

RESPONSE: THE PROBLEM OF SHIFTING SCIENTIFIC PARADIGMS: ON AVOIDING PREMATURE CLOSURE OF QUESTIONS IN SCIENCE AND RELIGION

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It has long been recognised that human evolution has biological and cultural components. Thomas H. Huxley's famous 1893 lecture, 'Evolution and Ethics' at Oxford University caused intense discussion (and no small degree of anxiety) precisely because of his explicit warning that future human flourishing depended on cultural factors.¹ If civilisation were to collapse, humanity would revert to earlier patterns of social violence that civilisation had managed to tame.

Since then, considerable attention has been paid to the interplay of biological and cultural evolution, exploring neglected issues in late nineteenth-century evolutionary debates and opening up new discussions. For example, might we think of the biological evolution of humanity in *Darwinian* terms, and its cultural evolution within a *Lamarckian* framework?² Lamarck's emphasis on the inheritance of acquired characteristics, the transformational pattern of evolution, and the concept of directed changes is inadequate as an account of the biological aspects of evolution; yet it seems to accommodate many aspects of human cultural evolution—such as the intentional redirection of western European culture at the time of the Renaissance through the reappropriation of classical Roman and Athenian cultural norms and exemplars.³

These debates continue, and others have emerged. The four papers gathered in this collection engage these discussions of the 'mutually constitutive interplay' (Ullrich) of natural and cultural forces in shaping hominid evolution in significantly different ways, indicating both the complexity of some of their issues, and their potential significance for constructive reflection within the community of scholars in science and religion. As these four important

¹Thomas H. Huxley, *Evolution and Ethics and Other Essays* (London: Macmillan and Co., 1894).

²Maria E. Kronfeldner, 'Is Cultural Evolution Lamarckian?', *Biology and Philosophy* 22, no. 4 (2007): 493–512, <https://doi.org/10.1007/s10539-006-9037-7>. See also Piers J. Hale, *Political Descent: Malthus, Mutualism, and the Politics of Evolution in Victorian England* (Chicago: University of Chicago Press, 2016).

³Peter Mack, 'Humanism and the Classical Tradition', in *The Oxford History of the Renaissance*, ed. Gordon Campbell (Oxford: Oxford University Press, 2023), 10–47.

contributions make clear, these conversations between theology and contemporary evolutionary theory can be worthwhile and productive, generating new lines of discussion for further exploration.

Michael Burdett offers a thoughtful and informed reflection on the ways in which human agents shape the future direction of evolution through environmental factors and genetic modification, and reflects on the significance of these developments for our understanding of providence. Victoria Lorrimar explores how recent biocultural evolutionary research affirms the importance of the imagination for human functioning and flourishing, and how this might inform an understanding of human distinctiveness. Nathan Lyons considers the view that morality is a driver of human evolution, forcefully stated by Victor Kumar and Richmond Campbell, and correlates this with Thomistic accounts of natural morality. Megan Loumagne Ulishney opens up an innovative and potentially productive reflection on the role of embodied social play in catalysing human (and non-human) flourishing, and how these insights can be articulated within a specifically theological anthropology.

Limits on space mean I can only pick up on two points for reflection, both of which are of wider interest. Victoria Lorrimar makes a point that needs to be affirmed vigorously in the face of rationalist accounts of the scientific enterprise on the one hand, or the human quest for truth and meaning on the other—namely, that the human sense-making apparatus is complex and dispersed, and enfolds what we loosely (and unhelpfully) term ‘reason’, ‘imagination’, or ‘intuition’, as if these were discrete and disconnected faculties.

The biologist and Nobel Laureate Peter Medawar argued more than a generation ago that scientists should be open and explicit about the role of the imagination in scientific theory production. Theories ‘appear in their minds along uncharted byways of thought ... they are imaginative and inspirational in character’.⁴ Medawar’s point is that most scientific papers ‘give the false impression that scientific discoveries merely arise from inductive observation. They do not make it clear that the essential mental process in research is the imaginative act, the formulation of a hypothesis to be tested later by experiments.’⁵

Lorrimar’s important analysis of the role of imagination moves us far beyond the obsolete rationalism of ‘hypothetical deductive’ approaches to scientific theory development, and acknowledges the proper role of the imagination in exploring and representing our world, and dealing with questions of meaning. To demand that humans limit themselves to ‘reason’ is impoverishing, and fails to do justice to the ways in which science actually operates. Lorrimar’s article offers some helpful pointers for building bridges between the sciences and the humanities through the ‘imagination’.

Michael Burdett’s reflections on evolutionary theory indirectly open up an important issue in the field of science and religion—the problem of follow-through on theological assessments of developments in the natural sciences, particularly evolutionary biology. When I was a research student in the Department of Biochemistry at Oxford University in the 1970s, it was assumed that there was no point in reading research articles that were more than ten years old, in that the field was undergoing such rapid change that older studies would be outdated and unreliable. While some landmark studies in the past continued to be referenced out of historical interest

⁴Peter B. Medawar, ‘Is the scientific paper a fraud?’, *The Listener* 70 (1963): 377–83, 377.

⁵Neil Calver, ‘Sir Peter Medawar: Science, Creativity and the Popularization of Karl Popper’, *Notes and Records of the Royal Society* 67, no. 4 (2013): 301–14, 308 (emphasis added), <https://doi.org/10.1098/rsnr.2013.0022>.

or professional respect, they were often used to indicate how much the field of research had changed since those times.

My concern is that discussion of some questions in the field of science and religion often tends to be ‘frozen’ at a specific point, sometimes in response to a specific publication, and subsequently discussed without reference to downstream reflections. Science often moves on rapidly from where it was a decade ago, pointing to the vulnerability of theological reflections based on a significant intervention in evolutionary theory in the past. The theological evaluation of developments in the field of evolutionary biology is likely to change over time, owing to shifts in focus and theoretical understandings within the science and religion community on the one hand, and the direction of travel of evolutionary theory on the other.

To explore this concern, I will consider a representative case study that Burdett mentions in his contribution to this issue: the fascinating 2013 collaborative project between the theologian Sarah Coakley and the evolutionary biologist Martin Nowak on cooperation within an evolutionary framework, which suggested this was crucial to understanding key evolutionary transitions, while reaffirming the validity of some significant theological questions.⁶

In the early 2000s, Nowak and others had argued that cooperation could be observed within—and not simply as a consequence of—the evolutionary process.⁷ These ideas were set out by Nowak and two Harvard colleagues in a paper of 2010.⁸ This was met by a significant critical response, partly because of its criticisms of then-dominant theories of kin selection and punishment, such as that of W. D. Hamilton, in which individuals were held to cooperate only to ensure the success of genetic relatives. Nowak followed this with his *Supercooperators*, which challenged the basis of ‘Hamilton’s Rule’ in a way that was academic in its foundation, but articulated in a way that ensured a wider readership.⁹ Nowak’s critique of Hamilton’s ‘inclusive fitness theory’ called into question both its mathematical basis as well as its explanatory value. This proposal remains under active discussion within the biological community at present.

The theologian Sarah Coakley, who worked with Nowak at Harvard on exploring the theological implications of this approach, rightly observed the relevance of this shift for theological ethics, which now ‘has a chance here to reassert its significance for evolutionary thinking, even as it enters into vigorous new debate with the genetic reductionism that has characterized the last generation of secular evolutionary thinking.’¹⁰ Christian theology and

⁶Sarah Coakley, ‘Providence and the Evolutionary Phenomenon of “Cooperation”: A Systematic Proposal’, in *Providence of God: Deus Habet Consilium*, eds. Francesca Aran Murphy and Philip Gordon Ziegler (London: T & T Clark, 2009), 179–93. For the full outworking of this programme of collaboration, see Martin A. Nowak and Sarah Coakley (eds.), *Evolution, Games and God: The Principle of Cooperation* (Cambridge, MA: Harvard University Press, 2013). For some issues this proposal raises, see Sarah Coakley, ‘Evolution, Cooperation and Ethics: Some Methodological and Philosophical Hurdles’, *Studies in Christian Ethics* 26, no. 2 (2013): 135–9, <https://doi.org/10.1177/0953946813477016>.

⁷See, for example, Martin A. Nowak, ‘Five Rules for the Evolution of Cooperation’, *Science* 314, no. 5805 (2006): 1560–3, <https://doi.org/10.1126/science.1133755>.

⁸Martin A. Nowak, Corina E. Tarnita, and Edward O. Wilson, ‘The Evolution of Eusociality’, *Nature* 466, no. 7310 (2010): 1057–62, <https://doi.org/10.1038/nature09205>.

⁹Martin A. Nowak with Roger Highfield, *SuperCooperators: Altruism, Evolution, and Why We Need Each Other to Succeed* (New York: Free Press: 2011). For the significance of this work, see Manfred Milinski, ‘Biology: A Revolution in Evolution’, *Nature* 471 (2011): 294–5, <https://doi.org/10.1038/471294b>.

¹⁰Coakley, ‘Evolution, Cooperation and Ethics’.

ethics can both find their place within this new way of thinking. This point was reaffirmed by Simon Oliver, who explored how the concept of ‘teleology’ could be reimagined in order to allow for a new normative account of nature in the light of these considerations.¹¹ As Coakley pointed out,¹² there are a number of philosophical and ethical issues that need addressing before further progress can be made, although these certainly appear to be capable of resolution.

So where is this debate today, more than ten years after it got under way? While Nowak’s approach to eusociality has gained support, it is still being evaluated at the scientific level. There was initially much comment in the literature relating to *Evolution, Games and God* (2013); yet its implications for some important wider questions, such as the origins of religion, remain to be explored. For example, some recent discussion of the evolutionary origins and development of religion has been specifically framed by Hamilton’s ‘inclusive fitness theory’;¹³ what if those same phenomena were to be framed using Nowak’s approach instead? Can we hope for a substantial intervention on this topic, now that the passing of time has clarified aspects of both the scientific and theological issues?

Burdett also notes the importance of Simon Conway Morris’s *Life’s Solution* (2003), which suggested that the phenomenon of convergent evolution raised some difficulties for Stephen Jay Gould’s emphasis on contingency in the evolutionary process.¹⁴ Twenty years have now passed since its publication, and a broad scientific consensus about the phenomenon of evolutionary convergence seems to be emerging.¹⁵ How might this shape theological reflection?

As these four papers indicate, such discussion is constantly moving, heading in new directions, exploring new avenues, and challenging what once seemed to be settled paradigms. My suggestion in this brief response to these essays is that we need to find a way of ensuring ongoing engagement with such big questions—perhaps in the form of periodic reviews of the ‘state of the question’—rather than leaving them suspended in an incomplete state of resolution, or ‘freezing’ the provisional answers given decades ago, as if these were definitive.

DATA AVAILABILITY STATEMENT

All data is drawn from publicly accessible sources.

¹¹Simon Oliver, ‘Teleology Revived? Cooperation and the Ends of Nature’, *Studies in Christian Ethics* 26, no. 2 (2013): 158–65, <https://doi.org/10.1177/0953946812473020>.

¹²Coakley, ‘Evolution, Cooperation and Ethics’, 139.

¹³For example, Bernard Crespi and Kyle Summers, ‘Inclusive Fitness Theory for the Evolution of Religion’, *Animal Behaviour* 92 (2014): 313–23, <https://doi.org/10.1016/j.anbehav.2014.02.013>.

¹⁴Simon Conway Morris, *Life’s Solution: Inevitable Humans in a Lonely Universe* (Cambridge: Cambridge University Press, 2003). Note also Simon Conway Morris, ‘Darwin’s Compass: How Evolution Discovers the Song of Creation’, *Science and Christian Belief* 18, no. 1 (2006): 5–22.

¹⁵See especially Vincent L. Bels and Anthony P. Russell (eds.), *Convergent Evolution: Animal Form and Function* (Cham, Switzerland: Springer Nature, 2023).