believe in God Almighty, maker of all things, visible and invisible. The natural world is the world God made, the sphere of God's creative, providential, and salvific activity. Accordingly, we pray that God's will in heaven will become his will on earth. The first miracle was when God commanded light to be, and so it was—and it was good. Then God commanded the heavens and the earth, day and night, land and sea to exist. God then filled these regions with celestial bodies, birds of the air, fish of the sea, and plants and animals. For Christians, nature's origin is supernatural. In turn, those who deny the supernatural are described as naturalists. For them, what humans see and perceive is all there is.²² This is known as ontological naturalism.

Ontological naturalism asserts that if a phenomenon cannot be explained by the laws of physics, it does not exist. Protagonists often ask the rhetorical question, by what laws of physics can the world of ideas impinge on the everyday world? This question assumes that the laws of physics are completely known to us. But how can we be certain? The scientific enterprise can only go forward if we assume that the world is a closed system and that cause and effect operate only within that system. Just because we cannot explain the relation between the natural and the supernatural—causally or otherwise—does not mean that there is no link, nor that the supernatural does not exist. By contrast, methodological naturalists would assume naturalism in their scientific pursuits. That is, when running experiments or studying phenomena, they would not include the supernatural world in their study. Most scientists who are Christian would be practising methodological naturalists, but they would also think and pray, thus moving in the interface between the world of ideas, the unseen world, and the seen world of everyday life. This integration is not without downsides when it comes to less educated believers.

22 D. Papineau, "Naturalism," in *The Stanford Encyclopedia of Philosophy* (Fall 2023 Edition), ed. E. N. Zalta and U. Nodelman. Available at <https://plato.stanford.edu/archives/fall2023/entries/naturalism/> (accessed 10 December 2024).

For Christians, there is indeed a close link between natural and supernatural, but the two can be sadly confused, as a recent court case in Toowoomba, Australia, illustrates. Here, Pentecostal parents of an eight-year-old child who had type I diabetes mellitus believed that they should show faith in God by hoping she would be healed. They would demonstrate their faith by withdrawing her life-saving insulin. Sadly, she died six days later. God's good gift of insulin, obtained and refined by secular drug companies, was only natural and the parents genuinely believed supernatural healing trumped natural healing.²³ Such a false dichotomy is one of the challenges facing Christian medical practitioners especially, whose patients struggle to live a life of faith in this natural world.

The final dichotomy is between the natural and the spiritual. The KJV renders 1 Corinthians 2:14 as "the natural man receiveth not the things of the Spirit of God." This has shaped so much conservative thinking, where faith eschews nature, and therefore science. The NRSV renders the term "natural man," *psychikos anthropos* as "unspiritual" with a footnote to say that the term is "natural." The NIV renders it as "the man without the spirit." Paul uses the same phrase in 1 Corinthians 15:44 to contrast the natural (*psychikos*) with the spiritual (*pneumatikos*), when he puts forward that the natural body will be sown in weakness and rise again in power as the spiritual body. Back to 1 Corinthians 2, Paul is critical of the person who lives purely in the horizon of this life, understood as material, and does not comprehend spiritual things. Only when we are enlightened by the Spirit of God will we understand the things of God. What a tragedy that such an understanding misled the decisions of the Pentecostal parents mentioned above. Paul has a much more positive view of glorifying God in our physical bodies (see, for example, Romans 12:1–2).

Scientists study nature. Hence their reference to their trade as *natural* science, *natural* philosophy. In the 16th and the 17th century,

23 "Murder accused faced 'constant religious push' to adopt belief that God could cure daughter's diabetes, court told," *The Guardian*, 22 July 2024. Available at <https://tinyurl.com/3n3rk553> (accessed 8 October 2024).

following from the cosmological thinking of Galileo Galilei and Isaac Newton, they assumed that the heavens could be described by defined laws of mechanics, that the universe is as predictable as a mechanism, for example a clock. What, then, of free thought, reason, and the emotions? This was Descartes' dilemma, where he explored the relation between the mind and the body, not completely satisfactorily.²⁴ The relation between the natural and the supernatural, the unseen world and the seen world, the world of the mind, or spirit, and the natural world, is a problem still with us. For example, the Templeton initiative that studied divine action in the natural world spawned five projects that considered quantum cosmology, chaos theory, molecular and evolutionary biology, neuroscience and the mind/body problem, and quantum physics and quantum field theory.²⁵ These projects have not led to a resolution either of the overarching problem of divine action in the world, nor of the hard mind/brain problem,²⁶ but they have given the problem a thorough airing. The divine action problem has analogy with the mind/brain problem, but the two are not entirely synonymous.

When it comes to ethics and theology, both natural law and natural theology have had a hard time. The concept of natural law has been around since antiquity. As one author has it, Greeks and Romans claimed that there were "eternal laws directing the actions of all rational beings and built into the very structure of the universe. Roman lawyers developed a doctrine of law that all civilized people would recognize ... [these] principles of morals could be known by reason alone, without revelation."²⁷

24 See B. Russell, *A History of Western Philosophy*, 542ff.

25 See R. J. Russell et al. (eds), *Neuroscience and the Person: Scientific Perspectives on Divine Action* (Berkeley, CA: Vatican Observatory and Center for Theology and the Natural Sciences, 1999), ii.

26 D. J. Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (Oxford: Oxford University Press, 1996).

27 J. B. Scheewind, "Natural Law," in *The Cambridge Dictionary of Philosophy*, 599–560.

Schneewind goes onto a discussion of natural law in the works of Aquinas—a differing view from Hugo Grotius, who believed natural law was not directed to our good but to set limits on our personal aims. Since then, there are those who subscribe to natural law either from a theist position or an atheist stance. Such views argue that good is rationally perceived and that all right-thinking people would subscribe to such a position. If only humans were so rational!

Both the views of Aquinas and Grotius—and any other system of right/wrong discerned autonomously—are radically rejected by Dietrich Bonhoeffer, who argues that the desire to discern good from evil autonomously was the first temptation of Adam and Eve; humankind suffered ever since from the consequences of eating that fruit.²⁸ He further argues that the Pharisees of Jesus’ time were guilty of that very issue—of always defining right from wrong—and that Jesus presented a new and very different way of understanding ethics, in terms of discipleship and relationship.

The naturalistic fallacy, that you cannot infer an *ought* from an *is*, is attributed to philosopher David Hume. Just because something is so does not mean it ought to be so. Just because humans eat meat does not mean they ought to eat meat. I first came across this idea in studying psychology as a second-year medical student, where human behaviour was under scrutiny. The attempt there was to make the study of human psychology “value-free” in order to be scientific. A similar discussion took place in trying to define illness and disease—especially mental illness—in “value-free” terms. As Fulford rightly claims, this is not possible.²⁹ Values are part of the fabric of our assessment of function and dysfunction, of health and disease. Philosopher Rachel Cohon has a very helpful article on Hume’s view of moral sentiments.³⁰ She

28 D. Bonhoeffer, *Ethics*, Touchstone edn (New York: Simon & Schuster, 1995; first edn 1949), 21–51.

29 K. W. M. Fulford, *Moral Theory and Medical Practice* (Cambridge: Cambridge University Press, 1989).

30 R. Cohon, “Hume’s Moral Philosophy,” in *The Stanford Encyclopedia of Philosophy*, available at <https://plato.stanford.edu/archives/fall2018/entries/hume-moral/> (accessed 10 December 2024).

points out that he uses many evaluative terms, indeed his discussion is about moral epistemology and where these evaluative terms come from. Do they come from reason, divine revelation, conscience, reflection on one's (or others') impulses, and emotional responsiveness, or from sense and "taste"? Hume argues for the development of "moral sentiment" that will then evaluate moral behaviour. He divides such moral sentiment into "natural," that is without cultural intervention, and "artificial," which depends on the need for common rules from society.

G. E. Moore, we are told,³¹ coined the term "naturalistic fallacy" of the *is/ought* distinction, trying to find some basis for goodness; disappointingly, he could not define good in any other way other than that good is good, a category in its own right, much like yellow is yellow. Critics of Moore, like A. C. Grayling, point out first that the naturalistic fallacy is not a fallacy. In his words, "It might be wrong to identify the good with some natural property or state, but it is not a contradiction or logical mistake to do so—and it is not restricted to naturalistic candidates for explaining the good."³²

Charles Taylor offers a discerning evaluation of the *is/ought* distinction, pointing out that we as social beings have many evaluative terms. As he points out, "Our language of deliberations is contiguous with our language of assessments, and this with the language in which we explain how people do and feel."³³ So, words like dignity, courage, and brutality are indispensable and cannot be readily fitted into a neat *is/ought* dichotomy. Rather than evaluation being an added category, for Taylor, evaluations are built into the very structure of our language and describe our relationship to ourselves and to others in society. Christians come to the natural world with our own faith and moral perspective. We see nature through that lens, as believers and disciples, not as dispassionate objective observers.

31 See E. D. Klemke, "G. E. Moore," in *The Cambridge Dictionary of Philosophy*, 582–583.

32 A. C. Grayling, *The History of Philosophy* (New York: Viking Penguin, 2019), 366.

33 Taylor, *Sources of the Self*, 53–90.

Natural Theology

A similar problem occurs with natural theology. With the advent of the discovery of the laws of nature and the orderly universe, it was thought that God could be inferred from nature. This spawned a number of lectures and treatises in the 17th century, such as the Boyle Lectures in England, in the 17th century, the Gifford Lectures in Scotland, in the 19th century, and the Bridgewater Treatises in England, in the 18th century. All thought to examine our understanding of God in nature as a means of exploring the glory and grandeur of God, and of defending the faith against infidels. McGrath describes a whole series of authors who chose to use their scientific discoveries as evidence of a wise, good, and powerful God.³⁴ Thus, we have William Paley's watchmaker argument—that if you find a watch in a field you would assume such an intricate mechanism must be the result of an intelligent watchmaker.³⁵ Unfortunately, the design of humans is somewhat flawed, there are aspects of our makeup which are not good—think of the menstrual cycle or the propensity of female bladder infections. And the course of the pudendal nerve right through the prostate gland is not the best way of innervating male genitalia. The argument of God from design does not lead directly to the God and Father of our Lord Jesus Christ, but our knowledge of God helps us make sense of the world.

The limits of natural theology have been well explored in chapter six of McGrath's *Scientific Theology*. We are much more modest about its place. It is interesting that in the revived Boyle Lectures, in 2024, the topic of discussion was, "Is religion natural?"³⁶ But the very fact that that question is evaluated by theologians and philosophers indicates that we are invited to see nature through an interpretative grid. For Christians, such a grid is coloured by their encounter with the divine,

34 McGrath, *A Scientific Theology: Nature*, 241–305.

35 W. Paley, *Natural Theology*, Oxford World Classics (Oxford: Oxford University Press, 2008; first edn 1802).

36 D. Ferguson, "Is Religion Natural?" ISSR, 2024 Boyle Lecture, available at <https://tinyurl.com/2ezcnm2n>, (accessed 24 October 2024). It includes a response from Fiona Ellis.

especially as seen through the lens of the other book of God, Scripture, the book of the Word that helps interpret the book of the world. McGrath has convinced me that a Christian doctrine of creation gives us a much clearer lens through which to see nature rather than trying to develop a Christian philosophy of nature. Job's rich encounter with God in nature is a salutary lesson in dealing with some of the deepest dilemmas as believers. In seeking to find vindication and justice in a world which for Job had gone badly wrong, Job seeks his day in court. In the words of William Cowper, struggling with his depression:

Blind unbelief is sure to err, and scan his works in vain;
God is his own interpreter, and he will make it plain.³⁷

But Cowper died in his melancholic depression, hopefully with some eschatological vindication. Job's day in court occurred when God entered into dialogue with him, showing him the wonder and grandeur of creation. For the rational Christian this is profoundly unsatisfactory as it does not make any of the reasons for Job's trials plain. The mystery of creation remains beyond human comprehension, and Job repentantly accepted that. And yet encountering raw nature as God's creation can be profoundly healing in nonverbal ways. It puts our own little lives into the larger perspective of God's grandeur, glory, and beauty. This is oddly healing in nonverbal, nonlogical ways.

A pale imitation of this occurred when I recently encountered new signs in Birrarung Park in Templestowe Lower, Victoria, Australia. These were calls on walkers to stop and become mindful of the beauty and healing of nature—if we would but stop and pay attention. It was part of a NatureFix program and one can even get an app for this.³⁸ It sees positive health benefits in spending time in nature and reflecting on nature. Ironically, one of the signs calls on us to express gratitude

37 W. Cowper, "Light Shines Out of Darkness," in *The New Oxford Book of Christian Verse*, ed. D. Davie (Oxford: Oxford University Press, 1981; paperback reissued 2003), 198–199.

38 See <https://www.naturefix.life/> (accessed 15 October 2024).

without identifying to whom we should be grateful. Without being cocky, we could use the words of the Apostle Paul, “what you worship as something unknown, I am going to proclaim to you” (Acts 17:33). The God and Father of our Lord Jesus Christ helps us make sense of the natural world. As the poet has it—

Summer and winter and springtime and harvest,
Sun moon and stars in their courses above
Join with all nature in manifold witness
To thy great faithfulness mercy and love.³⁹

A Theology of Creation

What would a theology of creation look like? I can only sketch a summary from two very useful sources—Alister McGrath in his *A Scientific Theology* and Tom McLeish in his *Faith and Wisdom in Science*. I have already referred to seeing the story of creation in the light of redemption, but both writers go further and point to the logocentric view of creation. In the beginning was the *Logos*—the Word of God who became flesh and dwelt among us (John 1:1–18). By him and for him all things were created and find their coherence in him (Colossians 1:13–20). By his word, light shone in darkness, order came out of chaos. All that is, seen and unseen, is made by him. By his command, God separated light from darkness, day from night and land from sea. By him the skies, the sea and the land were filled with God’s bounty and human beings, male and female, made in the image of God were commissioned as regents to fill the earth, subdue it, and have dominion over it. God’s creation is good, it is real, but it is *creation*, neither eternal nor divine. It is contingent, with its own rationality which the vice-regents can explore with the gifts of divine reason given by God.

39 T. O. Chisholm, “Great Is Thy Faithfulness” (1923), available at <https://tinyurl.com/yupb845k> (accessed 15 October 2024).

McGrath quotes Barth to point to his central theme that creation is a covenant commitment of God to humankind, a covenant which the disobedience of Adam and Eve did not negate, and which was renewed with Noah after the judgment of the flood—"seed time and harvest, cold and heat; summer and winter, day and night will never cease" (Genesis 8:22). So, creation is the sphere of divine providence. McGrath underlines von Rad's comment that the First Testament is mainly a book about the divine history of God in the lives of God's people, that God is the God of history, not just Jewish history but the history of the whole earth. Even with the mechanisation of our understanding of the natural world, God is still active, and we are not deists believing God started the world and left it to run on its own.

McLeish also emphasises that the doctrine of creation is not found only in Genesis 1 but in other Scriptures. The prophets appeal to nature for us to understand the grandeur and awesomeness of God (see Isaiah 40) and God's providence (see Psalm 104), and to learn from the wisdom of the farmers to cooperate with nature (see Isaiah 28:23–29). The "Writings" relish the wisdom by which the world was made (see Proverbs 8:22–31). This wisdom is a delight and creates joy. Meditating on raw nature in the end confronts Job with the mystery of his suffering and causes him to recognise that God's ways are past finding out.

The key creation theme in the New Testament, apart from bringing creation's Word of God into focus as the Word made flesh, is the hope of a renewed cosmos, when the current groaning futility of creation (Romans 8:22) will find its fulfilment with the second coming of Christ. The New Jerusalem will come down from heaven and there will be a new heaven and a new earth, in which God will dwell with God's people from every tribe and tongue and people and nation (Revelation 21).

Implications of the Christian Doctrine of Creation

There are certain consequences to the doctrine of creation that are relevant to this discussion. First, John Polkinghorne and others argue

that Christianity provided a unique set of metaphysical beliefs which were necessary to allow science to flourish. The early scientists were Christians who believed the world was rational, reflecting God's rationality; that it was ordered, reflecting God's faithfulness; that it was free to be itself and hence it was contingent, so that what it was could only be discovered by experiment and not merely by rational reflection; and that it was not sacred and hence could be analysed by mere mortals.⁴⁰ There is some substance to this claim but it can be overstated. Other civilisations had their sciences, though it is not clear why the Chinese, Indian, and Muslim worldviews did not spawn the sort of sciences developed in Europe. Nor is it easy to work out why Judaism did not spawn the sciences as we now understand them, even though there are many Jewish Nobel Prize winners—out of proportion compared to other nations.

Second, a doctrine of God the creator and sustainer of the universe, whose Son entered our world through the incarnation, makes an enormous statement about the importance of the created order. Christians are not Platonists who believe in the transience of the seen world and the reality of the world of ideas. Christians incarnate their behaviour and spirituality in the seen world of the everyday. At its bluntest, implicitly, doctors honour God when they care for the body, which is a spiritual act whose significance exceeds discursive theology. Theology itself must be rooted in concrete action, for faith without works is dead. This dual understanding, of the medical act as spiritual and of theology as embodied in deeds, challenges the idea that doctors save bodies while preachers save souls—that the body is transient

40 He put these four outcomes together in a lecture in Melbourne, but I have been unable to find them together in his writings—the nearest are orderly, contingent, worthy of study, and secular (without using these terms), in J. C. Polkinghorne, *Quarks, Chaos and Christianity: Questions to Science and Religion* (London: SPCK, 1994), 18, and rational and contingent in his *One World: The Interaction of Science and Theology* (London: SPCK, 1986), 1. Others have a slightly different quartet. Rhodes describes orderliness, intelligibility, reliability of human reason, and a belief in causality. See F. H. T. Rhodes, “Christianity in a Mechanistic Universe,” chapter 1 in D. M. Mackay (ed.), *Christianity in a Mechanistic Universe and Other Essays* (London: IVF, 1965), 18.

but the soul is eternal. Humans are body and soul, amphibians, as it were, standing in the interface between the seen world of nature and the unseen world of God and his spirits. Of course, the seen world of nature is also God's world, and the milieu of divine action.

Further, third, nature (or creation) is the theatre made by God in which humans were cared for by God, commissioned by God, disobeyed God, were judged by God, and will be redeemed by God. I have explored this aspect elsewhere.⁴¹

Finally, fourth, an understanding of nature and humanity's role in nature leads us to take seriously the human responsibility to God for the care of this world. This of course is not just a challenge for Christians but for all of humanity, and calls on Christians to cooperate with all human beings who care for the earth, confronting those who simply see the world as a resource to be exploited. This is a spiritual battle, in which Christians—like Daniel and his colleagues in the Babylonian court—must witness on the one hand to the God they worship and on the other to seek the peace and prosperity of the city in which they live in exile (see Jeremiah 29:7). What this will look like is a “wicked problem” and a challenge for all ISCASTians in their daily work.⁴²

Acknowledgement

It is only when I finished this essay that I started to appreciate fully the richness of Alister McGrath's contribution to my thinking. As I referred back to my well-underlined copy of his impressive *A Scientific*

41 A. Gijsbers, “Towards a Theology Integrating Creation, Providence and Redemption in Our Daily Work, Rest and Family,” *Luke's Journal* 26:1 (2021), <https://tinyurl.com/5c3s3cb8> (accessed 16 February 2025).

42 For further exploration of this difficult challenge, see my report on ISCAST's day conference of 7 September 2019, in A. Gijsbers, “Wicked Problems and the Hope of the Kingdom: Summing up the Issues from the Victorian Symposium,” ISCAST (5 December 2019), available at <https://tinyurl.com/y7esjrm5> (accessed 16 February 2025).

Theology, I realised how much of his ideas I had imbibed. His ISCAST Conference on Science and Christianity, on Reality, in 2007, added to that richness, and I am profoundly grateful. Tom McLeish's *Faith and Wisdom in Science* also has been a wonderful resource in reflecting on the nature of science and the joy and wisdom of creation. I follow a long way behind.

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Religious Minds in the Modern Evolutionary Synthesis

Samuel McKee

Abstract: The study of evolutionary biology at contemporary universities unfolds through the lens of the Modern Evolutionary Synthesis (MES). Historically, this constitutes the official marriage of classical Darwinian evolutionary biology and modern genetics, so that one cannot be studied without the other. In addition, a genetic lens is always applied to evolutionary biology, and genetics is understood evolutionarily. The founders of the MES included three prominent figures who were church-attending believers. This fact is often overlooked and unappreciated, especially by extremists on both sides of the creation vs evolution debate in the West. Herein, I examine the faith commitments and publicly expressed views of Theodosius Dobzhansky, Sewall Wright, and Ronald Aylmer Fisher. I also explore the implications of their understanding for the competing narratives, and why these figures are not more commonly known in the science and religion dialogue.

Keywords: evolutionary biology; genetics; Modern Evolutionary Synthesis; natural selection; panpsychism; science and religion

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This paper is a brief exploration of the religious faith of three of the most important figures in the Modern Evolutionary Synthesis (henceforth MES), also known as “Neo-Darwinism.”¹ It highlights the importance of the matter that three significant figures in a pivotal moment in the history of evolutionary biology espoused religious convictions. The fact is usually passed over in silence.² The MES was birthed in 1942 under Julian Huxley. Its key players included field biologist Ernst Mayr, palaeontologist George Gaylord Simpson, botanist and geneticist G. Ledyard Stebbins, geneticist Theodosius Dobzhansky, mathematician and statistician Ronald Aylmer Fisher, and population geneticist Sewell Wright. Others contributed to the acceptance of this merger into a cohesive, grand unifying theory of biology.

Charles Darwin had articulated the idea of natural selection in 1859, in *On the Origin of Species*.³ Gregor Mendel, a friar from Brno, later developed the ideas that would become the basis of genetics.⁴ Though Darwin considered the method of inheritance of characteristics and even had a copy of Mendel’s article in his home, he never appreciated the significance of genetics. Mendel’s work on pea plants gave a biological mechanism for evolution to complement natural selection.⁵ From 1900, debates grew over the preeminence of either selection or mutation. Thomas Hunt Morgan in his groundbreaking work on fruit

1 There are subtle differences between the two but for the purposes of this article I shall not go into these, instead referring to the marriage of ideas here as the MES.

2 See Richard Dawkins, *The God Delusion* (London: Black Swan, 2006), 103, 411; Michael Ruse, *Can a Darwinian Be a Christian?* (Cambridge: Cambridge University Press, 2010), 8–9. For example, as Dawkins asserts elsewhere, “Although atheism might have been logically tenable before Darwin, Darwin made it possible to be an intellectually fulfilled atheist.” Richard Dawkins, *The Blind Watchmaker* (New York: W.W. Norton & Co, 2015), 18.

3 Charles Darwin, *On the Origin of Species* (New York: Dover, 2006; first edn 1859).

4 See Ilona Miko, “Gregor Mendel and the Principles of Inheritance,” *Nature Education* 1:1 (2008): 134.

5 See N. C. Stenseth et al., “Gregor Johann Mendel and the Development of Modern Evolutionary Biology,” *Proceedings of the National Academy of Sciences of the United States of America* 119:30 (2022): e2201327119, <https://doi.org/10.1073/pnas.2201327119>.

flies, and Barbara McClintock in her research on maize, continued to place genetics at the forefront of evolutionary biology. Once the Second World War had ended, it had become apparent that natural selection and Darwin's ideas in *The Origin of Species* were essential players in evolution, and mutation alone could not account for change.

The synthesis saw Mendel's and Darwin's ideas brought together into an agreed formulation of modern evolutionary biology. Huxley deserves great credit for articulating this in his 1942 work *Evolution: The Modern Synthesis*, but it was the collaboration between scientists of different backgrounds, from the field work of Ernst Mayr to the mathematics of Ronald Aylmer Fisher, that gave it the most credence. Here, the largest scale macroevolutionary picture of species and populations could be brought into the same conception as the micro scale world of mutation in nucleic acids and proteins.

As I shall attempt to show, the contributors to the articulation of the MES had no religious or antireligious motivations. It was a scientific forum, not a philosophical one, no matter how much the discipline continues to court wonder and reflection. A great example of this is George Gaylord Simpson, a titan of palaeontology and one of the most important figures in the history of evolutionary biology. In his early life, he was a committed Christian, becoming an agnostic as an adult, though certainly no atheist. By the end of his life, he could be described as a functional atheist with more materialistic leanings. But even here, despite giving up his faith, he maintained a fierce agnostic streak that ultimate knowledge of the underlying dynamic that drove the development of life remained beyond human comprehension.⁶ The scientific background had been agreed, but the philosophical picture was anything but clear. Three other crucial thinkers who contributed vital elements of the MES will be given particular attention in this article.

I shall here note that this article focuses on these personalities who contributed during the earliest days of the MES. The molecular biology revolution unfolded dramatically in the generation follow-

6 See Léo F. Laporte (ed.), *Simple Curiosity: Letters from Gaylord Simpson to His Family, 1921–1970* (Berkeley, CA: University of California Press, 1987), 16.

ing their most important work. Undoubtedly the elucidation of the structure of DNA, the genetic code, the advent of sequencing, and their associated breakthroughs would shed new light on evolution as well as bring new levels of reflection, as was seen from the likes of Arthur Peacocke.⁷

Theodosius Dobzhansky

Population genetics was one of the most important drivers of the MES. It helped establish mathematical models to quantify aspects of evolution as the discipline of genetics itself was growing. Gene sequencing came shortly after the MES was generated, most importantly through the groundbreaking work of the double Nobel laureate Fred Sanger at Cambridge. Population genetics understandably brought both genetic variation and natural selection into close contact. Bottlenecks, genetic drift, and other drivers of speciation could be examined for the past, present, and even future predictions, as they related to adaptation, speciation, and the structure of populations. Theodosius Dobzhansky was one of the most important voices in this field. He contributed much original thought, was a fine communicator to academics and popular audiences, and his textbooks on evolution are still of outstanding quality half a century later. Depending on whom you ask, he can be counted as one of the most important evolutionary biologists since Darwin. He was also a winsome and popular figure who was happy to engage with critics and rivals both in print and in person.

Though not aggressive in debating his position, Dobzhansky was a committed Orthodox Christian who continually sought to bring the conversation about ultimate meaning from evolution to the fore. It is perhaps of little surprise that one of the biologists who expended the most effort in bringing about a synthesis of evolutionary biology and modern genetics also strived immensely towards a synthesis of

7 For example, Arthur Peacocke, *God and the New Biology* (London: Harper Collins, 1987).

evolutionary biology and religious faith.⁸ Synthesising knowledge was simply part of who Dobzhansky was.⁹

Perhaps the most famous quote of the entire discipline in the twentieth century comes from Dobzhansky's plume: "Nothing in biology makes sense except in the light of evolution."¹⁰ He is one of the most important figures in bridging genetics and classical Darwinism. He was also perhaps the most important voice during his lifetime in propounding theistic evolution as a popular perspective.

A popular science communicator, in *Biology of Ultimate Concern*,¹¹ he went beyond the exposition of science for the broad public by exploring the fundamental questions of meaning and purpose raised by genetics and evolutionary biology. In *The Wisdom of Evolution*, by Raymond J. Nogar, Dobzhansky contributed the foreword¹² to a large work exploring the mind behind evolution and its theistic implications. Dobzhansky argues there that a Thomistic and Catholic doctrine of creation is the most compatible philosophy behind evolution as creation, whilst dismissing materialistic explanations as unsatisfactory. He never regarded evolution as an ideology or doctrine, but he was greatly influenced by the palaeontologist and priest Pierre Teilhard de Chardin.

Viewing evolution as the method of God's creation, science and religion were never opposing forces to Dobzhansky. Indeed, the very thought of antagonism was bizarre to him. His *The Biology of Ultimate Concern* is a little-heralded treasure of reflection on religious faith and evolutionary biology. In this work, Dobzhansky engages not only

8 Theodosius Dobzhansky, *Mankind Evolving* (London: Yale University Press, 1962), xi.

9 Christopher Howell, "Between Darwin and Dostoevsky: The Syntheses of Theodosius Dobzhansky," *Christian Perspectives on Science and Technology*, New Series, Vol. 1 (2022), 28–45, <https://doi.org/10.58913/LGSN7318>.

10 Theodosius Dobzhansky et al., *Evolution* (San Francisco: W. H. Freeman and Company, 1977), 19.

11 Theodosius Dobzhansky, *The Biology of Ultimate Concern* (London: Rapp and Whiting Ltd, 1969).

12 Raymond J. Nogar, *The Wisdom of Evolution* (New York: Doubleday and Company, 1963).

Teilhard de Chardin, but also theologians such as Paul Tillich and others, which shows the breadth of his theological reflection. His most famous student was Francisco Ayala, who was a Dominican priest, and both have contributed frequently to the area of philosophy of biology. These contributions, alongside *The Biology of Ultimate Concern*, remain a treasure-trove for theistic evolution and the theology of the life sciences. Dobzhansky's thinking influenced Catholic, Orthodox, and other Christian traditions, especially of the mystical kind.

Dobzhansky, perhaps more than anyone else, must be taken seriously by those considering evolution and Christian faith. Because of the claims of Dawkins and others that evolution has eroded any realistic basis for religious faith in the creation of life, Dobzhansky's contributions as a prominent evolutionary biologist and outspoken Christian in this era would seem impossible; this makes his personality and input more relevant to the discussion than ever before. His stance is also a great historical inconvenience to those of the Intelligent Design position and to the critics of theistic evolution, who never mention his ideas.¹³ The same goes for our next two figures.

Sewall Wright

Sewall Wright was another geneticist intimately involved in the MES who had strong religious commitments. He regularly attended Unitarian church each week with his wife,¹⁴ and continued to practise his faith all his life.¹⁵

Wright was a major contributor to the birth of population genetics, alongside J. B. S. Haldane. (Population genetics deals with inherent

13 Indeed, a search for all three names in the Intelligent Design journal *Biocomplexity* yields no results. References to Dobzhansky in *Evolution News* are almost entirely reduced to mentioning his most famous quote (see note 10 above).

14 William B. Provine, *Sewall Wright and Evolutionary Biology* (Chicago: University of Chicago Press, 1989), 460, 497.

15 Michael Ruse, *Monad to Man: The Concept of Progress in Evolutionary Biology* (Cambridge, MA: Harvard University Press, 1996), 376.

genetic differences within and between populations, and was crucial for establishing the MES.) With Wright, as with Fisher, the mathematical and statistical element grew in importance within modern genetics, making evolutionary biology more of a statistical and measurable science that could be practised in the field and applied to living populations. This took evolutionary biology far beyond the mere finding and cataloguing of fossils. His work was essential in establishing ideas such as genetic drift and path analysis, which are common parlance in evolutionary biology today. What Wright contributed—alongside Fisher—was a computational analysis of gene frequencies in populations, where natural selection could be seen mathematically in tandem with genetic information such as mutation, migration, and drift. This led to evolution being understood more as the change in gene/allele frequency within a population over time. Modern genetics, particularly since the development of genomics and gene sequencing methods in the field, developed these concepts further, but at the time of the birth of the MES this was a transformative step.

Wright's other success came in the subtlety of his approach and its winsome manner in blending population genetics and statistics with the work of field naturalists like Ernst Mayr. There had been growing disparagement of what was mockingly called the “beanbag” approach to population genetics. Mayr and others put a huge premium on geographic isolation for speciation, and Wright also emphasised genetic interactions in smaller populations. He was instrumental in bringing these parties together more effectively.¹⁶

Wright was more ambitious in venturing into philosophy than others in the MES. The philosopher Charles Hartshorne became one of his best friends and the two collaborated often in writing.¹⁷ Hartshorne placed great emphasis on mind, and Wright endorsed

16 Peter Bowler, *Evolution: The History of an Idea* (Berkeley: University of California Press, 1989), 309.

17 See for example his tribute to Hartshorne: Sewall Wright, “Biology and the Philosophy of Science,” *The Monist* 48:2 (1964): 265–288, <https://doi.org/10.5840/monist196448215>.

a form of what we now call panpsychism (more popularly understood today by recent convert and philosopher of mind, Philip Goff¹⁸). Consciousness and its formation were foundational and fundamental, leading to Wright theorising their presence in the smallest elementary particles.¹⁹ This is in keeping with modern panpsychism and its idea of every atom possessing consciousness in some rudimentary form, with the universe itself painted against a backdrop of consciousness.

Unitarianism does not feature much in discussions around science and religion, partly due to the Unitarian church being much smaller, and partly as few scientists of that background have ventured into philosophy. Wright is a rare exception, though not forthcoming in religious defence. He happened to be a scientist who attended a Unitarian church, his openness to spirituality finding expression in the idealist philosophy and kindred spirit of Charles Hartshorne, who was a devoted religious observer. One can only speculate on the role of faith in developing Wright's idealism and on whether he equated mind and spirit in a traditional sense. It is unfortunate to have to speculate—in the absence of sources—as to what their private conversations may have revealed of Wright's religious commitments. What is certain is that, much as with the Quaker scientists of his generation, such as Sir Arthur Eddington, religious worldviews were often communicated by way of the philosophy of science, especially the philosophy of the mind, not in conversation with science proper.

Ronald Aylmer Fisher

R. A. Fisher was a British population geneticist and statistician who contributed the mathematical elements of evolutionary biology more than anyone else in the MES. He was the archetype of the English

18 Philip Goff, *Why? The Purpose of the Universe* (Oxford: Oxford University Press, 2023).

19 David M. Steffes, "Panpsychic Organicism: Sewall Wright's Philosophy for Understanding Complex Genetic Systems," *Journal of the History of Biology* 40:2 (2007): 327–361.

gentleman of the time: conservative, Anglican, and patriotic. Much as with Dobzhansky, he was more than ready to speak in public about his faith, and sought to explore the new science as a theist. This grew as his name did, and as he aged he took more opportunities to express his faith across different media.

Fisher must be considered among the greatest statisticians of history and one of the fathers of the enterprise of statistical analysis. His 1950 book *Contributions to Mathematical Statistics* is still venerated as a seminal work in the birth of the field. His main work for the MES was *The Genetical Theory of Natural Selection*,²⁰ which writers such as Richard Dawkins and Stephen Jay Gould have heralded as the most important text in evolutionary biology after Darwin.²¹ His application of statistical methodology to the emerging Mendelian genetics threw open practical evolutionary biology, moving it from the qualitative into the quantitative.

Fisher was a resolutely committed Anglican. He conducted his scientific work with devotion and then brought his devotion to science to bear in church. He wrote often for Christian magazines, gave lectures on science and religion, including his 1950 Eddington Memorial Lecture, titled “Creative Aspects of Natural Law.” In the latter, he said the following:

It is, therefore, almost axiomatic that the process by which living things, as we know them, have come gradually into existence, is, in the fullest sense, a creative process ... It is almost like saying that Creation is creative; the only new implication, and it is an important one, that the phrase now has is that for us creation is still going on.²²

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- 20 Ronald Aylmer Fisher, *The Genetical Theory of Natural Selection* (London: Legare Street Press, 2022).
 - 21 James Moore, “Ronald Aylmer Fisher: A Faith Fit for Eugenics,” in *Eminent Lives in Twentieth-Century Science & Religion*, ed. Nicolaas A. Rupke (Frankfurt: Peter Lang, 2009), 182.
 - 22 R. A. Fisher, *Creative Aspects of Natural Law* (Cambridge: Cambridge University Press, 1950), 4.

As we can see, he was certainly never shy in sharing his Christian philosophy and worldview interpretation of the new science when given a public platform. During this period of great international travel, high levels of communication, and overseas influence, academia and popular communication featured heavily with lectureships and symposiums meant to disseminate knowledge more broadly. The Gifford Lectures were arguably the premier annual lectureship at the nexus of science, philosophy, and religion. The University of Cambridge's newly established annual Sir Arthur Eddington Memorial Lectureship would grow alongside it, with the lectures published by Cambridge University Press. Fisher's choice of title and subject matter is notable for his desire to communicate the MES alongside his faith in this way, as is the fact that he was chosen to be the first biologist to give a lecture in the series.

Though vitalism was no longer a viable view in the life sciences, with the birth of molecular biology on the horizon, many believing scientists pondered the nature of life and its various levels, from the microbial to humankind. For some laypeople, church leaders, and many philosophers of religion, the demise of vitalism was a serious blow to Christian apologetics, as it removed what had previously been a seemingly self-evident argument for God. Not so with Fisher or the early generations of religious scientists during the MES. Fisher would often reflect on the nature of life in a philosophical manner in his printed lectures.

In 1955, he gave a broadcast on science and Christianity,²³ where he was critical of dogmatism and hypocrisy, which he saw as unlike Christ. For Fisher, there was no basis for rejecting either evolution on biblical grounds or the Bible on account of the new science. He treated his work as a calling to discover deeper truths about the world. As with Wright, he pursued mind and evolution in a form of panpsychism, being involved with the Society for Psychical Research.

23 F. Yates and K. Mather, "Ronald Aylmer Fisher 1890–1962," *Biographical Memoirs of Fellows of the Royal Society* 9 (1963): 91–129.

Unfortunately, Fisher became involved in the enthusiasm for eugenics.²⁴ Though not drawn to the ideas of the Nazis, he nevertheless saw genetics as a route to improving humanity through more selective breeding. Much in the vein of other evolutionary biologists such as Francis Galton and Horace Darwin, he held the view that a better British generation could be conceived if more care was taken in partner choice and proactive, selective breeding, rather than leaving things to the chance hand of nature. For these thinkers, it was careless and even reckless to not be more intentional in thinking about progeny.

Tension between eugenics and his faith is hard to find in his writings. It is almost as if it did not occur to Fisher. This has left a historical blight on his name, and despite *Genetical Theory* still being a famous text in the history of that science, students are less inclined to give attention to the later chapters that address eugenics. It must be noted here that, according to some philosophers of science, Christianity and evolutionary biology were the pillars of Fisher's eugenic motivations.²⁵

Eugenics and Unitarians

Perhaps we should not be surprised that Fisher and Wright are less appreciated in science and religion discussion, given their positions. Fisher's eugenics have led to his diminished status as a scientist committed to faith.²⁶ Much as with Sir Arthur Eddington as a Quaker, Wright's status as a Unitarian means he does not feature much as an archetypal religious scientist in many works on science and religion. However, their faith played no small part in their lives. There is scope here, therefore, to claim that if not for their less typical backgrounds and ventures, these men would be more highly regarded in science and religion, and the case of serious religious believers in the formation of the MES would be a better reported novelty in the history of science.

24 Moore, "Ronald Aylmer Fisher," 181.

25 Ruse, *Can a Darwinian Be a Christian?* 301.

26 Ruse, *Can a Darwinian Be a Christian?* 182.

The history of science and religion unfortunately hits barriers when concerning evolutionary biology. Much focus is given to the conflicts such as the Scopes Monkey Trial of 1925, or the Oxford Natural History Museum debate between Thomas Huxley and Samuel Wilberforce. Furthermore, Creationism and more recently Intelligent Design have distracted the discussion from a religious standpoint. Theistic evolution as a position has received more recent promotion, and important research has been undertaken on the early religious defenders of Darwin such as Asa Gray and John Stephens Henslow. Given the exceptional importance of the MES, it is interesting that the believing scientists treated here have not received more attention. Perhaps part of the reason is that religious motivations do not seem to have guided their scientific findings, or that their views were expressed philosophically in works that do not carry scientific importance in themselves.

Biases and prejudices, both of their time and in our contemporary world, come into play in diminishing the roles of that generation of religious evolutionary biologists, who belong to an era of historical interest in the initial dissemination and debate over Darwin's new idea. The generation of Dobzhansky, Wright, and Fisher was heavily invested in genetic mutation as a mechanism driving evolution forwards. After genome sequencing arrived with Fred Sanger, and many representatives of the MES generation had died, occasionally, mutation began to be viewed with suspicion as a mechanism of creativity due to its implication in genetic disease. But the thought that God would use a method that can bring death to produce more life should not be alien when dealing with a God of redemption, resurrection, and renewal. Perhaps it is the manner in which these men balanced their faith and science as less dogmatic that left them more open to seeing God work in such ways. But this might have had the unfortunate byproduct of them not featuring as famously as scientists of faith conviction.

The leading cause of the diminished status of their emphasis in science and religion must largely be attributed to the Unitarianism of Wright and the eugenics of Fisher. Obscurity and controversy

are certainly at work. This is not at all surprising when considering the position the University College London felt compelled to take on Fisher,²⁷ and that Unitarian journals are not replete with information on Wright.

Conclusions

Despite the claims that Darwinism is the end of reasonable religious belief,²⁸ it is incredibly difficult to sustain this claim in light of the personal convictions of these three individuals who were foundational for the development of the MES. Neither can the enthusiasm for their religious beliefs be dismissed in the cases of Dobzhansky and Fisher, in particular. All three made concerted efforts to synthesise faith with scientific expertise, resulting in an emphasis on mind and creativity. Arguments for their environment or upbringing being the sole cause for their religious convictions also fail when considering the situation in the United States. Dobzhansky was at Columbia University, just three years after the infamous Scopes Trial, when evolutionary biology and religious faith were at the highest levels of public strain. The release of the 1955 play *Inherit the Wind*, showcasing the heat of this conflict, comes a few years after the MES was established. One might not expect that in such a public furor, religious devotees in the field would be open about their belief.

Much as they saw no conflict between science and religion, they also fed no public dispute. None took part in debates, instead exploring their philosophy in academic writing and sharing their thoughts through other mediums such as lectures or popular books and articles.

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- 27 See the UCL statement on his biography at <https://tinyurl.com/yspk2t7k>, which reads: “The R. A. Fisher Centre for Computational Biology was founded in 2010 within the Department of Genetics, Evolution, and Environment (GEE) at UCL, with Professor Ziheng Yang FRS as its director. Following on from the UCL Eugenics Enquiry in 2019/20, in which the University’s associations with Francis Galton and Karl Pearson were reassessed, their names were removed from several buildings and spaces on our campus.”
 - 28 A good example would be Daniel Dennett, *Breaking the Spell* (London: Penguin, 2007).

None of them came into conflict with other members of the MES who held opposing views (such as Ernst Mayr or George Gaylord Simpson). It is certainly not easy to integrate a new, burgeoning science with faith without any theological training. Perhaps this is why Dobzhansky was most prominent in integrating faith into his perspectives, as his father was a priest, giving him a steady foundation for doing so.

In each case, but particularly in Dobzhansky's, we see the archetypal theistic evolutionist. Francis Collins made particular note of him²⁹ as a fine example for the religious evolutionary biologist to follow. From the earliest days of the MES, as well as following the work of Darwin himself, theistic evolution was the readily assumed position of those working in related academic fields.

Furthermore, as seen in Dobzhansky's writing, forums opened further for those in the life sciences to discuss God's creative work in public through an evolutionary lens. Fisher's Eddington Memorial Lecture in 1950 is a small example, but even before the MES we see Joseph Needham and others moving out from biochemistry into public philosophy.³⁰ Julian Huxley himself would publish a short work entitled *Religion Without Revelation* in 1941, to defend a more biologically grounded form of belief.³¹

Part of what has interested scholarship on the MES is the coming together of diverse branches of the life sciences. These have been synthesised into a coherent pathway that has led to the development of a practical evolutionary biology. From Mayr, the field biologist, to Wright and Fisher as statisticians and mathematicians, with everything in between, the MES was the unification of different branches into the successful integration of Darwin and Mendel's approaches.

29 Francis S. Collins, *The Language of God* (New York: Free Press, 2006), 199.

30 Another example of this is Charles E. Raven and Joseph Needham, *The Creator Spirit: A Survey of Christian Doctrine in the Light of Biology, Psychology and Mysticism*, The Hulsean Lectures, Cambridge, 1926–1927 (Cambridge, MA: Harvard University Press, 1926).

31 Julian Huxley, *Religion Without Revelation* (London: Watts and Co., 1941).

This accomplishment overshadowed the religious convictions of three of the thinkers who have gone largely unnoticed.

Nevertheless, the contributions of the thinkers reviewed above are of great significance to the history of science and Christianity, especially of Christianity and evolutionary biology. Just as with the early religious defenders of Darwin, key players in the birth of the MES had an active Christian faith and saw no conflict whatsoever between their research and their faith. One could call it a synthesis all of its own.

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A Biblical Account of Origins Should Also Explain the Origins of the Biblical Account

Alan Dickin

Abstract: The biblical account of origins includes the creation itself (Genesis 1–3) and the origins of civilisation, religion, and languages (Genesis 4–11). Ever since these accounts were first written down there have been questions about their meaning, and about how literally they should be taken. To grasp their meaning we need to understand their origins, but for most scholars the traditional view that they were written down by Moses is not consistent with the evidence from the texts. This causes difficulties of understanding, so that a reconsideration of the origins of the accounts is a necessary precursor to speculations about their meaning, especially in relation to the faith–science dialogue on cosmic origins. A viable explanation for the origins of the biblical creation accounts should explain the evidence for multiple documentary sources, as well as the historical origins of these sources. Such an explanation was outlined by William F. Albright, who attributed the creation accounts of Genesis to distinct Priestly and Yahwist traditions, while also affirming that much of this material was brought from Mesopotamia during the time of the patriarchs. This raises the question of how multiple accounts of origins could be preserved in the family history of one man (Abraham). However, this is possible if the Mesopotamian origins accounts included both oral and written sources. These different media would have allowed the preservation of conflicting accounts of

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origins that eventually fed into the tribal histories of Israel, now recognised as the Priestly and Yahwist traditions. This represents a testable model for the origins of the biblical accounts, allowing the possibility of a new understanding of biblical origins in Genesis, both as texts and as histories.

Keywords: Abraham; Creation account; Documentary Hypothesis; Priestly; Yahwist

For centuries, thinkers of all persuasions have been wrestling with the meaning of the creation stories of Genesis and the question of how they relate to nature and science. The debate has often been strongly polarised. For example, one extreme is represented by recent authors who claim that Genesis is basically a scientific textbook.¹ They give an interpretation of Genesis as if it were directly dictated by God, which overlooks the complexity of the biblical text and its long history of transmission.

Alternatively, if we could make a reasoned argument about the origins of the text, we could make a better case for grasping its meaning. However, when we follow this approach, we quickly run into another extreme of interpretation, which says that the origins of these texts cannot be known. This is based on the view that present explanations have failed, and that there is nothing new to be said: “After two and a half centuries of modern research, all conceivable arguments have been brought to the table.”²

This sounds much like the opinion of nineteenth-century physicists that there was nothing new to find in science, a belief that was held shortly before the discovery of radioactivity, relativity, and quantum mechanics. However, what this belief really showed was that thinking by a small self-selecting group of scientists had become

1 Hugh Ross, *Creation and Time* (Carol Stream, IL: Navpress, 1994), 45, 154.

2 Christoph Levin, “The Priestly Writing as a Source: A Recollection,” in *Farewell to the Priestly Writing? The Current State of the Debate*, ed. Friedhelm Hartenstein and Konrad Schmid (Atlanta, GA: SBL Press, 2022), 1–26.

sterile. I suggest that a similar type of tunnel vision has occurred in the present-day biblical studies community.

This is the basis for bringing new ways of thinking, such as those used by scientists, to the field of biblical studies; and this can conveniently be initiated by an examination of the issue in a journal that is designed for the interaction of science and faith. Such an examination is important because the early chapters of Genesis underpin the Bible's view of the relationships between God and humanity. For example, those engaging in the creation–evolution dialogue and those ministering in the area of marital relations often begin their discourse by quoting from the story of Adam and Eve. Therefore, an understanding of the historical origins of these texts is a foundational issue for Christianity that is highly relevant to members of ISCAST (Institute for the Study of Christianity in an Age of Science and Technology).

The Mosaic Tradition

Traditionally, the authorship of Genesis was unquestioningly attributed to Moses, since Genesis is the first of the “Five Books of Moses” (the Pentateuch). But even though Exodus says that Moses wrote down God’s “words” (the Law), there is no statement that Moses wrote Genesis, and certainly no claim that he wrote it down for the first time. Therefore, it is not surprising that increasingly critical questions were asked about the Mosaic authorship of Genesis when scholars reexamined traditional and received wisdom during the “Age of Enlightenment.”

One of the first to ask questions about the Mosaic authorship of Genesis was Benedict Spinoza. He suggested that the use of anachronistic place names and phrases, such as “to this day” (Genesis 22:14; 26:33; 32:32), implied that the Pentateuch was written much later than Moses, probably after the Jewish exile in Babylon.³ On the other hand, Jean Astruc attempted to reinstate Mosaic authorship of the Pentateuch by arguing that Moses himself had edited together two earlier written

3 Benedict Spinoza, *Tractatus Theologico-Politicus* (1670), trans. R. H. M. Elwes, *The Chief Work of Benedict Spinoza* (London: George Bell & Sons, 1891).

documents.⁴ Astruc identified these documents based on their use of two different Hebrew names for God, usually romanised as *Elohim* and *Yahweh*.

Later scholars abandoned Astruc's belief that the editing process was carried out by Moses, but adopted his idea that Genesis was composed from documentary sources that used different names for God. Hence, the Documentary Hypothesis was born. But if Genesis (and the Pentateuch as a whole) was composed by combining preexisting documents or sources, it is critical to have objective and consistent criteria to identify these sources.

Here, it should be remembered that the gospels of Matthew and Luke show clear evidence of having been derived by combining distinct source traditions.⁵ For example, Matthew's gospel contains almost all of Mark, in a somewhat condensed style, interleaved with another source that is common to Matthew and Luke (often called Q), and additional material (such as the story of the Magi) that is unique to Matthew. So the compilation of Genesis from distinct sources is not in itself problematical.⁶

The Documentary Hypothesis

The principal result of 19th-century scholarship on the Documentary Hypothesis was to recognise four main sources to the Pentateuch; the Yahwist (J), Elohist (E), Deuteronomist (D), and Priestly (P) sources, whose acronym in German, JEDP, signified the most popular theory on the relative ages of the sources. In addition, one or more redactors

4 Jean Astruc, *Conjectures sur les mémoires originaux, dont il paraît que Moïse s'est servi pour composer le livre de la Genèse* (1753; *Conjectures on the original accounts of which it appears Moses availed himself in composing the Book of Genesis*, published anonymously).

5 Burnett H. Streeter, *The Four Gospels: A Study of Origins treating of the Manuscript Tradition, Sources, Authorship and Dates* (New York and Toronto: MacMillan, 1924).

6 Hermann Hupfeld, *Quellen der Genesis und die Art ihrer Zusammensetzung: von neuem untersucht* (Berlin: Wiegandt und Grieben, 1853), 195.

presumably combined these sources into what we have in the Masoretic Text, the Septuagint, and the Dead Sea scrolls.⁷

Two of the principal sources in Genesis (J and E) can be described as epic sagas. They use different words for God (Yahweh and Elohim) but are stylistically similar. The P source also refers to God as Elohim (in Genesis) but has a very different style, displaying an interest in genealogies, covenant agreements, and lists, with a more rigidly organised content rather than a focus on dramatic story development. The D source does not contribute to Genesis, but claims to be the last speech of Moses, representing a summation of the Law intended to guide the Israelites in their conquest of the Promised Land.

Once identified, the ages and origins of these sources can be investigated in order to understand the origins and meaning of the text. However, scholars have always tended to mix up these two stages of thinking in their application of the Documentary Hypothesis, conflating straightforward source identification with the theological analysis and historical interpretation of source traditions.

For example, it was observed in the 19th century that in their preaching to the House of Israel, many of the biblical prophets seemed not to refer to large segments of the law, which implied that perhaps they did not have access to those parts. The Bible gives its own explanation for this observation in 2 Kings 22, which describes the finding of a “lost scroll of laws” in the temple. The claim that this scroll was found in the time of King Josiah immediately explains a previous lack of knowledge of part of the law (normally assumed to be Deuteronomy). But rather than taking this account at face value, Wilhelm de Wette developed a perverse alternative theory that this scroll of laws was a “pious fraud,” newly written in the time of Josiah and planted in the temple expressly to be “discovered” by the temple servants.⁸

7 Sidnie W. Crawford, “The Text of the Pentateuch,” in *The Oxford Handbook of the Pentateuch*, ed. Joel S. Baden and Jeffrey Stackert (Oxford: Oxford University Press, 2021), 41–60.

8 Wilhelm M. L. de Wette, *Beiträge zur Einleitung in das Alte Testament* (Contributions to the Introduction to the Old Testament; Halle: Schimmelpfennig, 1807).

This theory introduced the whole idea of the Pentateuch as an “invented history” of early Israel. This line of thinking was developed by Wilhelm Vatke,⁹ who argued that Israelite religion developed from a primitive *laissez faire* style of worship in its early phase (by which the patriarchs could offer sacrificial worship anywhere they felt to be holy) to an increasingly regimented cult overseen by a temple hierarchy. According to this Development Hypothesis, the ceremonial law supposedly received from God by Moses did not actually arise until after the Babylonian Exile. However, the conclusion of this line of thinking, initially spelled out by Karl Graf¹⁰ and fully synthesised by Julius Wellhausen,¹¹ was that the whole paraphernalia of the Tabernacle and Mosaic ceremonial law described in Exodus was an elaborate fiction.

This proposal represents a clear denial of the New Testament view of Old Testament religion, such as that summarised in the eleventh chapter of the Letter to the Hebrews. But Wellhausen’s rhetorical skills allowed him to hitch together the Documentary and Development Hypotheses, so that accepting the reality of source documents for the Pentateuch more or less meant treating them as fiction. The result was that most Evangelical Christians vehemently rejected the Documentary Hypothesis lest they also be accused by their churches and academic institutions of heresy. In contrast, most liberal scholars embraced the Documentary Hypothesis with enthusiasm, but as generation after generation of thinkers tweaked it, the basic principles of source identification underpinning the Documentary Hypothesis were gradually abandoned.

One of the notable recent steps in this process was the publication of a collection of papers in 2006 under the title *A Farewell to*

9 Wilhelm Vatke, *Die Religion des Alten Testaments nach den kanonischen Büchern entwickelt* (Berlin: G. Bethge, 1835).

10 Karl H. Graf, *Die geschichtlichen Bücher des Alten Testaments: zwei historisch-kritische Untersuchungen* (The historical books of the Old Testament: two historical-critical investigations; Leipzig: T. O. Weigel, 1866).

11 Julius Wellhausen, *Prolegomena zur Geschichte Israels* (Berlin: Georg Reimer, 1883). Translated by John Sutherland Black and Allan Menzies as *Prolegomena to the History of Israel* (London: Adam and Charles Black, 1885), 9.

the Yahwist.¹² The message was that one of the most well-established documentary sources, J, did not exist as a coherent tradition, but was simply an agglomeration of fragments. One of the marks of this way of thinking was to abandon the label “Yahwist” and simply refer to such material as “non-P,” meaning any text that was not stylistically identified as part of the Priestly source.

A more recent analysis of the J source in Genesis demonstrates the type of arguments used for its dismembering. For example, in identifying a lack of continuity between the non-P material in the primeval and patriarchal narratives, Jan Christian Gertz suggested that “the Patriarchal material seems to esteem the semi-nomadic lifestyles of the patriarchs and their families, which according to the primeval history must be regarded as unsettled and cursed.”¹³ This assertion is evidently based on the idea that God’s cursing of Cain with wandering in the Land of Nod was a criticism of the nomadic lifestyle. But this seems to be far from the truth—the sacrifice of Abel the pastoralist was accepted by God, whereas Cain’s, the (settled) farmer, was rejected. Similarly, the story of Babel implies judgement against the city and approval of the nomadic lifestyle.

In response to this type of argument, a return to the basics of the Documentary Hypothesis has been advocated by a new generation of scholars, including Joel Baden and Jeffrey Stackert.¹⁴ They argued that documentary sources should be distinguished on basic matters of narrative consistency or inconsistency in the description of past “events,” and on evidence for basic matters of belief, such as the revelation of the name of God, not based on value judgements about the theological message of different segments of the biblical text.¹⁵ This view

12 Thomas B. Dozeman and Konrad Schmid (eds), *A Farewell to the Yahwist? The Composition of the Pentateuch in Recent European Interpretation* (Atlanta, PA: Society of Biblical Literature, 2006).

13 Jan C. Gertz, “The Formation of the Primeval History,” in *The Book of Genesis*, ed. Craig A. Evans et al. (Leiden and Boston: Brill, 2012), 105–135.

14 Joel S. Baden and Jeffrey Stackert (eds), *The Oxford Handbook of the Pentateuch* (Oxford: Oxford University Press, 2021).

15 Joel Baden, *The Composition of the Pentateuch: Renewing the Documentary*

has been labelled the “neo-documentarian theory” by some, although to a large degree it involves a return to its roots.

To demonstrate that such a return is justified, we need to examine some specific texts that clearly suggest the existence of multiple sources for several Old Testament books, and which may also reveal relationships between these sources. We also need to assess the continuity of these traditions based on their fundamental characteristics as sources, rather than subjective judgements about their theological message. These assessments are the necessary first steps in understanding the origins of the creation accounts of Genesis.

Evidence from Conflicting “Eyewitness” Narratives

The strongest evidence for the Documentary Hypothesis (in the Pentateuch and in the following historical books) has always been the existence of multiple accounts of events with conflicting details. For example, the case for separate Priestly and epic saga sources can be seen clearly in the description of the birth of Benjamin (Genesis 35). The P source (Genesis 35:23–26) describes the birth of Benjamin in Paddan Aram, as part of a list of all the sons of Jacob organised according to their mothers (Leah, Rachel, and their two maidservants). In contrast, the E saga describes the birth of Benjamin between Bethel and Ephrath in Canaan, as part of a vivid account of the death of Rachel (Genesis 35:16–20). These two accounts are clearly contradictory, but because one is a genealogical catalogue and the other an eye-witness story the contradiction is not obvious. Editing either account for consistency with the other would have done violence to the narrative, so the redactor preserved the minor conflict between them, and most readers do not notice it.

A more obvious example of two conflicting versions of events comes from the life of King David, hundreds of years later (1 Samuel 16–17). Here, the events surrounding the killing of Goliath and David’s

Hypothesis (New Haven, CT: Yale University Press, 2012), 20.

promotion to the royal court are described in two significantly contradictory accounts. Although these accounts are in 1 Samuel, one of the sources was identified by Richard Friedman as the same J tradition considered a principal source of the Pentateuch. In fact, Friedman claimed that this narrative account was a continuous saga that described the history of the nation of Israel from the origins of humanity to the reign of David, with addenda up to the Jewish exile in Babylon.¹⁶

In the book of Samuel, this J source describes the anointing of David (son of Jesse) to be king, consistent with the Judean tribal history prophesied by Jacob in Genesis 49 (also attributed to J). According to 1 Samuel 16, David was sent to the court of King Saul because of his ability to play the harp, after Saul began to be tormented by an evil spirit. The result of this encounter is described as follows (1 Samuel 16:21–22, NIV): “David came to Saul and entered his service. Saul liked him very much, and David became one of his armour-bearers. Then Saul sent word to Jesse saying, ‘Allow David to remain in my service, for I am pleased with him’.” After this, J goes on to describe how the Israelite and Philistine armies confronted each other at Socoh, and how the Israelites were terrified of the Philistine champion, Goliath. However, this account of David’s promotion to the royal court is followed by a second version with a significantly different record of events.

This second account gives a detailed description of David’s killing of Goliath (1 Samuel 17). But as David is going out to meet Goliath, Saul inquires of the commander of the army (17:55), “Abner, whose son is that young man?” to which Abner replies (17:57), “As surely as you live, O King, I don’t know.” Then, a little later, after the killing of Goliath, Abner introduces David to Saul while David is still holding Goliath’s head in his hand. Saul now asks David himself (17:58), “Whose son are you, young man?” Hence, these quotes clearly show that in this version of the story, Saul had never met David before.

Evidence for the identity of the second source comes earlier in the chapter, where the Ephrathite ancestry of David’s father is noted

16 Richard E. Friedman, *The Hidden Book in the Bible: The Discovery of the First Prose Masterpiece* (San Francisco, CA: Harper, 1998).

(1 Samuel 17:12). The Ephrathites are believed to be a clan that originated from the tribe of Ephraim, whose territory was in the north of Israel. These Ephraimites apparently migrated to the Bethlehem area south of Jerusalem, and are believed to have married into the tribe of Judah through the female line (in the person of Ephrath); hence their name, Ephrathites.¹⁷ This connection suggests that the second source here is probably closely related to the E source in Genesis, the same one that described the death of Rachel (grandmother of Ephraim).

The Origin of Alternative Accounts of Events

Here it is necessary to reexamine one of the most basic tenets of scholarly thought concerning the origin and evolution of documentary sources. This tenet is well expressed in a recent paper by Erhard Blum on the coherence or otherwise of the Priestly source in Genesis: “If diachronically distinct material interrupts an otherwise coherent and continuous context, this speaks for the independence of the context in relation to the material causing the interruption.”¹⁸

This point demonstrates an expectation that the inserted material is “diachronic” in the sense that it is older or younger than the source that it interrupts. This expectation leads to huge problems, which Blum uses to attack the integrity of the P tradition as an independent source. For example, he argues that P’s account of the divine appearance at Bethel (Genesis 35:11–15) is a doublet of the interleaved J/E accounts in Genesis 28:11–19, and dependent on them, in the sense that P *reinterpreted* the encounter of Genesis 28:11–19. The basis of the argument is the similarity of the ritual and the divine promises in the two encounters. However, it overlooks a fundamental difference—Genesis 28 describes a vision on the way to Paddan Aram, while Genesis 35 describes one on the way back. In fact, E describes Jacob stop-

17 Nadav Na’aman, “The Settlement of the Ephrathites in Bethlehem and the Location of Rachel’s Tomb,” *Revue Biblique* (2014): 516–529.

18 Erhard Blum, “Once Again: The Literary-Historical Profile of the P Tradition,” in *Farewell to the Priestly Writing?* 27–61.

ping at Bethel on the way to Paddan Aram as well as on the way back. In contrast, P doesn't know about Jacob's experience on the way to Paddan Aram, so the ritual and the divine promises must be included in his account of what was really Jacob's second visit to Bethel, on the way back.

The root of this problem is Blum's assumption of a "diachronic" model, where one tradition must necessarily precede the other. Alternatively, P and J/E could report similar events based on *independent* recollections that were preserved until the time of their merger. For example, William F. Albright suggested that because the documentary sources were formed over a period of time, their ages could overlap rather than having a simple diachronic relationship: "Since many traditions embedded in our three sources were formed and even phrased at different times, we have a staggered chronological relationship between them which greatly enhances their historical dependability."¹⁹

Therefore, rather than being formed at different times, we should consider the alternative proposition that the traditions were formed *alongside* one another, but in different places or cultural contexts, which kept them separate even though they existed at the same time. For comparison, evolutionary science tells us that the basic requirement for the development of incompatible breeding populations is the geographical or behavioural separation of subgroups of a population, so that they can each develop their own self-propagating group.²⁰

In the case of the Pentateuch and the subsequent historical books (the "Former Prophets" of the Hebrew Bible), it is clear that these narratives developed within the tribal society of Israel. Therefore, it is natural to look for a tribal basis of alternative recollections of events that were developing simultaneously. This tribal aspect of the documentary sources has been recognised by some scholars, who identify the Yahwist (J) with the tribe of Judah, and the Elohist (E) with the

19 William F. Albright, *From the Stone Age to Christianity: Monotheism and the Historical Process* (Baltimore, MD: John Hopkins Press, 1940), 252.

20 David Lack, *Darwin's Finches* (Cambridge: Cambridge University Press, 1983).

tribe of Ephraim.²¹ But, in addition, the Priestly source should also be attributed to a distinct community within the tribe of Levi. The tribes were geographically separated after the conquest of Canaan, but before that they were socially separated, even when they were living as a single nomadic community. We can trace this tribal rivalry all the way back to their origins in the family of Jacob.

The separation of the tribal history of Ephraim probably began when the other brothers sold Joseph into slavery in Egypt. Here, I am assuming that this story in Genesis 37 is an account of real events. And one of the best reasons for believing this is the evidence that the story (as presently laid out) was composed by interfingering two slightly different accounts from E and J.²² In other words, the two slightly different accounts corroborate each other in the same way that truthful but slightly varying eye-witness statements do in a law court.

It was in Egypt that Joseph found success and began his own family tradition. Therefore, it should not be surprising that this tradition included the beginnings of a separate tribal history, which was passed on to the chosen descendant, Ephraim. This importance of family histories is an overlooked aspect of the ancient concept of the birthright. The birthright conferred ownership of the family tradition, which therefore passed to Ephraim rather than Manasseh. Likewise, when Judah was recognised as preeminent over his elders (Reuben, Simeon, and Levi), his tribe inherited the J account.

Many scholars dispute the existence of E as a genuine distinct source, arguing it is just a supplement to J.²³ For example, it doesn't have its own origins account. But that is exactly what we would expect from the tribal origins of the documentary sources. There is only room for one oral history in a single close-knit family, but as siblings separate into their own families, clans, and tribes, some may develop their own oral accounts. Hence, the family history of Ephraim (E) reaches

21 Richard E. Friedman, *The Bible with Sources Revealed* (New York: HarperCollins, 2003), 18–21.

22 Baden, *The Composition of the Pentateuch*, 34–44.

23 Baden, *The Composition of the Pentateuch*, 103–128.

only as far back as the knowledge its founder (Joseph) had about the experiences of his great-grandfather (Abraham) in Canaan.

Evidence for Documentary Continuity

Almost as important as the evidence for distinct sources (based on repeated accounts of events with differing details) is the evidence for documentary continuity. However, documentary continuity is expressed differently in P and the saga sources, reflecting their different functions. These differences need to be understood to appreciate the continuities of the distinct sources.

For example, the documentary continuity of the P source in Genesis is expressed in the repeated reporting of genealogical information. Whether or not the *toledot* genealogical “formula” itself was an addition by the redactor, it remains true that an interest in genealogical details is a consistent characteristic of the P document.²⁴ Another particular focus of P is on accounts of covenant relationships. Three of these covenants (creation, rainbow, circumcision) were regarded by Wellhausen as “preludes” to the Mosaic covenant.²⁵ Thus, the six-day account of creation forms the context of humankind’s commission to fill the earth, and this commission is reinstated after the Flood, before being narrowed into the national and tribal commissions of the patriarchs.

Covenant agreements also exist within the J source in Genesis, such as God’s promise of descendants to Abraham in Genesis 15. However, that particular covenant was “acted out” in a way that made it particularly suited to oral transmission. In contrast, the covenants in P needed to be recorded in writing because they required specific human observance. For example, they include three agreements between human parties alone (see Table 1). It is likely that these agreements were preserved on cuneiform tablets, since this type of record was commonly used in Mesopotamia to record legal agreements.

24 Blum, “Once Again,” 40–48.

25 Wellhausen, *Prolegomena to the History of Israel*, 7.

Cuneiform was the principal medium of international diplomatic communication up until the time of Moses.²⁶

Priestly narrative	Divine names	Legal requirement
Covenant of creation	Elohim only	First great commission
Covenant of building the ark	Elohim only	Promised reinstatement
Covenant of the rainbow	Elohim only	Reinstated commission
Covenant of circumcision	All three	Circumcision law
Abraham property purchase	None directly	Land agreement
Isaac's commission to Jacob	El Shaddai	National commission
Covenant promise to Jacob	Elohim only	National commission
Treaty, Pharaoh and Joseph	None	Land agreement
Blessing to Joseph and sons	El Shaddai	Tribal commission
Joseph burial instructions	None	Last will & testament

Table 1. Covenant agreements in Genesis that were most suited for recording in writing

Source continuity is also demonstrated by the presence of distinct words and phrases not used in the other sources. This allows the documents to be distinguished even in places where there is less clear evidence from duplicate accounts of events. For example, there are hundreds of descriptions of dying in the Pentateuchal documents, but only P uses the Hebrew word for “expire” (11 times) or the phrase “gathered to his people” (11 times) to describe death. In turn, only J uses the word *sheol* to describe the place of the dead (6 times).²⁷ Similarly, in describing procreation, only the P source uses the expression “be fruitful and multiply” (12 times), whereas only J uses the expression “to know” a

26 William L. Moran, *The Amarna Letters* (Baltimore, MD: Johns Hopkins University Press, 1992).

27 Friedman, *The Bible with Sources Revealed*, 9.

woman (6 times). J also uses the expression “to lie with” 11 out of 13 times (the other two in E).²⁸

Divine names represent a specific example of distinct vocabulary in the different sources, but this criterion has often been misunderstood. As Richard Friedman explains, it is not simply that the different documents use different names for God, but that these differences point to different *historical views* (on the part of their authors) about when the divine names were first revealed.²⁹ For example, when J quotes *dialogue*, his characters do not necessarily use the name Yahweh if they were living in a different culture from the people of God. For example, when Joseph refers to God while living in Egypt he uses the more generic word Elohim, even in the J source (Genesis 42–45). By contrast, J always uses the name Yahweh in narration,³⁰ since he believes that this name was revealed to humankind from the beginning (Genesis 4:26).

Strictly speaking, this cannot have been true, because the name Yahweh is Hebrew, which was not spoken where the primeval history is set, in Mesopotamia. But if the J tradition was passed down orally, the original name of the true God must have been updated over time to make the story more intelligible for later listeners.³¹ In that case, later guardians of the J tradition would not actually have known what name the originator of this tradition used for God.

In contrast, the E and P sources both claim that the name Yahweh was not known until the time of Moses. For example, Exodus 6:2–3 (P) spells this out explicitly: “And God spoke to Moses and said to him, “I am YHWH. And I appeared to Abraham, to Isaac, and to Jacob as El Shaddai, and I was not known to them by my name YHWH.”³² As a result, the P source never uses the divine name Yahweh in dialogue

28 Friedman, *The Bible with Sources Revealed*, 9.

29 Friedman, *The Bible with Sources Revealed*, 10.

30 Friedman, *The Bible with Sources Revealed*, 10.

31 Alan Dickin, “Recovering Genesis 1 from Scientific and Societal Misunderstanding,” *Christian Perspectives on Science and Technology*, New Series, 2 (2023): 28–57, <https://doi.org/10.58913/ULGJ3154>.

32 Friedman, *The Bible with Sources Revealed*, 10.

until the time of Moses, because its characters could not have known that name. However, the P author occasionally uses the name Yahweh in narrative if he wants to emphasise the continuity of revelation by the same God to the patriarchs and to Moses. For example, in the revelation to Abraham (Genesis 17:1), he says, ‘YHWH appeared to Abram and said to him, “I am El Shaddai.”’

Two Accounts of Creation

The above discussion has focused largely on the stories of the patriarchs and the subsequent history of Israel. These alternative accounts involve the sources J, E, and P, and are best explained by alternative tribal records of these events. But what about the alternative accounts of origins in Genesis 1 (up to Genesis 2:4a) and Genesis 2 (verses 4b to 25)? Firstly, these accounts describe events that evidently occurred long before the origins of Israel itself. Secondly, these accounts seem to be describing completely different creative events, rather than being duplicate accounts of the same creation.

There is an alternative “fundamentalist” view that the creative acts of Genesis 1 and 2 were consecutive, implying that the two accounts should be harmonised into a single coherent story. This kind of harmonisation might seem like a harmless simplification of the text for non-scholarly readers, but if the two creation accounts are actually describing creation from different perspectives, harmonising them into a single story is misleading and liable to cause misunderstanding and misinterpretation. In fact, this can be identified as a major cause of the naïve “creationist” approaches to the origins stories of Genesis that we are attempting to avoid.

Unfortunately, similar views have been adopted by conservative scholars such as John Walton and C. John Collins in their books and commentaries on Genesis.³³ These claims cannot be discussed in detail

33 C. John Collins, *Genesis 1–4: A Linguistic, Literary, and Theological Commentary* (Phillipsburg, NJ: P&R Publishers, 2006); John H. Walton, *The Lost World of Adam and Eve: Genesis 2–3 and the Human Origins Debate* (Westmont, IL: InterVarsity Press, 2015).

here, but a major argument against them is that the views of these scholars are themselves contradictory, since one identifies Genesis 2 as an elaboration of Genesis 1, while the other views the two accounts as sequential.³⁴

The Documentary Hypothesis avoids these problems by identifying the very different accounts of creation in Genesis 1 and Genesis 2 as the origins stories of two different communities. But before we ask what the different styles of Genesis 1 and 2 imply about the origins of these accounts, we need to examine one other important example of a Genesis narrative with alternative versions of events.

One or Two Accounts of the Flood?

The story of Noah's Flood was a major problem for the redactor of the Pentateuch because it was evidently not credible that the cosmic Flood happened twice. This might seem obvious, but the existence of two creation stories shows that this was not necessarily a given. Nevertheless, the redactor here adopted a different approach, finely interleaving two sources (P and J) to create a single account. The success of the redactor in this objective can be seen by comparing Genesis with the Mesopotamian accounts (see Table 2).

The evidence in this table shows that the complete biblical Flood Story has closer similarities with the Mesopotamian versions than either of the proposed biblical sources. Furthermore, the similarity seems to be strongest with the most recent Mesopotamian version of the Flood Story in the standard (first millennium) version of the *Gilgamesh Epic*. This is indicated by the + signs in the table, meaning sections of narrative that are definitely present, relative to Xs, meaning sections known to be missing from structurally complete parts of the tablets. In contrast, question marks indicate sections whose presence is unknown due to damaged or missing tablets.

34 Alan Dickin, *A Scientific Commentary on Genesis 1–11*, 3rd edition (Amazon, 2021), 64–67.

Event in the story	Genesis Source	Mesopotamian		
		G	A	S
1. The Flood was caused by divine plan	J	+	+	?
2. A reason is given for the Flood.	P, J	x	+	?
3. The hero is warned by divine revelation.	P	+	+	+
4. Hero instructed to build a large boat of a given size.	P	+	+	?
5. The hero is attentive and obeys the divine command.	P, J	+	+	?
6. Animals as well as people are loaded on the boat.	P, J	+	+	?
7. The hero is instructed to enter the boat.	J	+	x	?
8. The door is closed.	J	+	+	?
9. Duration of rain and floodwater rise is described.	P, J	+	+	+
10. The death of humankind is described.	P, J	+	+	x
11. The end of the rain is described.	P, J	+	?	+
12. The grounding on a mountain is described.	P	+	?	x
13. The hero opens a window.	J	+	?	+
14. Duration of waiting for waters to abate is described.	J	+	?	x
15. Hero sends out birds to test for abating of the Flood.	J	+	?	x
16. Hero offers sacrifices of worship after he is delivered.	J	+	+	+
17. Divine appreciation of the sacrifice is described.	J	+	+	?
18. The hero receives a divine blessing.	P	+	?	+

Table 2. Episodes in the Flood Story attributed to P and J, compared with episodes in the Mesopotamian accounts. Biblical sources: J = Yahwist, P = Priestly. Mesopotamian: G = *Gilgamesh Epic*; A = *Atrahasis Epic*; S = *Sumerian Flood Story*. Modified after Wenham.³⁵

35 Gordon J. Wenham, “The Coherence of the Flood narrative,” *Vetus Testamentum* 28:3 (1978): 336–348.

The close match between the complete biblical Flood Story and the account in the *Gilgamesh Epic* suggests that the redactor had access to the epic at the time he amalgamated his sources, almost certainly during the Jewish exile in Mesopotamia. The observation that the biblical account closely follows the Mesopotamian epic, but also retains numerous duplicate sections, is critically important. It implies that the sources themselves *predated* the exile. If the biblical Flood Story was a new composition during the exile, based directly on the *Gilgamesh Epic*, there would be no reason for it to preserve an origin from the interleaving of two source documents. However, it is equally unlikely that the overall story was created directly from two Mesopotamian sources, because the P source has such a strong Israelite genealogical imprint in it.

Additional evidence that the Flood Story was composed by interleaving two distinct source documents comes from characteristically different word usages in these two sources. The clearest use of such distinct language is seen in the P and J creation narratives, but the same distinct word usages can also be seen in shorter fragments of the Flood Story attributed to distinct P and J sources. These distinct patterns of word usage were summarised by Denis Lamoureux,³⁶ as shown in Table 3. The first section lists stylistic features and idiomatic expressions shared by the P accounts of Creation and Flood, while the second compares the J accounts. This impressive set of consistent expressions provides strong evidence in support of the Documentary Hypothesis, but raises the question of why the redactor should have wanted to retain two accounts of the Flood by interfingering them in this way.

36 Denis O. Lamoureux, *Evolutionary Creation: A Christian Approach to Evolution* (Eugene, OR: Wipf and Stock, 2008), Appendix 5.

Word/expression	P Creation	P Flood
Elohim	35x	16x
The deep	1:2	7:11, 8:2
Face of the waters	1:2	7:18
According to its/their kind	1:11–12, 21–25	6:20, 7:14
Wild and domesticated	1:24–25	7:14, 21, 8:1, 9:10
Birds referred to as “wing”	1:21	7:14
Swarm	1:20–21	8:17, 9:7
Creeping thing of the ground	1:25,30	6:20, 8:19
Creeping thing creeping	1:26	7:14, 8:17
Humankind in God’s image	1:26	9:6
Male and female	1:27	6:19, 7:9,16
Be fruitful and increase	1:28	8:17, 9:2, 9:7
Fish of the sea	1:28	9:2
It will be food for you	1:29	9:3
Word/expression	J Creation	J Flood
Yahweh	29x	10x
Anthropomorphic deity	2:8, 3:8,21	6:6, 8:21
Rain	2:5	7:4,10, 8:2b
Face of the ground	2:6, 4:14	6:7, 8:8,13b
Evil	2:9,17, 3:5,22	6:5, 8:21
Man and woman (of animals)	2:23–24	7:2
Curse/cursed	3:14,17, 4:11	8:21
Offering	4:3–5	8:20
Breath of life in “nostrils”	2:7	7:22

Table 3. Distinct word usages in the P and J accounts of Creation and Flood.

The best explanation is that the redactor wanted to use distinct information that the two sources brought to the overall account. For example, P contained genealogical and chronological information that tied the Flood Story to the overall structure of Genesis. On the other hand, J contained vivid descriptive detail that helped fill out details of the story. A list of these interleaved sections is presented in Table 4. This suggests that the genealogy of Noah (*italics in Table 4*) was cut into pieces and narrative sections were inserted between them.

6:9–10	<i>This is the account of Noah. Noah was a righteous man, blameless among the people of his time, and he walked with God. Noah had three sons: Shem, Ham and Japheth.</i>
6:11–7:5	Account of how God told Noah to construct the Ark to be saved from the Flood.
7:6–7	<i>Noah was six hundred years old when the floodwaters came on the earth. And Noah and his sons and his wife and his sons' wives entered the ark to escape the waters of the Flood.</i>
7:8–10	Account of how pairs of animals came to Noah and entered the ark.
7:11–12	<i>In the six hundredth year of Noah's life, on the seventeenth day of the second month—on that day all the springs of the great deep burst forth, and the floodgates of the heavens were opened. And rain fell on the earth forty days and forty nights.</i>
7:13–9:17	Account of Flood, including entry into the Ark, the advance and retreat of the waters, the exit from the Ark, the sacrifice of burnt offerings, and the new covenant between God and Noah.
9:18–19	<i>The sons of Noah who came out of the Ark were Shem, Ham and Japheth. Ham was the father of Canaan. These were the three sons of Noah, and from them came the people who were scattered over the earth.</i>
9:20–27	Account of Noah's drunkenness and the cursing of Ham.
9:28–29	<i>After the flood Noah lived 350 years. Altogether, Noah lived 950 years, and then he died.</i>

Table 4. Attribution of the Flood Story to distinct genealogical and narrative sources.

The Coexistence of Independent Primeval Histories

The best explanation for all of these features is that the accounts of primeval history, including the Flood stories in Genesis 6 to 9, were brought from Mesopotamia by the patriarchs, were incorporated into distinct histories during the early evolution of the Israelite tribes, and were recombined into a single narrative during the Babylonian exile. But, here, a major problem arises. If the documentary sources of the Pentateuch represent alternative accounts of events passed down as separate tribal histories, how could alternative accounts of the Creation and Flood be inherited and preserved by one man (Abraham) before the origins of the Israelite tribes from the sons of Jacob?

The most logical answer has already been hinted at—one of these traditions must have been written and the other oral, in order to preserve their distinct integrity. If this explanation seems speculative, it is nevertheless well supported by the character of the two sources (J and P). The primeval J source is almost always personal, dramatic, and anthropomorphic in its description of God. This style is present in all of its major narratives, including the Garden of Eden, the Fall, the murder of Abel, the Flood, the Tower of Babel, and the lives of the Patriarchs. In contrast, the P source is cosmic in its view and generally impersonal. P's interest in individuals is primarily genealogical, and it has a particular interest in treaties and covenants that would normally have been written down. The P account of the patriarchs is famously lacking in detail. For example, the absence of an Isaac narrative has often been noted.³⁷ But this is exactly what we would expect from a written source that was preserved by nomadic patriarchs who may even have been illiterate, but who could appreciate the importance of preserving venerated ancient inscriptions, even if they could not understand them.

This issue of reverence (or lack thereof) for ancient traditions is at the heart of the Jacob and Esau stories. The biblical portrayal of Esau is of a person who cared nothing for his birthright as the inheritor of

37 Blum, "Once Again," 31.

important ancient records; he reputedly sold them for a bowl of broth. On the other hand, it is evident that (for all their faults) Rebecca and Jacob understood this heritage, which is well expressed by the words uttered by the Archbishop of Canterbury as he presents the Bible to the British monarch during the coronation: “We present You with this Book, the most valuable thing that this World affords.”

We can see from the Genesis account that Jacob received no tangible benefit by buying the birthright and stealing the blessing of the firstborn from Esau; he obtained all of his worldly resources by working for Laban. This shows that the birthright and the blessing were primarily cultural or spiritual benefits, which God would presumably have given to Jacob anyway if he had not stolen them (see Genesis 48:19).

Divine Names and the Transmission of Sources

Having outlined a model of alternative written and oral accounts of the primeval history, it is necessary to consider how these traditions could have been preserved and transmitted, to reach us in their present state. A credible explanation for this process is an important step in establishing the feasibility of the model.

As is well known, divine names are frequently compounded in human names, thus revealing the names of the major gods at different times in history. For example, the name “Israel” is compounded from the divine name El and means “He wrestles with God”; while “Elijah” is compounded from both El and Yahweh, and means “My God is Yah(weh).” However, no names compounded with Yahweh are known before the time of Moses, showing that this name really was a new revelation to Moses. But, unlike P and E, the J source lacked any account of the revelation of this name to Moses. Therefore, the transmitters of the J tradition evidently assumed that the name Yahweh had always been the name of the true God, and they updated earlier divine names with Yahweh. (The name used in Genesis 2–3 is Yahweh Elohim, but this

is generally attributed to the redactor constructing a semantic bridge between the Elohim of Genesis 1 and the Yahweh of Genesis 4).³⁸

The usages of the divine name El can tell us quite a lot about the origins and evolution of the documentary sources of Genesis. For example, there are approximately fourteen usages of the name El in Genesis (depending on exactly how we count them), spread across all three documentary sources. This spread is consistent with El being the actual name for God used by the patriarchs. The majority are in compound names, the most common of which is El-Shaddai, but also El-Roi, El-Olam, and El-Bethel. These (comparatively rare) usages of El are vastly outnumbered by the usage of Yahweh in J and Elohim in E. Nevertheless, the multiple patriarchal names for God compounded from El may be the basis of the plural form of the generic word for God (Elohim) used in the final form of the Elohist saga.

In comparison with these compounded forms of El, there are four rare cases in E where the name El is preserved by itself. Three of these cases involve God speaking to Jacob, for example, “I am El of Bethel” (Genesis 31:13); “Get up, go to Bethel and live there and make an altar to El who appeared to you” (Genesis 35:1); and “I am El, your father’s God” (Genesis 46:3). The fourth case occurs when Jacob recites back what God just told him (Genesis 35:3). In addition, there is one case in J where the name El is preserved. This occurs in the prophecy of Jacob to his sons (including Joseph), when he says: “From El of your father who will strengthen you, and by Shaddai, who will bless you” (Genesis 49:25). However, it seems that the name El-Shaddai has been separated here into its component parts for poetic effect, and this form based on El-Shaddai is supported by the usage in Exodus 6:3 (P), where God says, “I appeared to Abraham, Isaac, and Jacob as El Shaddai.” This suggests that El-Shaddai was the normative compounding of El during the patriarchal period.

The conclusion we can draw from all of this evidence is that El was the name of God actually used by Abraham, Isaac, and Jacob, but it was translated in all three sources to the later usage of Elohim, except

38 Friedman, *The Bible with Sources Revealed*, 35.

where it was “protected,” either by compounding with another name that the later transmitter of the tradition wanted to preserve, or by being used in the very words of God, which were sacrosanct.

In comparison with the above, there is no preserved usage of the name El in the primeval history, which took place in Mesopotamia (Genesis 1–11). But we must remember that this history was based on two completely separate J and P accounts. We would not expect any early divine name to be preserved in the J source, since we know that all divine names there were replaced with Yahweh. In contrast, if the P source was written, a pre-Abrahamic usage of divine names could have been preserved through the patriarchal period.

By the time of Moses (mid-second millennium), cuneiform had become an international diplomatic script, used even in Egypt, as demonstrated by the Amarna letters. Raised in the Egyptian court, Moses could undoubtedly read cuneiform, so he could have read the primeval Mesopotamian history of Israel, including the Flood story. However, in Exodus all writing except the two tablets of the Decalogue was written on scrolls (Exodus 17:14; 24:7; 32:32). It is almost certain that this involved (cursive) hieratic script, as this was the only script that was widely used in the southern Levant for writing on scrolls. Hence, this is the point when cuneiform documents brought by Abraham from Mesopotamia were probably transcribed into hieratic Egyptian, to make them consistent with the newly written (P) account of Exodus.

Moses was probably familiar with oral accounts circulating amongst the Israelites that referred to God by several names compounded with El. In addition, he probably knew of the Mesopotamian names for God used in the Flood story. Hence, when God appeared to Moses at the burning bush, the names for God in Israelite tradition were many and varied, so that Moses’ question about God’s name was far from an idle one: “Suppose I go to the Israelites and say to them, ‘The god of your fathers has sent me to you,’ and they ask me, ‘What is his name?’ Then what shall I tell them?” (Exodus 3:13). In response, God revealed his new name “Yahweh,” which Moses could have used to translate all of the divine names in the written primeval history.

We know that the Egyptians were able to render the divine name Yahweh in hieroglyphics phonetically, because it was used on the Soleb inscription (see Figure 1 left, represented by the Gardiner signs M17A, O4, V4 and G1).³⁹ However, Moses evidently did not do this, since the Priestly source in Genesis does not use Yahweh. Instead, Moses probably rendered the names of the Mesopotamian gods using the generic Egyptian word for God, *netjer*. This is expressed by a flag-like hieroglyphic (and therefore hieratic) sign (R8 in the Gardiner sign list).⁴⁰

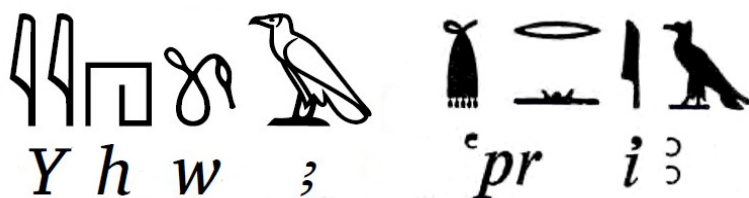


Figure 1. Phonetic spelling of the names Yahweh and Aper-El in hieroglyphics. After Hen⁴¹ and Zivie.⁴²

Somewhat more complex is the question of how the patriarchal name El was rendered in Egyptian signs. The answer is found in several hieroglyphic tomb inscriptions, where the divine name El is compounded as part of various Canaanite Egyptian names. The example in Figure 1 (right) is the name Aper-El, from Tomb 68 at Saqqara, where the signs for El are comprised from 'i' (M17) and '3' (G1), as shown in numerous

39 Titus Kennedy, "The Land of the š3sw (Nomads) of yhw3 at Soleb," *Dotawo: A Journal of Nubian Studies* 6:1 (2019): 175–192, <https://doi.org/10.5070/D66146256>.

40 Alan H. Gardiner, *Egyptian Grammar: Being an Introduction to the Study of Hieroglyphs*, 3rd edn (Oxford: Griffith Institute, 1957; 1st edn 1927), 438–548.

41 Racheli S. Hen, "Signs of YHWH, God of the Hebrews, in New Kingdom Egypt?" *Entangled Religions* 12:2 (2022), <https://doi.org/10.46586/er.12.2021.9463>.

42 Alain-Pierre Zivie, "Tombes rupestres de la falaise du Bubasteion à Saqqarah, Campagne 1980–1981 (Mission Archéologique Française de Saqqarah)," *Annales du Service des Antiquités de l'Égypte Le Caire* 68 (1982): 63–69.

examples by Hoch.⁴³ The G1 sign is the early form of Alef, contributing the sound “al.”⁴⁴ This appears to be an archaic phonetisation, before the proto-alphabetic letters “a” (as in *alpha*) and “l” (as in *lambda*) were derived from the hieroglyphic signs F1 and V1.⁴⁵

During the Israelite monarchy, when Hebrew written documents were being composed, the influence of Egypt was starting to decline. However, the hieratic script underwent a renaissance during the Judean monarchy (8th–7th centuries BC).⁴⁶ This was probably when the hieratic P document was translated into Hebrew, and the divine names would then have been recovered by comparison with the orally transmitted traditions of J and E, which were probably written in Hebrew during the time of Solomon. Assuming that Deuteronomy is the last speech of Moses, it must originally have been transcribed in hieratic, but was translated into Hebrew near the end of the Judean monarchy (after its rediscovery during the reign of Josiah). This explains why the Hebrew of P is later than J and E, but earlier than D.⁴⁷

Mesopotamian Origins of the Biblical Creation Stories

Having explored how distinct creation narratives could have been passed down in the history of Israel, it is also necessary to discern their origins in Mesopotamian history. The clearest evidence for the Mesopotamian origins of the creation stories comes from the J account (Genesis 2), which has many features in common with the mythology of the Mesopotamian city of Eridu and its patron deity, Enki. However,

43 James E. Hoch, *Semitic Words in Egyptian Texts of the New Kingdom and Third Intermediate Period* (Princeton, NJ: Princeton University Press, 1994), 27–28.

44 Thomas Schneider, “Etymologische Methode, die Historizität der Phoneme und das ägyptologische Transkriptionsalphabet, *Lingua Aegyptia* 11 (2003): 187–199.

45 Gordon J. Hamilton, *The Origins of the West Semitic Alphabet in Egyptian Scripts*, The Catholic Biblical Quarterly Monograph Series 40 (Eugene, OR: Wipf and Stock, 2024), 128.

46 Orly Goldwasser, “An Egyptian Scribe from Lachish and the Hieratic Tradition of the Hebrew Kingdoms,” *Tel Aviv* 18:2 (1991): 248–253, <https://doi.org/10.1179/tav.1991.1991.2.248>.

47 Friedman, *The Bible with Sources Revealed*, 7.

Genesis 1 also contains more subtle evidence of a Mesopotamian source (to be discussed below).

One of the major common themes in the biblical and Eridu origins accounts is the idea of one man who acts in a priestly capacity in a sacred space (such as the garden of Eden). In Mesopotamian mythology, this man was Adapa, priest of Enki at Eridu, whose story is told in the *Myth of Adapa*.⁴⁸ The story relates how Adapa went fishing to provide offerings for the Eridu temple. Remains of fish were indeed found on the altar of a primitive temple in Eridu, probably dating to the fifth millennium BC.⁴⁹ While Adapa was fishing, the south wind created a storm and sank his boat. But as he was drowning Adapa cursed the south wind, breaking its wing. As a result, he was summoned to heaven (presumably after his death) in order to justify his actions. However, due to intercession by Adapa's patron deities (at the direction of Enki, God of Wisdom), the God of Heaven was placated and went so far as to offer Adapa the Bread of Life. However, Adapa had previously been warned by Enki not to accept any food, as it would be poisoned. Therefore, he declined the bread of heaven, and consequently lost the chance of eternal life, in a way that somewhat parallels Genesis 2.

Another strong similarity between these traditions is a concern with the rivers of Mesopotamia. Genesis 2 describes the Garden of Eden as situated where a river divides into four, and names two of these rivers as the Tigris and Euphrates. Eden (*Edin*) is the Sumerian word for the plain of Mesopotamia,⁵⁰ therefore identifying the most likely site of Eden as the confluence of the Tigris and Euphrates at the southeast end of the plain. Similarly, the cult of Enki at Eridu was particularly associated with the Tigris and Euphrates, which are typically shown in the iconography of Eridu (see Figure 2) as originating in two flowing vases held by Enki, who is also the god of subterranean waters. In other

48 Stephanie Dalley (ed.), *Myths from Mesopotamia: Creation, the Flood, Gilgamesh, and Others* (Oxford: Oxford University Press, 1989), 182.

49 Seton Lloyd, *The Archaeology of Mesopotamia: From the Old Stone Age to the Persian Conquest* (London: Thames and Hutton, 1978), 16.

50 John A. Halloran, *Sumerian Lexicon* (Los Angeles: Logogram Publishing, 2006).

depictions of Enki, fish are seen jumping from the streams of water, emphasising their life-giving qualities.⁵¹

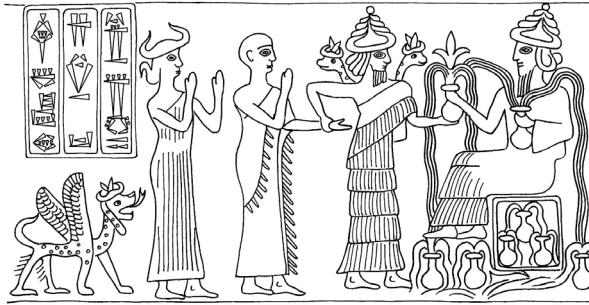


Figure 2. A human worshipper in typical Sumerian gown (Gudea) is introduced by his patron god to the great god Enki, seated on his throne and holding overflowing vases. Modern impression of a late third millennium seal. Louvre Museum.

This idea of Eden as watered by rivers and canals is also seen in several early cylinder seal impressions from the city of Ur. The examples shown in Figure 3 were excavated by Leonard Woolley, and show both arable lands and fish between two bounding rivers. These depictions connect the biblical picture of God making a garden in Eden with the Sumerian concept of Enki carefully creating the agricultural landscape of Sumer (*Enki and the World Order*).⁵² Similar parallels are found between the biblical description of Adam being made from the dust of the earth and the Mesopotamian idea of humankind being made from the clay of the ground.⁵³

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- 51 Jeremy Black et al. (eds), *Gods, Demons and Symbols of Ancient Mesopotamia: An Illustrated Dictionary* (London: British Museum Press, 1998), 75.
- 52 Jeremy Black et al. (ed.), *The Literature of Ancient Sumer* (Oxford: Oxford University Press, 2004), 215–225.
- 53 Dalley, *Myths from Mesopotamia*, 25.



Figure 3. Seal impressions from the early third millennium, showing signs for the plain of Sumer, “Edin.” University Museum, Pennsylvania and British Museum. After Legrain.⁵⁴

In contrast to the Eridu mythology of Genesis 2, the ancient city whose mythology is by far the closest to the creation story of Genesis 1 is Nippur. The patron deity of Nippur was Enlil, literally Lord-air/wind/breath, who along with Enki and the God of Heaven (An or Anu) made up a Sumerian “Trinity” of the ancient principal gods of the Sumerian pantheon. This preeminence is demonstrated by the consistent appearance of these three gods as the principal deities involved in all versions of the Flood Story (as discussed below).

A notable feature of the mythology of Nippur was the tradition that Enlil had separated the earth from the heavens, thus creating his own domain of the air between heaven and earth.⁵⁵ When we couple this idea with the part of Enlil’s name, *lil*, meaning wind or breath, we have a very similar picture to Genesis 1:2, where the wind of God was blowing over the face of the primeval waters before the beginning of creation, and likewise blowing over the face of the chaotic waters of the Flood in Genesis 8:1. These images are both from the biblical

54 Leon Legrain, *Ur Excavations*, vol. 3: *Archaic Seal-Impressions* (Oxford: Oxford University Press, 1936), Plate 23, 25.

55 Wilfred G. Lambert, *Babylonian Creation Myths* (Philadelphia, PA: Penn State University Press, 2013), 170.

P document, but their origins most likely go back to a Mesopotamian priestly source from the third millennium BC.

The Preservation of Mesopotamian Origins Stories

Finding linkages between the Genesis creation stories and ancient Mesopotamian cities and their patron gods is clearly important. But if the creation stories of Genesis were derived from Mesopotamian sources, why do we not find closer parallels to Genesis in Sumerian literature? There are two likely reasons for this disappointing lack of evidence. The first concerns the purpose of writing itself. Contrary to our natural assumptions, writing was not invented to record important religious or mythological ideas, but as a book-keeping tool. This is very clear from the early (fourth millennium) tablets found at the city of Uruk, which are almost exclusively administrative in nature.⁵⁶

The only fourth millennium tablets that are not administrative are systematic word lists that appear to have been used in scribal education. Furthermore, when the first literary tablets appear about 500 years later, they seem to be primarily or exclusively associated with scribal schools. These tablets were excavated from the mounds of Tell Fara (ancient Shuruppak) and Tell Abu Salabikh (possibly ancient Eresh). One of the most complete literary works found in these scribal schools was an ancient set of proverbs usually referred to as the *Instructions of Shuruppak* (the eponymous king of his city).⁵⁷ We know that this work was used as a scribal exercise because a small practice tablet was found, bearing only the first three lines of the introduction:

On a faraway day, indeed on a faraway day
On a faraway night, indeed on a faraway night
In a faraway time, indeed in a faraway time...⁵⁸

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- 56 Hans J. Nissen, "The Archaic Texts from Uruk," *World Archaeology* 17:3 (1986): 317–334.
- 57 Bendt Alster, *Wisdom of Ancient Sumer* (Bethesda, MD: CDL Press, 2005).
- 58 Robert D. Biggs, "The Abu Salabikh Tablets," *Journal of Cuneiform Studies* 20 (1966): 73–89.

The repetitive nature of this introduction perfectly illustrates why its copying was a favourite exercise for beginners. Indeed, the fact that a list of proverbs is the earliest significant literary work suggests that Sumerian scribes were not yet ready for religious narratives requiring complex grammatical constructions. These only appear hundreds of years later.

The second reason for a lack of Mesopotamian “versions” of Genesis is political interference in the traditional religion of Mesopotamia. Throughout the third millennium BC, the city of Nippur was the religious centre of Mesopotamian civilisation, and both Sumerian and Semitic rulers are recorded as building or renovating the temple of Enlil at Nippur.⁵⁹ However, towards the end of this period there were several strenuous efforts by both Semitic and Sumerian kings to promote themselves to divine status. This threatened the traditional religion of Mesopotamia and tended to corrupt its mythology. The first of these periods occurred when Semitic warrior kings from northern Mesopotamia conquered Sumer, establishing the world’s first empire at the city of Akkad.

The Akkadian empire had a relatively short duration of around 100 years, and according to a well-known lament called the *Cursing of Akkad*, its fall occurred when Mesopotamia was invaded by barbarians from the Iranian mountains.⁶⁰ The lament claims that this invasion was a judgement by the principal god Enlil, in response to the demolition of his temple at Nippur by King Naram-Sin of Akkad. Some scholars have questioned the historical accuracy of the *Cursing*, pointing out that after its demolition, the temple of Nippur was rebuilt by Naram-Sin’s son, several decades before the collapse of the empire.⁶¹ However, administrative tablets associated with the rebuilding process suggest

59 Piotr Michalowski, “The Strange History of Tūmal,” in *Approaches to Sumerian Literature*, ed. Piotr Michalowski and Niek Veldhuis, Cuneiform Monographs 35 (Leiden: Brill, 2006), 145–165.

60 Benjamin R. Foster, *The Age of Agade: Inventing Empire in Ancient Mesopotamia* (New York: Routledge, 2015), 350.

61 Henry W. F. Saggs, *Babylonians* (Los Angeles, CA: University of California Press, 2000), 75.

that the rebuilding was an attempt to secularise the temple institution, by introducing the worship of the sun-god to a temple previously devoted to Enlil.⁶²

The fall of Akkad was followed by over a hundred years of anarchy, from which Mesopotamian civilisation finally emerged when a new dynasty was founded at Ur (the so-called 3rd dynasty of Ur). The first king of the Ur III dynasty, Ur-Nammu, successfully conquered most of southern Mesopotamia, but then died unexpectedly in battle.⁶³ Such an inauspicious event would have undermined the stability of the new dynasty, and this probably provoked his successor, Shulgi, to undertake various strategies to bolster his position.

Shulgi proclaimed his own divinity and made a conscious attempt to use Sumerian literature as propaganda to reinforce his claim. In fact, Piotr Michalowski has argued that in composing material for court performance, Shulgi was destroying oral traditions that had been passed down for centuries. Thus, in addition to proclaiming himself a god, “He also wiped clean the literary slate of the land, replacing the old Early Dynastic mythological literature with a whole new corpus, much of which was focused on the person of the country’s ruler, that is on himself.”⁶⁴ This process of textural corruption explains why Sumerian literature from the early second millennium no longer retains a true picture of Sumerian religious origins, despite an ongoing fascination with epic tales about the earlier semi-mythical Sumerian kings.

62 Alan Dickin, *From the Stone Age to Abraham: A Biblical History of the Ancient World* (Seattle: Kindle Direct Publishing, 2021), 250.

63 Piotr Michalowski, “Maybe Epic: The Origins and Reception of Sumerian Heroic Poetry,” in *Epic and History*, ed. David Konstan and Kurt A. Raaflaub (Hoboken, NJ: John Wiley & Sons, 2010), 7–25.

64 Michalowski, “Maybe Epic,” 20.

The Significance of the Gilgamesh Cycle

One of Shulgi's strategies to bolster the status of his dynasty was the commissioning of a new version of the Sumerian King List.⁶⁵ An earlier version of the King List probably existed from the preceding Akkadian empire, and included the legendary ancient kings of Uruk: Enmerkar, Lugal-banda, and Gilgamesh. By connecting his own dynasty with Gilgamesh, Shulgi was able to promote his status as a divine king, because Gilgamesh had already (posthumously) achieved divine status by the end of the Early Dynastic period. This is demonstrated by several dedicatory inscriptions on ceremonial mace heads, which address Gilgamesh as a god.⁶⁶

We know that there were early written stories about the famous kings of Uruk because one of the practice pieces from the Early Dynastic scribal school at Abu Salabikh is from a story about King Lugal-banda.⁶⁷ In addition, Gilgamesh himself was the subject of several artistic depictions during the Akkadian dynasty, suggesting that he was already the subject of oral or written traditions by this time.⁶⁸ However, it is believed that these stories were first formalised into a Gilgamesh Cycle during the reign of Shulgi (*ca* 2100 BC), partly as school material to train scribes for his administration, and also for performance at the royal court. Six different titles from the Gilgamesh Cycle are known from later scribal schools of the early second millennium at Nippur. Only hints of this material are known from the third millennium, but enough to suggest that the written versions originated then.⁶⁹

65 Piotr Steinkeller, "An Ur III Manuscript of the Sumerian King List," in *Literatur, Politik und Recht in Mesopotamien*, ed. Walther Sallaberger et al., *Orientalia Biblica et Christiana* 14 (Wiesbaden: Harrassowitz Verlag, 2003), 267–292.

66 Albert T. Clay, *Miscellaneous Inscriptions in the Yale Babylonian Collection*, vol. 1 (New Haven: Yale University Press, 1915).

67 Robert D. Biggs, "The Abū Šalābīkh Tablets: A Preliminary Survey," *Journal of Cuneiform Studies* 20:2 (1966), 73–88.

68 Douglas Frayne, "Gilgamesh in Old Akkadian Glyptic," in *Gilgamesh: Ikonographie eines Helden*, ed. Hans U. Steymans, *Orbis Biblicus et Orientalis* 245. (Fribourg: Academic Press / Gottingen: Vandenhoeck & Ruprecht, 2010), 165–199.

69 Michalowski, "Maybe Epic," 19.

One of the most important titles in the Gilgamesh Cycle, based on the linkages it creates with several other literary works, is the *Death of Gilgamesh*. This work describes how Gilgamesh fell ill and died, but because Gilgamesh was reputed to be two thirds divine and only one third mortal it was also necessary to explain why Gilgamesh had to die. This is done by describing a dream that Gilgamesh apparently experienced, consisting of a dialogue between the gods. In this dialogue, a speech by the god Enki explained that the Flood Hero (here called Zi-ud-sura) was the only man who would ever receive eternal life, and therefore even a demigod such as Gilgamesh must die. Because of the important link this speech provides with the Flood Story, it is quoted here from the translation of Jeremy Black:⁷⁰

Enki answered An and Enlil:
“In those days, in those distant days,
in those nights, in those distant nights,
in those years, in those distant years,
after the assembly had made the Flood sweep over to destroy the
seed of mankind,
among us I was the only one who was for life (?),
and so he remained alive (?)—
Zi-ud-sura, although (?) a human being, remained alive (?).
Then you made me swear by heaven and by earth,
... that no human will be allowed to live forever (?)...

Not only does this speech directly link the Flood Story to the Gilgamesh cycle, but as an explanation of why Gilgamesh must die it summarises Sumerian beliefs about the Flood, setting the Flood in primeval times using the mythological introduction quoted earlier.

The *Death of Gilgamesh* also confirms the claims in the major Mesopotamian versions of the Flood Story that the deluge was brought by agreement of the divine assembly, ruled over by the three principal

70 Jeremy A. Black et al., *The Electronic Text Corpus of Sumerian Literature* (Oxford: Oxford University Press, 1998–), available at <http://www-etcsl.orient.ox.ac.uk/> (accessed 15 January 2024).

gods, An, Enlil, and Enki. This triad of gods was preeminent throughout Mesopotamian history until the time of Hammurabi. Their Sumerian origins are demonstrated by the earliest proto-cuneiform writing from Uruk, and their names are written using the same cuneiform signs on important Akkadian inscriptions such as the Stele of Hammurabi.⁷¹ The concept of the “divine assembly” or “divine council” is also quite widely known in the Bible. Hence, this provides an important link between Mesopotamian and biblical accounts, and may help us understand how Genesis and the Mesopotamian origins myths diverged from common early traditions.

The Transmission of the Flood Story

The Flood Story, as the strongest parallel between biblical and Mesopotamian views of reality, offers the best way to understand the relationship between them. The excerpt from the *Death of Gilgamesh* quoted above claims that the Flood was brought by the divine assembly, of which Enki was a part. However, in the *Sumerian Flood Story* it is clear that the assembly was ratifying the decision of An and Enlil: “A decision that the seed of mankind is to be destroyed has been made. The verdict, the word of the divine assembly cannot be revoked. The order announced by An and Enlil cannot be overturned.”⁷²

The *Sumerian Flood Story* emphasises the joint rule of An and Enlil both in the quote above, and at several other places in the story. However, in the Semitic *Atrahasis Epic*, the role of An is played down and that of Enlil (Ellil, in Semitic pronunciation) is emphasised. In this epic, the Flood is only the last of a series of catastrophic attacks by the gods against humankind, and these are explicitly attributed at the beginning of the epic to the sleep of Enlil being disturbed by humankind’s noise. Furthermore, in each “disaster episode” it is Enki

71 Robert F. Harper (ed.), *The Code of Hammurabi, King of Babylon: About 2250 BC: Autographed Text, Transliteration, Translation, Glossary, Index of Subjects, Lists of Proper Names, Signs, Numerals* (Chicago, IL: University of Chicago Press, 1904).

72 Black et al., *The Literature of Ancient Sumer*, 214.

(Semitic Ea) who provides a way out for humanity. Hence, when Enlil plans the Flood as a “final solution” (end of tablet 2), it is he who is trying to coerce Enki into swearing an oath not to warn humankind, as Enki had previously done. In response, Enki objects to this coercion, and says that the Flood is “Enlil’s kind of work,” not his own.⁷³

In the *Atrahasis Epic* the subsequent lines are lost, but in the *Gilgamesh Epic* Enki is said to have sworn the oath of secrecy. Nevertheless, in all of the Mesopotamian versions Enki manages to evade the oath and warn the Flood hero about the Flood by whispering his words to the walls of a reed hut, so that the wind (rather than he) carries the message through the walls of the hut to his devotee inside.

Based on these comparisons, I conclude that the process of evolution of the Mesopotamian versions of the Flood story was from an early form where all of the divine “Trinity” of supreme gods was part of the plan to bring the flood, to a later form where Enlil is essentially the sole instigator of the Flood, and Enki is the protector of humankind. Some biblical scholars have proposed a similar evolutionary process in the documentary sources of the biblical Flood story.

For example, Samuel Shaviv claimed that the P and the J versions of the biblical Flood story present two different divine viewpoints, in which P presents the view of Enki (saviour of mankind), whereas J presents the view of Enlil (instigator of the Flood).⁷⁴ However, this view contradicts the evidence from the creation accounts, where J clearly inherited the Enki tradition, whereas P was derived from the Enlil tradition. Furthermore, Shaviv’s view involves a selective reading of the Genesis Flood Story that distorts its meaning.

A straightforward reading of the Genesis text shows that the J account is more anthropomorphic than the P one, consistent with the differing styles of their creation accounts. For example, Yahweh is described as being grieved and regretting that he had made humankind before the Flood (Genesis 6:6), but also as smelling the pleasant

73 Dalley, *Myths from Mesopotamia*, 29.

74 Samuel Shaviv, “The Polytheistic Origins of the Biblical Flood Narrative,” *Vetus Testamentum* 54:4 (2004): 527–548.

aroma of Noah's sacrifice after the Flood (Genesis 8:21). These examples show that feelings attributed to Yahweh are both judgmental and merciful, just as the P account describes God as warning Noah that He will destroy the earth (Genesis 6:13), as well as remembering Noah in the midst of the Flood (Genesis 8:1). Therefore, I reject the claims of Shaviv, and assert that both the P and J sources see God as the instigator of the Flood *and* the saviour of Noah, by instructing him to build and enter the Ark to survive the Flood. Therefore, I suggest that both biblical accounts of the Flood (J and P) separately modified their Mesopotamian source traditions into a monotheist viewpoint.

For the oral tradition (J), this change must have been made by Abraham, who understood that the supreme god El who revealed himself to Abraham embodied both of the divine players in the Flood story, Ellil and Ea (in Akkadian). This understanding that a single God could speak in plural terms was preserved in two of the J stories of origins, the Eden narrative (Genesis 3:22) and the Babel story (Genesis 11:7), despite the apparent singularity of the revelation of Yahweh to Moses (Deuteronomy 6:4).

As noted above, Moses probably translated the multiple divine names in the written version of the Flood story (Enlil and Enki), using the generic Egyptian title of God (*Ntr* in hieratic script), thus showing that both divine persons were one God. However, he still maintained the plural speech of God in creation (Genesis 1:26). Therefore, when the hieratic was translated into Hebrew, it was appropriate to use the plural form Elohim, based on Genesis 1:26 and the concept of the divine council also found in the psalms (e.g. Psalm 82).

The Need for a Falsifiable Theory of Origins

The above arguments provide only a rough sketch of the possibilities for understanding the Genesis creation stories as distinct Mesopotamian traditions that were passed down for thousands of years, most notably through Abraham and Moses, before their merger during the Babylonian exile. However, the most important aspect of this sketch is that

it has the possibility of being tested. If it were not possible to express the ideas of Genesis 1 in cuneiform, hieratic, and Hebrew scripts, this would be an argument against the model presented.

This is the scientific basis for speculating on the origins of the Genesis creation texts, since scientific models are fundamentally based on their falsifiability. According to the book of Daniel, this concept was understood by king Nebuchadnezzar, who made the extreme demand that his wise men should recite to him the *content* of his dream (Daniel 2:5), in order to demonstrate their ability to interpret it (2:9b). In the same way, a viable theory of textual origins is important for validating textual interpretations. Therefore, since it is claimed that God's word endures forever (Isaiah 40:8), it seems logical that the origins of God's recorded words of creation should be sought with as much diligence as the material origins of the cosmos.

The conclusion of this investigation is that the origins accounts of Genesis were passed down directly from the earliest period of human civilisation in ancient Mesopotamia. There are good grounds for believing that these origins stories were inspired by God in Mesopotamia, either in the form of dreams (Genesis 1) or as symbolic descriptions of real experiences (Genesis 2–3).⁷⁵ They were not derived by “sanitising” corrupt myths, but are themselves the bedrock of truth, passed down by Abraham and Moses before their merger into the Pentateuch during the Babylonian exile. This evidence speaks for the reliability of these accounts, but also demonstrates their very ancient character. They cannot be comprehended by naïve fundamentalism, but must be understood by ongoing careful scholarship.

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75 Dickin, “Recovering Genesis 1,” 28–57.

A Centenary Retrospective on the Impact of Joseph Needham's *Science, Religion and Reality*

Samuel McKee

Abstract: Joseph Needham's *Science, Religion and Reality*,¹ published in 1925, was an extraordinary contribution to the science and religion dialogue. Coming during the interwar physics revolution, it is a forgotten and underappreciated collection from Cambridge that helped trigger several important pieces that shaped the discussion at an academic and popular level. The collection brought together an accomplished group of religious scientists, predominantly connected with Cambridge University, that held different perspectives on how science and religion interacted but agreed on their ability to relate. However, for a variety of reasons, it has remained obscure despite its immense influence at the time. Here, I explore its content and the value it still has in the present day.

Keywords: Eddington; History of Science; Needham; Philosophy of Science; Science and Religion

1 Joseph Needham (ed.), *Science, Religion and Reality* (London: The Sheldon Press, 1926).

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The dialogue concerning science and religion in interwar Britain was termed by the BBC in 1931 as “the great question of our time,”² but reaching this point was the crescendo of a complicated period. The late nineteenth century and early twentieth century saw strong, anti-religious popular publications meet religious revivals on both sides of the Atlantic, each of which considered religion and science to be opponents. The most historically notable examples were Andrew Dickson White’s *A History of the Warfare of Science with Theology in Christendom* (1896) and John William Draper’s *History of the Conflict between Religion and Science* (1874). Indeed, Lord Balfour makes explicit reference to this in his introduction to *Science, Religion and Reality*.³ Professor Matthew Stanley notes that this was a very difficult time to be a religious scientist, as fundamentalism was often forcing one to choose a side.⁴

Following the First World War, physics and astronomy saw major upheaval through Einstein’s Relativity theory, which by the mid-1920s was being applied to the universe in what would eventually be formulated as the Big Bang Theory in Georges Lemaître’s 1927 paper, which Sir Arthur Eddington would see translated into English.

Both Oxford and Cambridge Universities featured many scientists that had religious faith. With the popular dialogue declining, and nuance being lost in public media, a more concerted effort was made to bring higher levels of dialogue to the public. The annual Gifford Lectures⁵ were being published each year, having been established in 1887 by Adam Lord Gifford, in Scotland, to explore natural theology through the lectures of an eminent scholar. This built upon the nineteenth-century work of *The Bridgewater Treatises* and other published efforts in natural theology. However, these were not always scientific in nature, instead often featuring a voice from philosophy or theology. As publications such as *The Freethinker* (established in 1881 and then

2 *Science and Religion: A Symposium* (London: Gerald Howe Ltd, 1931).

3 Needham, *Science, Religion and Reality*, 3.

4 Matthew Stanley, *Practical Mystic: Religion, Science, and A. S. Eddington* (Chicago: University of Chicago Press, 2007), 194, 235.

5 See <https://giffordlectures.org/>

widely published from 1916) became more widespread, the conflict thesis was gaining momentum.

The largest public conflict came in 1925 with the Scopes Trial in Tennessee, where a schoolteacher, John Scopes, was found guilty of teaching human evolution to his students. The trial was broadcast globally, including by the BBC, and became a national representation of science pitted against religion in the courtroom. Given the large number of religious academics at Cambridge University, various outlets began to emerge for a more nuanced and elegant discussion of the interplay between science and religion from the academic to the public sphere, with expectation that this would sell strongly. Matthew Stanley describes the effort as follows:

In 1925 a volume appeared titled *Science, Religion and Reality*. Edited by Joseph Needham, it brought together an eclectic mix of philosophers, scientists, and historians to consider the relationships of religion and science from the perspectives of their disciplines. Needham sought to help round out human character by having “some feeling” for each of the forms of human experience, including religion and science.⁶

The editorial committee was chaired by the Reverend W. R. Inge (more commonly referred to as Dean Inge) and included seven Cambridge University officials, and one from Oxford University. The book itself was edited by Joseph Needham, fellow of Gonville and Caius College, Cambridge University.

Needham was a prolific polymath, who was only 25 years old at the time of publication. He gained his bachelor's degree, MA, and PhD from Caius College, all by 1925.⁷ He was immediately elected a fellow of the college and later became a fellow of both the Royal Society and the British Academy. A young prodigy, he contributed several books

6 Stanley, *Practical Mystic*, 184.

7 Maurice Goldsmith, *Joseph Needham: 20th Century Renaissance Man* (Paris: UNESCO Publishing, 1995), 31.

to the dialogue around science and religion through the twentieth century. He later won the Leonardo da Vinci Medal in 1968 for his work on the history of science,⁸ as he moved more from chemist to historian. Undoubtedly, the power of the collection came from the bigger names at the time, most notably Sir Arthur Eddington (1882–1944).

Significance

Eddington's expositions of Relativity sold in huge numbers in the years preceding *Science, Religion and Reality*. He had not yet explored the religious implications for the theory, but following the release of *Science, Religion and Reality* this would change. As Stanley explains: "Relativity became a serious religious issue only in the late 1920s and 1930s, when practicing, cutting-edge scientists like Eddington, Jeans, J. D. Bernal, and Joseph Needham became major players in the debate about religion and science."⁹ Indeed, all mentioned would publish their own popular works extending the thoughts of *Science, Religion and Reality*. The collection became the trigger for a flurry of influential, thought-provoking books that sold in high numbers, as the appetite for the discussion of science and religion grew in its wake.

Eddington had become a huge name following his proof of Relativity in 1919, when he sailed to Principe Island off the coast of Africa with Frank Dyson. His photographic plates demonstrated the incredibly accurate predictions made of the deflection of starlight caused by the sun's bending of spacetime due to its gravitation. He published three books between 1920 and 1923 on Relativity for the general public, making him the highest authority in the English language on the matter. As a result, Eddington sold well and had a large audience for whatever he said and became one of the premier science communicators of the 1920s and 1930s. For Needham to gain him as a writer for this collection guaranteed a strong audience in 1925, from a public still

8 <https://www.historyoftechnology.org/about-us/awards-prizes-and-grants/the-leonardo-da-vinci-medal/>

9 Stanley, *Practical Mystic*, 192.

eager to understand the implications of this new theory for the world around them.

Content

Lord Arthur Balfour, former Prime Minister, Chancellor of Cambridge University and Fellow of the Royal Society, gave the introduction to the collection. The professorship in genetics at Cambridge has carried his name since 1912. Known for his philosophical reflections on evolution and genetics, it was undoubtedly significant to have him open the collection. Balfour castigates the late-nineteenth century predictions that science would replace religion, and the accompanying pessimism that still remained as to whether religion could survive the technological advancements underway. He points both to history and to the quality of contributors to the volume as strong evidence that scientific advancement could never overcome the place of religion. With that settled in his eyes, he moves on to the more relevant questions raised in the volume, as well as the issue of how the two interrelate. He queries what one is to do with miracles, or how someone should respond to new scientific data that confronts personal faith. These foreshadowed the answers given by the other contributors, but also the later works of writers such as C. S. Lewis.

Balfour gives reference to his own Gifford Lectures a decade earlier, which is an action repeated by other authors in a signpost intended to draw awareness to the far larger dialogue that was present in science and religion. The general public is heralded to note that despite incidents such as the Scopes Trial and the calls of growing humanism that science had outcompeted religion, the dialogue was grander than this.

The next contribution is by Dr Bronislaw Malinowski who was Reader in Social Anthropology at the University of London School of Economics. This interesting chapter seeks to understand the global trend of religion along with its universal superstitions. Malinowski, although not a Cambridge academic, was celebrated at the time

for his exposition of religions' ubiquity and historical dominance of humankind. Together with Eddington and Inge, he also contributed to the BBC's first ever symposium on science and religion (September–December 1930, published in 1931).¹⁰ We are unsure of the reasons behind the order of the chapters, but undoubtedly this was of great interest to a world of empires.

The following two chapters also addressed the historical nature of religion. Dr Charles Singer, Lecturer in the History of Medicine at the University of London, traces the history of humanity from its primitive beginnings to the modern day, carrying on the exploration of Malinowski. Whereas Malinowski places his emphasis on superstition and “magic,” Singer is more interested in how humans have landed in a secular frontier where the supposed battle lines had been drawn. In the following chapter, Dr Antonio Aliotta, Professor of Philosophy at the University of Naples (translated from Italian by Fred Brittain from Jesus College, Cambridge University) focuses on the nineteenth century alone. This is a fully philosophical evaluation of the various perspectives on the dialogue over science and religion, from Kant to Positivism. He concludes with a survey of the extensive landscape and critically examines modernism, giving particular focus on the value of pragmatism. “Positive religion” is the happier place, he argues, by insisting that “It is of no use to ask, for example, whether the dogmas of Christianity correspond to objective entities; its truth must be measured by its historic efficacy, and by the organisation of souls into a concrete harmony which it has been able to realise for so many centuries through the medium of its dogmatic and ritual structure.”¹¹

At this point we have found that the goal of the book was to raise the conversation to a higher plane of dialogue, but in doing so the discussion is very much antagonistic to fundamentalism. Religion is discussed in its social and historical value, as being a more satisfying

10 *Science and Religion: A Symposium* (London: Gerald Howe Ltd, 1931).

11 Antonio Aliotta, “Science and Religion in the Nineteenth Century,” in *Science, Religion and Reality*, 186.

philosophical alternative to atheism, and as being interesting for its rich breadth and depth rather than being literally true in any regard.

The most celebrated chapter of the collection is given next by Sir Arthur Eddington, Plumian Professor of Astronomy at Cambridge University and Fellow of Trinity College. Stanley describes this first greater foray into religious writing by Eddington:

His contribution represented the culmination of his thinking on relativity by itself ... and was his first explicit public statement on the relation of science and religion. However, despite the apparent introduction of religious elements into his philosophy, it was in no way a departure from the ideas he had been developing. Indeed, “The Domain of Physical Science” was a natural outgrowth and likely put forth ideas that he had held for some time.¹²

For context, at this time Eddington had made a habit of short philosophical reflections to end his various books on relativity and stellar physics. However, this is a solely philosophical and religious exposition. Given the new world that physics has brought, Eddington’s chapter “The Domain of Physical Science” sets out to sketch its implications for materialism. The physical universe and how we describe it are more constrained and narrower in scope than previously thought by the public, and those seeing the triumphs of the new physics as further development over religion are very mistaken:

The core of the essay was the establishment of the legitimate boundaries of the scientific conception, illustrated with the image of the simple act of stepping into a room. The common man unhesitatingly strides forward, but the physicist hesitates: the floor’s solidity is an illusion, and in truth it is an insubstantial web of hurtling atoms and shifting force fields. This parable does double duty for Eddington. First, it shows the dramatic divorce between the scientific and everyday conceptions of the world. Second, it shows the limitations of the use of the scientific

12 Stanley, *Practical Mystic*, 184.

conception. We must not insist on it constantly or we cannot function. Instead, expediency should be our guide on its application.¹³

Relativity had now vanquished the idea that science could explain everything. Physics is now more restricted, not less. His call extends not only to the public, but to his fellow physicists whose work was now reduced to pointer readings and measurements.¹⁴ Eddington would greatly extend these sentiments in his later works *The Nature of the Physical World*, *Science and the Unseen World*, *New Pathways in Science*, and *Philosophy of Physical Science*. As Rupke explains, “A materialist view of the world demands a strong view of natural law and causality. Relativity shows that such laws are dependent on human intellect, and less on the world. Quantum theory allows one to disassemble the materialist view even further by undermining the possibility of precise human knowledge about the world.”¹⁵

Eddington does not propose that Relativity is evidence for God as such, rather it is evidence against a strict materialism.¹⁶ This became one of the best expositions of what many more religiously minded scientists would explain through the interwar period, including Edward Arthur Milne and Sir James Jeans. Idealism would return with a vengeance from within the physics department at Cambridge University, despite the corresponding anger of Bertrand Russell and many of the Logical Positivists. However, though not direct evidence for God, Eddington would later (especially in *Science and the Unseen World*)¹⁷ make clear “That the world took any coherent form was evidence for a world beyond the material: the spiritual.”¹⁸

13 Stanley, *Practical Mystic*, 184.

14 Stanley, *Practical Mystic*, 185.

15 Nicolaas A. Rupke (ed.), *Eminent Lives in Twentieth Century Science and Religion*, 2nd edn (Frankfurt: Peter Lang, 2009), 140.

16 Stanley, *Practical Mystic*, 188.

17 Eddington, *Science and the Unseen World* (London: Quaker Books, 2007).

18 Stanley, *Practical Mystic*, 186.

Unsurprisingly, as a Quaker, he was fiercely opposed to dogmatism, and this extended in his scientific philosophy to materialism which he saw as too prevalent.¹⁹ Nicholas Spencer has recently marked the release of *Science, Religion and Reality* as the moment Eddington made his full-fronted public attack on materialism and his campaign for his own brand of idealism.²⁰ His writing makes clear the importance of relativity for his mystical view of the world in how it aligns. Determinism had no ground left to stand on.²¹ Eddington also used this work to further emphasise his repeated claim that the stuff of reality is mind over matter.

Although not proof-texting, Eddington is not shy in quoting the Bible. He capitalises “Mind” and “Logos” when making references to God²² and does not generalise as much as the prior contributors. This is perhaps surprising given his Quaker faith over the more scripturally focused affiliations of the others.

Joseph Needham’s exploration of biology and consciousness well explains the considerations over a vital life force at the time. Notable geneticists such as Ronald Aylmer Fisher were publicly exploring what it was that vitalised living things from their chemical constituents. “Vitalism” would be dead by the birth of molecular biology after the Second World War, but at this point it was a serious topic of dialogue in religion and science from the life sciences.

Needham emphasised that explanations are needed at different levels.²³ Tiers of explanation exist of which the scientific, mechanical explanations serve as the lowest tier, giving a functional description of life. However, as one moves up tiers to the wholistic and then social

19 Rupke, *Eminent Lives*, 151.

20 Nick Spencer, *Magisteria: The Entangled Histories of Science & Religion* (London: Oneworld Publications, 2024), 343.

21 Jitse M. Van der Meer, *Facets of Faith and Science*, vol. 1: *Historiography and Modes of Interaction* (Lanham, MD: University Press of America Inc., 1996), 40.

22 Eddington, “The Domain of Physical Science,” 217.

23 See Niels Henrik Gregersen, “Emergence and Complexity,” in *The Oxford Handbook of Religion and Science*, ed. Philip Clayton and Zachary Simpson (Oxford: Oxford University Press, 2006), 771.

descriptions, the functional scientific description becomes unsatisfactory. We can regard Needham's chapter as of historical interest into the critiques of vitalism at the time, but the greater value comes in these views of analysis. Appeals to the soul, either from the realm of mind or from intuition or personality remain a point of emphasis.

Dr John Oman was Principal of Westminster College at Cambridge University. His chapter is concerned with linguistic analysis over the definition, role, and scope of religion and religious explanation of the world. Indeed, after Needham's chapter, the analysis from scientists ends and moves into the humanities. Dr William Brown, Reader in Mental Philosophy from Oxford University explores psychology and mysticism in religion, before Dr Clement Webb of the philosophy faculty at Oxford University gives a shorter analysis of religion as a civilisation builder and what a scientific and Christian civilisation should be, considering the growth of secularism.

Dean Inge, who never seems to write in brief,²⁴ gives a lengthy conclusion. It is more his own reflections on the matter of science and religion, though he is in the privileged position of having read the other essays. Much of his well-read reflections on the finer points of religious reflection on science, from Bacon to DaVinci, are well worth reusing today as qualitative historical reflection. His writing is the most explicitly Christian of the book, though he is keen to note that his is not an apologetic defence of the faith.²⁵

By this point, Dean Inge was well known for speaking in public, writing many (large) books and interjecting his voice into science and religion discussion. He himself gave a Gifford Lecture shortly before the end of the First World War. His conclusion was met with mixed reception, including this by Morgan in the *Journal of Religion*:

24 See for example, W. R. Inge, *God and the Astronomers* (London: Longmans, Green and Co., 1933) for his own later work on Eddington, Jeans, and Milne, in particular.

25 William Ralf Inge, "Conclusion," 347.

Dean Inge fulfils his reputation for wide learning and keen discernment, but he rarely leaves his readers in any danger of forgetting that he is above all things an orthodox theist and Christian mystic. Aside from the recognition of certain common problems, the makers of these essays display little unity in emphasis or technique. Despite the critical motivation of the volume, the aroma of apologeticism is somehow pervasive. The essays add strength to the conviction that man will long prove adept in finding reasons for his faith. It may be that science is destined to play a more minor role in the religious thinking of the future than we now suppose. It must be remembered that modern world-views inconsistent with historic Christianity certainly owe as much to anthropology, comparative religion, biblical criticism, and allied branches as to the contributions of the physical sciences. It becomes patent, therefore, that in the task of reconstructing religion for tomorrow, neither the scientist nor the theologian can be left unaided.²⁶

The book by its end is large at 396 pages, rich in depth and breadth. It warranted, and received, an ample response.

Immediate Impact

As noted previously, the book first served to change the conversation away from extremes. Given its size and scope, it was a thorough response to the polemics that emerged from the end of the nineteenth century by Dickson White and Draper. The conversation would only grow in intensity as Bertrand Russell would publish *Why I Am Not a Christian* (1927), *The Scientific Outlook* (1931), and *Religion and Science* (1935) over the following decade. Eddington, among his aforementioned publications, wrote his own brief counter in *Why I Believe in God: Science and Religion as a Scientist Sees It* (1930).

26 W. J. Morgan, Review of "Science, Religion and Reality" by Joseph Needham, *The Journal of Religion* 6:5 (1926): 533–536, esp. 536, <https://www.journals.uchicago.edu/doi/10.1086/480610>.

Undoubtedly, the organisation of Cambridge academics to create this high-level discussion was impactful for a general public unsure of what the implications were for the new physics on religious belief. This is reflected in the extraordinary sales numbers for the books of Eddington and Jeans.

Different voices were platformed by Needham and the committee from London, Oxford, and Naples. The collective voice was more powerful than a single one and is harder to counter. Park noted the value of this symposium as follows:

Symposiums are interesting and instructive mainly because they reveal the wide divergences in point of view of the persons who contribute to them. One who expects this of symposiums in general will not be wholly disappointed in the present volume. After a careful reading of the distinguished contributors, one gets the notion not only that they are not all talking about the same things, but that they do not wholly understand one another. This too is more or less inevitable, since they are not all communicating in the same universe of discourse. Still it is interesting to know what men as different in temperament, training, and outlook on life as Arthur William Balfour, who writes the Introduction to the volume, and Dean William R. Inge, who writes the Conclusion, would say or could say about the same subject; it is interesting to know what such distinguished men would say on any subject. Aside from the contributions of these two men there are several papers in this collection which have individual and independent importance. This is particularly true of the paper by Antonio Aliotta, "Science and Religion in the Nineteenth Century," and the paper "The Domain of Physical Science," by Arthur S. Eddington.²⁷

Writing for *The Philosophical Review*, Chambers celebrated the impact of the volume for countering a conflict narrative that had come to dominate popular circles in his review:

27 Robert E. Park, Review of *Science, Religion, and Reality*, in *American Journal of Sociology* 32:1 (1926): 135–136, esp. 135, <https://www.journals.uchicago.edu/doi/10.1086/214040>.

What, then, is the relation of science and religion? Not rival claimants for the realm of reality, but allies in the search of truth. For science maps out the structure of reality, while experience reveals its content. Whether, then, religion be a distinct variety of experience or the integral concord of all our experiences, it is not the enemy of science, except as science denies or ignores where it should observe and describe. From science to religion, from religion to science—that is the eternal rhythm of the process of the spirit, which rises from life to thought and returns from thought to life in a progressive enrichment which is the attainment of ever higher levels of reality and truth.²⁸

Others were more balanced in their critique.²⁹ Morgan, writing for the *Journal of Religion*, noted the power of Eddington's essay, but wondered why he diverged from other physicists in his Christian interpretation.³⁰ He was, however, more satisfied with Needham's exposition of why vitalism and neovitalism were not viable and the warning of nailing religious colours to the mast of the latest speculations in biology.³¹

Most skepticism was reserved for the other authors, with Morgan keen to bring down any gathering excitement for the collection to be seen by believers as a new scaffolding upon which to construct proofs of God:

Oman attempts to construct a concept of the supernatural on the basis of values. His contentions are neither new nor overwhelmingly convincing. Brown ... occupies himself with a distinction between individuality and personality and postulates God as the only complete person, "the totality of Reality itself." Webb insists upon the leavening and directing influence of a Christian ethic, lest science become "but a powerful instrument in the hand of

28 L. P. Chambers, *The Philosophical Review* 37:1 (1928): 78–82, esp. 82, <https://doi.org/10.2307/2179527>.

29 Another example is L. Arnauld Reid's review in *Hibbert Journal* 24 (1925): 594. See also A. E. Elder's review in *Philosophy* 1:1 (1926): 105–108, DOI: 10.1017/S0031819100014819.

30 Morgan, Review of *Science, Religion and Reality*, 534.

31 Morgan, Review of *Science, Religion and Reality*, 535.

passions and interests,” and consequently a menace to future civilisation. The concluding essay by Dean Inge is characteristic. He has no sympathy with efforts to reconcile religion and science on the basis of a delimited territory. He asserts that the Copernican cosmology “tore into shreds the Christian map of the universe.” He insists that the Christian heaven can no longer be regarded as a place.³²

Whilst the critical, academic response was predictably mixed, it accelerated the popular writing on the topic over the interwar years, with many more academics interjecting their voices into the science and religion dialogue.

Why It Has Remained Obscure

At this centenary retrospective, one wonders why this particular work has not received more historical acclaim. I offer three reasons in brief:

The Conversation Moved on as Individual Works Came to Dominate

Following its release, a far bigger platform was presented for individual published works to dominate the landscape of the science-religion dialogue. Eddington would release five works on the subject in the next decade, followed in competition by Sir James Jeans, and later Edward Arthur Milne. Inge would release his work *God and the Astronomers*, whilst the response would come from Bertrand Russell, Susan Stebbing,³³ and Chapman Cohen,³⁴ to meet the rise of religious scientists. Despite the BBC’s symposium, it was the rapid rise of individual popular works that would take the place of symposiums.

32 Morgan, Review of *Science, Religion and Reality*, 535.

33 L. Susan Stebbing, *Philosophy and the Physicists* (London: Penguin Books, 1937).

34 Chapman Cohen, *God and the Universe: Eddington, Jeans, Huxley and Einstein* (London: Pioneer Press, 1931).

The BBC Symposium

As mentioned, the BBC's first ever symposium on science and religion was a landmark program. Taking place in 1931, it gathered the growing momentum from works by Jeans and Eddington and extended the reach of the dialogue much further, which obscured the influence of *Science, Religion and Reality*. Accompanied by radio, the symposium was grander in scope and audience.

Eddington Memorial Lectureship and The Gifford Lectures

Following Eddington's death in 1944, the annual memorial lectureship in Cambridge would join the Gifford Lectures in producing published reflections on the intersection of science, philosophy, and religion for much of the twentieth century. Cambridge University Press would publish these, bringing a steady supply of individual reflections on the subject. Both continue to this day, although the Eddington Lectures now focus only on astronomy. Once the printed annual lectures were successfully distributed, symposiums became less prominent.

Concluding Remarks

Undoubtedly, the Second World War added to the reasons for this seminal work being ignored to the extent that it has been. In considering this environment, and the tensions of interwar physics, the work demonstrates extraordinary timing and is an impressive collection.

Despite the representation from Oxford, London, and further afield, the work was a Cambridge phenomenon in its instigation and execution. Cambridge University had maintained a generous dialogue on science and religion for centuries and this work carried on the tradition of Newton and others in this regard.

The review in *Nature* upon its release sums up the success of it, as follows:

There has been of late a recrudescence of interest in the relations between science and religion, and the present book is a solid and important contribution to the study of this question, so fundamental for every thinking man. The book is remarkable also as showing how great a change has taken place in the attitude both of the theologian and of the scientific man towards this ever-present problem. The hearty days are gone when Huxley gave battle to the bishops, and fierce controversy raged through the pages of the serious reviews. In this book the spirit of antagonism is gone, and there is an earnest seeking after not compromise, but reconciliation. The pages breathe a sweet reasonableness, and one almost longs—in unregenerate moments—for a little clashing of swords.³⁵

Despite this praise, the conflict was not gone, as is reflected in Russell and others bringing their counteroffensive in the writings that followed. But where Needham, Eddington, Balfour, and others succeeded is that these counteroffensives were not coming from the writing of scientists, but philosophers and popular writers. The growing public perception through the 1920s–1930s was that scientists were penning a different perspective on science and religion.

We must also reflect on *Science, Religion and Reality* as Needham's work. Despite his youth, this was the first popular work of the young polymath and set the course for his own writings in both science and the science-religion dialogue. Most notably, he would follow up with his own extensive volume of lectures on the matter in *The Great Amphibium*.³⁶ Throughout his long life, Needham would give lectures on matters of faith that would be transcribed and printed for popular release. His most famous contributions to the history and philosophy of science came as he set out to explore the historical reasons as to why Chinese and Indian civilisations did not develop science and technology as the Western world did.³⁷

35 E. S. R., "Science, Religion and Reality," *Nature* 117:2944 (1926), 475–478, <https://doi.org/10.1038/117475b0>.

36 Joseph Needham, *The Great Amphibium* (London: Student Christian Movement Press, 1931).

37 Clayton and Simpson, *The Oxford Handbook*, 30, 300.

As Stanley noted, Eddington's chapter "The Domain of Physical Science," published in Needham's volume, was the first occasion that he extended his idealist philosophy and religious epistemology to the public, with reference to Relativity: "For Eddington, mind and consciousness were identical with spiritual values, and the recognition of the former was a recognition of the latter."³⁸ And Eddington's work in the volume made the most headway with the general public. No wonder that his *The Nature of the Physical World*, released in 1928, sold 90,000 copies.³⁹ He articulated in common, more accessible parlance, the moral and ethical framework in conjunction with scientific and broader philosophical ideas that the modern churchman could utilise. Because Eddington would go on to be the most popular expositor of religion and science for the interwar period (with Jeans), we cannot understate the importance of his first contribution, published in *Science, Religion and Reality*. It set the table for his later success. Eddington's popular success in turn built the platform for future writings by Jeans, Milne, and others.

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38 Stanley, *Practical Mystic*, 187.

39 Rupke, *Eminent Lives*, 137.

The Ontological, Temporal, and Teleological Unity of Consciousness and the Body: A Response to Reductionism and Dualism

Walter Huddell

Abstract: David Chalmers' so-called *hard problem of consciousness* is concerned with how one can give an account of phenomenal conscious experience in physicalist terms. In this article, after a brief account of Cartesian dualism, I consider how John Paul II's *Theology of the Body* speaks to the prospects of a reductionist approach. This is then considered in light of Chalmers' description of the hard problem. This analysis will have implications for related questions about the engineering of strong artificial intelligence from a nonbiological substrate as well as some of the ambitions of the transhumanist movement. I suggest that to be human is to be an essential unity—a unity of our bodies and that within us which experiences the world. Furthermore, I propose that this unity has a kind of ontological, temporal, and teleological continuity. It provides us with sacramental meaning as human persons and affirms the redemptive meaning of the resurrection.

Keywords: artificial intelligence; consciousness; dualism; reductionism; transhumanism

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Even as recently as a decade ago, the origins and nature of consciousness might not have seemed to be a conversation in which ordinary Christians would choose to engage. Recent advancements in machine learning models, however, have made this area an important one for Christian thinkers and for grassroots discussion. It is now obvious that tensions arise between Christian accounts of what consciousness is and how it emerges, reductionist accounts, and the views of representatives of the “transhumanist” movement. Our contemporary technological context presents an opportunity for Christian contributions to the conversation, aiming to arrive at a more robust understanding of the human person.

In the present paper, I hope to make a modest contribution in that direction by considering a few of the ways consciousness and its relationship to the body have been understood by some prominent Christian and non-Christian thinkers. The discussion begins with the classic dualistic outlook of René Descartes, setting it alongside the intentionally sacramental view of John Paul II. This stark contrast will then lead to a consideration of contemporary questions, as well as the problems associated with engineering consciousness. Finally, I argue that a Christian understanding of consciousness and its relationship to the body offers an important cautionary word about the promises put forward by transhumanism with its technologically driven utopian vision for human persons.

The Classic Dualistic Vision: Descartes' Legacy

Most relevant for the shape of this conversation in the modern world is the thinking of Descartes. An intellectual descendant of Plato, Descartes is rightly categorised as a rationalist. In his *Discourse on Method*, his aim is primarily epistemological: To ground all of his thinking in the certainty he found in the mathematics of Euclid, a world wherein he found indubitability, logical necessity, and precision. He hesitated over the Aristotelian philosophy of his time as articulated by Aquinas and his intellectual progeny, wherein the contents of

the intellect were thought to be completely dependent on the senses. In turn, his notion of mathematical rigour compelled him to doubt the reliability of sensory experience. He articulates this in his *Discourse on Method*, as follows: “Thus, because our senses sometimes deceive us, I wanted to suppose that nothing was exactly as they led us to imagine.”¹ He goes on to assume that he is without a body, without a world, and without a place—a disembodied, dislocated mind. In arriving at his now infamous *cogito*, he argues on the basis of what he believes to be pure rationality that, as a thinking thing, he must exist.

Our focus is less on Descartes’ quest for epistemic certainty and more on his assertions about the relationship between his body and his mind or soul. Once he has established his existence, he goes on, “Thus, this *I*, that is to say, the soul through which I am what I am, is entirely distinct from the body and ... even if there were no body at all, it would not cease to be all that it is.”² In his *Meditations on First Philosophy*, he defines himself as “a thing that thinks,” and again as “a thing that doubts, understands, affirms, denies, wills, refuses, and that also imagines and senses.”³ Furthermore, this thinking thing is largely passive with respect to its reception of perceptible things from the senses. In fact, they are “produced without my cooperation and often even against my will.”⁴ Thus, his “*I*” is somewhat isolated from the body, versus what Aristotle or even Plato supposed.

The issues raised by Descartes in his *Discourse* and *Meditations* leave us with a number of questions that philosophers have been wrestling with ever since he raised them. Among them is the relationship between the mind or subject or self and the body. If the mind and the body are distinct substances, or, as Descartes puts it, if the human

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- 1 René Descartes, *Discourse on Method* (Indianapolis: Hackett Publishing Company, 1998), 18.
 - 2 Descartes, *Discourse on Method*, 19.
 - 3 René Descartes, *Meditations on First Philosophy* (Indianapolis: Hackett Publishing Company, 1998), 66.
 - 4 Descartes, *Meditations on First Philosophy*, 97.

person “is essentially a thinking thing, entirely distinct from the body,” how are these aspects of our humanity related?

For example, is the thinking thing that we are, the seemingly transcendent subject, an illusion, wherein mental states are simply reducible to physical states? Is what we think we are, the “I” for Descartes, just a byproduct of physical and chemical processes—a cog in a broader physical machine? Asked differently, are mental states just a subset of physical states? This view is known broadly in the literature as the reductive physicalist view where the phenomena of experience are reducible to physical laws.⁵

Let’s pose an additional but related question: Is the external physical world an illusion? Are we subjects living in a simulation generated by a computer? This view had been labeled the idealist position, according to which our experience of the external world is in some way false.⁶ It is noteworthy that most of us hold to this view on at least a limited level. Our experience of the external world does not reveal the underlying nature of, for example, the world at the quantum mechanical level. We do not have a subjective experience of the Higgs boson, or quarks, or the strange probabilistic nature of elementary particles modelled by the wave function. Nevertheless, most of us do not think that what we do experience is being fed to us by some sort of “evil genius, supremely powerful and clever,”⁷ for the purpose of deceiving us. Nor do most of us think that we are in some version of *The Matrix*.

A Christian Alternative: John Paul II’s Sacramental View

I find that one of the most compelling Christian responses to these questions is provided by John Paul II’s exegesis of Matthew 19 and Gene-

5 See David Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (New York: Oxford University Press, 1996), 93; J. J. C. Smart, “Sensations and Brain Processes,” *The Philosophical Review* 68, no. 2 (1959): 142.

6 Paul Guyer and Rolf-Peter Horstmann, “Idealism,” *The Stanford Encyclopedia of Philosophy* (Spring 2023 Edition), <https://plato.stanford.edu/archives/spr2023/entries/idealism/> (accessed 9 September 2025).

7 Descartes, *Meditations on First Philosophy*, 62.

sis 1–3. In Matthew 19, the Pharisees are testing Jesus with a question about marriage and the Law’s accommodation of divorce. “Is it lawful to divorce one’s wife?”⁸ The Pharisees are here pitting two competing schools of contemporary rabbinic teaching against one another: The conservative school of Shammai, wherein divorce was allowed only in the case of unchastity, and the more liberal school of Hillel, in which a man could divorce his wife in cases as trivial as a spoiled dish.

In his reply, as he often does, Jesus disables the premise of their question, by telling them that divorce is a kind of accommodation due to the “hardness” of human hearts.⁹ In this context, he then refers twice to “the beginning” and cites passages from the creation account found in Genesis. This double reference to “the beginning” is central: It sets the paradigm for God’s intention for marriage, giving the paradigm, as John Paul puts it, “normative meaning.”¹⁰ Using profound typology, the creation account in Genesis tells us what it means to be human among so many other things. The church fathers saw in Genesis the human person revealed as a kind of microcosm (literally a “little cosmos”) in which the greater cosmos is reflected.¹¹

The Lord’s response to the Pharisees includes references to both chapter 1 and chapter 2 of Genesis. We find an objective emphasis on our human personhood in Genesis 1, and a subjective emphasis in Genesis 2. The objective focus is on what it is to be human. The subjective focus is on what it is like to be human. Let us consider each of these in turn.

The reference in Genesis 1 is to humans (*adam*) created in God’s image as male and female. This appears in what some biblical scholars call the Elohist account of creation (versus the Yahwist account in Genesis 2). Of the Elohist account, John Paul says,

8 Matthew 19:3b. Biblical quotations are taken from the English Standard Version.

9 Matthew 19:8.

10 John Paul II, *Man and Woman He Created Them: A Theology of the Body* (Boston: Pauline Books and Media, 2006), 132.

11 See Gregory of Nyssa, *On the Making of the Human Being* 16.177; Maximus the Confessor, *Ambigua* 41.

Given that the creation of man as male and female ... is placed in the rhythm of the seven days of creation of the world, one could attribute to it above all a cosmological character: man is created together with the visible world.¹²

He goes on to point out that human persons are placed at the pinnacle of the cosmos (*kosmos*, literally the ordered world as first applied by Pythagoras¹³). Humans are in the visible world, part of “the visible totality of bodies.”¹⁴ They are in bodies but are unique as image-bearers. Thus, we see the objective character of the Elohist account, with its physical perspective on humankind (and the world), but also its meta-physical account of humans as image-bearers. This is what the human person is.

On the other hand, the Yahwist account in Genesis 2, which Jesus quotes directly in his debate with the Pharisees, is just as rich, but it has a different character, with human subjectivity especially highlighted. It is an older and more anthropocentric account. Even in the name of God used in this account, Yahweh, we see the covenantal relationship between God and humanity revealed.¹⁵ There is a kind of relational intimacy found in the description of our creation here, where God “breathed into his nostrils the breath of life, and the man became a living creature.”¹⁶ He is placed by God in the garden to work the very ground out of which he is made (which has not yet been cursed). The description of the Tree of Life further indicates God’s covenantal relationship with humanity.

In addition, the Tree of the Knowledge of Good and Evil reveals people’s self-determination, their agency as subjects. So, we see our subjectivity not only in our relationship with God, but also in our abil-

12 John Paul II, *Man and Woman*, 135.

13 Kenneth Sylvan Guthrie and David Fideler, *The Pythagorean Sourcebook and Library* (Grand Rapids, MI: Phanes Press, 1998), 22.

14 John Paul II, *Man and Woman*, 135.

15 John Paul II, *Man and Woman*, 142.

16 Genesis 2:7.

ity to exercise his will; to choose obedience and continued covenantal relationship with God, including access to the Tree of Life, or disobedience and death. Covenants, by their nature, suggest subjectivity. Again, in John Paul II's words,

This man ... is manifested ... as a subject of the covenant, that is, a subject constituted as a person, constituted according to the measure of "partner of the Absolute," inasmuch as he must consciously discern and choose between good and evil, between life and death.¹⁷

Man's subjectivity is further uncovered in his original solitude, his being alone, which he himself discovers through naming the animals. After naming these other bodies in the visible world, he understands that embodiment is common to all visible creatures (creatures in bodies), including himself. Yet, in the process of naming them, he "gains the consciousness of his superiority"¹⁸ over them. He uniquely understands himself as a subject, but also as a body amongst other visible bodies. This is what it is like to be a human person.

The Tree of the Knowledge of Good and Evil also serves as a boundary between people's condition of innocence before the fall, and their sinfulness after. The fact that Christ refers to the beginning points to what John Paul II calls an "essential continuity"¹⁹ in human persons between these two states. In addition, the Protoevangelium found in Genesis 3:15 points to the redemptive hope for the fallen creature found through Christ's work. This redemption entails the objective and subjective natures of persons as hoped for by Paul in Romans 8:23: "And not only the creation, but we ourselves, who have the firstfruits of the Spirit, groan inwardly as we wait eagerly for adoption as sons, the redemption of our bodies."

17 John Paul II, *Man and Woman*, 151.

18 John Paul II, *Man and Woman*, 148.

19 John Paul II, *Man and Woman*, 142.

We are struck by the change from the repetition of created *goods* in Genesis chapter 1 to a condition that is *not* entirely *good* in chapter 2. What is not good, is that among all the visible bodies in creation, human beings alone are conscious, free subjects in an objective body. They are not like the animals. They are unique among those creatures in the visible world, being image-bearers endowed with agency and self-understanding. In Heideggerian terms, people are the kind of Being for whom being is an issue.²⁰ Notice that this realisation comes as a result of engagement with the visible world, the world of bodies. The invisible nature of the human person—as subject, image-bearer, self-conscious creature with agency—is revealed by means of the visible—through the trees and the animals. Here is the heart of sacramental theology: A visible sign of an invisible reality.

This theology is found in Paul's description of humanity's accountability in Romans 1:19–20:

For what can be known about God is plain to them, because God has shown it to them. For his invisible attributes, namely his eternal power and divine nature, have been clearly perceived, ever since the creation of the world, in the things that have been made.

The invisible is made manifest in the visible. That is, things that are impossible to see (eternal power and divine nature) are “perceived” from things that have been made, and this has been so since the creation of the world. The visible world serves to show us invisible realities. And it is our being in a body that allows us to interact with and take in information from the visible world of objects.²¹

So, we see that, in a sacramental picture, embodiment takes on a much more critical role in our humanity and our knowledge of God. John Paul II writes, “The body, in fact, and only the body, is capable of

20 Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson (New York: Harper & Row, 1962), 32.

21 Other examples found in Scripture of the revelation of the invisible by means of the visible world of bodies include Psalm 19:1–6 and Jeremiah 5:21–22.

making visible what is invisible: the spiritual and the divine.”²² In the prologue to his gospel, John tells us that, “No one has ever seen God; the only God, who is at the Father’s side; he has made him known.”²³ The incarnation of the Word—the life, teaching, death, and resurrection of Jesus—is our clearest revelation of God to us. In John Paul II’s words,

The fact that theology also includes the body should not astonish or surprise anyone who is conscious of the mystery and reality of the Incarnation. Through the fact that the Word of God became flesh, the body entered theology—that is, the science that has divinity for its object ... through the main door.²⁴

Of course, the resurrection of our own bodies is also central to the Christian understanding of the gospel, since it is included in the matters “of first importance” that Paul delivered to the Corinthians.²⁵

This understanding of the body calls the hard Cartesian distinction between the body and the mind into question. Descartes’ view is that the subjective aspect of the human person “has no need of any place nor depends on any material thing.”²⁶ The sacramental model, by contrast, posits a body which is central to our perception of the invisible world.

Chalmers on the Hard Problem of Consciousness—Reductionist/Physicalist Dualism

Thus far, we have discussed Descartes’ rationalist program for grounding knowledge in reason alone and the questions regarding consciousness and its relationship to the body that Descartes raises. Particularly

22 John Paul II, *Man and Woman*, 203.

23 John 1:18.

24 John Paul II, *Man and Woman*, 221.

25 1 Corinthians 15:3.

26 Descartes, *Discourse on Method*, 19.

relevant for our purposes is the disembodied “I” that he puts forward. Descartes advocates for a soul that is a substance “entirely distinct from the body.”²⁷ We then considered one possible Christian alternative²⁸ in John Paul II’s *Theology of the Body*, in which the objective, visible nature of the human person’s being plays a much more pivotal role in our humanity. In this sacramental understanding, we are not spirits trapped in bodies. We are a kind of mystical union of subject and object, spirit and body, that is not so easily split.

We now want to turn our attention to more contemporary questions. Recall, at the outset we suggested that there were potential problems that consciousness poses for a reductionist or physicalist view of the universe. How can purely physical systems give rise to the phenomenon of consciousness? Is consciousness reducible to biology, chemistry and, ultimately, physics? If so, can we imagine engineering consciousness? If consciousness is reducible to physics, then one might ask if it is independent of the substrate in which it is physically housed. That is, could the wetware of biology be replaced by the hardware of silicon? To begin, let us consider the reducibility question.

One of the leading thinkers in consciousness studies over the last twenty years is Australian philosopher David Chalmers, who codirects New York University’s Center for Mind, Brain, and Consciousness. Interestingly, while he is no advocate for any kind of traditional Christian theism, Chalmers is critical of a purely materialist, reductionist account of consciousness. Before considering his critique, we would do well to establish some definitions.

Chalmers acknowledges that a definition of consciousness is notoriously difficult to pin down. He quotes Stuart Sutherland who bemoans consciousness’ resistance to clear definition in *The International Dictionary of Psychology*, wherein he points out that “it is impossible to specify what it is, what it does, or why it evolved. Nothing worth

27 Descartes, *Discourse on Method*, 19.

28 That is not to say that Descartes was not trying to argue within his understanding of a Christian framework.

reading has been written about it.”²⁹ Chalmers distinguishes between consciousness and notions like perception and thought, which may be unconscious. Rather, he associates consciousness with experience. Experience seems just as slippery with respect to definitions, but for our purposes it will suffice to understand experience as our subjective awareness, or the internal aspect of the qualities associated with perceiving and thinking.

The characteristics of experience differ from the computational work done by the neurons in our brains. When we perceive the colour red, our retinas receive light into them at a certain wavelength, the optic nerve then sends that information to the brain where it is processed in some way by its neural network. We recognise the input as red. But this algorithmic, quantitative, physical description, in some ways, fails to capture our subjective experience of redness. If one were to explain to a person who was blind the physical, chemical, and biological processes in as much detail as is currently possible from our scientific understanding, would that truly capture the experience of redness? The experience of pain may be another useful example. Can any of us truly know what the experience of a kidney stone feels like from any description short of actually going through the pain associated with a kidney stone in the first person?

Philosophers call the study of these aspects of consciousness phenomenology. Phenomenology, as one might expect, considers the nature of phenomena, or as the *Stanford Encyclopedia of Philosophy* puts it, “things as they appear in our experience.”³⁰ The focus here is not on a scientific description of phenomena. A psychological description is closer to the mark, but may still be misleading. This sort of analysis resists quantitative explanation and rather is primarily qualitative.³¹ In

29 Chalmers, *The Conscious Mind*, 3.

30 David Woodruff Smith, “Phenomenology,” *Stanford Encyclopedia of Philosophy*, 2013, <https://plato.stanford.edu/entries/phenomenology/> (accessed 10 November 2025).

31 It has been recently posited that Descartes’ differentiation between the mind—the “I”—and the body aimed at deciding where qualitative and quantitative assessments were supposed to be applied. See Doru Costache, “Consciousness

fact, philosophers have coined the term *qualia* for the properties that are brought about by experience. The non-materialist asserts that the qualia associated with redness are distinct from any formulaic account of how redness produces the associated mental state. It is often said that phenomenology considers “what it is like to be something,” language which was used above.

It should be mentioned that phenomenology extends beyond the consideration of sensory experience alone. We also have experiences such as introspection, mental calculation, and imagination, to name a few, which are not due to immediate sensory input. Descartes considers these as part of the things that make up the self from which he draws the conclusion that he exists. It is precisely consciousness in all of these forms that is the most real thing to us, that which cannot be doubted. So, in some sense, experience is the most immediate thing that we know.

We note that many aspects of this understanding of consciousness are not unique to human persons. Presumably, there is something along the lines of “what it is like to be” a chimpanzee or a dog. The questions that arise in this field are legion. Just how far can we extend the question of experience down the genetic ladder? Are cats self-conscious or is their being an issue for them? To what degree, if any, is silicon-based hardware capable of phenomenal experience? Most of these questions are beyond the scope of our current interests. We take for granted, though, that at least mammals have phenomenal experience of sensory information.

The phenomenal aspects of consciousness focus on what Chalmers refers to as the “hard problem of consciousness”: How can we account for conscious experience on the basis of a reductionist explanation? This differs from what he calls the “easy problems”: “How does the brain process environmental stimulation ... [and] integrate infor-

in the Cosmos: From René Descartes to David Bohm’s Revolution,” *Journal of Consciousness Studies* 32, no. 5–6 (2025): 155–179, esp. 159–166, <https://doi.org/10.53765/20512201.32.5.155>.

mation?”³² Much progress has been made in the last forty years in our understanding of the easy problems. Neuroscientists and computer scientists in particular have made great strides in this area. We understand the operation of the brain to a much greater degree than we did forty years ago. We have, furthermore, been able to engineer artificially computer simulations of certain tasks performed by conscious beings, many of which are able to pass the Turing test.³³ The phone in my pocket can correctly label faces, “know” when I have started my car, tell me the time required to reach my next presumed destination, and, via verbal direction, process language and tell me tomorrow’s weather. These problems are “easy” in the sense that we can now engineer them—or that we have a reasonable expectation that in the future we will be able to explain and simulate these behaviours. Arguably though, these advances fail to simulate “what it is like” to experience the seeing of a face or the colour red in the same way that explaining the physics and biology of the processing of light to a blind person, or presenting a deaf person with the algorithm associated with the recognition of one of Mozart’s symphonies, fails to adequately provide that person with the experience of colour or music, respectively. The hard problem asks if subjective, conscious experience in this sense can be reduced to the physical explanation.

A somewhat weaker notion of reducibility in analytic philosophy is that of “logical supervenience.” Logical supervenience is concerned with when a set of B-properties can be reduced to a set of A-properties. As Chalmers has it, “B-Properties supervene logically on A-properties if no two logically possible situations are identical with respect

32 Chalmers, *The Conscious Mind*, xi–xii.

33 The Turing test, which Alan Turing referred to as “The Imitation Game,” was his way of thinking about the question, “Can Machines Think?” He outlines the test in his 1950 paper entitled, “Computing Machinery and Intelligence,” *Mind* 59, no. 236 (1950): 433–460, <https://doi.org/10.1093/mind/LIX.236.433>. The machine is said to pass if a human interrogator, when unknowingly engaged in a dialogue with a machine, is unable to distinguish the machine’s answers from those of another human.

to their A-properties but distinct with respect to their B-properties.”³⁴ For example, the biological world logically supervenes on the physical world. Equivalently, if two entities are the same physically (imagine atom-for-atom), they must be the same biologically. In terms of the hard problem, we ask if the properties of consciousness logically supervene on physical properties, i.e., if physicalism is true.

Chalmers’ answer here is *no*. Among other arguments that he uses to make his case, his logical argument associated with “philosophical zombies” may be the most compelling. A philosophical or phenomenological zombie is a being associated with me, a copy that is physically identical to me in every way, atom-for-atom. This physical structure produces identical functional effects. When it eats an apple fritter, its taste buds process the sugar, sending an identical signal to the brain which thereby undergoes an identical chemical effect to that produced in my brain. The zombie smiles and communicates pleasure to the external world just as I would. The only difference³⁵ between me and my “philosophical zombie” is that my zombie has no phenomenological or subjective experience; the lights are simply not on. He does not actually experience the pleasure of the apple fritter (a tragedy indeed). To an external observer, no difference would be perceived between us: Our behaviour would be identical, but when I look at a cloudless sky, not only would I go through all of the physical processing associated with seeing blue, I would also have the experience of blueness. My zombie *doppelganger* would process the information through the same physical mechanisms but would not have the experience of seeing blueness as I do. In short, the zombie is not phenomenologically conscious.

Now, this is a logical argument from conceivability, not an argument from biological possibility in our world. It is not relevant if such a being could exist in our physical universe, according to our physical

34 Chalmers, *The Conscious Mind*, 35.

35 To address the objection that my zombie and I cannot occupy the same spatiotemporal location, Chalmers here adds the supposition that the zombie “is embedded in an identical environment.” Chalmers, *The Conscious Mind*, 95.

laws. Rather, we are only interested in the logical conceivability of such a being. For example, we could logically conceive of a universe where the acceleration of gravity on Earth is different from 9.8 m/s^2 . But we could not logically conceive of a bachelor who was married, nor a five-sided triangle. The terms are contradictory. Unlike a five-sided triangle, Chalmers argues, we could conceive of a “philosophical zombie” without logical or conceptual contradiction.

The argument that consciousness does not logically supervene on the physical is a *modus tollens* argument. We assume that physicalism is true. A “philosophical zombie” is logically conceivable and thus metaphysically possible (it does not violate any conceptual laws). But if physicalism is true, the consciousness that exists in me must be implied in my zombie since we are physically identical. But, by definition, my zombie is not conscious. Therefore, our assumption that physicalism is true is contradicted. Equivalently, consciousness does not logically supervene on the physical.

Here we have found two beings (the zombie and me) which are identical with respect to our physical properties. Yet, we are distinct with respect to consciousness: I am conscious, the zombie is not. Thus, we have provided a counterexample to the definition of “logical supervenience.”

A second compelling argument against reductionism is found in a paper that has become a standard reference with respect to these matters, entitled “What Is It Like to Be a Bat,” by New York University emeritus professor Thomas Nagel.³⁶ Nagel considers the divergence of phenomenal experience between, say, a human being’s experience of the external world to that of a bat, which navigates by echolocation. The physical account of the bat’s processing of the world in which it moves will obviously differ significantly from the account of our own primarily visual processing. How “what it is like” for me to walk through a room compares to “what it is like” for a bat to navigate the same room is mysterious, to say the least. Nagel suggests that what it is like for the

36 Thomas Nagel, “What Is It Like to Be a Bat?,” *The Philosophical Review* 83, no. 4 (1974): 435–450, <https://doi.org/10.2307/2183914>.

bat can only be understood from the point of view of the bat. A first person (or more appropriately a first bat) point of view is required.

Nagel uses this case to argue against a reductionist explanation of phenomenal experience.

For if the facts of experience—facts about what it is like *for* the experiencing organism—are accessible only from one point of view, then it is a mystery how the true character of experiences could be revealed in the physical operation of that organism.³⁷

Physical laws, by their objective nature, are accessible to all equally, regardless of one's point of view. We can write down equations that model these laws that can be objectively understood by anyone. The example of the subjective experience of the bat's navigation of its environment, however, seems to indicate a phenomenon that transcends that sort of objective access; only the bat (or, perhaps, other bats as well) truly knows what it is like to be a bat.

Again, it should be mentioned that the resistance of subjective experience to reductionist explanation extends beyond simply sensory or empirical experiences such as sight or sound. We likewise find it difficult to imagine an adequate physical account of our experience of introspection, or the “aha!” moment experienced by the mathematician when a previously obscure solution to a problem is exposed to the light of understanding. These examples of subjective experience call for an explanation of consciousness that draws on more than what physics and chemistry can offer.

So, I have argued that naturalistic reductionism falls short of being an adequate account of human subjective experience. Among several alternative explanations of consciousness other than reducibility that Chalmers puts forward is what he calls “naturalistic dualism.”³⁸

37 Thomas Nagel, “What Is It Like,” 442.

38 With less enthusiasm, Chalmers offers a second explanation known as panpsychism. Chalmers, *The Conscious Mind*, 293–301. See also Phillip Goff, *Galileo's Error: Foundations for a New Science of Consciousness* (New York: Pantheon, 2019).

He suggests that we need something else to explain consciousness besides our physics as it is now understood; a new fundamental property.³⁹ As an analogy, he cites Maxwell's equations that govern electromagnetism.⁴⁰ The Newtonian categories of mass, space, and time were insufficient to describe the behaviour of electricity and magnetism. Electric charge serves as an example of a new fundamental property that provides a way to describe the behaviour of electricity and magnetism with mathematical rigour. Perhaps consciousness requires some new fundamental *protophenomenal* properties alongside our current physics. This naturalistic dualism, Chalmers argues, would provide an explanatory framework for consciousness.

A related naturalistic account prominent in the literature is that of "emergent dualism."⁴¹ Herein, consciousness, or mind, emerges as a product of the brain. John Searle, for example, writes, "consciousness is a causally emergent property of systems. It is an emergent feature of certain systems of neurons in the same way that solidity and liquidity are emergent features of systems of molecules."⁴² William Hasker adds that mental properties "manifest themselves when the appropriate material constituents are placed in special, highly complex relationships."⁴³ To present this, Hasker uses the analogy of a magnetic field: "As a magnet generates its magnetic field, so the brain generates its field of consciousness."⁴⁴ This emergent consciousness is not a collection of properties but rather an emergent substance, a unity that cannot be decomposed. While it is caused by the physical substrate, as an emergent substance, it remains distinct from that substrate.

39 He is not the only one to think along these lines. Physicist David Bohm did, too. See Costache, "Consciousness in the Cosmos," 171–176.

40 Chalmers, *The Conscious Mind*, 127.

41 Cf. Marc Cortez's helpful summary in *Theological Anthropology: A Guide for the Perplexed* (New York: T&T Clark International, 2010), 72–79.

42 John Searle, *The Rediscovery of the Mind* (Cambridge: MIT Press, 1992), 111–112.

43 William Hasker, *The Emergent Self* (Ithaca: Cornell University Press, 1999), 189–190.

44 Hasker, *The Emergent Self*, 190–191. It should be noted that Hasker is careful to warn us against pressing the analogy of the physical field too far.

One notices in both accounts that analogies are made to electromagnetic fields. Like consciousness, before Maxwell's equations, these fields had an air of mystery about their nature. Maxwell's equations, however, have rigorous mathematical foundations with broad empirical support, which these accounts are lacking.⁴⁵ Similarly, the ontology of elementary particles such as electrons and the fields they generate remains a point of some contention. Physicists admit that they do not agree on "what, at rock bottom, quantum mechanics actually says. Physicists are extremely good at *using* quantum mechanics ... But it's a bit of a black box."⁴⁶ Again, however, unlike natural and emergent dualism, quantum mechanics is widely understood to be the most successful physical theory ever devised; it remains remarkably precise. So, while the "top quantum physicists in the world do not agree on what's going on to produce the results they predict and observe so successfully,"⁴⁷ they are in fact successful in their predictions. As in the case of electromagnetism, there is an entirely rigorous mathematical framework that underlies the Standard Model of particle physics. Natural and emergent dualism lack the theoretical framework and empirical verification of electromagnetism and quantum mechanics.

Furthermore, and more significant for the theist, while these dualistic descriptions attempt to provide explanations of how a seemingly immaterial consciousness arises from the material, they appear less adequate to account for causality in the other direction. This is sometimes referred to as the dissimilarity argument.⁴⁸ In the case of emergent dualism, how can a volition that occurs in the mind—a distinct substance from the physical—cause an action in the body, which is a physical substance operating in a closed system? How are

45 Giulio Tononi's "Integrated Information Theory" is cited as having the potential mathematical framework for such an explanation. See Francis Fallon, "Integrated Information Theory of Consciousness," *Internet Encyclopedia of Philosophy*, <https://iep.utm.edu/integrated-information-theory-of-consciousness/> (accessed 10 September 2025).

46 Sean Carroll, *Quanta and Fields* (New York: Dutton, 2024), 2.

47 Carroll, *Quanta and Fields*, 2.

48 For this and other critiques, see Cortez, *Theological Anthropology*, 75–77.

we to understand human agency, an attribute so central to image-bearing creatures, in a meaningful way in this framework?

Also important for the theist is the question of personal identity and its continuity, another critical aspect of image-bearers. How can a sense of self that emerges from the physical carry on beyond the demise of the body? Hasker, in his account of dualism, is helpful here, suggesting that God could maintain the emergent soul after death and that it would even retain its memory. In his words, “One might suppose that, were God to choose to maintain an emergent self in existence, he would be sufficiently astute to make sure that it was the same self he was maintaining, rather than a series of distinct individuals.”⁴⁹

John Paul II’s sacramental anthropology of embodied spirits provides a compelling alternative to these approaches, particularly for the Christian theist. For one, his view of the ontological, or essential, continuity and unity of the human person provides a bridge for the causal gap that affects other forms of dualism. For a being that is ontologically continuous, the agency of the soul is intimately connected to the action of the body. The invisible will and the visible body are unified as human elements. In turn, our ontological continuity is a critical aspect of our access to the unseen. It is our phenomenal consciousness and its relationship to the body that provide a mechanism for making visible the invisible and for making accessible the divine. This anthropology lies at the heart of sacramental thinking.

Second, the ontological and temporal continuity of the body and soul describes well our experience of brokenness in ways that other accounts do not. This continuity across the boundary of the Fall explains how these two aspects of ourselves are in tension in ways contrary to our design. At the centre of human brokenness lies now a stress, a groaning between one’s agency and one’s action. “For I do not understand my own actions. For I do not do what I want, but I do the very thing I hate.”⁵⁰ Paul describes a “war” raging between his “members” and his mind, his “inner being.”

49 Hasker, *The Emergent Self*, 233–234.

50 Romans 7:15.

Third, these ontological and temporal continuities point to a teleological continuity which provides one with a powerful account of human history. John Paul II's analysis of Jesus' dialogue with the Sadducees who denied the resurrection is insightful here. Therein, drawing on Paul's language of spiritual bodies in 1 Corinthians 15, John Paul considers our spiritualisation, the healing of the aforementioned tension between the body and the mind at the eschaton.

“Eschatological” man will be free from this “opposition.” In the resurrection, the body will return to perfect unity and harmony with the spirit: man will no longer experience the opposition between what is spiritual and what is bodily in him. Spiritualisation signifies not only that the spirit will master the body, but ... that it will also fully permeate the body.⁵¹

Resurrection is the end, the *telos* towards which history moves us.

Furthermore, essential unity and continuity in the resurrection explain why I remain a unique individual across the boundaries of Fall, Death, and Redemption. For John Paul, as it is for Hasker, miraculous divine action is still required for the soul's maintenance after death and it does not require the kind of asymmetrical dependence of the soul on the body.⁵² Therefore, we see in John Paul II's anthropology of ontological, temporal. and teleological unity and continuity, a kind of three-dimensional response to reductionism and substance dualism.

Can Consciousness Be Engineered?

Two things emerge in this anthropological account. First, consciousness is not reducible to physical processes. A purely materialist explanation of phenomenal consciousness is inadequate; a kind of dualism is needed. Second, to separate our conscious selves from our physical

51 John Paul II, *Man and Woman*, 391.

52 It ought to be said that, in most Christian accounts of being, the continued existence of all creatures at all times requires the divine maintenance of the *Logos*, “in whom all things hold together” (Colossians 1:17).

bodies is to do meaningful harm to the way God ordered the cosmos. In particular, our physical bodies in the visible world enable us to perceive the invisible world, thereby we perceive God's eternal power and divine nature. Baptism and the eucharist point us to the meaning of Christ's death and resurrection. A great number of invisible realities are accessible to us in the visible world through our bodies.

We now want to pivot to thinking about artificial systems. With respect to our first suggestion above, can we envision engineering computer-based systems with something like phenomenal consciousness? A related query is whether our own consciousness is the result of a simulation produced by a being of superior intelligence to our own. Might our subjectivity be the artefact of such a simulation? Furthermore, how does our being in a body relate to the hardware of an artificial system?

We first address whether consciousness could arise in an inorganic computational system. At first glance, our conclusion about the irreducibility of consciousness to the physical seems not to permit consciousness arising from a silicon-based system. Let us consider the import of the irreducibility conclusion more carefully. If we find Chalmers' argument compelling, then it has been shown that consciousness does not logically supervene on the physical; that phenomenal consciousness is not among the features that are reducible to the laws of physics. Descartes argued that the subject was a substance different from the body. Chalmers, in turn, offers the proposal that consciousness is a property. Now, while this property is not reducible to other physical properties as currently understood, such as mass or charge, he suggests that it "arises" from the physical body as a kind of artefact. He describes this property dualism as follows: "Conscious experience involves properties of an individual that are not entailed by the physical properties of that individual, although they may depend lawfully on those properties."⁵³

53 Chalmers, *The Conscious Mind*, 125. Furthermore, Chalmers argues against epiphenomenalism (*The Conscious Mind*, 150–160).

Put another way, consciousness is a property, not a substance, that arises from our physical bodies but is not reducible to our bodies. “It is a feature of the world over and above the physical features of the world.”⁵⁴ The being of these phenomenal properties are “ontologically independent of physical properties.”⁵⁵ We should note here that, unlike Chalmers, the Christian tradition is happy to accept the existence of “substances” over and above the physical, with no ontological dependence on the physical whatsoever. We say that God exists *a se*, that is, in and of himself.⁵⁶ Nevertheless, with respect to our first suggestion that we need something over and above the physical to account for consciousness, Chalmers offers that property dualism opens the possibility for consciousness arising from the physical. At the same time, he does not say it necessitates it. In the end, he leaves the matter open. Later, we will consider some of the implications of property dualism as it relates to artificial intelligence.

An important and well-known case in opposition to strong artificial intelligence has been put forward by University of California at Berkeley philosopher John Searle, known as the Chinese Room Argument.⁵⁷ Imagine a monolingual English speaker sitting in a closed room. In this room is a large basket full of Chinese characters. In addition, the room contains a complicated formula for exchanging certain Chinese symbols for others. The formula is written in English. We may imagine that this formula may be quite complicated, providing rules for exchanging even long sequences of Chinese characters for other sequences of Chinese characters. The formula only gives rules for the exchanging of symbols, nothing else. From outside of the room, the person inside is fed sequences of such Chinese characters. According to the formula, she exchanges certain symbols in the sequence for others and then sends the new sequence of characters back out of the

54 Chalmers, *The Conscious Mind*, 125.

55 Chalmers, *The Conscious Mind*, 125.

56 Exodus 3:14; John 1:4.

57 John Searle, “Minds, Brains, and Programs,” *The Behavioral and Brain Sciences* 3 (1980): 417–457. For Chalmers’ response to Searle’s argument, see Chalmers, *The Conscious Mind*, 322–328.

room. Suppose further, unbeknownst to the person in the room, that we call the incoming sequence of characters “questions,” the outgoing sequences “answers,” the formula “the program,” and the person in the room “the CPU.” This is the essential makeup of a digital computer. We imagine that one could remain in this role of following the formula for decades, acquiring great skill in following the formula, perhaps even approaching the speed of a digital computer. Searle’s argument is that at no point is the person in the room demonstrating anything approximating an understanding of Chinese. She is simply manipulating symbols according to the rules. The exercise is one composed entirely of syntax (symbol manipulation) with no semantics (conscious understanding of the meaning of the symbols). This is all a digital computer is capable of, according to Searle. Conscious experience involves at least semantics and thus a digital computer is incapable of grasping the meaning of things in the world and therefore is unable to attain conscious experience.

Searle’s argument here is compelling. A digital computer is essentially just a manipulator of symbols following certain syntactical rules.⁵⁸ A conscious agent must have semantic understanding and, since digital computers cannot, they cannot attain consciousness. Even so, let us grant Chalmers the benefit of the doubt, so that we might indulge ourselves with the possibilities that are opened up by conscious machines.

First, however, we should not sidestep an important issue in this context: Our previous discussion of reducibility focused on biological systems, whereas now we are considering silicon-based hardware. If consciousness does arise from a biological substrate, as Chalmers suggests is possible, it seems reasonable to suppose that it could arise from an inorganic one. Wetware vs hardware does not seem to be the determining factor for the possible arising of the property of consciousness.

58 Recent advances in neural networks and transformer-based large language models are quickly pushing back against simple characterisations of what computers are and do.

That consciousness can arise independently of the substrate is also relevant with respect to our second suggestion: That in God's order of creation the body provides the soul with a means of perceiving physical things that reveal attributes of God which are not visible. If consciousness is substrate independent, then one might entertain the possibility that not only can consciousness as a property arise from inorganic material, but that material is also capable of perceiving physical things in the visible world. We see this in abundance already. There exist a plethora of cameras, microphones, proximity sensors, thermometers, and accelerometers—to name a few that afford machines those perceptions, if that is the right word to apply. On one level, perception of the visible world is one of the easy problems. If so, then, it seems that there are ethical implications associated with our treatment of these machines.⁵⁹ Given our assumptions, these are not trivial matters. Let us briefly consider their significance in a bit more detail.

As we have seen, there is a great deal of debate about the feasibility of digital consciousness. This debate began in earnest in the late 1960s, largely fell out of favour in 1980s and 90s, and has more recently been revived. This revival is partially due to the enormous advances in computational and networking power that have occurred in recent decades. Transistors are on the brink of being constructed so small that quantum effects will need to be taken into account in their engineering. Google engineer and futurist Ray Kurzweil, in his book *The Singularity Is Near*,⁶⁰ observes that technology advances at an exponential rate. Moore's Law, for example, which predicts that the number of transistors that could be placed on a circuit would double every twenty-four months, has mostly held consistently since the inventor of the integrated circuit Gordon Moore observed the trend in the mid

59 See Carrie S. Alexander, "Domains of Uncertainty: The Persistent Problem of Legal Accountability in Governance of Humans and Artificial Intelligence," *Christian Perspectives on Science and Technology*, NS, 3, special issue: Artificial and Spiritual Intelligence (2025): 182–215.

60 Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology* (New York, Penguin Books, 2006).

1970s.⁶¹ Exponential growth begins slowly, almost imperceptibly. Yet, at a certain point, that growth explodes with a rapidity far beyond that which had come before (the singularity). Kurzweil suggests that we will have machines able to simulate human intelligence by 2030.⁶² Once there, the exponential growth continues, quickly moving beyond human intelligence into spheres of understanding that we are unable to imagine.⁶³ In this model, we would be akin to chimpanzees trying to understand the engineering of the Large Hadron Collider. If these machines are able to self-replicate—a not unreasonable hypothesis given the underlying assumptions regarding their intelligence—we now have all the ingredients that make up the best (or worst) of science fiction’s fantasies.

Conclusion: The Multi-Dimensional Unity of the Human Person

Recall that John Paul II offered a sacramental picture of our being that is ontologically continuous, that unites objectively the fact of being in a body—the “what it is to be” human—with its subjective, conscious dimension—the “what it is like to be” human. But he also argued for a temporal, “essential continuity” between our being in its state of original innocence and its current sinful condition. This continuity was justified on the basis of Christ’s reference to “the beginning” in his

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- 61 Kurzweil, *The Singularity Is Near*, 111. Strictly speaking, Moore’s 1965 article predicted transistor doubling every year, which he revised to every two years in the mid 1970s. It has since held at that rate.
- 62 Before immediately dismissing this prediction, consider that about 86% of Kurzweil’s predictions about technology since 1980 have been very much on the mark, depending on how one measures the accuracy. On another note, observe that Kurzweil is using the word “intelligence” in a way that differs from our use of the word “consciousness.” Kurzweil’s intelligence is closer to the notion of computational ability.
- 63 It is important to point out in this context that Kurzweil often uses a very particular definition of human “intelligence.” It may be better said that these artificial agents are simulating human intelligence and behaviour to a high degree. The very heart of Searle’s Chinese Room argument is that these agents are incapable of phenomenal experience and that they are merely performing a simulation.

discourse with the Pharisees in Matthew 19. It is important to add that this temporal continuity does not only apply to the boundary between a state of innocence and our current state of sin, but also, via the Proto-evangelium,⁶⁴ to a redeemed state. “To the words that [Christ] speaks with his own lips, we have the right to attribute at the same time the whole eloquence of the mystery of redemption.”⁶⁵ This is to say that Christ offers us a picture of human beings that have a kind of temporal and teleological continuity—as a unity of body and mind from prehistory, through the present, and forward into the eschaton.

So, the ontological unity—of people being temporally and teleologically continuous—is also the condition of our being in the resurrection. This account is also in accord with the Apostle Paul’s eschatological vision. Paul refers to Jesus’ resurrected body as a kind of firstfruits. In an agricultural context, the firstfruits of a harvest serve as an indication of the quality of the rest of the harvest that is to follow. In the same way, Jesus’ resurrected body is an indication of the nature of the resurrected bodies that will follow.⁶⁶ In terms of the importance of the resurrection of our bodies, it is noteworthy that Paul says that, without it, our “faith is futile.”⁶⁷

What is Christ’s prototypical resurrected body like? Well, first of all, it is a body. That is, we find that the resurrected Christ is not some sort of ghost. He presumably has the experience of hunger and asks for food.⁶⁸ He eats.⁶⁹ In the accounts of both John and Luke, he explicitly refers to his flesh and bones, and shows his hands and feet for these

64 Genesis 3:15.

65 John Paul II, *Man and Woman*, 143.

66 1 Corinthians 15:20–23. While illustrative, it is beyond the scope of this text to undertake a proper exegesis of the Apostle Paul’s distinction in 1 Corinthians 15 between the “spiritual” (*pneumatikos*) body that we receive in the eschaton and the “natural” (*psychikos*) body we have now. John Paul II suggests that it may be related to the future spiritual body being freed from opposition to the spirit; an opposition that the present body is subject to; while still remaining united to our spirit.

67 1 Corinthians 15:17.

68 Luke 24:41.

69 Luke 24:43; John 21:9–15.

bear the marks of his passion.⁷⁰ Second, it is a body that in some important ways is unlike those that we have now. He appears among the disciples in a room with locked doors.⁷¹ Perhaps his resurrected body is able to pass through walls or is not subject to the three-dimensional spatial limitations that we are bound to. That is, while still being a body, united with a consciousness having subjective experience, his body's relationship to the laws of physics as we currently understand them differs significantly from that of our current bodies.

Furthermore, there is some sort of continuity between his resurrected body and the body that endured the passion. Thomas is invited to "put out [his] hand and place it in [Jesus'] side."⁷² In the same vein, Augustine speculates that in the Kingdom even the wounds of the martyrs will be somehow transformed into something beautiful. "For this will not be a deformity, but a mark of honour, and will add lustre to their appearance, and a spiritual, if not a bodily beauty."⁷³ Thus, the resurrected body in some way retains the marks of the body from before the resurrection, an indication of continuity across a boundary. Presumably, the resurrected person also carries with it the conscious memory of the pre-resurrected body.

Even our present subjective experience of suffering points us to the ontological unity of our consciousness and our bodies in the future. In the context of our lost innocence and present condition, John Paul II points out that "our human experience is in some way a legitimate means for theological interpretation."⁷⁴ He cites Paul: "we ourselves, who have the firstfruits of the Spirit, *groan inwardly* as we wait eagerly for ... the redemption of our bodies."⁷⁵ Thus, the phenomenological experience of suffering now points to bodies to come, which will be imperishable. Our "groaning" further points to this kind of eschato-

70 Luke 24:39–40; John 20:20

71 John 20:19.

72 John 20:27.

73 Augustine, *The City of God* 22.19.

74 John Paul II, *Man and Woman*, 145.

75 Romans 8:23.

logical aspect.⁷⁶ Again, therefore, the unity of our conscious selves and our bodies holds within our ontology *and* holds temporally across the thresholds of our fall and redemption, providing it with teleological meaning.

We have already observed how this unified view of humanity differs from that of Descartes. It also bears distinction from some of what Chalmers puts forward. While Chalmers resists the understanding that reduces consciousness to our current understanding of physics—merely a serendipitous byproduct of the physics of our bodies—in his naturalistic dualism he leaves open the possibility of a new kind of fundamental property.⁷⁷ This “protophenomenal” property gives rise to phenomenal experience. But this naturalistic dualism fails to provide the kind of teleological appeal that we have outlined above. Furthermore, while not needing to appeal to God as an explanation, naturalistic dualism is not itself an explanation. It merely speculates the existence of a new, yet undiscovered fundamental property such as mass or charge.⁷⁸

In even more stark contrast to the unified view of humanity put forward in the Christian tradition I have outlined, we find Kurzweil and others⁷⁹ in the transhumanist community. As Kurzweil suggests,

when our human hardware crashes, the software of our lives—our personal “mind file”—dies with it. However, this will not continue

76 This is one of the more intriguing matters concerning the necessity of suffering in our own existence. Certainly, God thought it important that Job go through his trial. How many other biblical figures come to mind, whom God permitted to suffer for his own transcendent reasons? Hosea, Ezekiel, and Jesus come immediately to mind.

77 Chalmers, *The Conscious Mind*, 126.

78 Even Tononi’s Integrated Information Theory, while mathematical and in some sense scientific, is criticised for being untestable.

79 Valeria Graziani, “Transhumanism in the Age of ChatGPT: Five Thoughts from Transhumanist Zoltan Istvan,” *Singularity Group*, 22 February 2023, <https://www.linkedin.com/pulse/transhumanism-age-chatgpt-five-thoughts-from-futurist/> (accessed 15 November 2025). See also P. Sheehan (ed.), *Humanity 2.0? Christian Perspectives on Transhumanism*, ISCAST Discussion Papers, 17 October 2025, <https://iscast.org/transhumanism> (accessed 15 November 2025).

to be the case when we have the means to store and restore the ... information represented in the pattern that we call our brains ... At that point, the longevity of one's mind file will not depend on the continued viability of any particular hardware medium (for example, the survival of a biological body and brain).⁸⁰

At that point, Kurzweil argues, our minds can be uploaded into virtual bodies that inhabit either virtual worlds or are projected into the physical world.⁸¹ Kurzweil acknowledges the need for a body, but not the continuity, unity, and integrity of our present body with our consciousness. Rather, he predicts the increasing augmentation of our biology with the nonbiological to a predictable end. In a very different teleological vision from the one outlined above, he asks, "In the 2040s, when the nonbiological portion will be billions of times more capable, will we still link our consciousness to the biological portion of our intelligence?"⁸²

As the name "transhumanist" indicates, with its self-described optimism, whatever this immortal being is, it is *not* human. Any disunity of body and spirit constitutes something that is unnatural for the human person. John Paul II provides more help here in his analysis of Jesus' dialogue with the Sadducees about the resurrection.⁸³ To be a truly alive human is to be psychosomatic.⁸⁴ In his words,

In fact, the truth about the resurrection clearly affirms that man's eschatological perfection and happiness cannot be understood as the state of the soul alone, separated ... from the body, but must be understood as the definitively and perfectly integrated state of man brought about by such a union of the soul with the body, that it definitely qualifies and assures this perfect integrity.⁸⁵

80 Kurzweil, *The Singularity Is Near*, 325.

81 Kurzweil, *The Singularity Is Near*, 198, 312, 317.

82 Kurzweil, *The Singularity Is Near*, 377.

83 Cf. Matthew 22; Mark 12; Luke 20.

84 John Paul II, *Man and Woman*, 389.

85 John Paul II, *Man and Woman*, 390.

It is in this eschatological vision of the multidimensionally unified person that “we shall bear the image of the man of heaven.”⁸⁶

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Examining Photosynthesis Through the Lens of Natural Theology

Trevor D. Rapson

Abstract: This essay contributes to a transversal dialogue between science and theology. While considering natural processes, it interprets nature through the lens of God's self-revelation in Christ and Scripture. More precisely, focusing on photosynthesis, specifically Photosystem II, I argue that the system's fine-tuned properties, which enable oxygen production essential for multicellular life, resonate strongly with Christian theism. Moreover, Photosystem II's self-sacrificial function reflects a kenotic pattern embedded in creation, echoing the self-giving nature of the Triune God. While not seeking to prove the Trinity, or God's existence for that matter, this study shows how scientific insights can illuminate theological themes, deepening understanding and enriching the vocation of Christians engaged in science.

Keywords: *kenosis*; natural theology; Photosystem II; science-engaged theology; Trinity

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Alister McGrath has advocated an approach to natural theology whereby science is examined through a theological lens. His proposal anticipates what recently came to be called science-engaged theology.¹ This method does not seek to prove the existence of God from nature; rather, it employs Christian theology as an interpretative framework for observing the natural world as described by modern science.² This approach reads nature with an awareness of God's hiddenness, yet anticipates that creation may, to some extent "echo its origin and goal."³ Using this approach, I explore a key component of photosynthesis: Photosystem II (hereafter, PS II). This analysis considers how, when perceived through a theological lens, PS II appears to bear vestiges of the Triune God.

Photosynthesis, meaning "synthesis with light," is the biological process through which light energy is captured and converted into biochemical energy needed for life on Earth. This process provides all our food and most of our energy resources through fossil fuels.⁴ Importantly, photosynthesis also produces oxygen (O₂). Over geological eras, this process transformed Earth's atmosphere by increasing oxygen levels, enabling multicellular life to exist.⁵ This foundational role in sustaining life makes photosynthesis a compelling subject for theological reflection.

Scientific investigation into PS II over the last fifty years has revealed two striking features. First, PS II exhibits remarkable fine-tuning at a sub-nanometre scale: each atom is precisely positioned. Second, despite this exquisite design, PS II is irreversibly damaged

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- 1 See, for example, John Perry and Joanna Leidenhag, *Science-Engaged Theology*, Cambridge Elements: Elements of Christianity and Science (Cambridge: Cambridge University Press, 2023) and "What Is Science-Engaged Theology?" *Modern Theology* 37, no. 2 (2021): 245–253.
 - 2 Alister E. McGrath, *The Open Secret: A New Vision for Natural Theology* (Malden: Blackwell, 2008), 3.
 - 3 Alister McGrath, *A Fine-Tuned Universe: The Quest for God in Science and Theology*, Gifford Lectures 2009 (Louisville, KY: Westminster John Knox Press, 2009), 69.
 - 4 Robert E. Blankenship, *Molecular Mechanisms of Photosynthesis* (Oxford: Blackwell Science, 2002), 1.
 - 5 Blankenship, *Molecular Mechanisms*, 2.

in the very act of splitting water, requiring continual replacement. In other words, its life-sustaining function depends on its own destruction—a paradox that invites theological reflection on patterns of self-giving within creation.

This essay proceeds in four stages. First, it outlines the scientific understanding of photosynthesis and PS II. Second, it develops a theological argument that self-giving *kenosis* constitutes the life of the triune God and explores its implications for a doctrine of creation. Third, it applies this theological lens to interpret photosynthesis. Finally, it offers personal reflection on how the dialogue between science and theology enriches both perspectives.

Photosynthesis and Photosystem II

In the published version of his Gifford Lectures, McGrath briefly discusses the biochemistry of photosynthesis, outlining its overall process and its role in oxygen production.⁶ He argues that while the fine-tuning evident in biological catalysts, such as Photosystem II, can arise through the evolutionary process of natural selection, it is important to recognise that the functional properties of the catalysts are dependent on the predetermined properties of chemical elements, such as manganese, used within these biological systems.⁷ This paper examines PS II in more detail and pays particular attention to the damage that occurs to PS II through the water splitting process.

Oxygenic photosynthesis is an intricate process involving multiple enzymes, as summarised in Figure 1, whereby light energy is converted into chemicals such as starch and sugar. Photosystem II and Photosystem I work in tandem to carry out oxygenic photosynthesis.⁸ PS II initiates this process by catalysing the splitting of water molecules to provide electrons that drive the entire oxygenic photosynthetic process. Water splitting also produces molecular oxygen (O₂),

6 McGrath, *A Fine-Tuned Universe*, 158–159.

7 McGrath, *A Fine-Tuned Universe*, 164.

8 Blankenship, *Molecular Mechanisms*, 9–10.

and hydrogen ions (H^+). The latter contribute to generating adenosine triphosphate (ATP), the chemical energy that powers carbon fixation, converting carbon dioxide into sugars and starches, key building blocks for biological life.⁹

The importance of the second product of water splitting, O_2 , cannot be overstated. For most of Earth's history, the atmosphere contained virtually no O_2 , supporting only anaerobic bacteria. The emergence of cyanobacteria capable of oxygenic photosynthesis initiated a dramatic rise in atmospheric oxygen, enabling the evolution of multicellular organisms and the extraordinary biodiversity we observe today.¹⁰ This central role in sustaining and transforming life underscores why photosynthesis, and PS II in particular, offers fertile ground for examination through a theological lens.

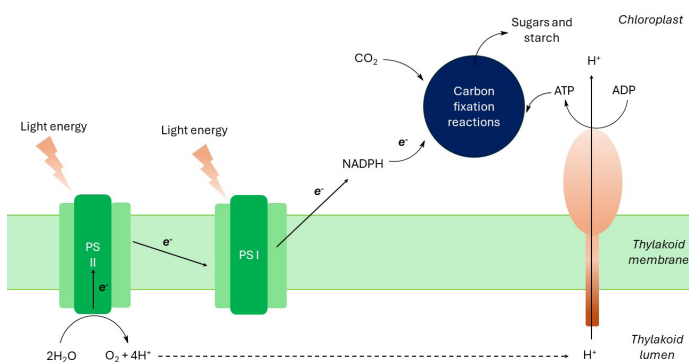


Figure 1: A summary of the processes involved in photosynthesis. Note the role of PS II in splitting water and providing electrons (e^-) to the downstream processes.

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- 9 Blankenship, *Molecular Mechanisms*, 6.
 10 Woodward W. Fischer *et al.*, "Evolution of Oxygenic Photosynthesis," *Annual Review of Earth and Planetary Sciences* 44 (2016): 647.

The Chemistry of PS II

Over the last forty years, advances in protein crystallography have given us remarkable insights into the complexity of PS II. This technique allows scientists to determine the exact atomic-level structure of a protein.¹¹ PS II has a highly intricate molecular architecture enabling it to absorb light energy and transfer it as electrons and protons (H⁺) to other components of the photosynthetic machinery. PS II is a large protein assembly that contains hundreds of pigments such as chlorophylls. These pigments are excited by light energy and transfer this energy to the reaction centre (see Figure 2a).

Within the reaction centre are two chlorophyll pigments that are positioned close enough to each other to share bonding orbitals and react as a single compound when excited (PD1 and PD2; see Figure 2b). Excitation of this special chlorophyll pair initiates charge separation, followed by the transfer of electrons down an electron transport chain.¹² Key to the whole system is that the flow of electrons occurs only in one direction. This unidirectional flow is essential for creating the conditions necessary for the challenging chemistry of splitting water, which takes place at the manganese cluster.

Following excitation in the reaction centre of PS II, there is very fast electron transfer from chlorophyll (Chl) to pheophytin (Pheo) within 3 picoseconds (3×10^{-12} seconds; see Figure 2b, Step 1). The second electron transfer is slightly slower, occurring in under 200 picoseconds (see Figure 2a, Step 2).¹³ These ultrafast steps prevent energy loss as heat and ensure efficient electron flow. Not only is this electron transfer very fast, it is also thermodynamically fine-tuned to ensure that the electrons flow in the correct direction and not in reverse. The combination of fast kinetics and favourable thermodynamics

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- 11 Wolfgang Lubitz *et al.*, “Water Oxidation in Photosystem II,” *Photosynthesis Research* 142 (2019): 105.
 - 12 Roberta Croce and Herbert van Amerongen, “Natural Strategies for Photosynthetic Light Harvesting,” *Nature Chemical Biology* 10 (2014): 492.
 - 13 Lubitz *et al.*, “Water Oxidation,” 109.

means that this electron transfer is “virtually irreversible and highly efficient.”¹⁴

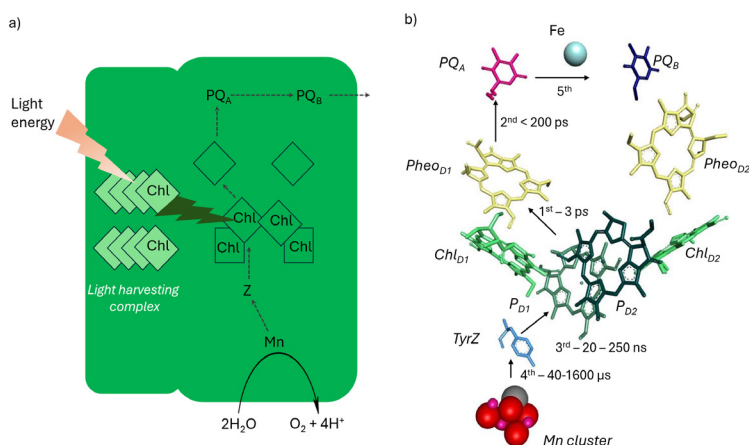


Figure 2 a) A simplified diagram of PS II. Broken arrows indicate the pathway of the electron transfer chain. b) Shows the atomic level detail of the reaction centre of PS II. An electron is released when excited by light energy. The order and timescale of the electron transfer steps is shown. Abbreviations: Chl = chlorophyll; Pheo = pheophytin; PQ = plastoquinone; TyrZ = tyrosine Z; Mn = manganese cluster; ps = picosecond; ns = nanosecond; μ s = microsecond.

Following charge separation, an electron hole in P680 is filled by an electron from a tyrosine residue (TyrZ). This process occurs a thousand times slower than the first two steps (20 to 250 nanoseconds). The slower third electron prevents reverse reactions, such as the reduction of O_2 back to water.¹⁵ The authors of *Lehninger Principles of Biochemistry* explain this remarkable example of fine-tuning, saying: “Nothing is left to chance collision or random diffusion.”¹⁶

14 David L. Nelson *et al.*, *Lehninger Principles of Biochemistry*, 5th edn (New York: W. H. Freeman & Company, 2008), 752.

15 Lubitz *et al.*, “Water Oxidation,” 109.

16 Nelson *et al.*, *Lehninger Principles of Biochemistry*, 752.

This precisely controlled sequence of electron transfer steps ultimately removes an electron from the manganese cluster, known as the Oxygen Evolving Complex (OEC) (see Figure 2b, Step 4) transforming it into an oxidising agent capable of splitting water. However, four electrons need to be removed from the cluster for water splitting to occur. These electrons are transferred one at a time to a nearby tyrosine residue (see Figure 2b, TyrZ), with each transfer requiring the sequential absorption of a photon.¹⁷ As two water molecules are oxidised, four electrons are provided into the photosynthetic pathway and one molecule of O₂ is produced.

While scientific techniques such as Electron Paramagnetic Resonance (EPR) spectroscopy and quantum chemical calculations have provided insights into how the OEC carries out water splitting, there are still many aspects that are not fully understood.¹⁸ Indeed, the more we uncover about PS II, the more its elegance and complexity invite reflection, not only on its biochemical sophistication but also on the deeper patterns it may reveal about the nature of creation.

Photodamage in PS II

In addition to an appreciation for the elegance and complexity of PS II, science has also discovered a “lingering enigma” in this system: it is irreversibly damaged during the very process of photosynthesis.¹⁹ Under normal light conditions, PS II has a functional lifetime of as little as 30 minutes.²⁰ This light-induced damage, termed photodamage, is a complex phenomenon that is not fully understood.²¹ The main function of PS II is splitting water to produce O₂. This unavoidably occurs

17 David L. Nelson *et al.*, *Lehninger Principles of Biochemistry*, 8th edn (New York: W. H. Freeman & Company, 2021), 714.

18 Lubitz *et al.*, “Water Oxidation,” 106.

19 Marvin Edelman and Autar K. Mattoo, “D1-Protein Dynamics in Photosystem II: The Lingering Enigma,” *Photosynthesis Research* 98 (October 2008): 609.

20 Lubitz *et al.*, “Water Oxidation,” 109.

21 Imre Vass, “Molecular Mechanisms of Photodamage in the Photosystem II Complex,” *Biochimica et Biophysica Acta—Bioenergetics* 1817 (January 2012): 209.

near photoexcited chlorophyll molecules. When O₂ interacts with these excited chlorophyll molecules it forms singlet oxygen, a highly reactive species that initiates damage to the protein structure and the chlorophyll pigments within it.²² In other words, PS II is destroyed by performing its essential function. To sustain photosynthesis, damaged components must continually be replaced, a process that consumes significant chemical energy in the form of ATP, the key product of photosynthesis (see Figure 1).²³

This energetic cost explains why deciduous trees suspend photosynthesis in winter, as the chemical energy that can be gained through photosynthesis is less than that required to replace PS II. When chlorophyll production stops and damaged PS II is not repaired, other pigments such as carotenoids (yellow and orange) and anthocyanins (red and purple) become visible, producing the vibrant colours of autumn. Hayley Bennett poetically observes that the plants “shed the green veils they have been hiding under, to take on an ensemble of red, yellow and orange.”²⁴ This paradox, that multicellular life is sustained through a process that entails continual self-destruction, offers a profound point of contact for theological reflection on the self-giving character of creation.

Moving from Scientific Observation to Theological Interpretation

Summarising what has been discussed thus far, photosynthesis and PS II have been intensively studied. PS II splits water to provide the source of electrons for photosynthesis. PS II is both remarkably tuned to carry out this difficult chemical reaction but also irreversibly photodamaged

22 Lubitz *et al.*, “Water Oxidation,” 109.

23 Nixon *et al.*, “Recent Advances in Understanding the Assembly and Repair of Photosystem II,” *Annals of Botany* 106 (2010): 12.

24 Hayley Bennett, “Trees Show Their True Colours in Autumn,” Royal Society of Chemistry, 12 October 2023, <https://edu.rsc.org/everyday-chemistry/the-chemistry-behind-leaves-changing-colour-and-falling-from-trees/4018155>. article (accessed 10 December 2025).

through this process. As a result, PS II has a short lifetime under operating conditions and needs to be continually repaired.²⁵

At this point, we must pause to consider the limits of what we can gain from the scientific study of photosynthesis and PS II. While scientific study can provide us with precise and useful data and information about how a process works, it is unable to answer deeper or metaphysical questions.²⁶ Addressing these questions belongs to the realms of philosophy and theology. It is for this purpose that I seek to examine the scientific findings about PS II through a theological lens. The goal of this approach is to find out the extent to which scientific discoveries can inform theology—after the fashion of science-engaged theology—and to test whether trinitarian theology can provide “an extended context within which to accommodate certain striking features of our current understanding” of creation as viewed by science.²⁷

Defining the Theological Lens

As discussed above, rather than seeking to prove the existence of God from nature, McGrath’s approach uses what we know of God through revelation in Scripture as a lens to view nature and scientific discoveries.²⁸ Following McGrath’s approach, I will be examining PS II as part of the creation by a triune God, paying particular attention to the concept of “vestiges of the Trinity.”²⁹ With this in mind, we next need to define the theological lens to be used in order to argue that aspects of creation mirror relationships within the Trinity.

25 Lubitz *et al.*, “Water Oxidation,” 109.

26 “Text 4: Karl Barth, *Church Dogmatics*,” in *T&T Clark Reader in Theological Anthropology*, ed. M. A. Cortez and M. P. Jensen (New York: Bloomsbury T&T Clark, 2017), 37–38.

27 John Polkinghorne, *Science and the Trinity: The Christian Encounter with Reality* (London: SPCK, 2004), 62.

28 Alister E. McGrath, *A Scientific Theology*, vol. 1 (Edinburgh: T&T Clark, 2001), 294.

29 Nicola Hoggard-Creegan, “Vestiges of Trinity,” in *Trinitarian Theology after Barth*, ed. Myk Habets and Phillip Tolliday (Cambridge: The Lutterworth Press, 2011), 201.

Trinitarian Kenosis

Christian tradition affirms one God in three persons (Father, Son, and Spirit) who share an undivided essence (see 1 Corinthians 8:6). Each person of the Trinity possesses the fullness of the divine essence yet is distinguished by relational identity³⁰—or uniqueness in terms of relating with the other two persons. The term *perichoresis*, first used by Gregory of Nyssa,³¹ describes this dynamic relationship. *Perichoresis* literally means rotation and suggests the image of a “divine dance.”³² Although the term *perichoresis* is not used in the Bible, there are many descriptions of the dynamic relationship between the Father, Son, and Holy Spirit, such as mutual praise and thanksgiving,³³ intimate knowing,³⁴ mutual indwelling,³⁵ mutual love expressed through both speech³⁶ and actions.³⁷ In seeking to capture the “dance-steps” of *perichoresis*, Jacqueline Service has proposed the concept of *kenotic-enrichment*.³⁸

The concept of *kenosis*, meaning “to be emptied,” derives from Philippians 2:7, which describes Christ as “emptying himself” (*heauton ekenosen*). In post-Reformation theology, *kenosis* became central to Christological debates, particularly in the 19th century. In response to historical-critical challenges to the divinity of Christ, Protestant theologians proposed that Jesus voluntarily suspended certain divine attributes during the incarnation.³⁹ This “kenotic Christology” sought

30 John Webster, “Trinity and Creation,” *International Journal of Systematic Theology* 12, no. 1 (2010): 9, <https://doi.org/10.1111/j.1468-2400.2009.00489.x>.

31 Daniel F. Stramara, Jr, “Gregory of Nyssa’s Terminology for Trinitarian Perichoresis,” *Vigiliae Christianae* 52, no. 3 (1998): 257.

32 Paul S. Fiddes, *Participating in God: A Pastoral Doctrine of the Trinity* (Westminster: John Knox Press, 2001).

33 Matthew 11:25; John 11:41.

34 Romans 8:26–27; Matthew 11:27; John 10:15.

35 John 14:10–11.

36 Mark 1:11; Matthew 17:5.

37 Isaiah 11:2; Acts 10:38.

38 Jacqueline Service, *Triune Well-Being: The Kenotic-Enrichment of the Eternal Trinity* (Lanham, MD: Lexington Books), 141.

39 Christoph Schwöbel, “The Generosity of the Triune God and the Humility of the

to reconcile the humanity of Jesus with scriptural and traditional assertions of divinity.⁴⁰ While these discussions were often framed in terms of limitation or self-renunciation, they laid the groundwork for a deeper theological exploration of divine self-giving.

In the 20th century, theologians such as Karl Barth, Wolfhart Pannenberg, Hans Urs von Balthasar, and Jürgen Moltmann reframed *kenosis* as being intrinsic to the eternal life of God, rather than a temporary act in the incarnation. Scripture offers glimpses of this self-giving dynamic: the Son handing the kingdom back to the Father (1 Corinthians 15:24), the Son “gifting” his life in unwavering trust (Luke 23:46), and the gifted sustenance of the Spirit in the resurrection (Romans 8:11). The prayers of Jesus in John 17 reveal mutual gifting of glory within the Trinity.⁴¹

Perceptively, David Bentley Hart highlights the relational interactions described at the baptism of Jesus as revealing “God whose life of reciprocal giving away and containing is also a kind of dancing and the God who is delighting in the dance.”⁴² Von Balthasar contends that mutual self-giving constitutes the life of the triune God.⁴³

Against this backdrop, Moltmann explains that Christ’s *kenosis* in Philippians 2:7 is not a denial or self-renunciation of divinity but is in fact the revelation of it.⁴⁴ Service expresses a similar perspective, pointing out that “the inherent nature of *kenosis*, vividly expressed in Christ, originates in the being of the triune God.”⁴⁵ She argues that the

Son,” in *Kenosis: The Self-Emptying of Christ in Scripture and Theology*, ed. Paul T. Nimmo and Keith L. Johnson (Grand Rapids, MI: Eerdmans, 2022), 298.

40 Schwöbel, “The Generosity of the Triune God,” 299.

41 Service, *Triune Well-Being*, xiv.

42 David Bentley Hart, *The Beauty of the Infinite: The Aesthetics of Christian Truth* (Grand Rapids, MI: Eerdmans, 2004), 175.

43 Hans Urs von Balthasar, *The von Balthasar Reader*, ed. Medard Kehl and Werner Loser, trans by Robert Daly and Fred Lawrence (New York: Crossroad Publishing Company, 1997), 428–429.

44 Jürgen Moltmann, “God’s Kenosis in the Creation and Consummation of the World,” in *The Work of Love: Creation as Kenosis*, ed. John C. Polkinghorne (Grand Rapids, MI: Eerdmans, 2001), 140.

45 Service, *Triune Well-Being*, xviii.

glory of the Trinity is both demonstrated and achieved through divine self-giving (John 13:31). Importantly, Service shows that divine *kenosis* is not depleting but is enriching.⁴⁶

Kenosis and Creation: A Spectrum of Views

Creation can be viewed as an act of *kenosis* by the triune God. Interpreting creation as a kenotic act of God is central to the approach that I take in this essay. However, scholars differ on how far divine *kenosis* extends in creation. Process theologians such as Ian Barbour argue that *kenosis* in creation involves voluntary self-limitation of God's power, which results in granting creation genuine freedom and exonerating God of responsibility for evil and suffering.⁴⁷ John Polkinghorne, in turn, conceives *kenosis* as the "risk" God takes by submitting to "the free process of creation." He goes so far as to say that "the Creator's kenotic love includes allowing divine special providence to act as a cause among causes."⁴⁸ Moltmann goes further, describing creation as an act of divine contraction: God withdraws to make room for creation.

Each interpretation carries significant metaphysical and moral implications.⁴⁹ For example Barbour's position of divine self-limitation reduces God's omnipotence and omniscience while Moltmann's view of *kenosis* leads to God and creation becoming mutually dependent.⁵⁰ The traditional doctrine of creation as espoused, for example, by the Nicene Creed, does not make God dependent on creation and main-

46 Service, *Triune Well-Being*, 143.

47 Ian G. Barbour, "God's Power: A Process View," in *The Work of Love: Creation as Kenosis*, ed. J. C. Polkinghorne (Grand Rapids, MI: Eerdmans, 2001), 5.

48 J. C. Polkinghorne, "Kenotic Creation and Divine Action," in *The Work of Love: Creation as Kenosis*, ed. J. C. Polkinghorne (Grand Rapids, MI: Eerdmans, 2001), 104.

49 Sarah Coakley, "Kenosis: Theological Meanings and Gender Connotations," in *The Work of Love: Creation as Kenosis*, ed. J C Polkinghorne (Grand Rapids, MI: Eerdmans, 2001), 200–202. Outlines overlap and differ in leading scholars' descriptions of a "kenotic account of the creator's relation to the creation."

50 Paul D. Molnar, "The Function of the Trinity in Moltmann's Ecological Doctrine of Creation," *Theological Studies* 51 (1990): 687.

tains ontological distinction between God and creation.⁵¹ Webster explains how God is complete and independent of creation saying “no perfection of God would be lost, no triune bliss compromised were the world not to exist, no enhancement of God is achieved by the world’s existence.”⁵² This essay views creation as a kenotic action of the triune God but seeks to avoid making God dependent on creation or conflating creation and the Creator.

Vestiges of the Trinity in Creation

Theologians such as Augustine, Bonaventure, and Jonathan Edwards examined the natural world expecting it to bear signs of God, in particular signs of the trinitarian relations envisioned in Scripture.⁵³ Importantly, these traces, imprints, signs, or vestiges do not prove the Trinity; rather, they are “profoundly consonant with a theology of nature that sees the relation of perichoretic exchange between the divine Persons as lying at the heart of the Source of all created reality.”⁵⁴ If *kenosis* amounts to perichoretic “dance-steps” within the Trinity, then creation itself may bear traces of this self-giving pattern. Moving forward, I will look for such vestiges or patterns within PS II.

Examining Photosynthesis through a Theological Lens

Provision

Through photosynthesis, light energy is used to fix carbon dioxide producing food, the chemicals that make up wood and other plant materials, providing shelter for animals and fuel for warmth. Fossilised plant material remains a major energy source today, all ultimately derived from photosynthetic organisms’ ability to transform gaseous

51 Daniel L. Migliore, “The Good Creation,” in *Faith Seeking Understanding*, 4th edn (Grand Rapids, MI: Eerdmans, 2023), 15.

52 Webster, “Trinity and Creation,” 12.

53 Hoggard-Creegan, “Vestiges of Trinity,” 204.

54 Polkinghorne, *Science and the Trinity*, 75.

carbon dioxide into other carbon-based chemicals. Photosynthesis also gives us oxygen. Without cyanobacteria, Earth's atmosphere would have remained anoxic, supporting only anaerobic bacteria. The rise of oxygen enabled the emergence of complex life and the extraordinary biodiversity we see today. Photosynthesis by plants and algae continue to make the oxygen we breathe today. When viewed through a theological lens, photosynthesis appears as the means by which God provides for creation, including the oxygen within the biosphere of Earth.

Fine-Tuning and Purpose

PS II, the enzyme that initiates photosynthesis, is astonishingly fine-tuned. Protein crystallography and spectroscopy reveal atomic-level precision far beyond the reach of any microscope. This observation is valid for many other enzymes within biology. When PS II is considered theologically, as a creation of the triune God, such fine-tuning, intricacy, and complexity are neither surprising nor unexpected. God creates with purpose, not on a whim; therefore, we should expect to find highly and precisely tuned systems within creation.⁵⁵ This level of fine-tuning or order is “rooted in and consistent with the life of the triune God.”⁵⁶ Hart explains that “creation is not the overflow of some ungovernable perturbation of the divine substance, or a tenebrous collusion of ideal form and chaotic matter, but purely an expression of the superabundant joy and agape of the Trinity.”⁵⁷

It is important to recognise that other interpretative lenses could be used to examine PS II, leading to different conclusions.⁵⁸ One commonly used lens is evolutionary naturalism, which seeks to explain fine-tuning without invoking a divine origin. McGrath notes that although fine-tuning can result from the evolutionary process,

55 Migliore, “The Good Creation,” 11.

56 Migliore, “The Good Creation,” 14.

57 David Bentley Hart, *The Beauty of the Infinite: The Aesthetics of Christian Truth* (Grand Rapids: William B. Eerdmans, 2004), 254.

58 Hoggard-Creegan, “Vestiges of Trinity,” 205.

evolution's ability to fine-tune itself depends on predetermined properties of chemical elements within their catalytical states. It is the quantum mechanical properties of metals that have enabled evolution to develop solutions such as photosynthesis and enzymes such as PS II.⁵⁹ Critically, the existence of fine-tuning noted within PS II does not prove the existence of a deity. However, when contemplated through a theological lens, fine-tuning is deeply resonant with PS II being part of creation by a triune God who operates at the heart of all created reality.⁶⁰

Kenotic Patterning

Alongside the intricate fine-tuning of PS II lies a paradox: PS II is irreversibly damaged in performing its essential function. Polkinghorne argues that trinitarian theology provides “an extended context within which to accommodate certain striking features of our current understanding” of creation viewed by science.⁶¹ I therefore propose that viewing PS II as part of creation by a triune God occasions a deeper theological insight into photodamage. Thus, viewed through a trinitarian lens, PS II is not only life-giving but self-giving; it sustains life through its own destruction. This pattern resonates with the kenotic life of the Trinity, where self-giving is pivotal for perichoretic life. The photodamage of PS II can thus be theologically interpreted as a mark of the nature of the triune Creator within creation or a vestige of the Trinity. This interpretation stands in contrast with evolutionary naturalism, where photodamage is seen as a limitation “for which nature has not found a perfect solution to circumvent.”⁶²

While the focus of this essay is on kenotic patterning within PS II, similar patterns have been identified elsewhere in biology. A good example is the continuous recycling of nutrients through the carbon and nitrogen cycles. Kenotic patterns extend beyond biology to astro-

59 McGrath, *A Fine-Tuned Universe*, 164.

60 Hoggard-Creegan, “Vestiges of Trinity,” 204.

61 Polkinghorne, *Science and the Trinity*, 62.

62 Lubitz *et al.*, “Water Oxidation,” 109.

physics, for example, where a star must “die” to provide the elements for new stars.⁶³ Poignantly, Rolston notes kenotic patterns within predation, saying

Since the beginning, the myriad creatures have been giving up their lives as a ransom for many ... The secret of life is seen now to lie not so much in the heredity molecules, not so much in natural selection and the survival of the fittest ... The secret of life is that it is a passion play.⁶⁴

Such widespread kenotic patterning within creation should be expected precisely because it emanates from the Triune God and bears trinitarian marks. The photodamage observed in PS II exemplifies such a pattern, not as evidence of pantheism, but as a sign of the relational link between the Triune God and creation. As Jacqueline Service notes:

The pattern of God’s being is, not surprisingly, the deep patterning for human life and the created order—entered into and actualized with increasing glory by worship that recognizes and orientates to the divine ways.⁶⁵

How Science and Theology Can Enrich Each Other

This essay began with a desire to contribute meaningfully to the dialogue between science and theology, aiming to enrich both disciplines. It is the result of a longterm effort to integrate my work as a scientist, in the area of biological chemistry, and my Christian faith. As I conclude, I reflect on how this journey has deepened my understanding of both creation and Creator.

63 Nancey C. Murphy and George F. R. Ellis, *On the Moral Nature of the Universe: Theology, Cosmology, and Ethics* (Minneapolis, MN: Fortress Press, 1996), 213.

64 Holmes Rolston, *Genes, Genesis, and God: Values and Their Origins in Natural and Human History* (Cambridge: Cambridge University Press, 1999), 307.

65 Service, *Triune Well-Being*, 25.

Robert Boyle, often regarded as the father of modern chemistry, eloquently stated:

The book of nature is a fine and large piece of tapestry rolled up, which we are not able to see all at once, but must be content to wait for the discovery of its beauty, and symmetry, little by little, as it gradually comes to be more and more unfolded, or displayed.⁶⁶

Boyle saw himself as a priest of nature, believing that his scientific pursuits were not hindered by faith but inspired by it. He viewed science as a form of worship serving “the chiefest temple of God.”⁶⁷ This perspective resonates deeply with me. It encourages a posture of reverence and curiosity, one that seeks not merely to publish or secure funding, but to uncover the intricacies of creation. This frame of mind I advocate makes me a far better scientist.

Studying PS II through a theological lens has prompted moments of awe and reflection. These moments invite not only scientific admiration but theological contemplation. It is in these moments that I pause, marvel, and worship. As theologian David Bentley Hart suggests, the feelings of awe and wonder when encountering beauty—whether in the grandeur of autumn leaves or the submicroscopic elegance of PS II—are ultimately an experience of love, leading us back to the “inexhaustible wellspring of love.”⁶⁸

This integrative process has also challenged and refined my theological understanding. In exploring the kenotic patterning within PS II, I initially saw these as divine fingerprints, traces of the Creator on the

66 Robert Boyle, *The Christian Virtuoso* (1692–1744), in *The Works of Robert Boyle*, ed. M. Hunter and E. B. Davis, 14 vols. (New York: Routledge, 2016), 530.

67 Harold Fisch, “The Scientist as Priest: A Note on Robert Boyle’s Natural Theology,” *Isis* 44, no. 3 (1953): 252–265, esp. 254 (citing Boyle, *Of the Usefulness of Natural Philosophy*, Part I), <https://doi.org/10.1086/348227>.

68 David Bentley Hart, “Beauty, Being, Kenosis,” in *Theological Territories: A David Bentley Hart Digest* (Notre Dame, IN: University of Notre Dame Press, 2020), 255.

clay of creation. However, revisiting the doctrine of creation reminded me that such metaphors risk reducing God to a mere craftsman.⁶⁹

An alternative metaphor to explain the origin of these vestiges was proposed by Sergii Bulgakov, who posits that, given that apart from God there is nothing, God created “out of his essence.”⁷⁰ He employs a botanical metaphor, describing the process as “implanting divine seeds.” While on face value this may appear to lead to pantheism or panentheism, Bulgakov carefully maintains an ontological distinction between God and creation. He describes the divine seeds as “initial, incomplete and nondefinite,” explaining that the “seed is only a seed, not the plant.”⁷¹ Crucially, he emphasises that “the boundary between the Creator and creation must be preserved unconditionally, but the existence of this boundary does not abolish the relation or link between God and the world.”⁷² This metaphor however still risks conflating God with creation.

I propose maybe a better metaphor is to think of these vestiges as expressions of what I call divine DNA, not the whole of God, but informational patterns that actively shape and sustain creation. In modern molecular biology we move genes around amongst different organisms; this does not change the ontology of the organism. More importantly, DNA remains active, dynamic, and formative in contrast to a seed that disappears as the plant grows. To me, this metaphor better captures the ongoing relationship between Creator and creation: the created world is distinct yet intimately connected, wholly dependent on God.

This journey has also illuminated the tension between God’s transcendence and immanence. Western theology often emphasises the transcendence of God as wholly other, sovereign, and beyond. Yet this emphasis can obscure the biblical witness to God’s nearness: “in whom we live and move and have our being” (Acts 17:28). Through this

69 David Bentley Hart, *The Experience of God: Being, Consciousness, Bliss* (New Haven: Yale University Press, 2013), 35.

70 Sergii Bulgakov, *The Lamb of God*, trans. Boris Jakim (Grand Rapids, MI: Eerdmans, 2008), 126.

71 Bulgakov, *The Lamb of God*, 127.

72 Bulgakov, *The Lamb of God*, 121.

study, I've been challenged to hold both truths together. The God who created PS II is not distant but present—active in sustaining life, revealing beauty, and inviting us into deeper communion.

In the end, the scientific investigation of PS II has not only expanded my understanding of photosynthesis, but has also drawn me into richer theological reflection. It has reminded me that creation is not God, but it is God's, saturated with divine presence, purpose, and love. And in studying it, I find myself drawn closer to the One who made it.

Conclusions

The process of examining Photosystem II (PS II) through a theological lens invites us to pause and marvel at the extraordinary complexity and fine-tuning embedded within this molecular system. PS II is not merely a chemical mechanism, it is a window into the deeper mystery of creation, revealing patterns of order, beauty, and purpose that resonate with theological themes.

This exploration has led us into the heart of trinitarian theology, where the kenotic love shared within the Trinity overflows into creation itself. The self-giving nature of God, expressed in the relational dynamics of Father, Son, and Spirit, finds echoes in the sacrificial and sustaining patterns observed in PS II. Such reflections deepen our understanding of divine immanence: God is not only the transcendent Creator but also intimately present in the processes that sustain life.

Perhaps the best way to conclude this essay is to reflect on the words of a 12th-century monk, Bonaventure, who wrote with a feeling of awe at nature:

The creation of the world is a kind of a book in which the Trinity shines forth, is represented and found as the fabricator of the universe ... Hence, as if by certain steplike levels, the human

intellect is born to ascend by gradation to the supreme principle,
which is God.⁷³

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73 Bonaventure, *Breviloquium*, *Works of St. Bonaventure* trans. Dominic Monti (New York: Franciscan Institute Publications, 2005), 96.

Contemporary Orthodox Views of Information Technology and Artificial Intelligence in Online Resources

Efthymios Nicolaidis and Doru Costache

Abstract: The article explores online resources for the purpose of identifying Orthodox Christian attitudes to information technology (IT) and artificial intelligence (AI) before 2024. It fills a gap in the literature, as a synopsis of these attitudes is so far unavailable. Online resources have been chosen given their wide availability and impact. After surveying independent views—of which some, of the “apocalyptic” sort, cause confusion and panic, while others are moderate and even well-informed—the article engages official and hierarchical stances on science and technology in general and on IT and AI in particular. It then considers reports on relevant conferences and workshops, as a worthwhile resource for the orientation of both official and grassroots views. The article, finally, summarises the mainstream Orthodox view of official stances and specialised conferences, which are characterised by balance and discernment, and briefly discusses the future of the Orthodox Church in the digital age.

Keywords: artificial intelligence; ethical concerns; information technology; Orthodox Christianity; pastoral concerns

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Orthodox Christians' contradictory responses to recent developments in information technology (IT) and artificial intelligence (AI) require study. A synopsis of their relevant attitudes and of the factors that condition them is not yet available, but specialised studies of IT and AI from an ethical and theological perspective are at hand.¹ Hence our interest in this topic. This study focuses only on Eastern Orthodox attitudes recorded before 2024, leaving out the views of Oriental Orthodox Christians and developments after 2023.

We tackle recent Orthodox responses to AI and technology more generally, but there are limitations to our study. First, we do not discuss monographs and research papers. Instead, our study focuses on internet materials, from official ecclesiastical documents to reports on conferences, seminars, and workshops to independent digital contributions. This choice of sources is motivated by our interest in determining what kind of information is available for average

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- 1 Here are the most recent publications: Marius Dorobantu, "Imago Dei in the Age of Artificial Intelligence: Challenges and Opportunities for a Science-Engaged Theology," *Christian Perspectives on Science and Technology*, NS, 1 (2022): 175–96, <https://doi.org/10.58913/KWUU3009>; Marius Dorobantu, "Artificial Intelligence as a testing Ground for Key Theological Questions," *Zygon* 57, no. 4 (2022): 984–99, <https://doi.org/10.1111/zygo.12831>; Marius Dorobantu, "Cognitive Vulnerability, Artificial Intelligence, and the Image of God in Humans," *Journal of Disability & Religion* 25, no. 1 (2021): 27–40, DOI: 10.1080/23312521.2020.1867025; Marius Dorobantu, "Human-Level, but Non-Humanlike: Artificial Intelligence and a Multi-Level Relational Interpretation of the Imago Dei," *Philosophy, Theology and the Sciences* 8, no. 1 (2021): 81–107, DOI: 10.1628/ptsc-2021-0006; Marius Dorobantu and Yorick Wilks, "Moral Orthoses: A New Approach to Human and Machine Ethics," *Zygon* 54, no. 4 (2019): 1004–1021, <https://doi.org/10.1111/zygo.12560>; Aristarchos Grekas, *Τεχνητή νοημοσύνη και Ανθρώπος: Ορθόδοξη θεολογική προσέγγιση* (Artificial Intelligence and the Human Being: An Orthodox Theological Approach; Athens: Apostoliki Diakonia, 2022); Aleksandar Petrović, "Middle Ages and Artificial Intelligence," in *Orthodoxy and Artificial Intelligence: Dictionary of Technology and a Double Logos: A Contribution to the Dialogue of Science and Religion*, ed. Aleksandar Petrović and Aleksandra Stevanović (Athens: Institute of Historical Research, National Hellenic Research Foundation, 2019), 37–60; Sandy Sakorrafou, "Greek Orthodox Perceptions of Communication Technology: Past and Present," *Christian Perspectives on Science and Technology*, NS, 3 (2024): 27–60, <https://doi.org/10.58913/IXKG8073>; Stavros Yangazoglou, "Θεολογία και Τεχνητή Νοημοσύνη" (Theology and Artificial Intelligence), *Theologia* 91, vol. 3 (2020): 95–124.

Orthodox believers (by which we understand people not engaged in a formal study of the Orthodox tradition, e.g., theological studies), which, we hope, will clarify the causes of their reactions to technology. Second, we address only tangentially the broader context of their attitudes to IT and AI, namely, the way they perceive faith and science or spirituality and technology within the context of misunderstandings about the meaning of tradition in the contemporary world. The study of this broader context is well underway,² with the recently concluded project

- 2 See, for example, David Bradshaw and Richard Swinburne (eds), *Natural Theology in the Eastern Orthodox Tradition* (St Paul, MN: IOTA Publications, 2021); Doru Costache and Geraint F. Lewis, *A New Copernican Turn: Contemporary Cosmology, the Self, and Orthodox Science-Engaged Theology*, Routledge Focus on Religion (London and New York: Routledge, 2024); Doru Costache, “Strange Bedfellows? Orthodox Perspectives on Theology, Spirituality, Science, and Technology,” *Studia Universitatis Babes-Bolyai Theologia Orthodoxa* 65, no. 2 (2020): 5–25; Doru Costache, “The Orthodox Doctrine of Creation in the Age of Science,” *Journal of Orthodox Christian Studies* 2, no. 1 (2019): 43–64, <https://doi.org/10.1353/joc.2019.0003>; Bruce V. Foltz, *The Noetics of Nature: Environmental Philosophy and the Holy Beauty of the Visible* (New York: Fordham University Press, 2014); Christopher C. Knight, *Eastern Orthodoxy and the Science-Theology Dialogue* (Cambridge University Press, 2022); Christopher C. Knight, “Analytic’ Natural Theology: Orthodox or Otherwise?” *St Vladimir’s Theological Quarterly* 65, nos. 1–2 (2021): 57–85; Christopher C. Knight, *Science and the Christian Faith: A Guide for the Perplexed* (Crestwood, NY: St Vladimir’s Seminary Press, 2021); Christopher C. Knight, “Natural Theology and the Eastern Orthodox Tradition,” in *The Oxford Handbook of Natural Theology*, ed. Russell Re Manning (Oxford University Press, 2013), 213–26; Peter Harrison, “Science, Eastern Orthodoxy, and Protestantism,” *Isis* 107, no. 3 (2011): 587–591, <https://doi.org/10.1086/688414>; Vasilios N. Makrides, “The Natural Sciences in the Framework of a European History of Religion,” in *Religion in Culture—Culture in Religion*, ed. Christoph Auffarth, Alexandra Grieser, and Anne Koch (Tübingen University Press, 2021), 271–94; Vasilios N. Makrides, “Orthodox Anti-Westernism Today: A Hindrance to European Integration?” *International Journal for the Study of the Christian Church* 9, no. 3 (2009): 209–24; Alexei V. Nesteruk, *The Universe in the Image of Imago Dei: The Dialogue between Theology and Science as a Hermeneutics of the Human Condition* (Eugene, OR: Pickwick, 2022); Alexei V. Nesteruk, *The Sense of the Universe: Philosophical Explication of Theological Commitment in Modern Cosmology* (Minneapolis: Fortress Press, 2015); Alexei V. Nesteruk, *The Universe as Communion: Toward a Neo-Patristic Synthesis of Theology and Science* (London: T&T Clark, 2008); Alexei V. Nesteruk, *Light from the East: Theology, Science, and the Eastern Orthodox Tradition* (Minneapolis: Fortress Press, 2003); Efthymios Nicolaidis et al., “Science and Orthodox Christianity: An Overview,” *Isis*, 107, no. 3 (2011), 542–66, <https://doi.org/10.1086/688704>; Stoyan Tanev, *Energy in Orthodox Theology and Physics: From Controversy to Encounter* (Eugene, OR: Pickwick, 2017); Elizabeth Theokritoff,

“Science and Orthodoxy around the World” both generating and cataloguing relevant information.³ Nevertheless, since IT and AI cannot be dissociated from this context, we will refer to such matters when the need arises. Third, we focus on materials published in English, Greek, and Romanian. For the original materials in Greek and Romanian, we provide our own translation.

We begin by surveying independent Orthodox materials available online that address IT and AI, aiming to identify the kind of ideas that are communicated in that space. This step is essential for identifying the factors that contribute to the confusion currently experienced by Orthodox believers, especially given the accessibility of these media and the misinformation spread by some of them. Second, we examine official Orthodox views of science and technology in the documents of the Holy and Great Council (2016) and relevant hierarchical stances. We endeavour to determine whether these official views, also available online—and which are characterised by nuanced judgment, prudence, and pastoral concerns—allow for the articulation of an Orthodox position on IT and AI, albeit by extrapolation. The fact that a recent document of the Ecumenical Patriarchate, *For the Life of the World* (2020), mentions IT and AI explicitly is an auspicious development. Third, we consider reports on conferences, seminars, and workshops, most of which seem to align with the official line. Throughout this analysis,

“Creator and creation,” in *The Cambridge Companion to Orthodox Christian Theology*, ed. Mary B. Cunningham and Elizabeth Theokritoff (Cambridge University Press, 2009), 63–77; Gayle E. Woloschak, “Science and Theology: Perspectives for the Future,” *Θεολογία* 95, no. 3 (2024): 343–355.

- 3 Many sources, including in languages of limited circulation, can be found in the repository of data of the project “Science and Orthodoxy around the World,” which ran at the Institute of Historical Research of the National Hellenic Research Foundation, Athens, Greece (2016–2023): <http://k2.altsol.gr/archive/search>. See also the edited volumes that resulted from the project: *Orthodox Christianity and Modern Science: Past, Present and Future*, ed. Kostas Tampakis and Haralampos Ventis (Turnhout: Brepols Publishers, 2022); *Orthodox Christianity and Modern Sciences: Theological, Philosophical, Scientific and Historical Aspects of the Dialogue*, ed. Christopher C. Knight and Alexei V. Nesteruk (Turnhout: Brepols Publishers, 2021); *Orthodox Christianity and Modern Science: Tensions, Ambiguities, Potential*, ed. Vasilios N. Makrides and Gayle Woloschak (Turnhout: Brepols Publishers, 2019).

we pay particular attention to differences between official ecclesiastical resources, hierarchical pronouncements, professional media, and independent opinions.

Our goal is to map the complex Orthodox Christian attitudes to AI and IT available online, and to understand the factors that cause confusion among the Orthodox in regard to recent technological advancements—such as conspiracist misinformation, digital addiction, the transhumanist agenda, dystopian narratives, and the lack of catechesis. It is in this light that we conclude with several remarks on the future of the Orthodox Church in the digital age.

Independent Orthodox Resources

We begin by considering independent internet resources of the last few years, whose widespread impact on the Orthodox cannot be underestimated. The opinions vary from “apocalyptic” conspiracies to rigorous analyses. We survey, first, conspiracist misinformation and then informed positions, presenting each category in chronological fashion and pointing out, where details are available, the nature of the platforms used for dissemination.

Cristina Roman’s article is representative of the opinionated inexpert.⁴ It takes issue with Dan Brown’s statement, on launching *Origin*, that AI will render obsolete traditional religions. Roman lists assertions from a range of (unreferenced) authorities that supposedly draw attention to the dangers of AI research. She claims that “the Apocalypse comes,” with “all the antichrists paving the way for the implementation of artificial intelligence and aiming to replace human consciousness.” The same goes for Dan Tănăsescu’s “apologetic” manifesto.⁵ His article summarises various conspiracy theories, from the

4 Cristina Roman, “Va supraviețui Dumnezeu științei!?” (Will God survive science?!), *Porunca Iubirii: Revistă ortodoxă de misiune și informare* (18 October 2017), <https://porunca iubirii.agaton.ro/articol/1909/va-supraviețui-dumnezeu-științei> (accessed 10 December 2024).

5 Dan Tănăsescu, “V-ați gândit totuși, de ce inteligența artificială este satanică?! Pentru că este o inteligență separată de spirit: nu este morală, nu are empatie,

5G networks to neuronal implants to cryptocurrency. Supposedly, these make it possible for AI to take over the world and to replace humans, with the latter ending up being sacrificed for the “neoliberal” agenda. And so on.

An article by Ananias Sorem jumbles religious ideas and conspiracy theories (abortion, clerical celibacy, technological age, papal primacy, sexual deviations, transhumanism, etc.), together with thoughts about modern anthropocentrism, for the purpose of offering an “Orthodox” refutation of technological progress.⁶ More coherent, though no less conspiracist, is a report on Slobodan Stojicevic’s talk given in Moscow, “Serbia: A Hybrid War Against Orthodoxy and ‘Color’ Schisms.”⁷ According to this report, the speaker accused USA NGOs, embassies, and tech companies of undermining the wholesome life of the Orthodox, inflicting upon them “the feminist and LGBT agenda” and causing schisms in the churches. Somehow unexpectedly, the report concludes that IT and AI research should be held in check.

Recently, Eleftherios Kosmidis took to criticising a symposium sponsored by the Archdiocese of Athens, on the healthcare benefits of AI (to which we shall return). His article⁸ characterises AI research as hellbent on having human beings “left behind” by advanced learning machines. But human wellbeing is not the author’s concern. Rather,

sentimente, umanitate” (Have you thought of why the artificial intelligence is satanic?! It’s because it is an intelligence separated from the spirit: it has no morals, empathy, feelings, humanity), *Apărătorul Ortodox: Portal alternativ de gândire și atitudine creștin-ortodoxă* (13 August 2021), <https://www.aparatorul.md/v-ati-gandit-totusi-de-ce-inteligenta-artificiala-este-satanica/> (accessed 10 December 2024).

- 6 Ananias Sorem, “An Eastern Orthodox Understanding of the Dangers of Modernity and Technology,” *Patristic Faith* (21 December 2021), <https://www.patristicfaith.com/orthodox-christianity/an-eastern-orthodox-understanding-of-the-dangers-of-modernity-and-technology/> (accessed 20 October 2024).
- 7 “Hybrid War Technologies against World Orthodoxy,” *Orthodox Christianity* (2 April 2022), <https://orthochristian.com/144268.html> (accessed 20 October 2024).
- 8 “Ημερίδα υπό την αιγίδα της Ιεράς Αρχιεπισκοπής Αθηνών, με θέμα “Τεχνητή Νοημοσύνη και Αυτισμός”” (Workshop under the auspices of the Holy Archdiocese of Athens on “Artificial Intelligence and Autism”), *Katanixi* (21 March 2023), <https://katanixi.gr/imerida-ypo-tin-aigida-tis-ieras-archiepiskopis-athinon-me-thema-techniti-noimosyni-kai-aytismos/> (accessed 15 May 2024).

he is interested in the possibility of new religions emerging from Silicon Valley. The article ends by observing that, “judging from the attitude of the Archbishop of Athens, we are preparing for an unconditional surrender to the scientific and philosophical authorities of the New Age.” This conclusion does not follow from the article’s discourse. The alarmist trend gains momentum. An undated anonymous entry on AI summarises the views of a technologist who, allegedly, unmasks the real motivation behind AI research, namely, to undermine Christianity on a global scale.⁹ The article supplies no supporting references. The same goes for other online materials, but we shall end this part of our survey by considering a media report on an unnamed “Orthodox priest” who conversed with ChatGPT.¹⁰ The priest, allegedly, checked AI’s awareness of Orthodox Christianity, aiming to have the machine proclaim the Orthodox as the only true church. Completely unrelated to the content, the anonymous article concludes as follows: “Artificial Intelligence could be described as the Apocalyptic Beast that in the near future will possibly rule over humankind.” It is reasonable to expect that, after the recently adopted European laws on AI,¹¹ more of the same will follow.

In all of the above, IT and AI are represented as the church’s purposeful enemy. Another common denominator to this kind of discourse is the inability of the authors to formulate cogent views about

9 “Chatbots-ii: Inteligența Artificială pregătită să desființeze Creștinismul” (Chatbots: Artificial Intelligence paves the way for Christianity’s downfall), *Lăcașuri Ortodoxe* (no date), <https://lacasuriortodoxe.ro/articole/17780-chatbots-ii-inteligena-artificiala-pregatita-sa-desfiinzeze-crestinismul.html> (accessed 20 March 2024).

10 “ChatGPT prefigurează Fiara Apocaliptică: Iată dialogul unui preot ortodox cu Inteligența Artificială Globală” (ChatGPT foreshadows the Apocalyptic Beast: Here is the dialogue of an Orthodox priest with the Global Artificial Intelligence), *Ziua News* (6 February 2023), <https://m.ziuanews.ro/stiri/chatgpt-prefigureaz-fiara-apocaliptic-iat-dialogul-unui-preot-ortodox-cu-inteligen-a-artificial-global-1574909> (accessed 20 March 2024).

11 See Lisa O’Carroll, “EU moves closer to passing one of world’s first laws governing AI,” *The Guardian* (15 June 2023), <https://www.theguardian.com/technology/2023/jun/14/eu-moves-closer-to-passing-one-of-worlds-first-laws-governing-ai> (accessed 14 June 2024).

technological innovation and to draw logically consistent conclusions. At best, this type of discourse confuses technology with its misuse. At worst, it causes panic to the average Orthodox reader who has neither theological nor technological training. A similar happening occurred recently, during the coronavirus pandemic.¹²

Other independent materials bear the semblance of balance, but are still problematic. For example, Eugen Tănăsescu wrote an article on the great strides taken toward building a machine that matches human intelligence.¹³ Tănăsescu is theologically trained and does not engage technical matters. Nevertheless, he tries hard to prove the Turing test as inaccurate and discusses at length the supposed reasons that prevent AI from ever attaining consciousness. This pseudoscientific discourse was republished by an official ecclesiastical outlet (undated),¹⁴ contributing to the confusion. The same goes for the conviction of Răzvan Ionescu that, irrespective of how much adaptive learning systems will progress, machines will never reach intelligence because they do not have consciousness.¹⁵ This conviction contradicts the speaker's—correct—point that the Orthodox do not rush to assess hypotheticals.¹⁶ Nevertheless, if hypothetical thinking is not favored by the Orthodox, how can he tell that machines cannot develop consciousness? Ionescu's argument echoes the creationist drivel that evolution

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- 12 See Vasilios N. Makrides and Eleni Sotiriou, "Conspiracies, Anxieties, and Ritual Arrhythmia: Exploring Orthodox Discourses and Practices in Greece and Cyprus during the Coronavirus Pandemic," in *Orthodox Christianity and the COVID-19 Pandemic*, ed. Tornike Metreveli, Routledge Religion, Society and Government in Eastern Europe and the Former Soviet States (Abington and New York: Routledge, 2024), 65–101, DOI: 10.4324/9781003372776-4.
 - 13 Eugen Tănăsescu, "Sfânta ... inteligență artificială?!" (Holy ... artificial intelligence?!), *adevarul.ro* (16 June 2014), <https://adevarul.ro/blogurile-adevarul/sfantainteligenta-artificiala-1542688.html> (accessed 10 October 2024).
 - 14 <https://dodoxologia.ro/sfanta-inteligenta-artificiala> (accessed 10 October 2024).
 - 15 "Science and Orthodoxy around the World: A Documentary Film," directed by Christos Panagos; Project "Science and Orthodoxy around the World," of the Institute of Historical Research of the National Hellenic Research Foundation (Athens: National Hellenic Research Foundation & IndigoFlicks, 2020), <https://www.youtube.com/watch?v=nHg5azXTxjg>, min. 37 (accessed 10 July 2025).
 - 16 "Science and Orthodoxy around the World," min. 34.

could never engender consciousness and intelligence. The view that “it’ll never happen” transpires also through the assertions of “Father Teologos,” who warns his followers against AI, while he uses a sophisticated platform for entrapping customers.¹⁷ The speaker must be possessing technical training. He makes valid points about theological anthropology and the need to use addictive technologies in moderation. Nevertheless, that human intelligence is “the Holy Spirit’s gift” which cannot be replicated algorithmically is neither theologically sound nor a competent guide on AI matters. And, as the recent calls of AI creators to stymie research show, “never” does not seem to be so far away.

Orthodox materials also include sound contributions based either on technological expertise or theological training or both. We begin with the article of Stavros Yangazoglou, originally published in a journal but then shared via a popular website.¹⁸ The author calls on Orthodox theologians to engage technological progress, including AI, *theologically*, not ethically and legalistically. But they must do so based on sound information,¹⁹ free of the technophobia promoted by dystopian popular culture and social media. For example, AI showed much promise during the coronavirus pandemic, predicting the spread of the disease and devising means for counteracting it. The benefits outweigh any reason for fearing AI, the author continues, but the possibility for this technology to be misused requires proactive measures. However, being proactive does not mean “imposing barriers and prohibitions on science,” Professor Yangazoglou concludes. Rather, it is about

17 “Părintele Teologos: Inteligența Artificială: Implicațiile duhovnicești în cotidian” (Father Teologos: Artificial Intelligence and its daily impact), *O chilie athonita: Bucurii din Sfântul Munte* (17 August 2021), <https://www.chilieathonita.ro/2021/08/17/parintele-teologos-inteligena-artificiala-implicatiile-duhovnicesti-in-cotidian/> (accessed 20 July 2024).

18 See Stavros Yangazoglou, “Θεολογία και Τεχνητή Νοημοσύνη” (Theology and Artificial Intelligence), Ορθόδοξη Ομάδα Δογματικής Έρευνας (1 January 2021), https://www.oodegr.com/oode/epistimi/bioh8ikh/t_n_1.htm (accessed 10 May 2025).

19 For the necessity of sound information, see also “AIOCS Conversations: Eftymios Nicolaidis on Orthodoxy and AI” (24 March 2023), https://www.youtube.com/watch?v=_Ugv8VppwSo (accessed 25 April 2024).

strengthening the human character of contemporary culture. It is the task of theological anthropology—which focuses on the person’s capacity for love and freedom—to inspire values able to ensure that AI works for humanity’s benefit.

Significant information was available on the Greek platform *Trapeza Ideon* (Bank of Ideas; as we prepare the article for publication, this website is no longer accessible).²⁰ Most contributors were technologists and philosophers, with some believers among them. For example, in an interview on intelligent machines, Nikos Abouris concluded as follows: “human beings will not stop experimenting and enquiring. But God also gave us critical thinking in order to assess and decide, to be responsible for the choices that will affect our future and the future of our children.”²¹ Not overtly Orthodox, this statement reflects the balanced views of Orthodox officialdom, discussed below. In turn, the recent article by Georgios Hatzivasileiou refers to ChatGPT as reminding us of the centrality of the *logos* (“cause, reason, and speech”) within contemporary culture.²² The author quotes John 1:1, taken to suggest that the human experience boils down to communicating meaning. The author’s valid analysis is not relevant here, but his conclusions are noteworthy: “AI ... will generate new ideologies, new theologies, new quasi-religions. These new religions will not originate in the temples of ancient Athens or Jerusalem, but in laboratories such as those of Silicon Valley or MIT.” The statement, free of conspiracist overtones,

20 <https://www.tideon.org/koinonia-thesmoi-dikaio/artificial-intelligence> (accessed 10 November 2023).

21 “Οι “ευφυείς” μηχανές χωρίς τον άνθρωπο είναι επικίνδυνες” (“Intelligent” machines without humans are dangerous), *Trapeza ideon* (27 September 2022), <https://www.tideon.org/koinonia-thesmoi-dikaio/414-artificial-intelligence/17865-oi-effyeis-mixanes-xoris-ton-anthropo-einai-epikindynes> (accessed 10 November 2023).

22 “”Εν αρχή ην ο Λόγος” του ChatGPT: Οι θεοί της τεχνητής νοημοσύνης” (ChatGPT’s “In the beginning was the Word”: The gods of artificial intelligence), *Trapeza ideon* (10 April 2023), <https://www.tideon.org/koinonia-thesmoi-dikaio/414-artificial-intelligence/19500-oi-theoi-tis-technitis-noimosynis> (accessed 15 May 2023).

is not unwarranted. The new “logos” is appealing—at least if we think of the Romanian innovation of the alternative “ChatGPT Church.”²³

In an important interview,²⁴ Marius Dorobantu states that progress toward the “human-level” AI is real, but what delays its achievement are, among other factors, problems with modelling human consciousness. Filling the informational gap that leads many Orthodox to confusion, Dorobantu provides technical details, which are of no consequence here, however. He also engages ethical issues. He refers to algorithms that “inherit our biases,” and the need to ensure that “people have the last word in decisions that strongly affect human lives,” so that technological advancements diminish, not increase, “economic inequalities.”²⁵ Similar concerns were expressed during a conversation of Vasile Bănescu and Kenan Dionisie Wang, hosted by the official broadcaster of the Romanian Patriarchate, Trinitas TV.²⁶ Both speakers mentioned the usefulness of technology, which eases life, while also pointing to the significance of a holistic development of societies, where digital and nondigital instruments complement each other.

These views—from the balanced and informed to the inexperienced and conspiracist—bring to light the inherent diversity pertaining to Orthodox Christianity in our time. Indeed, without exception and regardless of how wide apart they are, these views claim commitment

23 *Biserica GPT* (the GPT Church), <https://chatgpt.com/g/g-XcODqdQao-biserica-gpt> (accessed 25 April 2025). See also the report of Ana Maria Barbu, at PROTV (25 April 2023), <https://stirileprotv.ro/stiri/actualitate/zbiserica-gpt-ofera-online-servicii-religioase-de-la-rugaciune-pentru-o-calatorie-pana-la-demiterea-sefului-reactia-bor.html> (accessed 25 April 2025).

24 “Marius Dorobantu: AI is currently the most exciting phenomenon for someone who is deeply curious about existential or spiritual questions,” *Iquads* (12 August 2022), <https://www.iqads.ro/articol/60834/marius-dorobantu-ai-is-currently-the-most-exciting-phenomenon-for-someone-who-is> (accessed 25 April 2024).

25 See also “AIOCS Conversations: Marius Dorobantu on AI and Christian Anthropology” (21 December 2022), <https://www.youtube.com/watch?v=IVHJ-n4b1CA&t=815s> (accessed 25 April 2024).

26 “Credință și Cultură: Inteligența Artificială, beneficii și riscuri reale” (Faith and Culture: Artificial Intelligence, usefulness and real dangers), *Trinitas TV* (4 December 2022), <https://www.youtube.com/watch?v=OLbKRJ6ISfg> (accessed 20 July 2024).

to the Orthodox tradition. This amounts to a confirmation of the point, often repeated, that Orthodoxy is not as monolithic and homogenous as outsiders consider it to be. What matters here, however, is the high impact the independent voices have in the age of the internet; hence, the great responsibility of the contributors. While the “apocalyptic” rhetoric of conspiracists is the main source of confusion and panic for uninformed Orthodox, clergy and laity alike, the expert voices represent an important counterpoint that helps both the public and—when considered seriously—official Orthodox stances. We shall discover below that a series of recent ecclesiastical decisions are based on sound information.

Official and Hierarchical Stances on Science and Technology

The ecclesiastical positions on science and technology are, in the main, positive and ethically oriented, usually maintaining silence in regard to AI and IT. Alternatively, when these topics are addressed, more or less tangentially, the approach taken is pastoral,²⁷ creating a framework for the experts to have their say.

We begin by surveying the statements of the Holy and Great Council of the Orthodox Church (Crete, June 2016). The main relevant document is “The Mission of the Orthodox Church in Today’s World,”²⁸

27 Exception from this attitude makes “The Basis of the Social Concept of the Russian Orthodox Church” (2000), <https://incommunion.org/tag/the-basis-of-the-social-concept-of-the-russian-orthodox-church/> (accessed 20 March 2025). This document denotes a degree of technophobia and is extremely prescriptive in regard to scientific research. For the contextual reasons that conditioned this document’s position, see Regina Elsner, “Different Voices, Same Challenges,” 127–129, reproduced in Carrie Frederick Frost and Nadieszda Kizenko, “For the Life of the World: Toward a Social Ethos of the Orthodox Church,” *Journal of Orthodox Christian Studies* 5:1 (2022): 119–139.

28 <https://www.holycouncil.org/mission-orthodox-church-todays-world> (accessed 15 May 2025). For a relevant analysis of the conciliar documents, see Doru Costache, “Orthodoxy and Science: Insights from the Holy and Great Council,” *The Ecumenical Review* 72:3 (2020): 396–408. See also, for a broader array of studies, Vasilios N. Makrides and Sebastian Rimestad (eds), *The Pan-Orthodox Council of 2016: A New Era for the Orthodox Church? Interdisciplinary Perspectives* (Berlin: Peter Lang, 2021).

which considers mission as integral to the church's life. According to this document, being anchored in the ecclesial experience, mission must consider the impact of science and technology upon believers, with science and technology being the hallmarks of "today's world." The document recommends the adoption of a "positive attitude" toward research as "a gift from God to humanity," and affirms the autonomy of the scientific method (see F.11). That said, there are "dangers latent in the use of certain scientific achievements," and sometimes researchers "violate basic Christian and humanitarian values" (F.12). A nuanced attitude to science and technology transpires: The autonomy of research is unquestionable, but ethical criteria must be observed. The document does not specify in what ways Orthodox mission would make use of scientific knowledge and technological innovation, but its conclusions allow for constructive approaches.

The second relevant document is the "Encyclical."²⁹ Echoing "Mission," the document highlights the church's appreciation for science and technology, and warns about the unethical misuse of certain innovations (5.11; 5.12; 5.14; 6.15). Thus, left unchecked, biotechnological experimentation can affect the integrity of life, human and otherwise. Orthodox education, in turn, encourages the holistic development of the human person within a complex web of relations—with God, society, culture, and the environment (4.9). To that end, it draws on both its own tradition and contemporary culture, as the Orthodox have contributed to humankind's general progress throughout history. As such, the "identification of the church with conservatism, incompatible with the advancement of civilisation, is arbitrary and improper" (5.10; see also 6.17). The last point redresses the imbalance caused during the meetings that preceded the Council by church leaders who, in the name of the "tradition" or rather conservatism, opposed the Ecumenical Patriarchate's proposal to align our outdated ecclesiastical calendar, "Julian," to the current scientific calculations.³⁰

29 <https://www.holycouncil.org/encyclical-holy-council> (accessed 15 May 2025).

30 See brief notes on this matter in John Chryssavgis, *Toward the Holy and Great Council: Retrieving a Culture of Conciliarity and Communion*, Faith Matters

The third relevant document is “Message.”³¹ It shows that the Orthodox Church helps contemporary people to maintain a moral compass and that it contributes to healing the wounds of the world, socially, culturally, and environmentally. It confirms that the church respects the autonomy of research and does not oppose progress. Nevertheless, the church must withstand inventions that entail “the manipulation of freedom, the gradual loss of precious traditions, the destruction of the natural environment, and the questioning of moral values” (2; 7; 8). These guidelines might be taken as merely tentative advice, but are the source of the overall positive and nuanced attitude of the Orthodox officialdom to technology, discussed in what follows.

More recently, the Ecumenical Patriarchate released an important document, *For the Life of the World: Toward a Social Ethos of the Orthodox Church*.³² This document was written by experts commissioned in 2017 by Ecumenical Patriarch Bartholomew. In an *Orthodox Times* report, we read that it makes no “pronouncements on social challenges,” instead proposing guidelines for “difficult questions.”³³ There are no explicit references to AI within it, but *For the Life of the World* spells out with clarity the conciliar insights on research and technology, discussed just above. It reaffirms that the church opposes anachronism, anti-scientific attitudes, and technophobia, and that it encourages research that contributes to the wellbeing of human beings and the environment (71). For example, the document shows that the church does not object to “reproductive technologies,” while it “cannot approve of methods that result in the destruction of ... ova” (24). Its resistance to the latter relates to “the inalienable dignity and incom-

(New York: Greek Orthodox Archdiocese of America, 2016), 21–22, 24.

31 <https://www.holycouncil.org/message> (accessed 15 May 2025).

32 Available at <https://www.goarch.org/social-ethos> (accessed 23 May 2025). For a symposium on the document, including the text of the papers presented, see Frederick Frost and Kizenko, “For the Life of the World,” esp. 121–139.

33 “*For the Life of the World: Toward a Social Ethos of the Orthodox Church Is Now Available Online*,” *Orthodox Times* (March 27, 2020), <https://orthodoxtimes.com/for-the-life-of-the-world-toward-a-social-ethos-of-the-orthodox-church-is-now-available-online/> (accessed 10 June 2025).

parable value of every human life” (24; for other technological applications to healthcare, see 69).³⁴ Likewise, the church does not approve of war technologies that increase the capacity of global annihilation (42, 46). More relevant to our purposes is the fact that the document highlights the importance of digital tools that make possible new pastoral and outreach strategies (72).³⁵ As we read, the church appreciates the usefulness of these new means of communication, but warns against their negative impact on people’s wellbeing, such as by causing addiction, isolation, anxiety, and violence (70). However, the church’s care is not only about humankind; it encompasses the environment as well, encouraging technologies that protect life on earth (68, 71, and 76).

Distinct echoes of the conciliar documents are audible in all these points. The references to IT are precious for pastoral guidance, marking progress from the conciliar statements. Their applicability to AI is patent, namely, research in this area is encouraged, for the purpose of doing good, but ethical criteria should be observed. We shall see in the next section how this stance has already generated a robust and balanced mainstream opinion.

We now turn to relevant views of Orthodox hierarchs. Thus, the Ecumenical Patriarch Bartholomew developed the conciliar stance on technology in the address “Dilemma of the Century: Technology vs Politics,” delivered during the twenty-first Eurasian Economic Summit in Istanbul (12 April 2018).³⁶ The speech highlights the role of

34 Echoes of these nuanced stances can be found in Woloschak, “Science and Theology,” 344–350.

35 Patriarch Kirill of Moscow and All Russia echoed this stance a year later. In his words, “today [the church] uses electronic technologies for preaching the word of God” via websites and blogs. See “His Holiness the Patriarch of Moscow and All Russia Kirill gives an interview to Forbes France,” Moscow Patriarchate (26 October 2021), <http://www.patriarchia.ru/en/db/print/5856104.html> (accessed 10 November 2023). Similar stances multiplied in the wake of ChatGPT. See, for instance, Vlad-Mihai Agache, “Exemplu de rugăciune generată de Inteligența Artificială” (An example of prayer generated by the Artificial Intelligence), theodosie.ro (3 January 2023), <https://theodosie.ro/2023/01/03/exemplu-de-rugaciune-generata-de-inteligenta-artificiala/> (accessed 20 March 2024).

36 <https://www.ecupatria.org/2018/04/16/ecumenical-patriarch-bartholomew-at-the-21st-eurasian-economic-summit/> (accessed 20 November 2024). The quoted passages are slightly altered by us. For a summary in Romanian, see

technology today, with its positives and negatives. When it comes to contributions, we read, “technology is the ‘great power’ of our time. It effectively serves the human being, the prevention and treatment of diseases, it prolongs our lifespan, it facilitates our daily life, the outpouring of knowledge and information, and it promotes communication.” This positive contribution is accompanied, however, by unsettling developments: “Technology has become independent from humanity’s basic needs ... Instead of being humanity’s servant, it has become an ‘all-powerful goddess,’ which demands that we completely submit to her will.” Moreover, the IT means of communication “do not simply transmit information; they shape our views regarding life and its meaning, they steer our desires and needs and influence the ranking of our values.” What the conciliar documents put forward about contemporary biotechnologies, the Patriarch reiterates in terms of IT, doing so more clearly than *For the Life of the World*. But, he continues, the dangers posed by technological advancements are not the cause of contemporary existential problems. In his words:

Our greatest problems are not of a technical nature and do not derive from lack of information. Violence, crime, starvation, social injustice, fanaticism, and the clash of civilizations are not caused by lack of information or technology, nor can they be addressed through computer science. It is also evident that scientific progress and the development of technology do not answer the deep existential questions of humanity, and they most certainly do not eliminate these problems either.

The speaker warns against the vain hopes of contemporary technocracy that innovation could bring solutions to existential issues. But technocratic naivety does not justify technophobia. When it comes to seeking ways of overcoming contemporary issues, the Patriarch goes beyond the tentative advice of the Holy and Great Council.

Aurelian Iftimiu, “Patriarhul Ecumenic oferă soluții ‘Dilemei secolului: Tehnologie vs. Politică’” (19 April 2018), <https://basilica.ro/patriarhul-ecumenic-ofera-solutii-dilemei-secolului-tehnologie-vs-politica/> (accessed 20 November 2024).

The current dilemmas and impasses, he posits, cannot be overcome without the cooperation of “technology, politics, economics, and religion.”³⁷ This nuanced appraisal of the situation and the interdisciplinary search for solutions is typical of the Orthodox mindset; it surely echoes patristic wisdom.³⁸ No wonder that it is reiterated by mainstream ecclesiastical voices, as we shall discover further down.

In the same vein, as *Orthodox Times* reports, during a more recent meeting with parents, youth, and children, the Ecumenical Patriarch advised them on making proper use of technology.³⁹ On that occasion, he described innovation as a “technological miracle” of human ingenuity. Amounting to a “parallel school,” technological means such as “television and the internet are sources of values.” But, echoing his 2018 statements, the Patriarch also mentioned the need for young people to be aware of the downsides of overusing and misusing devices. People have “to make right use of them. Technological advancement requires freedom and responsibility.” He concluded that only the responsible use of technology can secure the balanced development of human personality—a stance that found an echo in the 2022 conclusions of Bănescu and Wang, mentioned earlier.

37 This interdisciplinary worldview of the Patriarch was recently discussed by John I. Jenkins in “Foreword” to *Global Initiatives of Ecumenical Patriarch Bartholomew: Peace, Reconciliation, and Care for Creation*, ed. John Chrysavgis (University of Notre Dame Press, 2023), vii–ix, esp. viii.

38 See John Hedley Brooke and Ronald L. Numbers, “Science, Eastern Orthodoxy, and World Religions,” *Isis* 107, no. 3 (2016): 592–596, <https://doi.org/10.1086/688464>; Doru Costache, “One Description, Multiple Interpretations: Suggesting a Way Out of the Current Impasse,” in *Orthodox Christianity and Modern Sciences: Theological, Philosophical, Scientific and Historical Aspects of the Dialogue*, ed. Christopher C. Knight and Alexei V. Nesteruk (Turnhout: Brepols Publishers, 2021), 33–49; Doru Costache, “A Theology of the World: Dumitru Stăniloae, the Traditional Worldview, and Contemporary Cosmology,” in *Orthodox Christianity and Modern Science: Tensions, Ambiguities, Potential*, ed. Vasilios N. Makrides and Gayle Woloschak (Turnhout: Brepols Publishers, 2019), 205–222; Efthymios Nicolaidis, *Science and Eastern Orthodoxy: From the Greek Fathers to the Age of Globalization*, trans. Susan Emanuel (Baltimore: The Johns Hopkins University Press, 2011).

39 “Ecumenical Patriarch to youth: Make proper use of technology” (4 January 2020), <https://orthodoxtimes.com/ecumenical-patriarch-to-youth-make-proper-use-of-technology/> (accessed 10 October 2024). Quotations slightly altered by us.

More statements have been issued by Orthodox hierarchs in recent years. Their messages seem to incline toward cautioning about the negative impacts of technology, without also asserting its benefits. This approach is surprising, especially given the wide popularity of IT during the covid crisis, where most churches reached out to believers by way of such means. We shall illustrate this category of statements by examples from the Romanian Orthodox Church.

During the covid lockdowns, the Patriarchal news agency *Basilica* reported that Bishop Iustin of Maramureș and Sătmar had preached in the diocesan chapel, deploring the absence of fellowship, with interaction between people being mediated by technological aids. In his words, “We enjoy the use of technology, but no longer live in fellowship.”⁴⁰ The Bishop further mentioned the need of balancing real life and virtual interaction. His message suggests reluctance in regard to technology, but must be understood within its historical context, namely, the known existential impact of isolation during lockdowns. It does not amount to a wholesale rejection of IT, therefore. As the sermon was streamed live from the diocesan Facebook page, it encouraged the listeners to seek balance, not to suppress technology. Nevertheless, the message did focus on technology’s incapacity to replace our need for socialisation.

In turn, Bishop Ignatie of Huși repeatedly affirmed the importance of “digital fasting” as an antidote for social media addiction.⁴¹ According to an *Orthodox Times* report,⁴² he declared that “the purpose

40 Iulian Dumitrașcu, “Ne bucurăm de tehnologie, dar nu mai trăim în comuniune” (13 May 2020), <https://basilica.ro/ne-bucuram-de-tehnologie-dar-nu-mai-traim-in-comuniune-comuniunea-o-dau-doar-familia-si-biserica-ps-iustin/> (accessed 10 October 2024).

41 The concept of “digital fasting” was already used in Greece. See Christos Aigidis, “Η Νηστεία των Social Media!” (26 February 2020), available at <https://www.romfea.gr/katigories/10-apopseis/35478-h-nisteia-ton-social-media> (accessed 10 March 2026).

42 “Bishop of Huși recommends digital fasting: We will realize how “drugged” we are using technology” (17 March 2021), <https://orthodoxtimes.com/bishop-of-husi-recommends-digital-fasting-we-will-realize-how-drugged-we-are-using-technology/> (accessed 10 October 2024). The quoted passages are slightly altered by us.

of fasting is not exclusively to give up, but to change some habits that turn us into slaves.” Fasting is as important in regard to “addiction to digital media” as it is about other dangerous habits. Thus, the speaker continued, “digital media fasting will help us realise how addicted we are, how ‘drugged’ we are by using technology. Technology is a blessing, but it matters how we use it.” Here, the Bishop echoes the Ecumenical Patriarch’s nuanced approach. The same goes for his statement that “technology changes our thinking” and weakens people’s capacity to focus. Technology is good, he continued, but its indiscriminate use has negative consequences. A couple of years later, Bishop Ignatie returned to the topic with a similar message.⁴³ The report does not include any positive references this time around, emphasising the negative impact of digital addiction: “We become the tools of our own tools.” The report also includes the Bishop’s admission of being addicted to social media, which seems to be the main reason for returning to the topic in pastoral but uncompromising terms—for the benefit of his audiences.

These warnings indicate a change of perception among Orthodox officials—perhaps denoting their awareness of the specialised and popular literature on digital addiction published in recent years⁴⁴—but

43 “Bishop of Huși urged to observe digital fast during Lenten season” (28 February 2023), <https://orthodoxtimes.com/bishop-of-husi-urged-to-observe-digital-fast-during-lenten-season/> (accessed 10 March 2024). See also the original Romanian report of Iulian Dumitrașcu, “Episcopul Ignatie: Suntem dependenți de tehnologie. Să postim mediatic!” (27 February 2023), <https://basilica.ro/episcopul-ignatie-suntem-dependenti-de-tehnologie-sa-postim-mediatic/> (accessed 10 March 2024).

44 See, for example, projects such as “Technology Addiction—Understanding the Connection: Technology, Addictions, and Mental Health,” of the Brain and Mind Centre at the University of Sydney, <https://tinyurl.com/hw45sz84> (accessed 10 September 2024), or the expert contributions gathered in *Technological Addictions*, ed. Petros Levounis and James Sherer (Washington, DC: American Psychiatric Association Publishing, 2022), or standalone studies such as Hilarie Cash et al.’s “Internet Addiction: A Brief Summary of Research and Practice,” *Curr Psychiatry Review* 8, no. 4 (2012): 292–298, doi: 10.2174/157340012803520513, and Amarjit Kumar Singh’s “Digital Addiction: A Conceptual Overview,” *UNL Digital Commons* (2019), <https://tinyurl.com/nhes8kv2> (accessed 10 September 2024), the popular-level work of Johann Hari, *Stolen Focus: Why You Can’t Pay Attention and How to Think Deeply Again* (New York, NY: Crown Trade, 2023), and the pastoral approach to the topic of Armand Babakhanian, “Church Responses and Theological Resources for Technological Addiction,” *Christian Perspectives on Science and Technology*, NS, 2 (2023): 58–79.

they do not amount to a wholesale rejection of technology. To prove this conclusion, we turn to the nuanced declarations of Archbishop Anastasios of Tirana, Durres, and All Albania. After being released from an Athens hospital, in 2020, Archbishop Anastasios thanked the medical personnel profusely.⁴⁵ On that occasion, he referred to scientific discoveries and technological innovations as expanding our horizons, securing our wellbeing, and enriching our existence. His paean to research includes a tribute to resourcefulness: “Today’s technology has eased our everyday life; it has contributed to tackling dangerous diseases; it has enhanced communication; it has advanced the exploration of the universe and so on.” No wonder the Archbishop’s enthusiastic endorsement of research and progress. In his words,

Orthodoxy approaches science and technology with doxology and thanksgiving to God who has granted to humans the possibility to look for truth and discover unknown aspects of the creation. It is worth underscoring that the Orthodox Church avoids treating condescendingly scientific research and does not pass judgment on every scientific achievement whenever it occurs.

One hears echoes from the Holy and Great Council’s reference to research as “a gift from God to humanity,” including its acknowledgment of scientific autonomy. But, the Archbishop continued, people should neither become arrogant because of science and technology nor trust them to solve all of humankind’s issues. In his words, “true wisdom goes together with genuine humility. We do not know everything.” Then, “science and technology alone cannot face and cure all human problems—moral, emotional, and existential.” Again, that

45 “Orthodox Views about the Development of Science and Technology” (15 November 2020), <https://orthodoxalbania.org/2020/en/2020/11/15/orthodox-views-about-the-development-of-science-and-technology/> (accessed 15 March 2025). The quoted passages are slightly altered by us. The original Greek version is found on the same website, “Ορθόδοξες απόψεις σχετικά με την ανάπτυξη των θετικών επιστημών και της τεχνολογίας” (<https://orthodoxalbania.org/2020/el/2020/11/15/ορθόδοξες-απόψεις-σχετικά-με-την-ανάπτυξη/>; accessed 15 March 2025).

science and technology have limitations does not mean that they must be abandoned.⁴⁶ On the contrary, the Archbishop continues, “the scientific research that aims at exploring the secrets of the universe and the spiritual endeavour of the church to approach and communicate with the creator are different ways of seeking the truth.” By highlighting faith and the scientific research as valid and complementary pursuits of the truth, Archbishop Anastasios echoes the Ecumenical Patriarch’s point about the cooperation of “technology, politics, economics, and religion,” expressed earlier that year. As with the Patriarch’s views, his thoughts draw upon the wisdom of the Holy and Great Council, confirming the balanced and nuanced attitude of Orthodox Christianity to science and technology.

In short, these official and hierarchical stances acknowledge the autonomy of research and the benefits of science and technology as a complementary way of seeking the truth and of working towards human betterment, different from the church’s own pursuit of the same goals. Nevertheless, affirming complementarity goes hand in hand with a critical spirit deployed for the purpose of securing the ethical aspect of research and the safe application of its technological outcomes. While all this is fine and justified from the viewpoint of the church tradition, we must point out that most of these documents and statements amount to pastoral advice, not being met with general approval. Their lack of authoritative status is one of the factors that eventually made possible the rise of confusing views on science and technology—including, recently, IT and AI—with the dominant factor being a negative appraisal of technological applications.⁴⁷ It is against this backdrop that we now turn to official statements on IT and AI.

46 The report of *Orthodox Times* focuses on the limitations of science, which is only one point among the many the Archbishop made in his speech. See “Archdiocese of Tirana: Science Cannot Cure All Human Problems” (15 November 2020), <https://orthodoxtimes.com/archdiocese-of-tirana-science-cannot-cure-all-human-problems/> (accessed 15 March 2024).

47 This pessimistic pitch was inaugurated by the Russian Orthodox “Basis,” 14.1, <https://incommunion.org/2004/10/14/xiv/> (accessed 20 March 2025).

Official and Hierarchical Stances on IT and AI

The above points on science and technology illustrate a dual approach, namely, positive assessment of the benefits of research in general and recourse to discernment in regard to its applications, when the latter prove to be detrimental to human (and environmental) wellbeing. This balanced approach tends to be replaced by a more reductionist treatment, however. Pastoral concerns about the negative impact of various technologies (especially digital) on human life have recently become more apparent. Because of this and the rise of technophobia, the Greek Orthodox Church, on which we primarily focus below, has been consistently engaging these issues. We could not find corresponding levels of interest elsewhere.

We begin by summarising the position of the Office of the Representation of the Church of Greece to the European Union, led until 2022 by Metropolitan Athanasios of Achaia. The relevant document, lodged by Georgios Lekkas, a member of that office until the end of 2019, includes comments on the draft of the European Commission's European Code of Conduct on AI, prepared by experts. Here are selections from this important statement:

The proposed European project of ethical deontology for artificial intelligence presupposes an understanding of human beings as autonomous, rational, and free entities, compelled to cooperate with their kind only in order to serve their own complex social needs. Moreover, the proposed project ... extends and applies to the field of artificial intelligence—indeed to artificial intelligence that will become autonomous in a very short time—the individualistic understanding of human nature whose dominance on a global scale has disastrous outcomes for people, who already face the prospect of isolation from one another and the destruction of the planet. Does it suffice to approach artificial intelligence in “anthropocentric” fashion, after the idolatrous idea of an “autonomous” human being, to which the project ... often returns? As an Orthodox Christian, my answer is “no.” ... human beings are not merely autonomous rational entities connected to others by expe-

riential necessity; they are free, intelligent, and loving hearts that by design need others in order to be free ... We must immediately criminalise research into the intersection of human and machine capabilities as crimes against humanity ... We consider it equally urgent to take legislative initiatives within the EU to prevent the anthropomorphic simulation of artificial intelligence systems to such an extent that it becomes difficult to distinguish humans and machines, as well as the establishment of a social belief in the equality of human and machine ... These systems must ALWAYS serve ... the ontological need for deep coexistence between all human beings within the single body of humanity. Otherwise, any such systems must be rejected, since every time the referential value of the human being is compromised, humanity is in danger ... of being transformed into something inferior.⁴⁸

The position expressed in this passage is grounded in Orthodox theological anthropology and ethics, along the lines of the conciliar stances reviewed in the previous section. The same concept of human integrity and dignity appears here as it does there, together with its corollary, the need of preventing technology from compromising human nature. But a growing worry about AI transpires through the passage quoted just above, given the obvious progress of intelligent machines. “Never” is already here. This awareness led the author and the office he represented to sideline the nuanced and usually irenic stances of the conciliar documents and of the hierarchs mentioned above. Addressing the topic of AI, here, is no longer a case of deploring technology addiction and its impact on human fellowship and wellbeing. AI is taken to be a present and clear danger to humankind. We shall soon discover that this position currently tends to supplant the moderate official stance.

One month later, *Orthodox Times* reported a conference of representatives of the European Parliament, the European Commis-

48 “Τεχνητή νοημοσύνη και εφαρμοσμένη ηθική. Αλλά ποια ηθική;” (Artificial intelligence and applied ethics. But what ethics?), *Romfaia News Agency* (4 February 2019), <https://www.romfea.gr/ekklesia-ellados/26881-texniti-noimosuni-kai-efarmosmeni-ithiki-alla-poia-ithiki> (accessed 20 September 2024).

sion, and churches, religious, and humanitarian organisations, held in Brussels.⁴⁹ The discussion focused on the European Code of Ethics on Artificial Intelligence.⁵⁰ On that occasion, Georgios Lekkas, representing the Orthodox Church of Greece, intervened twice. First, he pointed out the need to discuss AI within the broader “debate on European social and ethical values”; second, he demanded “the criminalisation of the attempts to aggregate human and mechanical elements, in order to protect not only human dignity, but the human species overall.” Lekkas’ interventions, voicing the position of his church (see the phrase “we consider” in his previous statement), illustrate the growing apprehension of the Orthodox in regard to technological progress, reviewed in the first section of this article, as well as his own February statements, discussed just above. This is an appropriate response to the news of unethical experiments in terms of human-machine hybridisation, but it also echoes the pessimism of the Russian Orthodox “Basis” about technology, together with its desire to control research activities.

When the European Commission made its AI guidelines public, yet another month later, on the occasion of Digital Day 2019, it acknowledged the contribution of the Church of Greece and its representatives. The guidelines, it was announced, include provisions for the protection of “social and environmental wellbeing.”⁵¹ This resolution did not bring the discussion to an end, however, Lekkas posting another statement

49 “Ethical concerns about AI in the European Parliament” (20 March 2019), <https://orthodoxtimes.com/ethical-concerns-about-a-i-in-the-european-parliament/> (accessed 20 September 2024). This news item was translated into Romanian by Iulian Dumitraşcu and published a few days later by the ecclesiastical media. See “Probleme de ordin etic privitoare la Inteligența Artificială, analizate în Parlamentul European” (27 March 2019), <https://basilica.ro/probleme-de-ordin-etice-privitoare-la-inteligența-artificială-analizate-in-parlamentul-european/> (accessed 20 September 2024).

50 European Commission, Directorate-General for Communications Networks, Content and Technology, “Ethics guidelines for trustworthy AI,” Publications Office, 2019, <https://data.europa.eu/doi/10.2759/346720> (accessed 25 September 2024).

51 “Vindication of the Office of the Church of Greece in the EU for Artificial Intelligence” (11 April 2019), <https://orthodoxtimes.com/vindication-of-the-office-of-the-church-of-greece-in-the-eu-for-artificial-intelligence/> (accessed 15 July 2024).

to the website of the European AI Alliance, a couple of months later.⁵² This statement outlines criteria meant to secure the development of trustworthy AI systems. In summary, these are: Societal control should be exercised so that AI development does not give power to the few over the many; AI should be conditioned to respect local features, in tune with the European principle of unity in diversity; the European Commission should establish a legally binding framework able to protect human dignity against irresponsible AI development; consideration should be given to stopping the development of AI systems interfaced with humans, or “human-machine” hybrids; the exclusion of machines from the protection of any European bill of individual rights and of any possible confusion between people and AI; a principle of “self-restraint” should guide research and application of AI technologies, so that a safe and equitable future is secured for humankind.

These criteria—seasoned with scriptural references—are valid, of course, but they do not represent a specifically Orthodox position. Only “self-restraint” might allude to the Orthodox ethos, namely, its ascetic side, though not exclusively, as it can be found in other spiritual traditions too. In making reference to it, Lekkas meant to illustrate a holistic worldview that parts ways with the nineteenth-century utopia of unbridled progress and the twentieth-century secular dogma of individualist autonomy. But his approach echoes the criticisms levelled by many modern thinkers, including of the secular kind, at positivism, scientism, and the economic rationale that dominate Western culture, from the end of WWII to date.

Moreover, his criteria diverge from the official ecclesiastical narrative regarding the autonomy of scientific progress and technological innovation. True, the Holy and Great Council pointed out

52 “The Principle of Self-Restraint as a Precondition of Trustworthy Artificial Intelligence” (21 June 2019), <https://ec.europa.eu/futurium/en/european-ai-alliance/principle-self-restraint-precondition-trustworthy-artificial-intelligence.html> (accessed 15 July 2024). See also “Statement of the Office of the Church of Greece to the EU for Artificial Intelligence” (21 June 2019), <https://orthodoxtimes.com/statement-of-the-office-of-the-church-of-greece-to-the-eu-for-artificial-intelligence/> (accessed 15 July 2024).

the need of ethical oversight for certain areas of research, but what Lekkas demands is a stringent ethical, legal, and political control that does not allow for nuances, nor does it match the church's pastoral approach. Once again, his statements echo the Russian Orthodox attitude to technology, together with the "apocalyptic" fears discussed earlier. He supports this stance, deftly, by evoking the scriptural test of the Tree of Knowledge as a warning that unrestrained development of AI can lead to ruin.⁵³ It can lead, he clarifies, to the discrimination of the "sophisticated human-machines" against natural humans, with the latter undoubtedly having to face the possibility of sharing in "the fate of the native peoples of Australia and America" subjugated by white colonialism. This wisdom lesson is undoubtedly useful, but the criteria and the demands of Lekkas contradict the moderate nature of the conciliar position. Furthermore, they convey nothing specifically Orthodox about AI.

The interest of the Church of Greece in IT and AI has increased. According to a media report, the announced agenda for the third ordinary meeting of its Holy Synod for 2019 (8–11 October) included relevant items.⁵⁴ Thus,

The topic of digital technology will ... be at the forefront, and its implications for the role and mission of the Church will be discussed by Metropolitan Maximos of Ioannina, while Metropolitan Nikolaos of Mesogaia and Lavreotiki will refer to artificial intelligence and its challenges.

53 For a similar approach, more recently, see the response of Marius Dorobantu to a talk of Ted Peters: "Robotics, Artificial Intelligence, & Transhumanism: Can Technology Enhance the *Imago Dei*?" (26 May 2023), the Sydney College of Divinity's Theology Research Network and ISCAST's seminar series "Religiously Human in a Techno-Scientific World: Theological, Missional, and Pastoral Perspectives," available at <https://www.youtube.com/watch?v=LfjQuYtAgFk&t=4440s> (accessed 28 May 2025).

54 "The Agenda of the Holy Synod of the Hierarchy of the Greek Church," *Orthodox Times* (4 October 2019), <https://orthodoxtimes.com/the-agenda-of-the-holy-synod-of-the-hierarchy-of-the-greek-church-meets-on-tuesday/> (accessed 20 March 2024).

At that meeting, as another report of *Orthodox Times* informs us, the two hierarchs did address the announced items.⁵⁵ Thus, Metropolitan Maximos pointed out that Orthodox Christianity is not an archaic and phobic religion that rejects enquiry, research, and progress. On the contrary, its wisdom, accumulated through the ages, shows the importance of being attuned to the times—including technological advancements—for developing an effective mission. The church itself was often at the forefront of innovation and progress. Clear echoes of the conciliar statements are discernible here. The report further mentions the debate that ensued, with Archbishop Ieronymos of Athens emphasizing the importance of distinguishing between the right use and the misuse of technology. The report continues with a very brief reference to Metropolitan Nikolaos' address on AI, and concludes by mentioning the discussion that followed, with many voices pointing out that Orthodox theology must address the implications of AI and technological advancements more broadly. The church, the report affirms, “assesses, accepts, and implements all modern scientific achievements in the interest of the people.”

Details about the intervention of Metropolitan Nikolaos are available elsewhere.⁵⁶ The report shows that the speaker referred to the “challenges posed by artificial intelligence,” decrying the use of technology for self-aggrandisement within our culture. More specifically, he alerted the audience of the fact that, sometimes, contemporary technological advancements serve an atheistic agenda, namely, replacing God by human ingenuity. The same goes for AI research. In harmony with the official documents discussed in the foregoing, the Metropolitan pointed out that the issue for Orthodox Christians is not

55 “Digital technology and artificial intelligence on the Agenda of today's Hierarchy meeting,” *Orthodox Times* (10 October 2019), <https://orthodoxtimes.com/digital-technology-and-artificial-intelligence-on-the-agenda-of-todays-hierarchy-meeting/> (accessed 20 March 2024).

56 “Ο κόσμος δεν διψά για Τεχνητή Ευφυΐα, αλλά για κατά Θεόν σοφία” (The world is not hungry for Artificial Intelligence, but for divine wisdom), *Orthodoxia News Agency* (10 October 2019), <https://www.orthodoxianewsagency.gr/epikairota/o-kosmos-den-dipsa-gia-texniti-eyfyia-alla-gia-kata-theon-sofia/> (accessed 20 March 2024).

the development of AI systems; it is the ideological claim that people can attain omniscience through scientific research and omnipotence through technology. He further mentioned that AI has wide applicability, sometimes of a vital nature, but with the public having to be vigilant about its use for human enhancement—from gene-editing to technologies that alter nature and gender. Regardless, the Metropolitan ended, the church neither fears nor rejects science and technology; instead, it values the contribution of scientific and technological advancements to increasing the quality of life.

We bring this section to a close by returning to the statement of Archbishop Anastasios, mentioned in the previous section.⁵⁷ The statement mentions the fact that “artificial intelligence augments the possibilities of the intellect,” taken to be a worthy contribution. However, it continues, “the human being is not only an intellectual entity. Artificial intelligence will never replace love.” As the report quoted here summarises the Archbishop’s words, it is difficult to infer what prompted the last point. However, his nuanced stance is important, emphasising the significance of technological advancements as well as the need to draw a line between human and machine.

In summary, the above ecclesiastical positions on AI and IT take stock of the recent emergence of systems that, presumably, threaten human integrity and ethical values. While the circumstantial character of these positions is understandable—especially the worries that transpire at times—they also highlight, once more, the precariousness of the Orthodox conciliar framework, with the stances considered just above largely ignoring the Holy and Great Council’s moderate views. In part, they also betray lack of sound information and, for that reason, a tendency to surrender to the tides of popular opinion.

Conferences, Seminars, and Workshops

The above conclusions bring to light the importance of robust discussion among Orthodox scholars, as a prerequisite for informed official

57 “Orthodox Views” (15 November 2020).

and hierarchical positions. Fortunately, grounded and lucid opinions are not absent; the same goes for open debates. It is to these opinions that we now turn.

One of the earliest academic approaches to AI in the wake of recent developments is a paper by Marius Dorobantu. Delivered for the first conference of the International Orthodox Theological Association (IOTA; Iași, Romania; 9–12 January 2019),⁵⁸ the paper provides an expert update on AI research and shows realistically that, in time, the difference between human consciousness and machine intelligence will decrease. Dorobantu asks whether Orthodox theological anthropology is prepared to tackle the possibility of machine intelligence comparable to human consciousness. He believes that the current ontological interpretation of *imago Dei* makes the Orthodox approach to AI difficult. He proposes that the “image of God” should be rendered in functional or vocational terms, not ontological. Such an interpretation would tell us more about human nature and, at the same time, would give theologians the opportunity of perceiving “strong AI” as an ally, not as humanity’s foe.⁵⁹ The implication is, we assume, that a functional definition of the “image of God” might be applied, down the track of technological evolution, to human creations, especially AI. This trailblazing paper was soon followed by other undertakings.

Of note is the initiative of the “Evangelistria” parish of Piraeus, Greece, which, in 2020, and in cooperation with the Piraeus Association of Scientists, organised a series of seminars on AI. Thus, a workshop took place in February, “Artificial Intelligence and Governance,” with

58 Marius Dorobantu, “Strong Artificial Intelligence and Orthodox Theological Anthropology: Challenging the Concept of *Imago Dei*,” audio recording published on 22 April 2019, https://www.ancientfaith.com/specials/iota/44_strong_artificial_intelligence_and_orthodox_theological_anthropology (accessed 20 October 2023). Unfortunately, as we were preparing the article for publication, we noticed that this page does no longer exist.

59 See also Dorobantu, “*Imago Dei* in the Age of Artificial Intelligence,” 179–193, as well as his recent article, “A for Artificial, but Also Alien: Why AI’s Virtues Will Be Different from Ours,” *Christian Perspectives on Science and Technology*, NS, 3, Special Issue: “Artificial and Spiritual Intelligence” (2024): 160–182.

Sergios Theodoridis as presenter. According to a report,⁶⁰ the speaker refuted the myth of machine intelligence able to surpass and supplant its creators. He pointed out that, at this stage, AI systems make predictions based on acquired knowledge that they process due to algorithms written by programmers. In short, machine intelligence is statistical, not creative, drawing on the available data that it accesses at a super-human speed. The closest analogue to machine intelligence is animal intelligence, which also works by association and cannot “generate concepts and ideas.” What is problematic, therefore, is not machine intelligence; it is the tendency of certain milieus to reduce human complexity—with its aptitude for “creativity and imagination”—to statistical thinking and algorithms. After asserting that the current panic in regard to AI is unwarranted, Professor Theodoridis ended by expressing confidence in the capacity of “open and free societies to learn from their mistakes, discuss, redefine their goals, and create their future.” The seminar series ended in June, with contributions from Michalis Bletsas, Isidoros Pahoundakis, Efstratios Spyrou, and Athena Tokatlidou. Professor Bletsas, for example, emphasised “the need for current and correct information about this important technological tool [that is, AI] and its multifaceted potential.”⁶¹

The “Evangelistria” parish returned to the topic of AI by organising a conversation between Elias Liamis and Sergios Theodoridis (11 October 2021).⁶² The report mentions Professor Theodoridis’ reiteration that, currently, AI does not match human cognition, regard-

60 See “Τεχνητή Νοημοσύνη: Το Τέλος της Εποχής του Ανθρώπου” (“Artificial Intelligence: the End of the Age of Man?”) *Orthodoxia News Agency* (11 February 2020), <https://www.orthodoxianewsagency.gr/enories/texniti-noimosyni-to-telos-tis-epoxis-tou-anthropou/> (accessed 20 September 2024).

61 “Ο Καθηγητής Μιχάλης Μπλέτσας (MIT) για την Τεχνητή Νοημοσύνη” (Professor Michalis Bletsas (MIT) on Artificial Intelligence, *Orthodoxia News Agency* (18 June 2020), <https://www.orthodoxianewsagency.gr/enories/o-kathigitis-mixalis-mpletsas-mit-gia-tin-texniti-noimosyni/> (accessed 20 September 2024).

62 “Τεχνητή νοημοσύνη: Ένα εργαλείο στην υπηρεσία του ανθρώπου και των αναγκών του” (Artificial Intelligence: A Tool in the Service of Humankind and Its Needs), *Orthodoxia News Agency* (13 October 2021), <https://www.orthodoxianewsagency.gr/enories/texniti-noimosyni-ena-ergaleio-stin-ypiresia-tou-anthropou-kai-ton-anagkon-tou/> (accessed 20 September 2024).

less of how proficient it is at gathering data. So far, machine intelligence falls short of the creative and emotional capabilities pertaining to the human psyche. A human being is capable of “social feelings, solidarity, and love,” while AI is a “useful tool,” and a morally neutral one at that, which should not be feared. People should be mindful, however, of the possibility of misusing AI for destructive purposes and the push to reduce human complexity to machine algorithms.

Another noteworthy event, held on 14 February 2020, was the ninth youth conference of the Metropolis of Mesogaia and Lavreotiki, Greece, which addressed “Artificial Intelligence and Intelligent Teenagers.” The speakers at this full day event were Metropolitan Nikolaos and three experts, George Giannakopoulos, Evangelos Gongolidis, and Emmanuel Laskaridis, who debated the *status quaestionis* in AI and related ethical issues.⁶³

Then, in June that year the webinar “Artificial Intelligence and Orthodox Theology: First Investigations” was held,⁶⁴ being organised by the Facebook group “Cosmology and Theology—Science and Religion.”⁶⁵ On that occasion, George Giannakopoulos and Stavros Yangazoglou introduced AI and Orthodox anthropology, respectively, whereas Alexandros Batalias undertook to bridge the two fields. The speakers discussed the possibility of deepening our understanding of human nature by examining AI, as well as nuancing the current perception of AI from the viewpoint of theological anthropology. However, as

63 “9ο Νεανικό Συνέδριο: Τεχνητή Νοημοσύνη και Νοήμονες Έφηβοι,” *Orthodoxia News Agency* (4 February 2020), <https://www.orthodoxianewsagency.gr/νέοι-και-εκκλησία/9ο-neaniko-synedrio-texniti-noimosymi-kai-noimones-efivoi/> (accessed 20 July 2025).

64 The video recorded talks are available on YouTube at the following addresses: G. Giannakopoulos’s intervention at <https://www.youtube.com/watch?v=zkoj3toywqQ>; Stavros Yangazoglou’s intervention at <https://www.youtube.com/watch?v=AftNo12BzUc>; the round table at <https://www.youtube.com/watch?v=KnKACLMvVJM> (accessed 20 July 2025).

65 “Διαδικτυακή Ημερίδα: Τεχνητή Νοημοσύνη και Ορθόδοξη Θεολογία: Πρώτες Διερευνήσεις” (Online Workshop: Artificial Intelligence and Orthodox Theology: First Investigations; 15 June 2020), <https://www.pemptousia.gr/2020/06/diadiktiaki-imerida-techniti-noimosini-ke-orthodoxi-theologia-protess-dierevnisis/> (accessed 20 July 2025).

Professor Yangazoglou stated, despite any similarities that might be traced between human and artificial intelligence, human experiences are characterised by a free and loving relationship with God, while AI is conditioned by humans, its creators.

The nuanced positions of the expert speakers that contributed to these events—of which some have been ecclesiastically approved—contrast with the alarmist views discussed in the previous section and the conspiracist voices presented earlier. The only ecclesiastically sanctioned academic event that expressed unequivocal pessimism, that we know of, was the roundtable on AI and Christian ethics held in August 2021, in Petropavlovsk-Kamchatsky (Russia).⁶⁶ There, Moscow Patriarchate’s representative Alexander Volkov restated the opposition of his church to a “science that seeks to be completely devoid of moral principles.” He also put forward that “every human development must include a religious dimension.” What would motivate this ecclesiastical rejection of scientific autonomy is the fact that “the church is not indifferent to the future of humanity”; in the name of that future, the church is entitled to oppose research that contradicts religion, he continued. No wonder his conclusion that the church must make sure that AI research does not lead to humanity’s downfall. The speaker’s views are not new; they originate in the Russian Orthodox Church’s “Basis.”⁶⁷

Apart from this exception, Orthodox symposia and workshops on AI continued to display a nuanced attitude. Thus, on 28 January 2023, the Orthodox Academy of Crete organised an online event in honour of the Holy Three Hierarchs, saintly protectors of education.⁶⁸

66 “Ορθοδοξία—Επιστήμη—Ηθική—Τεχνητή Νοημοσύνη” (Orthodoxy, Science, Ethics, and Artificial Intelligence), *Orthodoxia News Agency* (26 August 2021), https://www.orthodoxianewsagency.gr/patriarxeia/patriarxio_mosxas/orthodoksia-epistimi-ithiki-techniti-noimosyni/ (accessed 20 July 2025).

67 The same ideas are attributed to the Russian Orthodox thinking by Teresa Obolevitch, *The Eastern Christian Tradition in Modern Russian Thought and Beyond*, Contemporary Russian Philosophy 4 (Leiden and Boston: Brill, 2022), 125.

68 “Ορθόδοξη Ακαδημία Κρήτης τίμησε τη μνήμη των Τριών Ιεραρχών” (The Orthodox Academy of Crete honoured the memory of the Three Hierarchs), Orthodox Academy of Crete (31 January 2022), <https://www.oac.gr/el/epikaira/enimerwtika-deltia/i-orthodoxos-akadimia-kritis-timise-ti-mnimi-twn-triwn-ierarxwn-p635.html> (accessed 20 July 2025).

The webinar explored the significance of AI systems for education and research. The speakers mentioned the benefits of technological development, including IT and AI, which contribute to the improvement of life and study. They also highlighted the importance of balance between technological advancement and spiritual criteria in education and everyday life. For example, Professor Vassilis Digalakis encouraged the audience not to fear AI, but to train for using it both safely and creatively. The same holds true for the conference “Artificial Intelligence and Autism” organised by the Greek Ministries for Digital Governance and Health and the Archdiocese of Athens.⁶⁹ The conference took place on 24 February 2023, and acknowledged “the key role of artificial intelligence in the digital transformation of society, including the use of innovative methods in different areas of application, such as diffuse developmental spectrum—autism.” The speakers provided details regarding the successful use of AI for diagnosing autism and for monitoring the wellbeing of persons with autism. This enthusiastic endorsement of AI was reiterated during a meeting of Archbishop Ieronymos of Athens and the two keynote speakers, Professor Konstantinos Daskalakis and Archimandrite Apostolos Kavaliotis, which stirred the conspiracist reaction mentioned earlier in this study.

Should the sound information presented at these events be received by the higher ecclesiastical echelons as well as the grassroots believers, the continuous Orthodox engagement of IT and AI could maintain and further nuance the balanced attitude intimated by the conciliar documents and *For the Life of the World*.

69 “Συνάντηση Αρχιεπισκόπου Αθηνών με τον καθηγητή του MIT Κωνσταντίνο Δασκαλάκη” (Meeting between Archbishop of Athens and MIT Professor Konstantinos Daskalakis), *Orthodoxia Info* (24 February 2023), <https://orthodoxia.info/news/synantisi-archiepiskopoy-athinon-to-2-4/> (accessed 20 July 2025). See also “Τεχνητή Νοημοσύνη και Αυτισμός: Από την έρευνα στην εφαρμογή” (Artificial Intelligence and Autism: from research to application), *Athens-Macedonian News Agency* (February 24, 2023), <https://www.amna.gr/health/article/711113/Techniti-Noimosuni-kai-Autismos-Apo-tin-ereuna-stin-efarmogi> (accessed 20 July 2025).

Conclusions

In the light of the above and at face value, the official and the expert stances of the Orthodox on IT and AI are not homogenous. But the contrast—between voices urging tougher regulation in the field, voices praising the beneficial implementation of AI in the area of health and wellbeing, and other views in between—is not of a fundamental nature. There is a common denominator to most of these informed positions, that is, they encourage research and promote scientific literacy, while they discourage the unethical use of technology. Indeed, their proponents highlight the importance of solid information—not garbled by the transhumanist agenda and dystopian narratives—together with discernment and moderation in the use of technological devices. Notwithstanding the genuine worry of certain hierarchs about digital addiction and the alienation caused by the indiscriminate use of technology, this common denominator is already present in the documents of the Holy and Great Council of the Orthodox Church and in *For the Life of the World*. The framework is in place, therefore, and, as we have briefly seen, is consistent with the historical wisdom of the Orthodox experience, foremost with the patristic tradition and its innumerable examples of scientific engagement, mentioned in the introduction to this study.

What this framework is lacking is practical implementation across the Orthodox churches, especially through catechetical instruction. Without determination to implement this framework, untrained believers and the broader uninformed public will continue to fall victim to the “apocalyptic” narrative and conspiracy theories. And, it seems, not all Orthodox churches are interested in organising relevant catechetical programs for believers—to match the Church of Greece’s initiatives and, to give another example, the national springtime youth camp held at Găbud *skete*, Romania, in May 2022.⁷⁰ The reasons behind

70 Ștefana Totorcea, “Tabăra de primăvară de la Găbud: Tinerii vor dezbate împreună cu invitații lor tema tehnologiei”(Springtime camp at Găbud: Youth will debate the topic of technology with their guests), *Basilica* (March 31, 2022), <https://basilica.ro/tabara-de-primavara-de-la-gabud-tinerii-vor-dezbate->

this reluctance to implement the framework have not been addressed here. It is our opinion, however—based on the sources referenced in the introduction—that these reasons have to do with certain anachronistic drives, of which the best expression is the “Julian” calendar still in use in the Orthodox churches, itself the product of a bygone scientific age. Either way, the proliferation of conspiracist and “apocalyptic” ideas is directly proportional to the lack of interest in scientific literacy within many churches, and to catechetical programmes that ignore the realities of our time.

But the proliferation of conspiracist views can be stymied through implicit forms of catechisation, as well. For example, *Orthodox Times* published in September 2021 the following announcement: “Archdiocese of America: Over \$100,000 worth of technology devices was distributed to the parishes.”⁷¹ According to the report, the items were donated in order to support teaching and learning activities in schools affiliated with the church. Apart from the intrinsic value of this donation, it also constitutes a clear sign that technology can be used well and that the church does not fear it. The same effect can be achieved by other means. Very recently, for instance, the young Orthodox scholar Christopher Howell proved to his university students the limitations of AI through an ingenious exercise, namely, asking them to mark “assignments” produced by ChatGPT.⁷² The results were overwhelming, with students’ confidence being restored upon the realisation that the machine is not infallible. Coming from an Orthodox academic, this lesson is significant and, together with the other worthwhile contributions surveyed above, could contribute—after the fashion of the snowball effect—to the formation of a nuanced Orthodox

impreuna-cu-invitatii-lor-tema-tehnologiei/ (accessed November 25, 2022). The purpose of this camp was to familiarise the youth with the spiritual life, and to provide them with opportunities for discussing the impact of technology on life.

71 <https://orthodoxtimes.com/archdiocese-of-america-over-100000-worth-of-technology-devices-was-distributed-to-the-parishes/> (accessed November 25, 2022).

72 See C. W. Howell, “Don’t Want Students to Rely on ChatGPT? Have Them Use It,” *Wired* (June 6, 2023), available at <https://www.wired.com/story/dont-want-students-to-rely-on-chatgpt-have-them-use-it/> (accessed June 9, 2023).

attitude, informed, confident, and discerning—a positive counterpoint to the damaging conspiracist voices that litter the internet.

The findings of the survey undertaken here corroborate Vassilis Adrahtas' conviction that, in principle, the Orthodox church is equipped for surviving and flourishing in the digital age.⁷³ What can dispel the current confusion and make Orthodoxy's survival and flourishing possible is the integration of the factors discussed above: The rich history of patristic engagement of science and technology, recent conciliar and related documents, up-to-date expert information on science and technology, including IT and AI, theological reflection, and catechetical and pastoral initiatives that include elements of science and faith in the form of science-engaged theology.

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73 Vassilis Adrahtas, "Orthodox Theology Enters the Virtual Age..." *Greek City Times* (February 19, 2023), https://greekcitytimes.com/2023/02/19/orthodox-theology_virtual_age/ (accessed March 15, 2023).

Book Reviews

Loren Wilkinson: *Circles and the Cross: Cosmos, Consciousness, Christ, and the Human Place in Creation*

Eugene, Oregon: Cascade Books, 2023; 324 pages

ISBN 9781666746341, first edition, paperback

Foreword by Peter Harris

AU\$57

Loren Wilkinson is an Emeritus Professor of Regent College, Vancouver. He is a philosopher, an environmentalist, a Christian, is well-read in science, and was one of my teachers when I attended Regent College in the 1980s. This book has been described by one of Wilkinson's colleagues (Iain Provan) as being about "Life, the Universe, and Everything" which is true, but the subtitle gives a better idea of the depth, reach, and purpose of the book. Wilkinson weaves through this book stories from his own journey, beginning in his childhood on a farm in Oregon, in view of the Cascade Mountains.

The notion of "circles and the cross" is an allusion to many things: one is the Celtic cross with its circle around the place where the pieces of wood intersect, being the location of Christ's suffering; a second is Andrei Rublev's icon (1411 or 1425–26) of the Trinity in which the three figures make a circle which the viewer is invited to join.

The book explores three singularities or mysteries: cosmos, consciousness and the cross. Why is there something (cosmos) and not nothing? How is it that humans are conscious, are conscious of consciousness, and are able to reflect on their place in the cosmos? The third mystery is the cross, in which we see the self-giving of the Creator, in death. Bringing these threads together, Wilkinson concludes persuasively, that in the cross there is reason for confidence in the Creator's sustaining and loving of this world and its creatures despite human destructiveness.

Part I is entitled “Being Conscious in the Cosmos.” The second chapter presents some facts that are reason to wonder about the miracle of the origin of life on earth. One example is the great oxygenation holocaust, in which anaerobic organisms, which had produced oxygen by photosynthesis over a billion years, died or were marginalised by an explosion of aerobic life. In a second example, the resonance level of the carbon nucleus is such that helium and beryllium readily combine to generate an abundance of carbon, the essential basic element of life. Carbon can combine with helium to form oxygen, but this is much less favourable because the resonance of the oxygen nucleus is 0.5% too low, meaning that carbon is not depleted by the formation of oxygen and the balance of carbon and oxygen is favourable to life.

Part II addresses “Science: Pleasure, Paradox, and Pain.” People are enticed into science by delight at the natural world (senses, right brain) and so investigate to generate factual knowledge (left brain). In this context, Wilkinson points out that the spirit of St Francis of Assisi of loving openness to other creatures led to empiricism, where the scientist stands under creation rather than imposing understanding. Duns Scotus, a Franciscan, is a further significant figure. God is motivated not by reason but acts willingly out of love (voluntarism), each creature has its own distinctiveness (haecceity or this-ness), each creature is “good” in its own right as identified by God in Genesis 1 (univocity of being), and creation is elevated by the incarnation (primacy of Christ).

But as Wilkinson notes Johannes Kepler’s meticulous observations reduced the motions of the planets to geometric terms and Isaac Newton understood the earth and the cosmos as a machine, thus the world was diminished to a supermarket of commodities to be used and manipulated. While the power of scientific understanding improved the human condition, it wounded the planet.

In Part III, “Corrections, Movements and Visions,” philosophical movements, beginning with the Enlightenment, are explored. The Enlightenment reflects a culture in search of certainty, not only in the physical, but also the psychical, to the exclusion of the divine. Romanticism sought to restore the wonder of creation, as exemplified by the

English Romantic poets. Coleridge, who was one of these, scorned the reductionism of Newton and Locke, stating in the context of his emerging Christian faith that both consciousness and cosmos must be regarded as mysteries understood “in the light of ‘the eternal act of creation in the infinite I AM’” (p. 145).

However, relativity and quantum theories indicated that creation could not be understood simply as a machine, but greater complexity, even spontaneity, was present. Further, the precision of parameters underlying the cosmos and life in it, such as that resulting in the balance of carbon and oxygen, mentioned above, suggests purposefulness. Some have therefore adopted a pantheistic worldview in which the universe has an internal purpose. Awareness of environmental connectedness and the growing environmental crisis have led to a search for a new religion, for as Bron Taylor has stated, quoted by Wilkinson, “traditional religions are ill-suited to face this challenge, as they are ‘generally concerned with transcending this world or obtaining divine rescue from it’” (p. 192).

Within Part IV, “Jesus as Surprising News about the Creator,” in a chapter on the Trinity, Wilkinson quotes John Polkinghorne, physicist and theologian, saying in his Gifford Lectures in 1993 “The proclamation of the One in Three and the Three in One is not a piece of mystical arithmetic, but a summary of data” (p. 241). Here Polkinghorne made a connection between the complexity of the deep structure of physical reality and the deep structure of the one God.

In his final chapters, Wilkinson explores most “surprising news about the Creator,” the kenosis (self-emptying) of God, which prompted creation and redemption, both out of love. The very act of creating beings with true self-will means the power of the omnipotent is limited. If we are genuinely free, we must have the ability to follow our own will, not God’s [and, I add to clarify Wilkinson’s meaning, to do so even when not in disobedience]. Without denying the forensic purpose of Jesus’s crucifixion, he suggests, quoting Richard Rohr who cites Duns Scotus, that it was “‘a pure and gracious declaration of the primordial truth’” (p. 264). In support of this view, I cite Revelation 13:8 (NIV [2011]), which

refers to “the Lamb who was slain from the creation of the world.” Or is it the names that were written in the book of life before the creation of the world (see NIV footnote)? I question whether Christ’s death was necessary without sin, but I can understand the incarnation being intrinsic to the nature of God and his relationship to creation.

With regard to kenosis in creation, Wilkinson quotes Katherine Sonderegger who states “He is content to hold the cosmos in being yet not be an element within it” (p. 269), meaning we cannot detect gaps requiring the hypothesis of God, either in the process of evolution or God’s upholding of all things. I add that, similarly, in history and in individual lives, God most often works out his purposes using human agents and natural processes.

Drawing on Gerard Manley Hopkins’s notion of “selving,” that is being oneself (intransitive) or contributing to the selfhood of others (transitive), he notes that our intransitive selving is always costly to others, even without sin, since for example to eat is to consume other creatures. I wonder, therefore, would it have been possible for a population of eight billion humans without sin to thrive without being destructive of this planet? In contrast, God’s selving is always transitive as well as intransitive. We humans can choose transitive selving of other humans and other creatures.

The conclusion describes the triptych, by the Australian Lindsay Farrell, which graces the cover of the book and depicts the central message of the book: that despite our destruction of ecosystems and global warming “creation is ‘safe’ ... because the same [as in creating] loving creativity is ever exercised upon it” (p. 273). The left panel of the triptych depicts an island topped by rugged green trees with the snow-capped Cascades in the distance and the skyline of Vancouver just discernible. The centre is of the same island after clear felling, covered by a tangle of tree debris. The right panel is of a lake surrounded by rocks and seen from above. Further inspection reveals outstretched arms across the top of the left and right panels, with the centre panel being of a thorn-crowned head and the right panel an empty tomb with a stone bench.

This is a book born of deep thinking drawing on an extremely broad range of sources. It took me going over the book a second time to catch the trajectory of the book, in terms of the birth of science, the mechanistic understanding of creation, the desire to remove God's place in our thinking, the intimations of spontaneity in quantum theory and of purpose in the precision of fundamental parameters, the search for religion in the twentieth century, and the centrality of the incarnation, crucifixion, and resurrection of Christ in giving meaning and purpose to the cosmos and each of our lives. The book is easy to read for those with some background in the topics covered, but less easy to comprehend, in the sense of grasping the whole. It is very much worth the effort.

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Carmody Grey: *Theology, Science and Life*

United Kingdom: T & T Clark, 2024; 270 pages

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AU\$60

In *Theology, Science and Life*, Carmody Grey, assistant professor of Catholic theology at Durham University, argues that a strong division between theology and science is unsustainable. She applies this idea to the study of biology.

Grey argues that theology should guide all areas of knowledge, not just be treated as another academic subject. She challenges the idea that reason and faith should be separate, insisting that theology should influence how we understand everything.

Grey supports John Milbank's view that Christian theology is unique in promoting peaceful differences, unlike secular thinking, which often sees differences as sources of conflict. She also discusses Michael Hanby's ideas, stating that science is not separate from theology and that modern biology often overlooks the deeper meaning of life.

Grey proposes a way of thinking about biology that sees life as deeply meaningful and connected to the divine. She draws on German-born Jewish philosopher Hans Jonas to suggest that a Christian approach can offer a richer understanding of life by combining insights from both science and theology.

Refusing Confinement: The Nature of Theology

In her first chapter, Grey argues that theology should be an all-encompassing intellectual framework that shapes our understanding of reality, rather than merely another academic discipline. She challenges the modern idea of autonomous, secular reason by arguing that all reason is inherently theological, illuminated by the divine *logos* and rooted in the knowledge of God. Theology should not be compartmentalised but must inform and critique all areas of knowledge and existence, challenging the so-called Enlightenment's separation of reason and faith.

Grey's metaphysical stance emphasises that all creatures inherently participate in the divine, removing any separation between the divine and the created order, both cognitively and ontologically. She blurs the line between transcendence and immanence, proposing that all human knowledge of God is mediated through creation, making theology relevant to every aspect of human enquiry.

Grey critiques modern social theory, which claims to explain society purely in natural terms, marginalising theology. She contends that no discipline can be neutral or separate from theological insight, and criticises modern theology for its "false humility," where it accepts a secondary role to other disciplines. She believes theology should

act as a meta-discourse that critiques and qualifies other fields of knowledge.

Theological Reason: The Story of Peace

In her next chapter, Grey explores theological reason as an alternative to secular reason, highlighting Christianity's narrative of creation, redemption, and sanctification. She uses theologian John Milbank's ideas to show how this narrative promotes peaceful understanding of differences, unlike secular rationality, which often frames difference in terms of conflict.

Milbank argues that the Christian narrative is uniquely capable of mediating differences without resorting to violence, proposing that ultimate reality is fundamentally peaceful. He compares Christianity's peaceful beginning, marked by creation and grace, with Nietzsche's view of violence and power as the origin. For Milbank, this foundational peace enables a truly peaceful society, as seen in Christian practices.

Grey further elaborates on how Milbank positions Christian theology as a "master discourse" not in terms of domination but in its unique ability to sustain peaceful difference. Theology is seen here as a meta-narrative that can embrace all stories without reducing them to violent competition. This peaceful mastery aligns with the Christian belief in a harmonious creation and ultimate redemption.

Theology Alone is Science: Assessing Milbank

In Chapter 3, Grey expands on Milbank's argument that theology holds a primary and unique position among the sciences. She revisits and refines Milbank's ideas, especially in relation to biology, emphasising that theology should not eradicate other disciplines but instead disrupt and "make strange" other discourses, enhancing their distinctiveness while preserving their integrity.

Milbank and Grey's theological positions show similarities to Wolfhart Pannenberg, though they do not acknowledge his influence. This is a shame. Their approach, which focuses on theological critique and transformation of all knowledge, often neglects empirical and historical methods, making it less accessible and defensible in scientific contexts.

Pannenberg's emphasis on the historical nature of revelation and the integration of theology with science and philosophy addresses this gap. He provides a framework where theological claims are subject to historical and rational analysis, making his approach more relevant for interdisciplinary dialogues and for those who value empirical substantiation.

Despite thematic similarities, Grey and Milbank do not acknowledge Pannenberg as an influence. They instead draw on other theologians and philosophers like Maurice Blondel, who emphasises the ubiquity of cultural and linguistic mediation, and the *nouvelle théologie's* view of nature as always graced.

Milbank and Grey's theology, while rich and transformative, is less accessible and empirically grounded compared with Pannenberg's framework. Pannenberg's focus on historical verification and rational coherence makes his theology more practical and interdisciplinary. Each approach has its strengths, but the shortcomings of Milbank and Grey highlight the challenges of integrating their rich theological vision with the demands of empirical and rational discourse.

Legitima Autonomia? Defining Theology's Mastery

In the next chapter, Grey examines the relationship between theology and the sciences, focusing on Michael Hanby's work. The chapter compares Milbank's and Hanby's approaches, suggesting that Milbank's method can resolve issues Hanby raises. Grey argues that Milbank's idea of theology's "mastery" over the sciences is not inherently hostile but seeks to manage differences between them.

Grey critiques Hanby's defence of a universal objectivity of reason and a genuine autonomy of the sciences. Milbank's approach, on the other hand, views theology as the sole adequate manager of peaceful differences among disciplines. She notes that Milbank's dedication to rescuing theology may neglect the distinct differences of the scientific disciplines, focusing instead on theology's disruptive role. The chapter explores how theology can engage with sciences like biology without displacing them.

In *No God, No Science*, Hanby argues that modern science relies on theological and metaphysical foundations and cannot be fully separate from theology. He supports the idea that while sciences are autonomous, they are underpinned by a doctrine of creation. Hanby believes that dividing theology and science is a false dichotomy and that understanding the natural world requires theological perspectives.

Hanby argues that modern biology is influenced by hidden (unorthodox) theologies and needs theological critique to reveal these assumptions. While his view aligns with Milbank's approach, Hanby emphasises the doctrine of creation and defends the rationality of the natural order as a reflection of divine creation.

Grey contrasts Hanby's and Milbank's views to protect the uniqueness of disciplines without granting them extra-theological status. However, she might be overly idealistic about Milbank's ability to reconcile differences in scientific discourse. More concrete examples are needed to show how this peaceful difference can be practically achieved.

Theology and Biology: The Meaning of "Life"

In Chapter 5, Grey presents her "theology of biology," arguing that "knowing life is knowing God, and knowing God is knowing life." She argues that theology must both engage with the world's mediation of God and interrogate all forms of knowledge through its narrative of peace. This involves viewing organic life as a theological object and integrating it with other disciplines while addressing any conflict.

The chapter suggests two moments in theology's engagement with scientific knowledge of life. First, it highlights the gap between scientific and Christian understandings, noting how science often reduces life to mere mechanics, stripping it of intrinsic meaning and purpose, while theology views life as divinely purposeful and meaningful.

This moment of discontinuity "make life strange" by contrasting reductionist scientific views with theology's rich, purposeful narrative. Grey argues that theology should critique and reframe scientific accounts to reveal deeper, divine dimensions of life, challenging the notion that life can be fully explained by science alone.

The second moment sees scientific knowledge as a participatory act in God's ongoing creative act, making it inherently theological. Grey argues that science is not just objective observation but an engagement with divine reality, suggesting that scientific discoveries are not merely human achievements but reflect the divine mind and fit into a broader theological narrative. This view promotes a harmonious relationship between theology and science, seeing them as complementary in understanding life and creation.

Grey draws on Hans Jonas's existential and phenomenological approach to biology, which emphasises that life's purposefulness and meaningfulness cannot be fully understood through reductionist scientific methods. Jonas argues that living organisms exhibit an inherent vitality beyond physical or chemical processes. Grey uses this idea to challenge reductionist biology, suggesting that this vitality reflects a divine reality. According to her, life, as seen through Jonas's perspective, participates in a greater divine creative act, aligning with her theological view that all life manifests God's creativity.

Hans Jonas and the Testimony of Life

In Chapter 6, Grey looks more closely at Jonas's philosophical biology, highlighting his focus on the living body. She explains how Jonas uses Darwinism and metabolism to challenge purely immanent

interpretations of biology. His approach is presented as a critique and a continuation of theological narratives, stressing that without a Christian perspective, life remains defined by conflict, suffering, and death.

Grey highlights Jonas's work as implicitly theological, challenging Enlightenment views by focusing on desire, temporality, and embodiment. Jonas critiques metaphysical dualism and its monistic offspring, using both negative and positive reasoning to expose inadequacies and demonstrate life's inherent transcendence. Jonas uses Darwinism and metabolism to rehabilitate teleology, asserting that life's freedom, inwardness, and purpose are inherent in organic life.

Additionally, Jonas critiques modernity's dualistic metaphysics, linking it to nihilism and the estrangement between humanity and nature. He argues for reintegrating human and non-human life, promoting a "cosmic piety" that acknowledges the kinship between all forms of life. Grey presents Jonas's work as a significant contribution to theological discussions, bridging philosophical and theological perspectives.

Life After All: A Theological Vitalism

In Chapter 7, Grey applies Jonas's philosophical biology to a Christian theological vitalism, emphasising life as a continuous, self-assertive process, inherently opposed to secular nihilism. She critiques Jonas's vitalism, seeking to develop a more robust theological vitalism that addresses the realities of death and conflict.

Grey argues that biological facts are inherently linked to psychic phenomena, suggesting that life itself bears witness against secular reason. She proposes that life's intrinsic properties, viewed as theological testimonies, offer a more comprehensive understanding that integrates both scientific and theological perspectives, providing a deeper narrative of life's complexities and conflicts.

Strengths, Weaknesses, and Challenges

Overall, this book is an ambitious and thought-provoking work that seeks to bridge the gap between scientific and theological understandings of life. Grey's deep engagement with philosophical biology, particularly through the lens of Hans Jonas, allows her to construct a nuanced and robust theological framework that critiques and builds upon existing scientific narratives.

One of the book's strengths is its interdisciplinary approach. Grey does not shy away from complex scientific concepts, instead embracing them to enrich her theological arguments. Her thorough examination of Jonas's vitalism and its implications for understanding life, freedom, and purpose provides a solid foundation for her own theological propositions. By intertwining biological facts with theological narratives, Grey offers a fresh perspective that challenges reductive explanations and highlights the inherent transcendence and purposiveness of life.

However, the book is not without its challenges. Grey's dense and highly intellectual writing style may be difficult for some readers to fully engage with. Her deep analysis and wide-ranging references require careful and attentive reading. Additionally, while Grey's arguments are compelling, some readers may find her theological assertions to be somewhat interpretive, especially when integrating Jonas's philosophical biology into a Christian framework.

Nevertheless, this book is essential reading for those interested in the intersections of these fields and for anyone seeking to explore the deeper implications of life and its metaphysical dimensions.

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February 2025

**Calum MacKellar and Trevor Stammers (eds.):
*The Ethics of Generating Posthumans:
 Philosophical and Theological Reflections
 on Bringing New Persons into Existence***

London: Bloomsbury Academic, 2023; 246 pages

ISBN 9781350216587, first edition, paperback

AU\$60

In this ambitious collection of essays, editors Calum MacKellar (Director of Research of the Scottish Council on Human Bioethics) and Trevor Stammers (at the time of publishing, editor of *The New Bioethics*) bring together a range of philosophical and religious perspectives on their central questions: would it ever be ethical to bring posthuman persons into existence; and if so, what would be the necessary conditions for the *ethical* production of such persons? The essays all clearly focus on the generation of posthuman persons (rather than a more diffuse and generalised discussion of trans- and posthumanism). As such it proves to be a useful addition to the rapidly growing literature in the field that will be of interest to those who wish to bring Christianity and science into fruitful conversation.

The book consists of an introduction, followed by five themed sections and a conclusion.

The Introduction does what a good introduction ought to do: it seeks to define and locate transhumanism and posthumanism (from hereon, H+) as philosophies and movements conceptually and historically, and helpfully outlines the structure and contents of the book.

Part I, “Who is a transhuman and posthuman person?”, addresses fundamental philosophical questions relating to the notion of personhood and its application to transhuman and posthuman beings. The four pieces range from a survey of the history of the notion of “person” (Fuchs), through an affirmation of the personhood of trans/posthumans from a Thomistic/Aristotelean perspective (Playford), through Taylor’s understanding of the ways that humans can express agency

under or *through* technology and the difficulties raised for the H+ agenda (Parker), to Hölzchen's application of the Kantian categorical imperative to the issue.

Part II, "How can transhuman and posthuman persons be generated?," consists of an essay by Wilmott that (as the title suggests) surveys the technologies that might be deployed in the H+ project.

Part III, "Philosophical aspects in generating transhuman and posthuman persons", turns explicitly to conceptual issues relating to generating H+ beings. Eglington opens by suggesting that H+ has more in common with Nietzsche's notion of the *Übermensch* than Christian notions of the inherent vulnerability of persons before James suggests more positive perspectives in light of a nuanced application of Heidegger's theory of technology. Stammers' piece closes this section by arguing that, whatever the moral status of an *intelligent* machine (whatever we mean by that), its producers would be morally accountable for any evils it produces.

Part IV, "Theological aspects in generating transhuman and posthuman persons", presents three "Abrahamic" religious viewpoints: Blausten's Jewish perspective focuses on the tradition of the *golem* in rabbinic thought and its relativising of the status of the product versus its producer (more on which below). Wee's (Christian) Thomistic argument is sharply critical of the H+ project, whereas Suleman suggests that Islamic tradition does not see the generation of novel beings as "playing God" in an inappropriate way. She does, however, suggest that a radically *independent* being would be deeply problematic, given the importance of a recognition of, and submission to, dependence on God in Islam (as well as Islam's concern for the interdependence of humans in community).

Part V, "Ethical aspects in generating transhuman and posthuman persons", considers the relevant ethical questions from two contrasting points of view. MacKellar's piece focuses on "generation," contrasting manufacturing (in the case of H+ beings) with procreation (drawing on a particular theological account of the generation of children in the context of a committed marriage). In contrast, Wright adopts a "first

person” point of view, asking how a H+ being might see themselves, especially in light of the “genealogical bewilderment” experienced by adopted children and those born using donated gametes.

The conclusion seeks to bring this together. While it seeks to review the various perspectives articulated in the essays, it ends by questioning the possibility of *ethically* generating H+ persons.

As can be seen from this brief synopsis, this is a wide-ranging book that will reward close reading. It is also impossible to do it justice in a review of this kind, so let me make three comments that might whet readers’ appetites (and stimulate debate with the book).

First, it should be noted that the theological perspectives are drawn from the three monotheistic “Abrahamic” religions, Christianity, Judaism, and Islam, with a heavy preponderance of the first. While that is acknowledged by the editors, and fits with the interests of most readers of this journal, this does leave significant gaps in the discussion. It also struck me that broadly conservative Christian perspectives dominate the discussion (especially those from a Thomistic/ natural law tradition). It would have been useful to include an essay (or two) from those who are more open to H+ interests, including, perhaps, a Christian transhumanist. While I find Christian transhumanist arguments unpersuasive, they have a place in a book of this kind.

Second, I was pleased to see a number of pieces consider the importance of the motivations and character of those who generate such persons (a theme that does not always get the attention it deserves). I was fascinated by Blausten’s exploration of Jewish traditions of the *golem*. If only a truly righteous person could create a golem, this raises the question: given the milieu in which H+ is imagined, can we imagine that a truly righteous person would be motivated to generate a post-human person? What could possibly be a *righteous* motivation for such an enterprise (for surely mere utility would not suffice)? Similar questions are also present in Stammer’s piece on moral responsibility, if from a very different perspective. His piece raises important questions about the possibility of a “moral Turing test.” If a machine generates responses that are indistinguishable from those a person would make,

must we grant it the equivalent personal (and moral) status? As Searle pointed out in his famous “Chinese room” thought experiment (<https://plato.stanford.edu/entries/chinese-room/>), the question of whether there is any “interiority” going on inside the black box that generates an apparently personal (and we might add, moral) response, is fundamental not incidental to the philosophical status of the entity making that response. While an H+ entity may *simulate* personal and moral qualities, without some kind of understanding (an interior experience as a *subject* of some kind) it cannot *exemplify* them.

Finally, and related to this last set of questions, is Wright’s concern with the *experience* of H+ beings. That properly *subjective* first-person point of view is quite illuminating. So, too, is her suggestion that a key ethical question in play is whether H+ beings would experience unconditional love and respect. My suspicion is that they may well not. This is a serious concern given that neither this question nor that related to the motivations of those who might generate H+ persons seem to attract much attention in the H+ literature.

Overall, this book is worth adding to your reading list if you are interested in H+ and the possibility of H+ persons. It may not be the first book you turn to, but questions relating to their nature and (theological and moral) status are both interesting and intrinsically important, and so worth the attention of people (like readers of this journal) who wish to explore the intersections of science and faith.

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March 2025

Matthew Nelson Hill: *Embracing Evolution: How Understanding Science Can Strengthen Your Christian Life*

Downers Grove, Illinois: IVP Academic, 2020; 156 pages
 ISBN 9780830852833, first edition, paperback
 Foreword by J. Richard Middleton
 AU\$31

Hill has written a book which is accessible and chatty in style to persuade the general Christian reader that, rather than there being reason to fear accepting that humans have developed from a process of evolution, there is instead much to be gained for the pursuit of holiness from understanding our roots.

After explaining his objectives in Chapter 1, his next chapter is entitled “Reading Scripture Faithfully” and he draws on what is called in the Wesleyan tradition, “the quadrilateral” of Scripture, church tradition, reason, and personal experience with God. For those who might have reservations about the role of traditions, he points out that major church doctrines such as the Trinity, and the dual divine and human nature of Christ, were thrashed out in ecumenical councils. He addresses the question of mode of interpretation, literal or otherwise, and cites Augustine (and later in the book Irenaeus, Basil the Great, Origen, and others) as an early Christian theologian with a non-literal interpretation of Genesis 1–3. He asserts that Scripture, including Genesis 1–3, is to be read for formation not information.

In Chapter 3, “Adam and Eve, the Fall, Predation, and Death,” Hill admits to some uneasiness around the suffering and destruction which the evolutionary process has involved and is ongoing in the world today. However, “death is ... a *necessary* ingredient for life. In the great chain of existence, if organisms don’t die then life cannot spring forth” (p. 40). Furthermore, Christ’s death brings life, and his resurrection was only possible because he died. In this same chapter he claims that many biologists believe that humans have a single male ancestor.

It is my understanding that genetic evidence indicates that the original humans were a population of tens of thousands (see BioLogos Editorial Team, “Adam, Eve and Human Population Genetics” *BioLogos* 2014 updated 2021. <https://biologos.org/series/genetics-and-the-historical-adam-responses-to-popular-arguments/articles/adam-eve-and-human-population-genetics>), although mitochondrial DNA points to a single female ancestor. The mitochondria of a woman with no female offspring are not carried to future generations and by this process the mitochondria of a single woman came to dominate.

Chapter 4, “The Nuts and Bolts of Evolution,” is where I have serious reservations. Hill is a philosopher and theologian, not a scientist. He would have been well advised to have had a scientist as a coauthor. This is one example of my objections: He suggests that the variation in the arrangement of DNA between closely related species is like the difference between the arrangement of German letters in *Mein Kampf* and *Communist Manifesto*. This analogy may have some merit as an argument, but it does not further our understanding and is misleading. Most people today have sufficient understanding of the nature of DNA to be given a more meaningful explanation.

Next, in Chapter 5, Hill considers “Relating to Science.” Proposing a constructive method for science and the Christian faith to relate, he draws on Hegel’s concept of thesis and antithesis resolving in sublation with the parts still in tension and retaining their distinctive characteristics. I am certainly with Hill when he states, “We should never fear moving closer to the truth” (p. 80), whether that be in science or theology.

In the sixth chapter, “Understanding Evolutionary Theory Can be Empowering,” Hill gets to the central thesis of the book. If we understand that our impulses for continuous sex and food are primeval, from a time of scarcity and tenuousness of life, we will be better able to resist those temptations, as we understand that we now live in times of plenty. He claims that he has seen many Christians benefit from this understanding, but, frankly, it does not work for me. I am more easily motivated by the words of Scripture outlining for us what pleases our

Lord and Saviour and what grieves him. As I see it, Hill is trying to find morality in the Book of Creation, but the only valid source is the Book of Scripture.

The penultimate Chapter 7 discusses the benefit of cooperative communities in contemporary non-human groups and in human evolution: since “tribes of Good Samaritans will out reproduce tribes of thieves” (p. 109. Quoted from Holmes Rolston, “The Good Samaritan and his Genes.” In *Evolution and Ethics: Human Morality in Biological and Religious Perspective*. P. Clayton and J. Schloss [eds], Grand Rapids, MI: Eerdmans, 2004, p. 244).

His last chapter, Chapter 8, discusses the importance of community for the fostering of virtue and holiness, where the community provides accountability and example, as well as recipients of virtuous acts. He completes the book on two significant notes: (1) “[i]n light of our common ancestry, the incarnation elevates all things, not just us [humans]” (p. 129); and (2) to avoid or deny our evolutionary origins is detrimental to our Christian witness.

I do not wish to be overly disparaging, but I feel unable to recommend this book. There are more helpful books available for those who wish for an explanation of the theory of evolution, both for the purpose of understanding the science and to grapple with the implications for faith, for example F. S. Collins’s *The Language of God. A Scientist Presents Evidence for Belief* (Simon & Schuster, 2007) or D. R. Falk’s *On the (Divine) Origin of our Species* (Cascade Books, 2023).

As an alternative to Hill’s assertions that understanding the origins of our impulses helps us towards holiness, I would suggest that understanding evolution provides reasons to praise the God of creation; praise changes our hearts and leads to holiness.

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March 2025*

Michael Ruse: *Darwinism as Religion: What Literature Tells Us About Evolution*

Oxford, UK: Oxford University Press, 2016; 328 pages

ISBN 9780190241025, first edition, hardcover

AU\$112

I have great appreciation for the late Professor Michael Ruse. He was an important voice in both the history and philosophy of science, and science and religion, for a very long time and his passing last year was a big loss. His examination of the challenges around evolution and religion was a strong focus of both his research and popular writing. Ruse, having personally been an expert witness in some of the clashes (the 1981 McLean versus Arkansas trial), is one of the most qualified to write a work such as *Darwinism as Religion: What Literature Tells Us About Evolution*.

On its release, this book gained popular praise from those that oppose evolution. Given Ruse's opposition to the New Atheism, he was often cited by those opposed to a resolute materialism or scientific dogmatism. In particular, Ruse is much used by creationists and those from the Intelligent Design movement, forgetting that Ruse himself approved of the verdict in the 2005 Kitzmiller versus Dover trial that ruled Intelligent Design was not science. My concern regarding this particular work of Ruse is that the title is cited rather than its content. Ruse has previously explored the scientific roots and history of evolutionary biology, but this work seeks to explore its popular influence and expression in the arts and literature.

This book is *not* a genetic fallacy, by which I mean that it does not explain away evolution due to its background or the conditions behind its emergence. From the introduction, Ruse makes clear that this is not a historical exploration of why evolution as an idea came into being through social, political, philosophical, and environmental factors. Anyone looking to Ruse for evidence that Darwinism is *just* a religion will not find justification here. Instead, what Ruse seeks to

achieve is an explanation of Darwinian thinking since *On the Origin of Species* and *The Descent of Man* as taking the form and role of a religion in opposition to the world system from which it emerged, principally Christianity (p. ix). This might sound promising to the opponents of evolution, but he is not saying that evolution is just that, more that it has taken the role of a “secular religious perspective” (p. ix) in its location of humans. Emphatically, he says “I am very much NOT saying that this is all there is to be said about evolutionary thinking” (p. x).

The first part of the book is a background of the philosophical and literary climate in the eighteenth and early nineteenth centuries that preceded Darwin’s work. Ruse outlines how evolutionary theory over the course of 300 years has influenced literature and the arts and vice versa. The Victorians seemed to see evolution coming (p. 7) and were more than happy to welcome its view of progress (p. 11). Progress is read into evolution and society even today by many, as it was then. The resistance to religion articulately inherited through David Hume and Voltaire rallies evolution to its corner through the lens of Progress and is opposed by those wary of its pull (p. 13). Ruse commits time and an impressive array of sources to exploring how the role of Progress as a philosophy shaped the perception of evolution.

The second part of the book is committed to deepening the intellectual exploration of the ground before 1859. Ruse remarks that evolution was “not some new enthusiasm” (p. 33). The interplay of the emerging science and philosophical background are blended well. Perhaps surprisingly to some, neither deism nor materialism are principally in view. Alfred Tennyson among others shows a Christian openness to evolution pre-Darwin (p. 35). To those that blame Darwin for everything, Ruse makes it so plain how the theory was right there, ready to be discovered and accepted by Christian and non-Christian alike. Indeed, Ruse is keen to give most blame to the German textual critics (p. 40) for all the damage to Christianity.

The third part of the book deals with Darwin’s ideas as expressed in *On the Origin of Species* and *The Descent of Man*. Those familiar with Ruse’s other books will recognise the expertise and wealth of

background knowledge he calls upon. Darwin is no anti-Christian demolition man, and Ruse explains why. He is also no apologist for Progress (p. 48). Darwin's underlying philosophy is deconstructed for what it is around questions of morality, human behaviour, and epistemology. Given the importance of sexual selection to his theory, *The Descent of Man* is shown as a product of its time as well as scientific observation (p. 51). As the reader moves on, Ruse makes plain the popular and academic disagreement with Darwin's claims as well as those of Thomas Henry Huxley and Alfred Russell Wallace.

As the book progresses, Ruse takes a chapter each to examine individual sources of tension and shows how Darwinian thinking has permeated modern thought in a manner characteristic of religion for many issues such as God, race, morality, sex, and human value amongst all animals. I appreciate his speculation on the future of a post-Darwinian world as the wisdom of a writer that has witnessed much of the movement of evolutionary perspective: "In the post-Darwinian world, not only does nature not sing, it is hard to hear the tunes of heaven either" (p. 282). His summaries of the individual topics are accessible to those with no background in either the science or the philosophy. However, despite the title, I expect those protesting that evolution is not a religion will find themselves well satisfied with Ruse as an ally after all.

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March 2025

Michael Ruse: *Darwinism as Religion: What Literature Tells Us About Evolution*

New York: Oxford University Press, 2016; 323 pages
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 AU\$110

Before his death in late 2024, Michael Ruse was author or editor of some 50 books. He introduced countless people to the history and philosophy of science, to evolutionary biology and its history, and to many aspects of Darwinian science and its development. An atheist, Ruse engaged in scholarly and popular discussions about science and religion. In debate, he was a careful listener who challenged others to think clearly about their assumptions, whether they were Christians, religious, lay people, or his fellow atheists.

As a philosopher of science with special interest in biology, he wrote extensively on evolution. His 1996 *Monad to Man* is a provocative work tracing the idea of progress within biology. What Ruse describes as Progress is exemplified by the nineteenth century change in the belief in an unchanging natural world to one where steady improvement was expected. The notion of progress becomes popular in the period leading up to Darwin's publication of his theory. Ruse argues many biologists warm to the notion of progress as implied purposeful improvement despite the randomness of Darwinian evolution. Ruse's ideas are controversial because biologists are not supposed see purpose in random selection and also because his criticism is often true. Many biologists tacitly believe in purpose in random process or regularly use purpose language.

Anybody interested in the science and religion debate will be rewarded by carefully considering Ruse's writings and contributions to debates.

This book, one of his last before his death, is one of Ruse's many on the implications of Darwinism on belief. It is unusual in that the focus of this book is on the influence of Darwinian thought on English

language literature during the nineteenth and twentieth centuries. Ruse is writing about what he knows well, which is English literature and poetry. There are many quotations throughout the book.

The first chapters look at ideas in literature before the publication of Darwin's theory. It then discusses Darwinian theory's reception, before examining the influence of Darwinism on literature in eight thematic chapters. These themes include such topics as: God, origins, humans, race and class, morality, sex, sin and redemption, and the future. The final four chapters look at developments in the mid to late twentieth century as Darwinism became a background to thinking and how differences in interpretation continue.

Ruse asserts that in literature Darwinian thought developed the marks of having become a secular religion with distinctive belief systems and attitudes. These were expressed in thought and action.

Broadly, Ruse describes a notion of progress that developed before Charles Darwin during his grandfather's generation. This notion of improvement became widespread in literature and became a fertile ground for the reception of Darwin's theory. Then, amidst this fertile ground, with the publication of *On the Origin of Species* (1859) and *Descent of Man* (1871), Ruse argues that literature reflected many Darwinian ideas both quickly and widely. For support, he gives many examples in each chapter, intended to relate to the chapter's theme, and cites a range of scientific, secular, religious, and atheist authors on each topic.

Ruse outlines a general progression from progress to evolutionary progress. It is unclear at times whether the evolutionary progress in his examples is Lamarckian (by inherited attributes) or Darwinian (by random natural selection). Finally in each chapter, Ruse moves towards literary examples reflecting purposeless development in keeping with random natural selection. This is a strict understanding of Darwinism that seems to be in keeping with Ruse's atheism.

The assertion that Darwinism underpins a form of secular religion affecting morality, human behaviour, and understanding of the future is well supported. It is also obvious that Ruse is not happy with

people who uncritically accept these “beliefs.” Some of his harshest words are aimed at those he describes as the philosophically naive, such as the new atheists Richard Dawkins, Daniel Dennett, Christopher Hitchens, and Sam Harris.

Overall, I believe Ruse has identified the important role that Darwinism has played and continues to play in academic and popular thought. Nevertheless, there are some concerns with this book which are not related to his atheistic conclusions. These need to be considered carefully by the reader. My issues relate to the book’s logical and historical rigor. Ruse has always been controversial, and while I may be convinced by his thesis, I am not sure his many critics would be. Some of my concerns are set forth in the following.

First, it hinders his argument that he does not clearly define “religion.” Additionally, often his literary choices and examples do not clearly relate to the theme of each chapter or even the point he is making. For example, Ruse quotes two of Emily Dickinson’s poems in his chapter on God (pp. 92, 93) in a subsection on God in Nature. The first he admits is not Darwinian and the other does not mention God. Moreover, there are also historiographic issues. In this example, one poem is undated (mid 1860s?) and the other is 1873. It is not clear that *On the Origin of Species* or *Descent of Man* could have been read by the poet to have been an influence on the poet. This is one of numerous examples.

Moreover, it is well known that there were a number of competing models for evolutionary development from the 1870s through to the 1920s (see Peter Bowler, *Reconciling Science and Religion*, 2001). Lamarckianism competed with Darwinian selection for a long time. As such, it is unclear which of the models actually influence the literary examples that Ruse cites. He does not make the distinction. This is frustrating for the historian.

Ruse’s choice and range of literature is selective. Most of the poetry and fiction were well known to Ruse. I do not know enough about late nineteenth century literature to have an opinion about whether his selection is broad enough to support his case. However, an

odd choice was to exclude science fiction from his discussion. This is one field of fiction where evolutionary thought and Darwinian thought is strongly influential. Ruse does not seem aware of this except for his consideration of Arthur Conan Doyle's *The Lost World* and H. G. Well's *The Time Machine*. He can be excused for this omission—it would have made the book needlessly many times longer.

Overall, Ruse's case is well supported. Darwinism shows all the hallmarks of a secular religion. While this may not be the first of Ruse's works that someone new to the science and religion debate should read, it is one that should be on their reading list. Although accessible to an interested lay reader, it will be more useful to academic readers.

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April 2025

René Erwich and Alatine Leene: *Unquenchable Love: Gender, Sexuality, and Theology in Conversation*

OR, USA: Cascade, 2024; xx + 244 pages

ISBN 9781666778243, first edition, paperback

AU\$36

Gender and sexuality became front-page news early in 2025 when the new President of the USA signed an Executive Order stating that US Government policy from now on is that “there are only two genders—male and female.” What are Christians—and others—to make of this? How does it engage the biblical affirmation that humans are made in the image of God? How does it relate to the experience of many people?

This book addresses these questions directly and in detail. The authors, Prof. René Erwich and Dr Alatine Leene, are from the Netherlands. In 2020 Dr Leene was that country's “theologian of the

year.” Prof. Erwich, now at Viaa University of Applied Sciences in the Netherlands, was Principal of Whitley College, the Baptist College of Victoria, from 2017–2023, so has a strong Australian link. Both write out of considerable experience as pastors and teachers: they aim to “provide food for thought from a theological perspective, in the hope that it might help in conversations about gender and sexuality” (p. 214). Although “Initially, we were thinking of a specific target audience of broadly evangelical Christians,” they recognise that “people from all walks of life, people of different faiths, or those with no faith may also wish to read this book” (p. xiii). I hope they do.

Erwich and Leene offer a wide range of resources on the topics considered and set parameters on the issues from Christian faith. But, to encourage reflection from the ground up, they deliberately refrain from drawing firm conclusions. If you are looking for answers around gender and sexuality, you will be frustrated. But you will find manifold resources to encourage you, not so much to have a “position,” but to live life in Christ faithfully.

Talking about sexuality easily raises anxieties in each of us. There is nothing in this book to embarrass any reader; the authors respect you. “*Unquenchable Love* is a book in which LGBTIQ+ Christians can feel safe,” a back cover states—and I’d add, so can “straight” ones. Each chapter ends with questions to encourage *safe* discussion.

The Preface outlines the “Approach and Structure” of the book, with a clear table (from Richard Osmer) of its stages (pp. xiv–xv). This approach starts with “What is going on” and “Why?” before looking at “What should be going on?”, using Christian resources (notably the Bible) to help learn “What will we be doing differently in practice?” This method may draw debate—but the Bible and classical Christian faith are not sidelined.

Chapter 1, the Introduction, seeks “to explore the confusion around sexuality we observe in Christian circles and beyond” (p. 2). Sex (“which is everywhere”), sexuality, and gender are carefully distinguished, taking into account changes in Western societies. A figure (p. 13) sets out how identity, expression, biology, and orientation relate

in being male and female; this page would be an excellent start for group reflection. An informative Table of Terminology lists fifteen items, from “Gender identity” and “Binary thinking” to “Transgender” (pp. 17–18). These terms are then used consistently across the book.

The Introduction concludes with “Theological Reflection on Sexuality,” taking up insights from Rowan Williams: “the whole history of creation tells us again and again that God desires us ... so that we may ‘grow into’ the same triune God who loves us” (pp. 21–21). At the core of this position is that being human involves “embodied grace.”

Chapter 2 takes “A Look into History,” from the philosophers of Greece and Rome, early church history (especially Paul), the Middle Ages (women then seen as “failures, imperfect men” (p. 36), the Reformation (where marriage becomes affirmed), the Enlightenment (a “double standard” between genders) to the twentieth century—feminism, homosexuality, and churches’ responses. This quick skip made me more aware of how social norms shape our understanding of one another as gendered humans. As a noteworthy aside, what might be learnt from the First Nations people of this land about gender issues? Their adherence to complex marriage patterns supported their long-term flourishing.

“Gender, Sexuality and Modern Science,” Chapter 3, covers a vast range of material, grounded in wide reading of scientific and theological work. Again and again comes the refrain: which are more significant: essentialist (nature-based) or constructivist (nurture-related) approaches to gender? Two tables (pp. 63, 65) set out “Biological Sex Variations,” with a brief history of their emergence. Insights from psychology, anthropology, and sociology are taken up before a “Mid-term Review: what significance do these perspectives have?” That, indeed, is a major question!

The authors’ method turns to “What should be going on” in Chapter 4, “Gender and Sexuality in the Bible,” the book’s longest chapter. It starts by asking, “How do we read the Bible?” Seeing the Bible as a rulebook is contested, since the rules derived are largely shaped by readers’ context. The “traditional” view that sex belongs

only in marriage is described effectively (pp. 96–97, 101) but is then left aside. While a power imbalance between women and men can be seen in Testaments, this view, it is concluded, “benefits no-one, and it does not do justice to the character of the Bible” (p. 99).

The approach which the authors prefer is that “the Bible is central as a *narrative of desire* ... God desires to share his (*sic*) life, love and grace with us. The Bible is full of desire” (p. 98). With this in mind, “Sexuality and Marriage in the Hebrew Bible is taken up: how different relationship structures were then from now! Particular topics are marriage, adultery, prostitution, divorce, sexual pleasure, nudity, cleanliness and promiscuity, ending with ‘The Positive Image in the Songs of Songs’” (which opens the Preface, p. ix).

A turning-point is “Diversity and the Big Picture in the New Testament,” focussed around Galatians 3:28. “It seems that ... an apparently logical division of humanity into two groups—male and female, masculine and feminine—has been abolished since the coming of Christ” (p. 118). This by no means ends discussion, however! On “Jesus and Gender,” the authors conclude that “Jesus’s interaction with and approach to women is unprecedented! ... Jesus brings them into God’s family and into the wider circle of disciples, and respects them fully” (p. 123). His attitude as a male is seen most clearly in Philippians 2:6–11, “the *way of un mastery*” (p. 124, the authors’ emphasis). His “circumcision is an example of something that threatens masculinity,” while the depiction of the “cosmic Lord” in Revelation is not of a warmonger but “the lamb as if slain” (p. 126). A keen reflection on being a eunuch for the kingdom of God follows, before a brief consideration of marriage and divorce (pp. 132–33, no surprises) leads into a fuller reflection on homosexuality and homosexual relationships (pp. 134–143, rightly pointing to Romans 1:18–32 as central). The chapter concludes by stepping “Briefly Back to Some Pauline Texts ...” with interesting ideas (pp. 143–146).

“Desire as a Theological Framework for Gender and Sexuality” is the focus of Chapter 5. Erwich and Leene argue for a “Via transformata” rather than binary (Karl Barth, for example), privatised, or

eschatological pathways. In this, “Faith, sexuality and eroticism are not simply linked to, but embodied in a discourse of shalom (peace, well-being, wholeness) and justice” (p. 155). The “Contours” of “Desire as a Theological Framework” are spelled out around the need to balance Eros and Agape. The dark side of desire is fully acknowledged (2 Samuel 11 is cited), but the Song of Songs once more offers positive insights. A helpful discussion arises from Augustine’s contrast between *uti* (use) and *frui* (enjoy) in desire, grounding an insightful reflection on *eros* in modern life, and in our relationship with God.

This theological chapter draws on the work of David Jensen, Professor of Reformed Theology at Austin Seminary USA, and Adrian Thatcher, Professor in the University of Exeter. But English priest and theologian Sarah Coakley’s writing drives it, setting out Eschatological, Trinitarian, and Pneumatological perspectives—and back to Rowan Williams and embodied grace. Thus, “There is no such thing as perfect sex. Sex does not redeem but, by God’s grace, sex becomes graceful. Desire then takes the shape of embodied grace” (p. 165).

“Hot Issues,” Chapter 6, takes the reader from broad perspectives and ideals to some harsh realities of sexuality in today’s world. The initial topic is Polyamory—loving more than one person, including sexual intimacy, at the same time. It becomes clear that is a major issue today. Though the authors’ aim is to promote reflection rather than rules, the authors here come close to taking a stand: polyamory “may lead to a separation of eros and agape and that is not preferable. On the contrary, we would like to see them kept together very closely.” Further, “Approaching desire from a theological perspective has something exclusive about it, because it requires connectedness and surrender” (p. 181).

Discussing “Purity and Virginity,” the theological issue discerned is the imbalance in what these mean for women and men. After describing a “chastity gala” in a US church, the obvious question is asked, “Why does this ceremony not exist for men?” (p. 184). How Mary as a virgin offers an example to women leads to the need for care in how metaphors are applied to living. For example, what does it mean

for Christian men to be part of the bride of Christ (compare with 2 Corinthians 11:2, Revelation 21)?

Reading “Disability, Illness and Sexuality,” as someone for whom life has not included disability or chronic illness, the sensitive detail on sexuality is insightful. Models of disability are reviewed critically, leading to a telling conclusion (p. 191):

The core in all of this is always that God is on the side of what is broken and violated and that Jesus was broken and violated, and is so close to us in our hurt. Desire as embodied grace, and the imperfection of desire throughout the course of this life, can be seen as exactly where there is limitation and (severe) disability.

“Love and Sex Online” leads into a lengthy discussion of prostitution, sex work, and pornography (pp. 192–209). On each of these issues, the authors point out the interactive links between “Sex, Sexism, Power and Violence”—not least their impact on many female pastors: “abuses of power and injustices must be stopped” (p. 211).

This “Hot Issues” chapter concludes with a brief consideration of intersex and transgender people. Because “Christ has broken through binary thinking once and for all” (p. 212), such gender variations “could lead to deeper theological reflection ... taking us further in our theological anthropology” (p. 213). This leads into Chapter 7, “Unquenchable Love,” a short reprisal of the authors’ aim and method. The last word is a commendation of conversation, “perhaps starting with people who are transgender” (p. 222).

It is important to note that, on each topic discussed, contemporary scholars are cited, and generalisations eschewed in favour of research-based positions. A full Bibliography (print and web) is included. An Index of subjects and names completes the book.

If I have a reservation, it is that the focus on “hot issues” including divorce means that little is said about the most common human setting for sexuality: marriage (whether formal or *de facto*). This could lead to a false impression as to its ongoing importance until the new creation.

In a future edition, I'd encourage the authors to assess how "divine desire" and "embodied grace" are to be lived in marital life.

That said, I have no hesitation in commending this book, with some qualifications.

The book is clearly written and well structured, but the complex nature of its subject means that it not an easy read.

The authors' method will frustrate readers looking for answers. But as the book progressed I came to appreciate it, even when feeling uncomfortable—not a bad thing, since that encourages reflection! A consistent conclusion is that Christians need to set aside strict binary attitudes and the resulting power imbalances.

The theological framework offered, that God desires us, so that human living involves "embodied grace," has the promise of fruits beyond this book. That is its enduring quality, which sustains life in Christ beyond the social changes around gender and sexuality.

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May 2025

Kenneth Alan Miles: *From Billiard Balls to Bishops: A Scientist's Introduction to Christian Worship*

Eugene, OR: Resource Publications, 2023; xviii + 166 pages
ISBN 9781666759242, first edition, paperback
AU\$20

First, this is an *enjoyable* read. Each chapter opens with a story of someone who is ill being diagnosed using a variety of imaging techniques. The author, a specialist in radiology and nuclear medicine, clearly delights both in his work and in his Christian faith (of Roman

Catholic tradition). Readers will come away with a better understanding of what medical imaging involves, and how the scientific methods used relate to diagnosis.

But don't be put off by the title! As the Introduction states, it came from a talk to a church group and is a chapter heading: bishops are mentioned just once, and billiards not much more. The subtitle is more to the point, and is why I asked to review this book, which speaks to both scientists and liturgists.

A distinctive element is the use of the various types of imaging in diagnosis—X-rays, CT, PET, and other scans—to explore how evidence is properly gained and applied. This leads to a five-level table (p. 48) in which evidence from opinion (bottom level), experiences (levels 2–4) and experimental data (top level) are related. How reason, intuition, and uncertainty interact in evidence assessment is a highlight of the analysis, which is applied to experiences of God, especially in liturgy.

Part I unfolds this process to explore scientific method as used in medicine, opening this out to consider experiences of God. It takes a fresh and nuanced approach to apologetics, based in a Christian worldview but also supporting the reality of religion (mistaken or otherwise) generally. The final chapter in this Part, “A Case for Worship,” pulls together the sequence of evidence issues explored.

Part II builds on this approach to assess how typical elements in corporate Christian worship give evidence of, and are shaped by, God's presence and action in nature. This is food for thought for anyone who takes part in liturgy (of whatever tradition), especially for those responsible for its construction, preparation, and leading. Place, words, posture, prayer, community, rituals, presiding, and more are assessed, along with their effect on unbelief. A brief chapter considers how these have been affected by online worship post-COVID: a typo is the telling omission of the second and third letters in “denomination”!

Issues taken up across the book include chaos theory, AI, electron behaviour, evolutionary mechanisms, DNA, and more. The importance of the “autonomic nervous system” in our bodies is seen to be of particular significance. Theological discussion is less frequent than

medical and scientific matters, but is informed, classically Trinitarian, and is sensitive in debated areas (for example, speaking in tongues, healing, rituals, prayer for others).

Each chapter is beautifully organised, not least due to the tables and diagrams that illustrate the text, with helpful subheadings. A bibliography rounds out the book: the scientific material listed is extensive, but while theological works are few, the choice is wise (Karen Armstrong, Rowan Williams, N. T. Wright, C. S. Lewis), plus citations from official liturgical sources.

The final brief chapter is “Science as an Act of Worship”—amen to that! Yet only in the last sentence is “worship” considered beyond liturgy, whereas in biblical terms, “worship equals liturgy plus lifestyle.” That said, the book’s overall thesis is seen in this quotation: “The entire natural world can be seen as a complex system of interconnected components operating in the context of God” (p. 144).

I have no hesitation in commending this book. Any reader who wants to explore how evidence is gathered and assessed across the wide range of human knowing will benefit from it. Liturgists will find important clues as to how the sciences can assist Christians in understanding why and how we act in church—and in all of life.

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May 2025

Randal Keynes: *Annie's Box: Charles Darwin, His Daughter and Human Evolution*

London: HarperCollins Fourth Estate, 2001; xvi + 334 pages

ISBN 9781841150604, first edition, hardcover

AU\$60

Randal Keynes is the great-great-grandson of Charles and Emma Darwin. Annie, their first daughter, after a joyful life died aged just ten. Looking through “a case of odds and ends one day,” Keynes found her box of treasured things, including a lock of her hair, that her mother had kept. With the box was a note, in Charles’ “untidy writing,” detailing Annie’s last illness, and a “memorial” of her that he penned. In time they had been forgotten.

Keynes was intrigued and began to piece together the story—and its lasting impact on Darwin’s work. The result is a work of social history, focusing on the people involved. This beautiful book follows the marriage of Emma and Charles, and its impact on his developing ideas about human evolution. It is well-organised, readable, and interesting. Its high level of detail never gets in the way.

Alongside the main interest, Darwin’s ideas, Keynes paints a picture of life in well-to-do English families who had benefitted from the Industrial Revolution. Helpful resources include a list of the Darwin and Wedgewood families, together with close colleagues, two sections of photographs, many illustrations, detailed notes, and a full Index.

The flyleaf (p. vii) cites a letter of 1863 from Charles to his long-time friend, botanist Joseph Hooker: “Much love, much trial” These words speak eloquently of both Charles’ family life and of his emerging insights into nature. The suffering involved in his concept of evolution increasingly worried him: it would see him cease regular churchgoing to become an agnostic (his word), though he could not see the world arising from chance.

Keynes’ thesis is that memories of Annie’s happy life and untimely death shaped Emma’s and Charles’ worldviews for the rest

of their lives. I am not in a position to assess this claim, but Keynes backs it with evidence and uses it to show the importance of feeling in Charles' scientific work. His book is significant for Christian understanding of and responses to Darwin's ideas in several ways.

First, after the voyage of *The Beagle* as a young man (21 to 26 years), Charles' whole life was spent working in and around the large family household. This environment played a key part in his instinctive habit of constantly assessing his ideas. He was a warm-hearted father, and delighted in his children, but could not help recording their stages of growth and awareness of others. In his opening comments Keynes thus writes, "There is one idea at the heart of my account. Charles' life and his science were all of a piece" (p. 1).

Secondly, Darwin's work showed our human kinship with animals. More than the concept of evolution—in his day questioned mostly by scientists—it was this idea that saw him pilloried in the popular press and in many pulpits. Yet his greatest concern about his discoveries was the enormous suffering involved in the struggle for life to emerge. It is this, Keynes argues, that saw Darwin gradually leave Christian faith behind.

Christian engagement with evolutionary ideas has gone on for 150 years or more. Darwin's life has been scrutinised by several authors, and his scientific insights (and their social consequences) have been tested and refined. Christian responses have been many and varied—and still keep coming. Why recommend yet another book on the topic?

First, setting Darwin's work in the context of his household uncovers the close association between nature, human feeling, and the emergence of social networks (as among other animals). This is part and parcel of Keynes' empathetic analysis of Darwin's shifts in spiritual understanding. Such an analysis questions too-easy criticism of his work, and calls readers to the often-costly journey of integrating faith and life-experience.

Secondly, this book makes Christian readers aware of the significant changes in Christian theology that have come about in the wake of Darwin's work, but were hotly contested in his day. An obvious example

is the widespread abandonment of Archbishop Ussher's dating of creation in 4004BC, as theologians have come to terms with geology. In the past century, Darwin's struggle over suffering has been amplified by its horrors, leading theologians to reassess the traditional notion of divine impassibility, and accept that suffering lies at God's heart—an emphasis now seen in some hymns. Most recently, environmental awareness has led theologians to stress human “sixth-day solidarity” with other animals, rather than contrasting us with “brute beasts.”

Keynes notes that the Darwin and Wedgewood families, though attending their Church of England parish churches, were Unitarians (which Keynes documents). But seeing the God of Israel as capricious and violent, and rejecting the doctrine of the Trinity, leads to God being experienced as distant. And being uncomfortable with the biblical emphasis on redemptive suffering leads to downplaying the passion of Christ. Did the memories kept by Emma and Charles of Annie's death and life in some way fill this gap for them?

It is well known that Charles and Emma had divergent theological views: Keynes points to their conversations about this as part of their considering marriage. Emma put great store in the hope of life after death, which Charles increasingly questioned, though neither seems to have related it to the resurrection of Christ. If they had lived out of a more Christ-centred worldview, what difference might that have made to both their lives, and science?

I warmly commend this book, especially to Christians involved in science and theology. As well as shedding light on the interactive and human aspects of both, it can be read as an invitation for followers of the Lord Jesus to integrate faith and life with integrity.

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June 2025

Francis S. Collins: *The Road to Wisdom: On Truth, Science, Faith, and Trust*

London: Hodder & Stoughton, 2024; 241 pages

ISBN 9781399822329, paperback

AU\$35

This book is very timely and important, having the purpose of addressing the polarisation of society, which extends across all political spheres and includes political positions (left vs right), response to the COVID-19 pandemic, climate change, Israel's actions in Gaza, race-relations and many other areas. This polarisation is particularly apparent in the US but it is also present in Australia and New Zealand. The author has been central to public health decisions and advice and also has made multiple constructive attempts to communicate across the divide.

Francis Collins was the Director of the US National Institutes of Health (NIH; until the end of 2021) after he had completed the Human Genome Project of which he was Head. In this book, Collins is seeking to illustrate how we can move forward in harmony despite disagreement, and how we can discern where the truth lies despite being assailed by a multitude of voices, particularly many expressing outrage.

As NIH Director, Collins had a key role during the COVID-19 pandemic, including drawing together the people and resources required to fast-track vaccine development and clinical testing. At the time he stepped down from his role at the NIH, he was still mulling over the breakdown in the trust of science and that 230,000 Americans had died unnecessarily because of vaccine refusal. In this context, he agreed to speak at a debate organised by Braver Angels, entitled “An Elitist and a Deplorable Walk into a Bar.” His opposing speaker was Adam “Wilk” Wilkinson whose case was that public health decisions imposed blanket restrictions and recommendations across the nation without consideration for local and individual situations. Collins was able to admit that Wilk had highlighted ways the response had been

imperfect, but he also pointed out that the government was in crisis mode and given the risk to life presented by the virus, collateral damage was impossible to avoid.

After describing this episode Collins lists four essential goods: truth, science, faith, and trust, which form the frame of the book. In Chapter 2, “Truth,” he illustrates different levels of truth, using a diagram of concentric circles, with the centre being “necessary truth” (for example, $2 + 2 = 4$), the second circle “firmly established facts” (for example, Earth is a sphere), the third circle “uncertainty” (for example, life exists on other planets) and the outer circle “opinion.” He uses Jonathan Haidt’s metaphor of the rider and the elephant, where the rider is conscious reasoning and the elephant is all other impulses, to indicate how readily we are controlled by cognitive bias, despite what we imagine to be the case. He suggests that each of us has a metaphorical “web of belief” with beliefs held passionately at the centre and beliefs that are important to us but less critical further out from the centre. Comparing these webs of belief can help us to find common ground with those with whom we have disagreements. Collins urges prolonged listening and generosity of spirit where there is disagreement.

In the chapter on “Science,” Collins describes some of the achievements of science, particularly those from mapping the genome, triple therapy for cystic fibrosis, CRISPR to knock out the faulty gene in sickle cell disease, and the use of check point inhibitors to treat former President Jimmy Carter’s melanoma. And yet, despite the many successes, a Pew Research Centre Poll found that only 29% of Americans said they had confidence in scientists to act in the best interest of the public.

“Faith,” the fourth chapter, describes his journey to faith from atheism at age 26 years, and his firm belief in evolutionary creation leading to the formation of the online resource, BioLogos (<https://biologos.org/>). During a meeting with Christopher Hitchens (“Hitch”), one of the “Four Horsemen of the Atheistic Apocalypse,” he was dealt an insulting response to a question, but in one-to-one conversation afterwards, Collins found Hitch to be warm and engaging. From this

meeting, a friendship developed leading to Collins's guiding Hitch to enrol in a clinical trial involving precision oncology following genome sequencing of his oesophageal cancer. Hitch eventually succumbed. Collins confesses "I miss him" (p. 157). While not explicit, I think this account is intended to illustrate that we can have friendships involving mutual appreciation across faith divides. Nevertheless, Collins is convinced of the truth and societal value of the Christian faith. He urges Christians to develop critical thinking, which was lacking in rejection of COVID vaccination.

In the penultimate chapter, "Trust," Collins proposes four interlocking criteria when deciding whom (person or institution) to trust: competence, integrity, humility, and aligned values. He is cautious about the last of these since it "may severely limit our opportunity to learn from objective experts who don't happen to inhabit our same bubble" (p. 189). During the height of the pandemic Collins worked closely with Anthony Fauci, and indeed Fauci reported to Collins. Collins laments the unwarranted distrust and threats of physical violence Fauci faced for his advice. Collins's assessment: Fauci is "the greatest public servant I have ever known" (p. 194).

In the final chapter, "Hope and a plan of action," Collins advises that our "mental immunity" can be disrupted or go into overdrive, leading to our being infected by falsehoods or inoculated against the truth. Therefore, we should prepare our minds, by anticipating objections to truth claims. Here he gives examples regarding climate change. We should also subscribe to reliable news sources and avoid making and sampling statements of outrage. We should engage with those with differing opinions, not to win arguments, but to listen, learn, and foster our own curiosity. He asserts that the worst outcome of the current polarisation is withdrawal from the political process as nations need leaders with vision and character. The book ends with an invitation to make a pledge to take action to engage.

The book's writing style draws the reader in with both principles and illustrative examples, and the author's faith shines through as a guide and a beacon of hope. The book is intended for all readers, but

Collins would consider academics of any discipline to have a particular responsibility to take up his challenge. The one objection I have is that Collins does not mention the importance of prayer. This may be because Christians are renowned for using prayer as a copout, but without God's blessing, our efforts will come to nothing.

Many readers will be interested to know that Tim Keller, in his dying months, urged Collins to write this book and the book is dedicated to him.

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June 2025

**Derek C. Schuurman, Steven H. VanderLeest,
and Ethan J. Brue: *A Christian Field Guide to
Technology for Engineers and Designers***

Downers Grove, Ill: IVP Academic, 2022; 240 pages

ISBN 9781514001004, first edition, paperback

AU\$47

As our society becomes increasingly techno-centric, the ethical and existential questions of what we should design and for what purpose are ones we need to be asking, not only as consumers of technology but especially as those who are designing and building them. In this field guide, the authors Derek C. Schuurman, Steven H. VanderLeest, and Ethan J. Brue, all either professors or professionals in engineering, frame these questions within a Christian context: how does the Christian worldview specifically inform the way we create technology?

Written in a collaborative manner, each chapter is written by a different author, tackling this important topic from a diversity of

lenses ranging from historical and theological to philosophical and practical. It is written with the Christian young professional working in an industry related to engineering or design in mind, but has broad implications for the wider public as consumers of technology and for any Christian struggling to integrate faith and work.

The book begins with a chapter by all three authors and reflects on why humans invent technology. Using the example of the Wright brothers who invented the first airplane, the authors argue that we are “driven by delight in creating something new and beautiful and noble” (p. 5). Technology is born out of envisioning a different reality, and ultimately “our yearnings and imaginations reflect personal values shaped by desires and longings within our hearts ... they are glimpses of the ultimate dream: the longing to see the new creation and the new Jerusalem” (p. 14).

Brue then delves deeper into how the biblical creation–fall–redemption narrative should inform those desires. We were mandated to “fill, rule over, care for and keep the creation” (p. 28). Thus, our call as engineers “is to be culture makers that enable all of creation to flourish and reach its full God-glorifying potential” (p. 28). The fall has marred this vision in the ways that we have made technology our idol and asked it to do what only God can do (that is, give us hope and comfort). But we are then invited into God’s redemption plan of bringing “beauty, hope or healing to a broken world through engineering” (p. 36).

The next three chapters make a philosophical argument of what constitutes “good technology” and provide a rubric of how engineers can incorporate not just ethical principles but this vision of a better reality into their design process. First, VanderLeest makes the case for why engineers are responsible for the effects of the technology we design by deconstructing common myths that excuse the designer from any downstream effect. Yes, a computer does not have moral agency, he says, but they still “bear the biases and embed the values of the designer” (p. 44). From glaring mistakes such as the ones that resulted in the collapse of the Hyatt Regency to more insidious choices such as the decision to overlook how IBM was being used by the Nazis

to improve the effectiveness of the extermination of Jews, VanderLeest argues that the engineers behind these decisions needed to be held responsible for the consequences, intended or unintended.

Then, in the next chapter, he continues by outlining normative principles for rightly creating and designing technology, based on Dooyeweerd's nine modal aspects of reality. For example, applying the norm of "clarity" to technology design means openly communicating its benefits and dangers. The norm of "stewardship" implies making frugal but not stingy use of resources, while the norm of "justice" means treating all people fairly with technology design and trying to avoid discrimination. These norms are to guide our design process but discernment is always necessary, and we are to seek God's guidance as we work, VanderLeest reminds us.

Finally, Schuurman ends the philosophical segment with a chapter on engineering ethics. He outlines three main ethical frameworks: deontological ethics, that is, the following of rules (for example, the National Society of Professional Engineers code of ethics), consequentialism which finds its most well-known form in utilitarianism, and virtue ethics which focuses on moral character. "For the Christian engineer," Schuurman states, "professional ethics are necessary but not sufficient ... [we are called] not only to avoid harm but to be obedient to our call as agents of renewal in the larger context of God's coming kingdom" (p. 103).

The next three chapters switch from a philosophical to a historical lens, by examining how sin has distorted technology in the past and how that should inform how we think about technology in the future. Schuurman introduces us to the term technicism which is "the trust in the progress of technology to solve all our problems and to bring health and material prosperity" (p. 114). He argues that this worldview "does not view creation as something to be stewarded but as something to be manipulated for power and control" (p. 111) and as a result has amplified the consequences of sin. We need to be asking ourselves: to what direction is the technology pointed? Is it pointed towards disobedience or obedience to God?

Brue then takes us through a fascinating historical look at why the electric vehicle failed in the second half of the nineteenth century. Along with a host of complex reasons, he emphasises that it was the cultural value of automobility, that is “the desire to escape ordinary life whenever and wherever a person wanted to do so” (p. 126) that ultimately caused its downfall. Thus, in designing future technologies, we need to be aware of the cultural values that are shaping what is considered progress.

To this point, Schuurman contrasts two different ways of viewing what is considered progress when thinking about technology: technological optimism and pessimism. While technological optimism, such as the transhumanism movement, places a lot of faith in technology to fix current human limitations, technological pessimism, as played out in many science fiction books or movies, sees technology as the root of society’s problems. As Christians, Schuurman argues, we must not veer towards either optimism or pessimism—our hope cannot be solely in technology, but we also cannot blame technology for society’s problems. The problem lies within the human heart and thus the solution must address that.

The final two chapters lay out practical ways we can love God and neighbor by designing technology; we need not leave our neural nets to follow God. VanderLeest acknowledges that there is a group of Christians who scorn technology, believing it more holy to avoid it altogether. He points out, however, that there are many biblical examples of technology such as fishing nets or city gates, and that technology itself is not the root problem. Indeed, there are ways to better share the gospel via technology, love our neighbor better (for example, through video conferencing apps) and even love God better (for example, telescopes that help us enjoy God). Even the very act of designing technology is fulfilling our cultural mandate in the same way that composing music or writing poetry honors God. “Technology design can become an end ... [where we] find joy and delight in the creation of the tool especially when we design it for someone else” (p. 178).

In the final chapter, Schuurman explores several thorny and practical ethical issues that a young Christian engineer could face. He does this in the form of fictional letters exchanged between an engineer and his mentor. The mentor gives him several pieces of good advice: being salt and light in your workplace means doing your work diligently, remembering to rest and sabbath, being honest with managers and customers, or speaking out if you are unsure about design or safety norms.

As a field guide, this book does an excellent job of covering a host of practical ethical questions Christian engineers should be asking, while also giving the proper theological, historical, and philosophical framing to these questions. While the book briefly touches on how to apply these principles to a current and controversial topic such as transhumanism, I would have loved to see more case studies on how a Christian should approach similar issues.

I would highly recommend this book as a good starting place for any Christian professional in engineering who wonders how their faith relates to their work. This reviewer hopes more works of a similar nature are published in the near future as we struggle to keep up with the pace of technological progress and its implications for Christians living faithfully in this world.

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July 2025

Doru Costache: *Humankind and the Cosmos: Early Christian Representations*

Leiden/Boston: Brill, 2021; 415 pages
Supplements to Vigiliae Christianae
ISBN 9789004465954, first edition, hardcover
AU\$219

Doru Costache is Associate Professor in Patristics at the Sydney College of Divinity. His PhD is from Bucharest, Romania, and his specialisation is (Eastern) Orthodox Christianity and theology, particularly in the patristic or early church era. He is a prolific academic writer and an ISCAST fellow deeply interested in the science–Christianity interface.

In *Humankind and the Cosmos*, Costache does not so much return to his beloved early church as speak to us from his dwelling there. His sense of the ongoing relevance of Orthodox theology is one of this book's twin poles. The other is the sense that Christian faith can meaningfully engage in scientific discussion in the present day and speak theological truth into that discussion.

To show that this engagement is possible, Costache wants to demonstrate that early Eastern Christianity not only excels in the contemplative sphere but speaks to the tangible realm that interests scientists. It is not purely ethereal. “The idea of this book comes from my discovering how very little we know about the early Christian worldview and what it says about people's place within the universe” (p. 1). While Costache manifests a genuine affinity for the contemplative strengths of Eastern Christianity, he also regards “the backdrop of cosmic evolution, the genesis of our planet, and the emergence of life on earth” (p. 5) as an indispensable part of a theological view of the world and humanity's place in it. The historical figures studied demonstrate ways of holding the two together.

Humankind and the Cosmos showcases a series of well-known patristic figures and works, from the *Letter to Diognetus* and Ignatius in the Apostolic Fathers, through Irenaeus, Clement of Alexandria,

Origen, Athanasius, Evagrius of Pontus, Basil of Caesarea, his younger brother Gregory of Nyssa and finally John Chrysostom, all with a trend-centred topical chapter structure. Many of these exclusively Eastern church figures (p. 25) will be known to readers by name, except perhaps Gregory of Nyssa, whose non-contemplative works have recently attracted more interest from scholars looking for models of integration of Christian theology and contemporary science.

The departure point for this study represents a challenge for Costache's thesis: "Initially the early Christians did not consider the scrutiny of the natural world on its own terms a priority" (p. 27). Was parousia expectation a factor here? If you expect to be leaving home, you might not give too much thought to the furniture and construction of the old house. Yet in a musical analogy employed by the earliest figures in his list, the harmony of the Logos-based invisible substructure of reality manifests itself in the orderly worship of well-functioning church communities (p. 86) and in the visible cosmos (pp. 90–95); creation's song is restored in the soul of the believer through Christ. Then Clement's vast and sophisticated viewpoint extends to "grasp[ing] the universe together with its creator" (p. 119). Costache then attempts to prove that contemplation of nature retains a strong place in Clement's disciple Origen's thought even though "he might not be as intensely interested in the cosmos as Clement before him" (p. 161).

At the book's midpoint, increasing consciousness of physical nature grows in the still dominantly contemplative thought of Athanasius and Evagrius, for whom the cosmos could function as "another scripture" (pp. 178, 209) making spiritual realities available to the Christian ascetic. Costache finds in Evagrius "genuine interest in the natural world," debunking "the hypothesis that Evagrius believed in creation's dematerialisation and that he proposed a spiritualist metaphysic" (p. 216). But with Basil, "the early Christian representation of reality progressed towards becoming ... a genuine cosmology" (p. 219). Evagrius shows genuine interest in the detail of natural phenomena. In his *Hexaemeron*, "he described the creation from the vantage point of the available sciences" (p. 226).

Chapter 6 is the most groundbreaking in terms of patristic scholarship, exploring the *Apology for the Hexaemeron* of Gregory of Nyssa as an apologetic work intended, in the words of Juan Gil-Tamayo, “to harmonise ... the creation narrative and scientific cosmology” (p. 300). Finally, concerning the theological significance of humanity in the cosmic order, Costache turns to John Chrysostom, who “refutes the objection,” both ancient and modern, “that humankind’s late arrival excludes its dignity” (p. 359).

The general trend Costache distills is this (p. 12): “Initially, Christians were hesitant about all things worldly,” yet “the cosmos and the relation of Christians to it sequentially moved from the periphery to the centre of their theological reflection.” Therefore, early Christians’ “view of reality and how they inhabited the earth,” which “goes largely unnoticed in the scholarship of the early Christian world,” can suggest, Costache concludes, “a superior solution to the widespread opinion in our age—that scientific and theological perspectives are incompatible. It also reveals an important task of contemporary Christians, namely, to replicate the achievements of past generations by redrafting the doctrine of creation in the framework of today’s scientific culture.”

This is not a book for someone who feels tired of reading at the end of a tweet. It is long, dense, and academic, representing cutting-edge patristic scholarship. It is a book to be taken seriously, not just in early Christianity studies but also in science and religion. Does Costache successfully demonstrate that the early church took a real interest in the external, physical world and offers feasible models for Christian engagement with science today? He shows that figures like Gregory of Nyssa, Basil, and John Chrysostom articulate a worldview (a favourite term) that treats the external world as theologically significant, inspiring praise of God. At times, Costache optimistically reads patristic thought more amenable to contemporary values or to his own mind than I believe it really was; for example, maintaining that Gregory of Nyssa was a sort of evolutionist in any sense we would recognise by that term today (pp. 332–33) or that early Christians “became more and more aware of the divine calling to safeguard the world and to

contribute to its flourishing” (p. 366). However, his program of rediscovering the profound contributions of early Christian thinkers for integrative theological thinking and apologetic conversations today, once we cope with the necessary intellectual cross-cultural transitions, is truly worthwhile. He is to be commended both for his impressive mastery of patristic thought and scholarship as well as the sheer quality of his writing. This book is very clearly written and readily comprehensible when read with time and patience. If you are serious about understanding historic Christian cosmology and anthropology, this might be your book.

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August 2025

Paul Tyson: *A Christian Theology of Science: Reimagining a Theological Vision of Natural Knowledge*

Grand Rapids: Baker Academic, 2022; 182 pages

ISBN 9781540965516, first edition, paperback

AU\$29

Paul Tyson is that person who has read all the books you know you ought to have read and have not. Reading *A Christian Theology of Science* is like visiting an inveterate scholar and bibliophile at home. I used to visit Frank Andersen in his Melbourne, Australia home before he passed away, and books were stacked around his lounge room like ragged skyscrapers. This is the feeling when reading Tyson’s book. A digital reference manager is essential for quick pillaging of all of his citations!

There are Christian works available that undertake a scientific view of theology, or place Christian theology and science side-by-side,

but when we seek Christian theologies of science as we might a theology of the environment, a theology of work, or the like, they seem distinctly thin on the ground. Tyson's title caught my eye soon after its publication for that reason. It begins to fill a space where theological reflection seems to have been lacking, despite the Christian's sense that all domains of life deserve and need such reflection.

To take one step back for a moment, Paul was at the time of this book's publication a senior research fellow at The University of Queensland's (UQ) Institute for Advanced Studies in the Humanities, an institute now apparently mothballed given that the former weblink now simply leads back to UQ's Faculty of Humanities, Arts, and Social Sciences website. This UQ department of constantly evolving name and scope was where I completed my PhD studies. Chief amongst Tyson's many stimulating academic colleagues in that Institute and department was an esteemed name in the field of science and religion, Peter Harrison, my co-supervisor. Harrison is well known for serious definitional and intellectual-historical work on the supposed domains of science and religion—especially his 2015 *Territories of Science and Religion*.

In an earlier venture into this topical domain, Harrison wrote “‘Science’ and ‘Religion’: Constructing the Boundaries,” *Journal of Religion* 86.1 (2006): 81–106. A passage in that article functions as a conceptual jumping-off point for Tyson's book, so I quote a section here (p. 88):

With the benefit of hindsight, we can now see that over the course of the past 150 years a remarkable reversal has taken place. Whereas once the investigation of nature had derived status from its intimate connections with the more elevated disciplines of ethics and theology, increasingly during the twentieth century these latter disciplines have humbly sought associations with science in order to bask in its reflected glory—whence bioethics and science-and-religion.

This “remarkable reversal” is the cultural moment that plays a fundamental conceptual role in Tyson's book. He refers to it first on page

31 and offers several complementary definitions of the term thereafter. The remarkable reversal is “a first-order interpretive transition concerning where the locus of truth itself lies: it shifts from the divine Creator to the human knower” (p. 32). It is “the most important lifeworld transition in the historical relationship between Christian theology and modern science” (p. 71) when “in the late nineteenth century modern science displaced Christian theology as the dominant public truth discourse of Western European knowledge” (p. 72). Shortly afterward the entirety of Chapter 5 is devoted to the exposition of this turn in intellectual history.

This epochal shift in the ground rules of legitimate knowledge, Tyson feels, renders contemporary science-and-religion discussions rather futile, since they take place on modern science’s terms, and these terms are stacked against Christian belief, which would see God as the ground and origin of ultimate reality and simultaneously the source and basis of reliable knowledge about that reality, including the realities of the natural world. To rule theological language and indeed all metaphysics as out of bounds in the truth conversation, as Tyson thinks contemporary science does, hobbles the Christian thinker from the get-go and predefines the terms of any discussion according to naturalistic and even materialistic parameters. Christian participants in science–religion discussion are subject to a kind of antimetaphysical gag order. What Christian scientists would often describe as a methodological naturalism, a willingness to set aside transcendent factors for the sake of exploring natural phenomena on a level plane with people of different beliefs or none, Tyson thinks readily washes over into a philosophical naturalism, doubting the ability of real humans to demarcate belief and practice in such a clinical way. Tyson’s closing call is for Christian thinkers about science to abandon efforts to discuss ultimate truth with non-Christian scientists on the implicit and severely limiting conversational terms set for them by naturalistic science, and to rediscover “a new conceptual language and a new integrative outlook” (pp. 181–82) that is bold enough to redefine the

conversation in ways that actually permit Christians to speak of truths beyond naturalistic limits.

Readers who are Christian scientists might react with some dismay, I suspect (speaking as a biblical exegete, from the outside) to Tyson's despair over the science–religion enterprise, notwithstanding the backing of intellectual historians such as Harrison, who would see even these categories as a recent construction. Some Christian scientists might have more faith than Tyson in the efforts of thinkers such as John Polkinghorne, Ernan McMullin, or Alister McGrath (a rather androcentric, Anglocentric, and ancient sample, now that I think about it) to explore the interface of these constructed territories, despite the limitations of the enterprise. Nonetheless, his challenge is worth hearing. If an inherent dysfunction of unrecognised clashing philosophical assumptions and values is destined to frustrate efforts at détente until they are brought to the surface, the sooner we realise this, the better. If Tyson is too jaded about this, much can still be learned in testing the point.

In place of an engagement with existing science–religion discourse, then, Tyson's book represents an intellectual ground-clearing operation, like the bulldozing of some inner-city slum ready for a new construction project. The prospect of construction of a positive theology of science is an exciting and I think really necessary one. What we largely have here is cleared ground ready for such a task. Readers who have mentally co-operated with Tyson's argument might have laid aside allusions that secular and Christian scientists largely share an intellectual basis for understanding and practice and, to boot, might have absorbed a healthy consciousness of the epistemic damage done by the fall of humanity, something Tyson takes very seriously. They have learned that even scientific knowledge is always, as Michael Polanyi would say, personal knowledge and never truly objective (p. 176). They stand warned to “stop pretending that there are no serious problems with [between] the prevailing reductively naturalistic theoretical framework of modern science and orthodox Christian theology” (pp. 174–75). Yet by the end of the book, the constructive

work of framing out a Christian theology of science largely remains at the blueprint stage.

So, I appreciated Tyson's awareness of the huge influence of philosophical first principles and theological assumptions on all intellectual pursuits, his theological orthodoxy and postmodern-tinged sense of the contextualised nature of all knowledge and his sassy impertinence. But as a lover of the details of science, the texture of rocks, the behaviour of birds, the variety of landforms, the fluid mechanics of waves, what I hungered for were clearer signs of a love for the detail, the tangible stuff of science. Such a prolegomenon as this could not be chiefly a catalogue of natural phenomena (or better, created phenomena), but I wanted to see more examples, more breaking out of abstractions and contact with the phenomenal muddiness of the physical realm. I felt that Tyson shared with Plato, as he himself hints, a preference for the invisible, transcendent realm as the ultimately real (pp. 105–107) and sympathised less with Aristotle's focus on the tangible things. Certainly, Tyson is right to say that the early church found greatest philosophical rapport in the Logos-generated ontology of all its existing philosophical neighbours. But the scientist who loves the very textures of the tangible things might find little of that kind into which to sink her fingers here.

This book is a blue cheese of sorts: sharp, strident, of an unmistakable flavour, not to be ignored, probably not to everyone's taste. It is very much worth obtaining and reading. And it awaits a volume 2, whether from Tyson or some other thinker, a constructive Christian theology of science that utilises the ground that has been cleared here in order to build.

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August 2025

Philip Goff: *Why? The Purpose of the Universe*

Oxford: Oxford University Press, 2023; 192 pages

ISBN 9780198883760, first edition, hardcover

AU\$27

Philip Goff's personal journey into what he terms a heretical form of Christianity has been intriguing to watch. Having encountered his views before, I find them to be well thought through. He holds a similar philosophy to others in the history of science and religion such as Sir Arthur Eddington, who likewise blazed an unconventional path.

Why extends his previous writings on panpsychism as he asks philosophical questions of the Anthropic Principle, popularly known as cosmic "fine-tuning." His conclusion is that the challenge of the immense improbability of this fine-tuning, the existence of consciousness, and its associated difficulties such as the mind body problem, mean that the universe itself is infused with purpose. He extends this to argue that the problem of suffering means that the "Omni-God" is unlikely, resulting in the conclusion that a "Limited Designer" is behind ultimate reality. Whilst much of this may seem controversial to those with a materialist philosophy, he makes his case that this is a growing viewpoint with more research behind it.

The universe must have purpose (p. 2), yet to Goff, a personal God seems unlikely (p. 3). Given the implausibility of the value nihilist position that has often been taken in philosophy, which itself is an anti-reason position (p. 11), a single divine mind behind the workings of the universe is much more likely (p. 16). This has been the traditional view of the theist in philosophy of religion.

However, Goff builds a different case. He argues for what he terms the "Value-Selection Hypothesis" which says that the fundamental constants and quantities underlying the fabric of the universe are ordered to allow for a universe of value and purpose (p. 21). This brought about a goal-directedness from the very beginning of the universe (p. 22). To Goff this is so obvious it seems strange to have to

defend it, but it is the association with natural theology that has caused it to be rejected out of hand by scientists and philosophers (p. 23). Given the incredible improbability of chance or materialistic explanations satisfying the data of fine-tuning, cosmic purpose appears the only viable option (p. 31). Goff wields his philosophical tools with stern prowess in dealing with explanations such as the multiverse, and modern ideas of inflation and simulation theory (p. 30). For a relatively short book that separates the technical and more accessible in helpful fashion within each chapter, he manages to incorporate Bayesian methods and the tools of the logician in a way that the lay philosopher can readily grasp. Chance is ruled out thoroughly (p. 34).

When turning to consciousness, Goff is even more blunt in his assessment regarding its currently insurmountable problems from neuroscience and philosophy of mind, and disposes of any expectation of a materialistic explanation in the near or distant future (p. 47). There is no apologetics for panpsychism at this point, but instead a rigorous exposition of the landscape of consciousness. Science cannot be the full story of reality. This leads him to introduce “pan-agentialism” which posits agency as the root of physical reality (p. 50). The former atheist in Goff is admittedly reluctant to arrive at his conclusions regarding the hard problem of consciousness but one finds his honesty as refreshing as his rigor. Micro-reductionism cannot account for agency at the level of particles (p. 54). One is left then with panpsychism, which is where Goff does become something of an apologist. Consciousness pervades the fabric of the universe at its most fundamental level (p. 58).

Goff commits much energy in the latter portion of the book to fleshing out this claim and one instinctively recoils at the idea. However, he is persuasive in marching us from particles to tigers then humans in presenting explanations at each level with recourse to science and philosophy (p. 67). This is not at all different from the arguments of Erwin Schrödinger and Sir Arthur Eddington in the interwar period (p. 75). Goff feels the intersection of each half of his book cannot be mere coincidence: consciousness and cosmic fine-tuning seem to fit (p. 76).

The conclusion Goff reaches after a detour through the problem of evil is that of skeptical theism (p. 96) and the existence of a Limited Designer (p. 118). I expect this will satisfy neither side, yet historically it has fared well with some surprising voices from both science and philosophy (p. 125).

Given the lack of progress from materialism in either consciousness or fine-tuning, and with no promise on the horizon for it, Goff at least has made a far superior case than any made from the skeptical camp and he gives both sides of the debate plenty to consider (p. 127). When one takes physics as pure mathematics at its base, then one is simply describing structure which cannot produce consciousness, yet he contends that “the mathematical structures of physics cannot produce consciousness, but consciousness can produce the mathematical structures of physics.” (p. 127).

His conclusion presents his own spiritual journey to what he calls a heretical form of religious faith, drawing on mysticism and its Eddingtonian compatibility with panpsychism and his Limited Designer Hypothesis. Here he defends the rationality of this faith from those that see it as more evidence of an abandonment of reason. His story interweaves the personal and philosophical. For Goff, this leap of faith is both rationally justified and intellectually consistent with a structuralist and realist philosophy of science (p. 143).

This is an interesting contribution to the analysis of the implications of cosmic fine-tuning, the hard problem of consciousness and our search for meaning in a mathematical universe. Goff well-defends his case that “The universe looks very different when we stop pretending we’re mechanisms” (p. 150) and I applaud his attempt at justifying panpsychism within a scientific framework.

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September 2025

Jonathan Haidt: *The Anxious Generation: How the Great Rewiring of Childhood is Causing an Epidemic of Mental Illness*

UK: Penguin Press, 2024; 400 pages

ISBN 9781802063271, first edition, paperback

AU\$18

Jonathan Haidt's timely book presents a high level of research scholarship, yet is delivered in an appealing, communicative style for a non-expert readership. He initially makes engaging use of an allegory, introducing some of the complexities a child today must navigate while growing up in the increasingly uncharted territory of adolescence—a very different experience from that of their parents. Part 1 “A Tidal Wave” picks up this theme, with the surprisingly poignant chapter title, “The Surge of Suffering.”

While much of the research cited could also support the now-common general reference to a “tsunami of depression,” Haidt differentiates one form of suffering from another, focusing on *anxiety* as the ubiquitous concern. As an insightful social psychologist, he convincingly argues that while other factors like climate change, social unrest, and the COVID-19 pandemic contribute to youth suffering, the primary culprit can be recognised as the rise and acceptance of digital platforms and smartphones between 2005 and 2010. With careful use of research, Haidt builds a compelling case asserting that this “Great Rewiring” has had a profoundly negative impact on Gen Z (those born from 1995 onward) who potentially will experience ongoing concerns. This technological shift continues to affect the next generation (Gen Alpha?) now entering the fray of childhood and adolescence, all with “a need to develop competencies, overcome innate childhood fears, and prepare to rely less on their parents” (p. 8). The prevalence of health repercussions on this vulnerable generation abounds. But parents, too, are caught in this struggle, grappling with how to protect their children and effectively mitigate these outcomes.

Clarity is given in Part 2, “The Backstory,” where Chapters 2–4 inform us about what children need to develop into healthy adults. He contrasts the valued freedoms of previous generations’ childhoods—rich with play, discovery, and risk-taking—with the current reality where these experiences have been eroded by the ubiquitous presence of phones. Problems associated with social media’s immediate availability are clearly identified, with relationship-building opportunities now at risk, whether for social learning or for developing strong, healthy bodies. Instead, children are enticed into exploring an unreal virtual world, created by others. Play-based learning, with discovery possible through safe, nurturing, risk-taking environments, has been thwarted. Instead, their young brains are inundated with mass media influences well before the child is ready to understand or reflect on the impact of what is being advocated. Childhood play-based activities that had previously enabled a healthy transition into readiness for adult demands is lost. Haidt helps us reconsider those important skills that foster independence, including those that enable an awareness of risks, learning to be less self-preoccupied, becoming more resilient, and having a greater ability to choose beneficial rather than destructive behaviours.

Part 3, “The Great Rewiring” (Chapters 5–8), provides Haidt’s understanding more directly on the downsides of a life entrapped (“rewired”) within a phone-based childhood. He draws attention to major differences between boys and girls, and how the invasion of the smartphone and its controlling effect on the way people “think, feel, judge, and relate to others” (p. 216) creates a personally alienating isolation from their real world. Harmful effects are outlined, not the least of which are digital addictions, massively contributing to how children have become deprived of interpersonal connections. These are demonstrably shown to be crucial in developing mature adult relationships. His cogent recognition of many well-established psychological theories such as attachment and attention-deficit issues support a sound empirical basis to his work.

The final Part 4, “Collective Action for Healthier Childhood” (Chapters 9–12), constructively suggests necessary actions now crucial for a healthy childhood to become a realistic possibility. Haidt sets this book in the context of an anxious generation, already “wired up” to pressures that have created an epidemic of “mental illness.” Psychologists have long believed that proactive prevention is far better than prescribing a cure. A collective response is now proposed to reverse some of these unhealthy trends. Such actions are framed in positive “how-tos” for each nominated group: tech companies, governments, schools, and parents, encouraging all to seriously reconsider their respective responsibilities. The author’s challenge is imperative: to act now! Pertinent psychological, spiritual, and practical solutions throughout his book leave us with few grounds on which to believe it is too late.

In Haidt’s concluding chapter, his appeal returns the reader to his initial allegory: today’s child is akin to the child taken to Mars, hence this chapter’s title, “Bring Childhood Back to Earth.” Haidt’s understanding of the current epidemic of mental illness is that children have been taken from the real world into a dominant virtual world. In contrast to the real world, that virtual world, with brief reference to AI, is concisely depicted (p. 9) as one that “promotes anxiety, anomie, and loneliness. The Great Rewiring of Childhood, from play-based to phone-based, has been a catastrophic failure” (p. 293).

For the reader with more questions than the book presents, there remains an extended and impressive Notes section with many references for each of the chapters. A full Index also provides a helpful paginated resource for terms used throughout, to efficiently enable a review of the author’s perspectives.

As a retired practitioner psychologist of many years, then a post-graduate teacher of clinical psychology at Monash University, and a grandmother of 12 developing children—all at various stages of managing the world of phones and the impacts of mass media—I am heartened to read this book. Collegial findings support the clear outlines presented herein: both of the enormity of the problem and the

need to act. A gracious way forward is carefully offered to encourage readers to respond with a concerted effort to stop the ship from sinking. A new generation is already in the making. Let us encourage them by being the leaders we need to be.

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November 2025

Denis R. Alexander: *Are We Slaves to Our Genes?*

Melbourne, Australia: Cambridge University Press, 2020; 252 pages
ISBN 9781108445054, first edition, paperback
AU\$47

Can our genes truly dictate who we are—or do we retain the freedom to shape our identity? In *Are We Slaves to Our Genes?*, Denis Alexander interrogates this question through behavioural genetics, blending rigorous science with philosophical inquiry. A British molecular biologist with four decades of research experience, Alexander draws on his academic and professional background to explore whether genetic determinism genuinely threatens human free will.

To understand the book's academic roots, it helps to note that it originated from the Gifford Lectures delivered at St Andrews University in 2012 and was later published as *Genes, Determinism and God* in 2017. This current edition was prompted by a request for a version more accessible to general readers. In my view, however, it remains somewhat academic and assumes at least a basic understanding of genetics and philosophy. To support readers, the book includes a “Notes” section and a “Definitions of Technical Terms” section. The book contains twelve chapters and a useful “References” section, which highlights the breadth of research engaged throughout the discussion,

including Alexander's own research contributions. The first ten chapters primarily lay the groundwork for addressing the book's central question: "Are we slaves to our genes?" Chapter 1 explores common misconceptions in genetics. Chapter 2 introduces foundational concepts, leading to an understanding of genetic information and how it flows. Chapter 3 builds on this by examining the interaction between genes and the environment, and how this shapes human development. Chapter 4 delves into behavioural genetics—highlighting both its potential and the challenges involved in interpreting its data. This is made clear by looking at a number of practical examples in Chapters 5–10, including mental health, educational attainment, weight, levels of religious and political commitment, and sexual orientation. This leads to the titular question of the book in Chapter 11 and enters the area of free will and determinism. The closing chapter (Chapter 12) focuses on the role of genetics in human identity in relation to two competing world-views: Judaeo-Christian *imago Dei* and transhumanism.

The idea of genes as "difference makers" is a central theme in the book, especially within the context of complex polygenic systems. Alexander explains that most traits result from the combined influence of many genes, each contributing a small effect. Occasionally, a single gene variant can trigger a cascade of biological changes that significantly alters the outcome. A trait's phenotype typically emerges when the cumulative genetic influence exceeds a threshold and is shaped by epigenetic regulation and environmental factors. Some traits show continuous variation, forming a spectrum rather than discrete categories (for example, sexual attraction—discussed in Chapter 10). Thus, genes are best understood as contributors to variation within a probabilistic framework, rather than as deterministic agents.

For example, Chapter 5 illustrates the idea of genes as "difference makers" by examining neurodevelopmental and psychiatric conditions such as autism, schizophrenia, bipolar disorder, major depressive disorder, and Alzheimer's disease. While each has distinct genetic risk factors, some variants are shared across disorders, suggesting common biological pathways—particularly in gene networks regulating

early synaptic development. These conditions arise from the cumulative effect of many genes, each contributing modestly to overall risk. Although the chapter is titled “Genes and mental health,” the inclusion of Alzheimer’s—primarily a neurodegenerative disease—indicates a broader focus on brain-related disorders.

Personal choice is another important concept in the book, particularly in how it interacts with genetic predisposition. For example, Chapter 8 discusses body mass index (BMI), noting that individuals with risk variants—such as those in the *FTO* gene—are not deterministically bound to higher BMI. Instead, maintaining a healthy weight may require greater effort through lifestyle choices like diet and exercise. Notably, regular physical activity can influence the epigenome, helping to mitigate genetic risk. While the concept of personal choice is present throughout the book, its role within the broader mix of genes, variants, epigenetic regulation, and environment could be more clearly defined. Alexander’s focus on specific variants, including *FTO* for BMI and *ApoE* for Alzheimer’s (Chapter 5), added clarity and interest to the discussion.

This sets the stage for Chapter 11, where Alexander tackles the concept of emergence in relation to free will and determinism. Alexander acknowledges that brain processes follow the laws of chemistry and physics yet argues this does not negate free will. To understand how genetic variation influences human behaviour—typically in non-deterministic ways—we must consider how the mind emerges from the brain. This relationship exemplifies strong emergence, where mental properties—such as reasoning, reflection, and decision-making—cannot be reduced to or predicted from the brain’s physical components alone. In contrast, epigenetic regulation, synaptic changes from learning, and lifestyle factors like diet and exercise represent weak emergence—complex outcomes traceable to molecular interactions. Free will, as presented, arises from a dynamic interplay of genetic, epigenetic, environmental, and behavioural factors, best understood along a continuum between determinism and free will. However, I felt that while Alexander introduces emergence as a conceptual framework for understanding free will, he does not fully integrate it into his

broader argument. Its explanatory function remains underdeveloped, which slightly weakens the coherence of the chapter's discussion.

Finally, the book turns to the question of identity. In Chapter 12, Alexander contrasts the Judaeo-Christian concept of *imago Dei* with transhumanism. While Alexander compellingly argues that worldviews exert a powerful causal influence on human behaviour and engagement with the world, the chapter would have benefited from connecting this discussion with genetics and his earlier treatment of emergence into a more unified explanatory model of identity. The chapter emphasizes the top-down impact of worldview on identity—suggesting it may outweigh the bottom-up effects of genetic inheritance. The discussion on healing and enhancement acknowledges a blurred boundary, yet the two worldviews diverge sharply in their conclusions. Christian enhancement centres on virtues cultivated through the Holy Spirit within community, while transhumanism envisions individual perfection through technology and genetic modification, detached from a relational context. This last chapter concludes nicely by stating that only when suffering from severe genetic pathology are we slaves to our genes. We are also not slaves to our worldviews, but they significantly shape how we interpret genetic applications—especially those aimed at human enhancement.

As a science educator, I found the book's framing of genes as "difference makers" rather than absolute determinants particularly insightful. By emphasising the interplay of genetic influence with personal choice, epigenetics, and worldview, it offers rich material for classroom discussions—covering health and behaviour alongside deeper questions of free will and identity. The book is highly recommended for anyone seeking a thought-provoking exploration of human genetics, particularly those interested in bioethics, philosophy of science, or science education.

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November 2025

Andrew J. Brown: *Recruiting the Ancients for the Creation Debate*

Grand Rapids, MI: William B. Eerdmans, 2023; xviii + 348 pages
ISBN 9780802874597, first edition, hardcover
AU\$49

Years ago, I had the pleasure of reviewing Andrew Brown's 2012 book, *The Days of Creation: A History of Christian Interpretation of Genesis 1:1–2:3* (Deo Publishing). This was the work of a Protestant scholar who specialised in the history of interpretation of Genesis 1, a scriptural narrative I have been reading through patristic lenses since 2009 (counting only my publications in English). What took me by surprise is that several chapters of that book explored patristic exegeses. I found many points of agreement between his approach and my own, which intensified my sense of pleasant surprise—a different reaction from the glazed eyes of Brown's own recent audiences (p. 2), regardless of his vernacular experiments (see pp. 19–20).

In this new book, Brown, a Lecturer of Old Testament and Hebrew at the Melbourne School of Theology and an ISCAST fellow, shows his ongoing interest in the use of the Genesis narrative within Christian theology through the centuries. While his works largely cover the same ground, the recent book does not merely amplify the argument of the previous one (p. ix). Admittedly, *Recruiting the Ancients* contributes to the history of reception of Genesis 1 as much as the 2014 work does (pp. 11–14). Here, however, Brown focuses primarily on the way recent scholars engaged the narrative's earlier interpreters (pp. 1–2)—from the dawn of the Christian era (Chapters 1–6) and the Western Middle Ages (Chapter 7) to the Reformers and John Wesley (Chapters 8–10). He calls this engagement “recruitment,” which is not a praise of the “recruiters” (pp. 4–6, 8–11), that is, scholars from various sides of the creation debate who refer to the “ancients” to substantiate their own views.

Indeed, Brown suspects many scholars of bias in their references to the earlier interpreters of the narrative. Anachronistically, he points out, the “recruiters” pick and choose passages from the “ancients”—“superficially, selectively, or carelessly” (p. 5)—recasting them within the framework of more recent concerns about figurative and literal approaches to Genesis 1 and what Brown calls throughout “creation week.” Examples of “recruitment” can be found in many places (pp. 47–48, 63, 122–124, 130–131 etc.). It is this realisation that determined him to “revisit the ancients” (pp. 280–286) to set the record straight and to stymie the misrepresentation of traditional interpreters as siding with issues of our times. As such, Brown’s book is a necessary *vademecum*, especially for academics and enthusiasts whose background is not in early Christian and medieval studies—and who will undoubtedly get upset at having their proof-texting strategies dismantled by him.

Nevertheless, *Recruiting the Ancients* is significant for more reasons than its goals of drawing attention to the modern hijacking of the “ancients” and relearning how to read them. I shall return to this shortly. Here, I must acknowledge at least the thrust that undergirds the book’s argument. That is, its implicit message that, after several centuries of polemics over creation and the nature of the Genesis narrative of creation, the time has come to learn wisdom. And, Brown appears to suggest, as I gather, wisdom is not found in the biblicism of the last few centuries; we discover it within the complex tradition of interpreting Genesis 1, spanning two millennia (pp. 14–18). If my interpretation holds, this is a subtle counterpoint to the modern arrogant claim that the “ancients” were precritical and dumb. And I believe that Brown’s treatise proves me correct, no matter his point that “the evangelical rediscovery of the early church” does not mean “simply to go back to a patristic faith” (p. 286). Which is fine anyway.

But this is where several issues present themselves to the patristics scholar; and this is my only kind of objection to Brown’s approach: that he did not grasp the field of patristics in its dynamic. While his book is the outcome of a daring project in biblical studies and the history

of faith and science, Brown overall relies on old patristic scholarship. True, his nod at the recent disallowing of the modern myth of Alexandria vs Antioch (pp. 104–106) shows that this is not always the case. Nevertheless, consistently, he attempts to identify—by the dogmas of old scholarship—who among the “ancients” read the “creation week” literally and who did not. It is this concern, which bespeaks a historicist drive (reading the “ancients” only within their own context), that determined Brown’s opposition to “recruitment,” against the new scholarship that boldly converses with the “ancients” in contemporary terms (see, for instance, Jordan Daniel Wood, *The Whole Mystery of Christ*, 2022; unreferenced). His approach to patristics corresponds to what modern scholarship does to Scripture, considering it historically and literarily.

As Charles Kannengiesser showed in *Handbook of Patristic Exegesis* (2004; unreferenced), the “ancients” operated with a “rich” concept of scriptural “letter” but this does not bother Brown. But this “rich letter” renders inapplicable to patristic interpreters the modern reductionist scheme of either literal or figurative reading. The fact that the “creation week” is a projection of modern concerns does not obfuscate his own search either. Nor does the fact that Augustine does not mark the end of the patristic tradition. In a way, Brown “recruits” the ancients, too, for the authors he treats in this book had much more to say than whether Genesis 1 was about literal days or ages, or merely the parable of an instantaneous creation. In my *Humankind and the Cosmos* (2021; unreferenced), I discussed Clement of Alexandria’s use of the Genesis narrative as a framework for tackling broader matters of the theology of creation, as well as both Clement’s and Origen’s keen interest in the natural world, not only in the invisible, contrary to Brown’s assertions—assertions that, to be credible, would have required more textual engagement than what the author afforded (see Chapter 1). Also there, I showed that Basil of Caesarea’s *Hexaemeron* is not the literal take on Genesis 1 most modern scholars believe it to be—and Brown agrees with them (see Chapter 5). And so on.

That said, Brown surprised me again by deftly addressing the difference between the patristic topics of the world's ages as mirroring the "creation week" and the Genesis "days" as ages of the "world week" (pp. 53–102). It is always exciting to find out something new, and I am grateful to him for this cogent discussion. It is for this and for its many other virtues that I recommend *Recruiting the Ancients* to scholars of reception history of Genesis 1 and to historians of science and religion. Wholehearted congratulations to the author.

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**J. P. Moreland, Stephen C. Meyer, Christopher Shaw,
Ann K. Gauger, and Wayne Grudem (eds.):
*Theistic Evolution: A Scientific, Philosophical,
and Theological Critique***

Wheaton, IL: Crossway, 2017; 1005 pages

ISBN 9781433552861, first edition, hardback

AU\$185

From the full-frontal attack on evolutionary theory by the Intelligent Design (ID) creationist community comes this large work on theistic evolution. All the major names rallied their voices into an extensive text on the problems they claim make the position untenable. Given how each has marshalled their previously published works into each chapter, this is presented as a comprehensive debunk of the scientific, philosophical, and theological basis of being a person that holds to the truth of both evolution and theism.

I have little good to say about this book, mostly because the book itself has almost nothing scientific to say. Anyone that has read

a scientific paper or text before in school, college or research expects data, information presented clearly, and scientific analysis. Despite the promises in the preface and introductory chapters, there is no science at all from the very beginning. Given my experience reading the ID works, my expectations were already low for the scientific content (both its volume and truth) but even then I was shocked by the complete absence of science. We meet a few claims, followed by hundreds of pages of philosophy, theology, and apologetics. There is simply no new data, which is especially odd given that this work comes from 2017, and biology has exploded into a new data revolution. The giveaway comes from the fact that the two most cited evolutionary scientists in the book (by a huge margin) are Charles Darwin and Richard Dawkins. One suspects that the authors have little familiarity with modern evolutionary biology, nor current biology in general.

I am disappointed that we are promised one thing and then left empty handed. We are told “this is the best critique of theistic evolution available” and that it “persuasively argues that theistic evolution fails as a theory—scientifically” (p. 1) but this never comes. We are warned of “the common, unwarranted assumption that Darwinism is doing well as measured by scientific evidence” (p. 1). These encouragements from the recommendations, all from theologians rather than scientists, clue us as to the real target audience. No scientist will be satisfied. This book is to persuade Christians with no scientific understanding that ID is scientific truth. It could not work on any other audience.

The foreword by Steve Fuller informs us that Intelligent Design “remains very much on the table as a scientific explanation” (p. 27) and that evolution “amounts to an outright betrayal of both the scientific and Christian message” (p. 32). Strong claims indeed. In a bizarre comparison to the effect of the Reformation on the explosion of modern science, ID is arrogantly compared to a new Reformation. This is especially odd given the immense productivity of biology following the Darwinian revolution of the nineteenth century, the modern evolutionary synthesis of the mid-twentieth century, and the transformation of all the life sciences since the Human Genome Project led by Francis

Collins, who is also relentlessly attacked in the book. The truth is that the 160 years since Darwin has seen biology morph from an observational science into a practical science, so the reverse of Fuller's claim is true.

In one of the most ironic statements in the entire book, Stephen Meyer tells us, of evolutionary biology, that “this tangled—indeed, convoluted—view of the origin of living systems adds nothing to our scientific understanding of what caused living organisms to arise” (p. 47). This is a perfect description of ID which has produced zero scientific understanding of life and its origins, but is completely untrue of evolutionary biology, especially in its modern context. Apparently, evolutionary biologists are leaving in droves (p. 52; in fact, they are not), scientists everywhere are coming round to ID (they are not), and the only reason more are not is because evolution has been insulated from criticism (p. 54). This is the opposite of the truth in the booming hard-data science of 2025, along with the continual claims of bias (p. 54) which repeat throughout the book—again ironic coming from ID which is pure bias. Meyer promises that the first nine chapters will produce “a wealth of scientific evidence from an array of biological subdisciplines” (p. 50) but this never comes.

In Chapter 1. Section 1, Doug Axe begins the so-called scientific critique by explicitly telling us that we require no technical expertise or understanding to denounce evolution—only intuition (p. 83–84), before then explaining why experts cannot be trusted. There are unsurprisingly no data claims made in this chapter which is not a good start for the scientific critique. Meyer, himself not a scientist since graduate school in the early 1990s, also offers no data. He assures us that Axe's work (published between 2000 and 2004) showed that functional genetic sequences are too rare to account for evolution (p. 105), but this data is not presented in the book so we simply must trust their “expertise.” For those with knowledge of genetics, this claim is untrue but it is also very dated. We are now 20 years removed from Axe's work and in a new era of biology.

The third chapter by Matti Leisola is the only chapter offering any hard science in exploring synthetic biology (p. 140) but almost immediately becomes an attack on “naturalism.” After this, evolution is left behind for an exploration of abiogenesis instead by James Tour (p. 165) and the origins of information by Meyer again, promising to “demonstrate scientifically” that evolution cannot account for it without any demonstration. All this amounts to is a pointing at actual research and saying “I don’t think so” whilst offering no science in return, only the idea of a designer. Perhaps the worst attempt at science comes from Jonathan Wells in Chapter 7 which is a hopelessly fumbled and outdated attempt at molecular biology from someone who never practiced nor published in molecular biology. There really is nothing to see here. This book should not sit on any science and religion shelf because from then on, all that follows is philosophy and theology.

The book is also a fierce attack on science itself, both the authority and practice of it. A huge problem one encounters even before reading is the sheer lack of scientific expertise. The authors, with one or two exceptions, have published almost no science or have not done so for decades. None are authorities in their fields, nor can they hold up against the litany of Nobel Laureates and research professors on the side of evolution. This puts them in the strange position of touting their own expertise to be trusted but discounting all expertise overall. This is a fundamental problem for ID as an industry. Moreland is touted as a scientist with a PhD though he graduated in the 1980s and never published. Axe’s work is championed yet he has only four publications from twenty years ago. It explains the lack of data presented in the book and why from the opening chapters this is evidently an apologetics book, rather than any kind of scientific critique.

A contradiction of the book is that, until Wayne Grudem’s chapter, it states that it does not advocate for creationism or a literal reading of Genesis, but from that chapter onwards (p. 61) we are explicitly told repeatedly that a literal interpretation of Genesis’ creation account is essential to faith and apologetics. This is not the only contradiction that the reader is continually tossed between. Given the old-earth roots

of many of the authors, one wonders why exceptions are made to the data of other sciences regarding the earth's age, but not to biology. If one were to follow the advice given, one would emerge a flat-earth creationist believing in a domed, primeval model. This is perhaps the ultimate tragedy of the ID movement today: the other creationist positions lean heavily on ID for its scientific claims, and yet these creationist movements are becoming more conspiratorial and many now teach flat earth and reject all science. Rather than the new Reformation promised by Steve Fuller and a new dawn for scientific freedom under ID promised by Stephen Meyer, William Dembski, Doug Axe, and others in the book, ID is leading creationists against science in more extreme forms than ever.

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December 2025

Sy Garte: *Science and Faith in Harmony: Contemplations on a Distilled Doxology*

Grand Rapids, MI: Kregel, 2024; 256 pages

ISBN 9780825448157, first edition, paperback

AU\$35

Many may consider Sy Garte an unlikely convert. Garte is a highly respected biochemist; he has been a professor at three universities, authored hundreds of scientific publications, and had leadership positions in the National Institutes of Health and a number of other scientific organisations. For much of his life, he was a self-described “full-blown” atheist (p. 176). If the New Atheists are to be believed, Garte is the last person who should have been tempted to accept the

God hypothesis's "most unloving instantiation, Yahweh, nor his insipidly opposite Christian face, 'Gentle Jesus meek and mild'" (Richard Dawkins, *The God Delusion*, Bantam Press, 2006, p. 31).

As Garte's dissatisfaction with his reductionist atheist worldview mounted, he found himself increasingly drawn to the world's largest religion. A combination of apologetic arguments and a profound experience of Jesus finally led Garte to commit his life to Christ. He chronicled the story of his conversion in his 2019 book *The Works of His Hands: A Scientist's Journey from Atheism to Faith* (Kregel Publications). In *Science and Faith in Harmony*, Garte sets out to describe how his scientific career and religious beliefs are not just compatible; they are also in deep harmony.

The book takes the form of forty-four short "vignettes," discussing topics such as creation, grace, evolution, DNA, quantum physics, Christian growth, and the church. Each chapter normally includes a story from Garte's life and a scientific concept explained in layperson's terms. Garte pulls the threads together at the end of each chapter with a personal reflection. Sometimes this takes the form of a practical recommendation, but often Garte simply encourages the reader to be more awed by Creator and creation alike. After each chapter, Garte has included a short list of resources for engaging more deeply with the topic. These include books, articles, or videos, and can be anything from secular science talks to theology tomes. Having read or watched a number of the resources Garte recommends, I can testify that they are, in many cases, excellent choices and well worth engaging with.

There is much to commend about this book to Christians and sceptics alike. In particular, Garte's own experience of becoming Christian lends considerable weight to his perspective on science and faith. As with C. S. Lewis before him, sceptical readers can be encouraged that Garte is coming from a place of understanding. Moreover, Garte's tone is very personable. The book reads almost as if you are engaging Garte in a wide-ranging conversation on a lazy Sunday afternoon. Garte's deep appreciation of the natural world and God's grace infuses every page. It is easy to tell that Garte loves the things he is

writing about, and his passion for them can be infectious. At many points throughout the book, Garte really does succeed in conveying the beautifully harmonious relationship between the study of the natural world and the tenets of the Christian faith.

Throughout the work, Garte engages in a number of intriguing speculations about theology and science. These are somewhat reminiscent of C. S. Lewis's gentle speculations in his apologetics books. However, in contrast to Lewis, Garte's speculations fly dangerously close to the borders of Christian orthodoxy. For example, in Chapter 13, Garte suggests that the new creation "isn't even a physical universe at all but a spiritual realm" (p. 78). This is in tension with the historic Christian belief in the resurrection of the body, an event which happens to the human corpse. To be clear, it does not seem like Garte is deliberately trying to subvert orthodox belief in the resurrection, but rather that he does not grasp its importance.

Garte also uses quantum physics to justify some questionable statements about the Incarnation. Contrary to the understanding of many Christians throughout history, Garte seems to accept that Jesus being simultaneously human and divine "would violate the logical law of noncontradiction" (p. 120). To support this astonishing admission, Garte appeals to quantum physics, asserting that it reveals a reality which "defies the rules of logic" (p. 120). This is not only a nonstandard interpretation of the Incarnation, but also a misunderstanding of the relationship between quantum physics and logic. While both the Incarnation and quantum physics are frequently described as mysterious, or even paradoxical, to claim that they are logically impossible (like, for example, a married bachelor) is philosophically untenable. Garte wraps up his argument with an even more shocking conclusion: "when we want to know the truth about our created world, science trumps logic every time" (p. 120). This assertion leans into the dogma of scientism, which holds that science is the best or only way of ascertaining truth, normally at the expense of philosophy. I was disappointed to see that Garte is still sympathetic to this aspect of the New Atheists' ideology.

For a book that spends much of its time discussing the concept of purpose, it remains unclear what purpose *Science and Faith in Harmony* is meant to fulfill. Garte imagines the book serving to bring a rationalistic sceptic to church and helping a science-loving child of Christian parents retain her faith. According to Garte, “my overall purpose ... is to reveal God’s truth that science and Christianity are not in conflict” (p. 16). However, Sean McDowell clarifies in the foreword that “this is not an apologetics book” (p. 12). McDowell’s observation holds true, as Garte references theistic arguments, historical evidence, and answers to objections without ever exploring them in detail. He also devotes very little space to some of the most serious areas of alleged conflict between science and Christianity, such as how to interpret the first chapters of Genesis, or how to understand evolution and *imago Dei*. Because of the book’s sparse coverage of these topics, I am doubtful that a sceptic would find much here to convince them. Likewise, I do not think a Christian struggling with doubt would find much solace in Garte’s words.

What would *Science and Faith in Harmony* be good for? I think Garte’s use of the term “doxology” in the subtitle is a good hint. Garte’s vignettes may work better as liturgy than apologetics. Given their brevity, his chapters could act as a suitable scientific and personal prelude to worshipping God in a church context. It is easy to imagine a chapter being read out in a service or small group Bible study for the encouragement of the parishioners. However, even though it contains the potential to edify Christians, I would caution those who wish to use this book for such a purpose. Garte’s wild speculations, untethered as they are from mainstream Christian theology, may severely limit the usefulness of his book.

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Opinion & Response

Is Our Current Age Ahistorical or Dyshistorical? Reflections on *Priests of History* by Sarah Irving-Stonebraker

Alan Gijsbers

In *Priests of History: Stewarding the Past in an Ahistoric Age* (Zondervan Reflective, 2024), author Sarah Irving-Stonebraker gives a delightful account of how she became a Christian. She was in her late 20's and everything was going well for her academically, but she moved from being politely hostile to the Christian faith, to committing herself to Christ. She and her household are now very disciplined and committed Christians, who draw on the traditional practices of protestant Christianity to connect to the past and so give shape to their future life. It is quite a journey, and I was left wanting more, particularly because one of the drivers was her encounter with the science and theology of Robert Boyle (1627–1691) and Robert Hooke (1635–1703). When she studied their writings, she discovered how much their Christian commitment shaped the way they saw their science. This is very different from today's approach to people's faith commitments. Now people's beliefs and commitments are regarded as private affairs not worthy of inquiry or comment—taboo even. This is different from the

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secularity I encountered in India where people's faith commitments were recognised and respected, even when one's faith was different from another's. There, faith shaped values and motives. By contrast to India, Australian secularity does not discuss faith or values easily.

Irving-Stonebraker claims we are living in an *ahistoric* age which ignores the past. This reminded me of when I commended a seminal paper on the biopsychosocial model of medical care by George Engel¹ to a medical registrar. It was in about 2015. The registrar looked at the paper and said that it was so dated because it was written in 1980. So last century!

However, can we describe our age with the thesis that we are ahistorical? John Hedley Brooke in his history of science and religion² warns us against making sweeping generalisations about history as there are always counterfactuals against any historical thesis. He was addressing the myth of the conflict between science and religion, when their relationship is much more nuanced and complicated. Likewise, Peter Harrison presents an attractive thesis: that the new hermeneutic approach to Scripture, developed during the protestant reformation, led to the development of the new approach to nature.³ There may well be some truth to that in relation to the basic sciences, but the thesis flounders on the fact that the development of the science of anatomy and pathology started in the universities of northern Italy about half a century before Martin Luther nailed his 95 theses to the Wittenberg door. The anatomical pioneer and catholic, Andreas Vesalius, was not particularly a biblical scholar, but he was a member of The Brotherhood of the Common Life, to which Thomas à Kempis and Erasmus of Rotterdam also belonged.

1 Engel, G. *The Clinical Application of the Biopsychosocial Model*. Am J Psychiatry. 1980; 137:535–544.

2 Brooke, J. H. *Science and Religion: Some Historical Perspectives* (Cambridge University Press, 1991).

3 Harrison, P. *The Bible, Protestantism and the Rise of Natural Science* (Cambridge University Press, 1998).

But is our age ahistorical or *dyshistorical*? I recall representing ISCAST which sponsored a public lecture given at The University of Melbourne by George Ellis FRS (a Fellow of the Royal Society) on the origin of the universe. It was an ISCAST lecture that the physicists of Melbourne expressed interest in joining. As chair of the gathering I thought I would present Johannes Keppler's famous prayer invoking awe and wonder that he could think God's thoughts after him. As I addressed the 700 or so members in the audience, it felt as if I had somehow transgressed the bounds of good taste by bringing faith commitments into a physics lecture. Faith commitments, so germane to Keppler, Boyle, and Hooke, are taboo in our modern society.

I am a physician in addiction medicine. I am also a historian in that every patient tells their story of how they developed their addiction. I am interested in their faith commitments, that is their belief in the dimensions of meaning, purpose, and relationships (the Christian's virtues of faith, hope, and love in secular terms) because these virtues drive their lives and are a valuable resource to help their recovery. Ironically, the modern corporate world spends a lot of time in governance defining their mission, vision, and core values (that is, their secular faith commitments) while there is little exploration of these virtues for individuals. When I alluded to these virtues in the case of Keppler, somehow I crossed the boundaries of good taste. Even doctors are nervous exploring these faith dimensions as they are afraid such explorations may be misinterpreted as proselytising. Such fear needs to be challenged, for humans need to be free to explore these dimensions as they reflect on who they are, what their values are, and how this impacts their approach to their physical and mental health.

Such dimensions need to be explored by historians as they study their subjects. There are a number of episodes throughout history where this did not occur, not because they did not study history (they were not ahistorical) but because the spiritual dimension was not part of their historical enquiry. For example, in Hugh Aldersley-Williams's otherwise outstanding biography of Dutch diplomat Constantijn

Huygens and his more famous son, Christiaan Huygens,⁴ who was a polymath, the first non-English FRS, discoverer of the rings of Saturn, and a leading figure in the development of science in Europe, there is no mention of the family's Calvinist background. This happened despite the fact that Constantijn, Christiaan's father, mentored William, the future king of England, king Billy of Irish infamy, a staunch protestant who rescued England when the Catholics threatened to transform the restored monarchy to a Catholic state. Their faith commitments must have mattered, as Constantijn attended the notorious Council of Dort (1618–1619). However, the biography is silent in this area. Likewise, in researching the very accessible stories of the rise of anatomy and pathology—biographies of stalwarts of anatomy like Antonius Vesalius, Felix Platter, Jean Fernel, and William Harvey—it required some digging to find out what faith commitments motivated these pioneers. Some, like Thomas Sydenham, Hermann Boerhaave, and Ambrose Paré were overt in their commitment to Christ; others, like Charles Darwin, were ambiguous, and later in Darwin's life, agnostic, but these dimensions, worth exploring, are either glossed over or are footnotes to their story.

Thus, there is a history, but the stories are selective, seen through our modern, empty, secular lens.⁵ This dyshistory calls on Christian historians to tell histories that position people's faith commitments much more front and centre. It is not just restoring history but telling a truer, richer history. That work needs to take place not in a Christian echo-chamber but in the secular marketplace of ideas as a corrective for distorted stories. This, I think, Irving-Stonebraker does. For instance, in examining some Christian stories addressing slavery in the UK and US, and the aboriginal story in Australia.

4 Aldersley-Williams, H. *Dutch Light: Christiaan Huygens and the Making of Science in Europe* (Picador, 2020).

5 I call Western secularism empty because it is silent on faith commitments, unlike Indian secularism which acknowledges and respects faith commitments as part of public discourse; with Karl Barth: "Where difference is understood and respected, and yet commitments are neither hidden nor diluted."

I am surprised that Irving-Stonebraker, who cut her historian teeth on Boyle and Hooke, did not include the history of the sciences in her book. I strongly commend Tom McLeish's *Faith and Wisdom in Science*⁶ and his later *The Poetry and Music of Science*.⁷ Both profoundly explore a bridge between the great divide of the arts and the sciences, pointing out that by resurrecting the old appellation of science as natural philosophy, the love of the wisdom of nature, not only do we discover a much longer and richer history of what we now know as science, but we also discover the need to encase the sciences within the values and stories found in the arts. Thus, the pursuit of beauty (p. 164–9) is not just the domain of the arts but is a necessary dimension in the exploration of scientific frontiers. Her encounter with Boyle and Hooke points the way forward.

I was disappointed by Irving-Stonebraker's treatment of the question of slavery. The story she tells is a very partial one and somewhat idealistic. The heroes she describes, Mary Prince, Anna Hart Gilbert, and Elizabeth Hart Twaites, were wonderful people and committed Christians who struggled to abolish slavery. But the stories here are one-sided. I was recently in Newburyport MA where I visited the First Presbyterian Church. The great evangelist George Whitfield, who founded that church, is buried there in a crypt below the pulpit. Whitfield advocated humanity in the treatment of slaves but also lobbied the government of the state of Georgia to allow slaves. Whitfield believed his orphanages there needed slaves to stay financially viable. So, slavery became legal in Georgia. Ironically, about 40 years after Whitfield's death, William Garrison, the famous abolitionist, was born in the house next door to the church. I could not find a clear account of Garrison's faith commitment, but he is now eulogised for his leadership in the abolitionist movement. His good friend, John Greenleaf Whittier, author of the famous hymn "Dear Lord and Father of Mankind," came from the neighbouring town of Amesbury MA.

6 McLeish, T. *Faith and Wisdom in Science* (Oxford University Press, 2014).

7 McLeish, T. *The Poetry and Music of Science: Comparing Creativity in Science and Art* (Oxford University Press, 2019).

Whittier was a well-known Quaker and staunch abolitionist. He also chronicled in poetry the sad story of the cruel mistreatment of Quakers by the Puritans of New England. The story, as Irving-Stonebraker admits, is complex, but that is only alluded to rather than explored in her book.

Diving more deeply into the nature of history, Irving-Stonebraker has avoided the thorny issue of the difference between her modern, scientific approach to history and the way history is recorded in the Bible. Thus, for example, in the biblical book of Joshua, God is not just active in history, but he speaks his intentions in the first person. Likewise, my colleague Dr Luke, in both his gospel and the book of Acts, describes God or God's Spirit as actively speaking participants in the narrative. What sort of history is this? Why have we a different, more "scientific approach" now? How is our approach justified?

Similarly, the Swiss minister and theologian J. H. Merle d'Aubigny's *The Reformation in England*⁸ has a much more lively, almost novelistic approach to history. It is a vivid read but the biases and judgments of the author are much in evidence. The review of d'Aubigny's book in *The Reformer's Bookshop* laments that since this 1962 reprint there has been strong decline in biblical literacy: "Biblical illiteracy is the norm, secularism now dominates the Continent that witnessed the reforming work of Luther, Zwingli and Calvin, Tyndale, Cranmer and Knox. In this hostile climate ..."⁹ However, the style of writing history has changed, and Irving-Stonebraker represents the new approach—more objective and detached, which I agree with. But on what basis is this approach justified? It is an approach foreign to the historians described above. The basis of the new is not found within Scripture; from this angle it seems an unbiblical, yet properly objective, approach to history.

8 d'Aubigne, J. H. M. *The Reformation in England* (Banner of Truth, 1962).

9 Anonymous reviewer of d'Aubigne's *The Reformation in England*. <https://reformers.com.au/products/9781848716506-the-reformation-in-england-daubigne-j-h-merle?srsltid=AfmBOoomDYeCzVvWXPfly9BGocjk0HZDM8hsmvF5CKA8yDaMTRiqA8c4>.

How do we not just preserve our stories, but pass them on to the next generation? Irving-Stonebraker tells us that the daily, weekly, and seasonal liturgical rhythms shape her family's practices. I was surprised that she drew on protestant divines but did not draw on the First Testament's strong comments for parents to pass on the traditions to their offspring; for instance, in the exposition of the Torah and the wisdom literature. Her strategies of cultivating and keeping our histories are of necessity rooted in traditional practices, but are there not more modern ways to do the same thing? New songs set to new music, however difficult for traditionalists, are a way of re-incarnating the gospel into new idioms. The challenge of the Internet or Zoom meetings can be made into exciting new ways to pass on our traditions. Likewise, there are now historical novels and even historical comic strips like the adventures of Asterix which can also enrich our past.

These are mere caveats to what has obviously been a very stimulating read. Irving-Stonebraker has provided a motivating account of a better, more Christian approach to history. This serves as a light on how the virtues (like meaning, purpose, and relationships described above) might shape everyday practice to the glory of God, so that people, like Irving-Stonebraker, are motivated to ask why scientists do what they do, and how she can explore her own virtues as a result.

