Reviews

Paul Copan and Douglas Jacoby
Origins: The Ancient Impact and Modern Implications of Genesis 1-11

Nashville: Morgan James, 2019. 250 pp. pb. £12.99. ISBN 978-1-68350-950-9

Copan and Jacoby offer an accessible introductory commentary on the prologue to Genesis. They stand within the scholarly consensus, and explain to readers, living amidst the new paganism of the twenty-first century, how Gen. 1–11 challenged and subverted the old paganism of the Ancient Near East (ANE).

Readers should recognize that 'Genesis is seriously interacting with the ancient world, critiquing its polytheistic worldview whilst providing a credible alternative' (xii). 'Most of the material in Gen 1–11 closely parallels pagan accounts of primeval history' but 'turns them on their heads. The folly of idolatry is exposed, often even satirized' (14), the pagan myths parodied (201).

'All of Gen 1–11 critiques ancient culture and beliefs, and if we can understand this critique, we will not only better grasp the message of Genesis, but also be better equipped to engage our own culture' (25). The radical newness of biblical theology shines most clearly when people can spot the differences from the original enveloping pagan myths; and they can do this only if they are familiar with those myths (15–16, 206).

It is mystery to me how people can read Gen. 1–11 as prosaic data about past events, when the alternative, seeing it as a subversive retelling of pagan sagas, shows the sublime character of Israel's God (207). How ever did little Israel discover a God of such glory in an all-prevailing pagan environment of such squalour—apart from revelation?

The absolute difference between Israel's God and the gods of the ANE is emphasised (31–42). Only Israel's God is uncreated; has total authority over the primeval dragon and the chaotic sea (49–50); provides for, and seeks relationship with, humanity (83); values obedience rather than technological progress (123–125); sends a flood expressly to judge sin -unlike the pagan gods, riled by humanity's clamour (160); and scorns Babylonian ziggurat religion (197f).

Familiar elements of the stories are richly symbolic: Eden (84–87); the snake as a 'chaos creature' representing pagan fertility religion (98); an anthropomorphic God (103–104); cherubim, borrowed from pagan religion, as metaphorical guardians (110); and 'sacred numbers' giving symbolic ages of *righteous* patriarchs (perhaps contrasted to *powerful* kings celebrated in the Sumerian King List, 133–137).

In the Table of Nations (Gen. 10), the term 'sons of' indicates peoples of relevance to Israel's history, not biological relatedness (190–191). Should Gen. 10 (with its plethora of languages, v. 5, 20, 31) follow Gen. 11 (which describes the proliferation of languages)? The authors acknowledge the texts as figurative critiques of pagan religion for which chronological sequencing is inappropriate.

Inevitably, certain topics invite further discussion. There is insufficient information about what constitutes 'death' (Gen 3:3–4). I am confused by the statement that humans 'were created with perishable bodies that God sustained in existence, but God withdrew that sustaining grace when they rebelled, and natural mortality took effect' (82). Spiritual death, separation from God, is the result of sin (as in the terms of the covenant; Dt. 30:15, 19).

If humans had never sinned, would the Bible story go directly from Gen. 1–2 to Rev. 21–22 (112)? Such thinking is speculative, but Gunton believes otherwise: 'had there been no fall, it would have still been the Father's good pleasure to come into personal relation with us through the incarnation of his Son' (*Christ and Creation*, 96).

Several interpretations are offered for 'Sons of God' mating with daughters of men (Gen. 6:1–4). Surprisingly, the authors favour liaisons between angels and women (146). Others posit that this cipher refers to ritual prostitution, integral to fertility cults of the ANE (Wenham, *Exploring the OT Volume 1*, 25–27; Lucas, *Genesis Today*, 119–120). Such fertility rites were the last straw in depravity that provoked God's righteous judgment. The flood story follows immediately.

The book concludes with four brief appendices, including some reflection on science. The authors say little about biological evolution, probably reflecting their charged American *milieu*, and their desire to build bridges. (See their 'Postscript: A Caution to Teachers'.) They acknowledge that the science/Genesis issue 'is generally uncontroversial among Christians in the biological sciences' (8n7), and that the possibility of human life requires an anthropic universe (68n92). Their bibliography includes works by Rick Colling, Francis Collins, Darrel Falk, Denis Lamoureux, Alister McGrath and Dennis Venema & Scot McKnight.

This book would grace church libraries and would benefit parents, teachers and youth workers - anyone who seeks to understand the Genesis prologue better, or who is troubled by rumours of Genesis-science conflict. It clearly connects the motifs of Gen. 1–11 with those comprising the widely circulating stories of the ANE. To read the stories of Gen. 1–11 without regard to genre is dangerous (53). To read them correctly - as contrasting Israel's holy God with paganism's unholy deities - is life-giving.

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Philip Clayton and James W. Walters (ed.),

What's with Free Will?

Eugene, Oregon: Cascade Books, 2020, 207pp. pb. £22 ISBN 1-5326-8162-2

The problem of free will and determinism has a venerable history, and has become more acute with apparent advances in neuroscience. The Introduction to this book informs us that 'neuroscience shows that most choices are directly traceable to nature and nurture. Additionally, these actions have detectable roots in the subconscious a split second before conscious actions.' This sentence, which itself raises questions, sets the tone for the book, which tends to take an uncritical, even unreflective, attitude to the pretensions of much modern science. One consequence of this is that there is much in these pages about 'non-reductive physicalism'. That is a view propagated by, amongst others, Nancey Murphy, and also held by Philip Clayton, joint editor of this volume. The view opposes the crude reduction of mental events to physical events, even neural ones. Resisting the identification of the two, it still claims that the mind emerges from physical processes, and is able to exert 'downward causation' on them. Yet it simultaneously wants to resist the dualist separation of the two, and its espousal of physicalism affirms a physical momism. The dilemma is how the mind may not be ontologically separate from the physical, but can still act on it. The very nature of physicalism seems to insist on the sole reality of a bottom-up line of causation, with no

non-physical causes. Mental events are said by non-reductive physicalists to 'supervene ' on the physical but, unless the two are ontologically separate, it is hard to understand what that means without making the mental just an alternative form of language to describe physical events.

This volume is the product of a conference held in 2017. Influenced by the work of Philip Clayton, of the Claremont School of Theology, who writes an interesting chapter and the Conclusion, the other contributors, for the most part, confront the difficulties of trying to reconcile the ambitions of science with our own sense of our freedom to choose and to act and with the feeling of moral responsibility we have for the results of our actions. Issues concerning the nature of the self and the possibility of our surviving physical death are also involved. The volume does not cover any new ground in neuroscience, nor does it offer a fresh philosophical approach, but contains intelligent, and sometimes thought-provoking, reflections on familiar themes. Most of the contributors are based at a Seventh-day Adventist institution in California, Loma Linda University.

The importance of belief in free will in human life is stressed, coupled with the obvious point that such life can never be free of all constraints. Yet the fact that a belief in determinism could adversely affect human behaviour itself underlies the crucial role that rational thought, the product of human freedom, itself can play. Even scientific beliefs depend on the understanding that we are free to recognise truth, and reason our way towards it.

One significant contribution, however, simply changes the subject. Marlene Ferreras, has no room for traditional arguments about free will, since her focus is on the social and cultural causes at work in restricting human freedom. She disregards neuroscience, so as to concentrate on the alleged lack of freedom of women in the Global South, and how they are unjustly oppressed by a socio-economic system. The contribution could be dismissed as an irrelevant aberration in the collection, but her views are typical of much that is becoming fashionable in universities on both sides of the Atlantic. She quickly dismisses the work of Plato and Aristotle as the precursors 'of a Western, white, European, heterosexual, androcentric culture that has constructed the theological anthropology that has become normative for our culture in United States'. This analysis, following the post-Marxist Critical Theory of the 1960s, views people as the mouthpieces of the social structures they inhabit. For her, there must be 'alternative epistemologies' and 'alternative realities'. Who you are will matter more than what you believe. The pursuit of reason will inevitably then be replaced by the exercise of power. Ideas of free will, and indeed of rationality, become replaced by reference to repressive social structures that allegedly condition thought. This appeal, through theories of 'intersectionality', to systematic forms of social oppression, involves political attacks on the possibility of the free-floating rationality that has been the ideal of both philosophy and science. All this involves a different notion of freedom than that discussed in the other contributions to this volume. On this basis, many of the achievements of science, not least in neuroscience, could be rejected as the prejudices of scientists who are predominantly Western, male and white. Whether the inclusion of such views in this volume is a sign of the future direction of much academic thought remains to be seen. Their growing influence in many contexts is undoubted.

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Simon Friederich

Multiverse Theories: A Philosophical Perspective

Cambridge: Cambridge University Press, 2021. 200 pp. hb. £49.99. ISBN 9781108487122

In this scholarly book Professor of Philosophy at the University of Groningen Simon Friederich makes a significant up-to-date contribution to the ongoing debate surrounding the possible existence of a multiverse, a gigantic, usually infinite, collection of universes. He professes to do so as an unbiased philosopher with no axe to grind, and his treatment does indeed seem a very fair assessment of different sides of the debate.

The idea of a multiverse is often invoked to explain the so-called fine-tuning of physical parameters, which is needed so that the universe gives rise to life. To evaluate the claim that the observed values of these life-friendly parameters are improbable and thus in need of an explanation, Friederich employs the notion of subjective or epistemic probability and utilises Bayes's theorem.

The least satisfactory chapter is chapter 3 in which Friederich discusses the design argument response to fine-tuning. He divides the designer hypothesis into two camps, those which hypothesise an 'abstract' God and those for which God takes an interest in human affairs. One problem is lumping together the Greek deities with the God of the Old Testament and what he mysteriously describes as the 'deity/deities' of Christianity. Strangely to readers of this journal he sees the God of the Bible as 'in conflict with well-established tenets of the modern scientific world view'. He seems not to appreciate that Christian theologians – perhaps having in mind such great figures as St Thomas Aquinas – have no difficulty in seeing the 'abstract' God who is omnipotent, omniscient, etc as identical to the God of the Old Testament and the triune God (singular) of Christianity.

The inference to a multiverse from fine-tuning may fall at the first hurdle if it commits the so-called 'inverse gambler's fallacy', analogous to a gambler walking into a casino, observing that someone has just had a remarkable winning run at the roulette table, and inferring that many games had been played before that. Friederich describes opposing sides in this debate and concludes that we cannot tell for sure whether the fallacy is committed. I have argued myself that it is not, one parallel being (as Friederich acknowledges) the much less controversial inference from life on our planet to the existence of many planets. My own position is that design does a better job of explanation even if a multiverse (minus God) is an alternative candidate.

A vital difference between the 'other planets' argument and multiverse theories is that empirical testing of the latter is notoriously difficult, as for example in the popular string-theory-landscape-combined-with-inflation model. This is important since Friederich argues that we need reasons independent of the fine-tuning to believe in them, as with other planets. Other universes, however, are generally undetectable in principle so one needs to ask instead what 'typical' observers in a multiverse would expect to see in their particular universe. This approach, dubbed the Self-Sampling Assumption by Nick Bostrom but renamed the Self-Locating Indifference principle by Friederich, is beset by the difficulty of defining the most suitable reference class from which a typical observer is chosen.

Friederich devotes a chapter to various philosophical conundra arising from self-locating indifference principles. One of these is the notorious Doomsday Argument: I am more likely to find myself where I do in the sequence of all human beings who exist or will exist in a universe with 200 billion humans in

total than in a universe with 200 trillion humans in total, by a factor of 1,000. I have argued, with others, that this argument can be defeated by utilising, rather than the Self-Sampling Assumption, what Nick Bostrom calls the Self Indication Assumption which takes account of the fact that the universe with the larger number of humans gives me 1000 times the probability of existing, cancelling out the Doomsday factor. Friederich's detailed study, invoking his similar 'Background Information Constraint', ends up saying something similar.

Moving beyond the string theory model to the most extravagant multiverse theories, Friederich finds these altogether wanting. Thus the Everett quantum branching multiverse suffers irremediably from failing to explain why we observe the probabilistic outcomes we do in our branch. The case is much worse for David Lewis's modal realism, the view that all possible universes exist. Friederich, rightly in my view, sees this as incoherent since universes in which induction goes awry would swamp those in which it functions. This would undermine the basis of science since one could dismiss any new or unusual observation in the laboratory as 'something which is bound to happen in some universe' rather than seek a normal scientific explanation.

Max Tegmark's Level IV multiverse proposes that all mathematical structures have physical existence. This too is incoherent since it does not distinguish between quantities in physical theories which have physical existence and those which are 'surplus formal structure'. I would add, with philosopher Tim Mawson, that the induction problem applies to this version of the multiverse too.

A problem with these dismissals is that something like modal realism or Tegmark's Level IV is needed to explain the fine-tuning. If only a subset of possible universes exists, one can always ask, 'Why this particular subset generated by this particular mathematical structure, so that it contains life-bearing universes, out of all the many possible subsets of universes?' The fine-tuning is simply shifted up a level. Only a maximal multiverse can explain why our universe, or life-bearing universes at all, exist. Back to design?

As with most books it seems these days, there are a few errors not picked up in proof reading. The most confusing is << (much less than) in a couple of places when >> (much greater than) is meant. This should not detract from the importance of this book to ongoing debate on a fascinating topic of interest to scientists, philosophers, and theologians alike.

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Neil Messer

Science in Theology: Encounters between Science and the Christian Tradition

London/ New York: T&T Clark, 2020. xii + 191 pp. pb. £16.99. ISBN 978-0-567-68981-8

Rather than another model of the interactions *between* science and religion, Messer here offers a typology to classify how scientific findings are used *in* theology. Messer draws on a common motif of theological reflection, as a conversation drawing on scripture, tradition, reason and experience, and suggests five possible variations on how one might employ science as a voice of reason within this reflective process. This typology comprises a spectrum between two extremes: type 1 allows contribution from science but ignores any from Scripture and Christian tradition and type 5 eschews scientific ideas; in types 2 and 4 science or tradi-

tion respectively are allowed a more dominant voice, while neither takes priority in type 3.

Following this introduction, the central three chapters of the book each focus on one specific area of 'encounter' between science and Christian tradition: divine action, natural evil, and scientific investigations (or 'explanations') of religious belief. Messer examines, compares and evaluates some of the different voices in each field and classifies them as to how they use science in theology. In the process he provides a very clearly laid out introduction to each of the scientific and theological areas under debate, including handy explanatory boxes setting out terminology associated with science-theology encounters in that field and some of the scientific concepts; for those less familiar with Christian theology, there is a useful glossary. (I found the boxes useful when attempting to navigate what I always find a bewildering set of terms employed in discussions of divine action.)

For example, when considering the issues of theodicy arising from the process of evolution, Messer begins by exploring examples that illustrate the two extreme positions; in this case Richard Dawkins epitomises type 1, with his rejection of any input from theology, and young earth creationism's rejection of any scientific evidence for evolution places it firmly in type 5. Among the three types allowing some dialogue, Ruth Page's critical engagement with traditional theological positions, and the attention she pays to evolutionary suffering, render her approach an example of type 2, privileging the voice of science over that of theology. Into type 3, where science and theology are allowed equal voices, he places Christopher Southgate's 'compound theodicy' (85) while Nicola Hoggard Creegan's rejection of the idea that evolutionary evil is part of God's plan, is placed broadly within type 4, although close to type 3 since she draws on the Extended Evolutionary Synthesis to speak of sensing the divine in nature. Very different theories can fall within the same type of dialogue and may lie near adjacent types.

Messer's typology allows one to examine the degree to which different projects in the science-faith interface are shaped respectively by scientific findings and by tradition; how loud a voice does science have and is it being allowed to muffle or silence Christian tradition? Consideration of the Type can shed fresh light on the approaches taken but it also allows us to consider the strengths and weaknesses of each kind of dialogue; while Messer favours the dialogical types, especially type 4, he finds some dangers inherent in each category and some approaches that fall within Type 1 or 5 may have value in specific contexts. Indeed, it may be that some issues would benefit from approaches that fall within different types and balance one another. In his conclusion, Messer also touches briefly on two other potential actors in any scientific-theological dialogue: philosophy and the creative arts, (represented by poetry). The book closes with a set of questions to help analyse and plan work in science and theology.

The proposed typology will be of interest to anyone in the field and it could be applied to other religious traditions. Messer moves with authority between science, theology and philosophy and presents a useful schema for analysis of different 'encounters' within the field of science and theology in a manner relevant and helpful to those coming from either direction. As such it would prove of value to anyone embarking on reading or research in this field, or simply wishing to pursue theological reflection on topics in this area. Messer's typology contributes to ongoing debates on method in theological reflection: how does it make use of science and how does

it integrate scientific understandings with theological resources? The various models of theological reflection have differing fundamental assumptions (e.g. see Helen Collins, *Reordering Theological Reflection: Starting with Scripture*, London: SCM, 2020, 36-55) and Messer's typology might be adapted to enable examination of those assumptions, and the ways in which other non-theological sources are employed in the reflective process.

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Graham Swinerd and John Bryant
From the Big Bang to Biology: where is God?

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263 pp. pb. £9.99 ISBN 979-8682034901

When asked to review '*From the Big Bang to Biology: where is God?*', my first reaction was to ask: 'Do we really need another book exploring the relationship between Science and Faith?' However, having read and enjoyed its content I am convinced that this book, has a distinctive approach to the topic which has much to commend it. A key feature is that it is written by two successful career scientists, one from the Biological Sciences and one from the Physical Sciences, who are passionate about both their science and their Christian faith. John Bryant was a Professor of Cell and Molecular Biology at the University of Exeter with international research projects focused on DNA and genes in plants and has a continuing interest in Bioethics. Graham Swineherd was a space scientist and engineer in both industry and academia having started his scientific career with a PhD in Einstein's theory of gravity. For John, both science and the Christian faith have been at the centre of his life from an early age. However, for Graham there was an early interest in space and astronomy, but this was accompanied by the view that science explained everything and so there was no need for God. Faith made an unexpected entry into his life when he was about fifty, helped by the realization that the mysteries of our improbable universe might best be explained by the existence of a creator.

This book is not so much an apologetic account of the relationship between science and faith as a personal testament to the wonders of our universe, from the big bang to the molecular mechanism of life itself, and how they point to, and enhance our faith in, a Creator. It has a personal and colloquial style which is easy to read and probably reflects its origins - a series of one-week conferences on science and faith led by the authors. For both authors, there is a harmony and a synergism between their science and their faith that they are keen to share with others including scientists, many of whom still mistakenly see science as disproving God, as well as some Christians who worry that the discoveries of science may undermine faith. As the authors unwrap some of the remarkable intricacies of the workings of the universe and the mechanisms of life that science has revealed, they see firm evidence for the presence of a Creator at work. Indeed, their faith has 'added a new dimension to their work as scientists. It has allowed a greater sense of awe at the majesty and grandeur of God's creation.' (220). The authors' hope is that the content of this book will educate, encourage and enhance the faith of fellow Christians, including those who have previously seen science as a threat, and also help those for whom science has been a barrier to belief in God to think again.

The book has nine Chapters. It begins with a brief overview by John on what lies behind the science and faith debate and how it evolved over time. He ends

the chapter with a very brief overview on what science is and what it does. Graham then expands on this further in Chapter 2 and looks in more detail at the scientific method and the importance of recognizing its limitations. Science cannot explain everything thus leaving no room for God, despite the claims of the 'New Atheists' such as Richard Dawkins. Nor will it be able to provide 'a theory of everything' – for example the origin of the universe and the laws of nature - or answers to the issues of meaning or purpose – the why as opposed to the how of existence. Chapter 3, also written by Graham unpackages the science behind the Big Bang and the evolution of the universe and briefly relates it to the Genesis account of creation. This chapter is quite heavy on science and although great efforts are made to explain things in a jargon-free manner, those without some background in physics may struggle with the detail. Graham continues into Chapter 4 where he explains the many examples of extraordinary fine-tuning in the physics of the cosmos that have allowed a planet to form with conditions that are right for life to emerge and evolve into the amazing diversity of life we have today. As he explains in this chapter, it was pondering the incredible improbability of these events that was a major factor in leading him to explore Christianity and to find a life-changing faith for himself.

In Chapter 5 John takes over the writing and explains the current scientific thinking on how life first emerged and evolved into the complex life forms we have today. He explains how life is dependent on information, encoded in DNA and translated into proteins as well as energy harnessed from the environment by processes involving complex molecular machines. He moves on from a consideration of the underlying biochemistry of life and proposals as to how it may have originated in the first place more than 3.5 billion years ago (still largely a mystery) to the evolution of progressively more complex life forms. The broad brushstrokes used avoid the reader becoming lost in scientific detail but are sufficient to illustrate how evolution gives the appearance of being a directed and purposeful process. Does this perhaps provide reasons to believe in a divine creator? John continues into Chapter 6 where he briefly summarizes current thinking on the progressive evolution of hominins into humans and some of the distinctive features of *Homo sapiens*. This includes our highly developed brains that may underlie the features of our brains that set us apart in terms of our degree of self-awareness, purpose and personhood. He includes a brief consideration of the part played be genes and environment in making us the individuals we are before asking whether there is something more to us than can be simply explained by genes and environment. He reflects on how this resonates with the Christian view of humans being made in the image of God and provides an explanation for the spiritual dimension that we experience. In Chapter 7 John looks at the relationship between the scientific and biblical accounts of creation. He briefly discusses the origins and tenets of Creationism and Intelligent Design (ID) and shows that they do justice to neither the science nor the text of scripture and its intent. However, the important distinction is made between seeing the overall evidence of design and purpose in creation, that points to a creator God, and the theory of ID which focuses on particular processes that are regarded as demonstrating 'irreducible complexity' and / or 'specified complexity' and so demand divine intervention. Such an approach, that focuses on individual molecular mechanisms such as the bacterial flagellum and the flow of information required to make them, is effectively falling into the trap of being a 'God of the Gaps' argument which runs the risk of being undermined as scientific

understanding increases.

The penultimate chapter contains contributions by both authors and considers the intricate balance of natural systems, biological, ecological and meteorological, highlighting the damage we are doing through our human activities. The resulting climate change, environmental degradation and loss of biodiversity threatens our planet, and the authors challenge us as to how we should respond, especially as Christians who are called to be stewards of God's creation. The final chapter is an Epilogue in which the authors summarize their arguments for science and faith being complementary in understanding the world we inhabit. They end with a section on 'Why Believe?' which includes a very brief and somewhat personal consideration of spiritual experiences and healing which I found less helpful.

In summary, this is a very readable book that I would recommend to Christian friends who might benefit from catching a glimpse of the wonders of creation revealed by science and how they can enhance rather than undermine faith. I would also consider giving it to scientific colleagues that I know who themselves are not believers but are seeking some kind of faith that makes sense of their lives. They might be open to discussing whether our highly improbable universe, that gives the impression of being designed, might be best explained by the presence of a creator God.

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Sy Garte

The Works of His Hands: A Scientist's Journey from Atheism to Faith

Grand Rapids, MI: Kregel, 2019. 256pp. pb. £9.99. ISBN 978-0-8254-4607-8

Sy Garte is someone who delights in discovery, and this is evident in *The Works of His Hands*. In the first part of the book, comprising nine chapters, Garte describes his career in biochemistry and the sense of wonder engendered by his research; he also describes (in less detail) his journey towards faith. In the second part, comprising a further five chapters, Garte seeks to address some of the issues and questions raised by the synthesis of science and faith.

Garte's love of questions began at an early age. He grew up in a fundamentalist family – but not in the ordinary sense of the word. His parents were a rarity – members of the American Communist Party. Although they had left the Party by the time Garte was born their worldview nevertheless permeated Garte's childhood and he was brought up in a materialistic world where religion was seen as false and evil. Garte began to look to science to answer what he considered to be some of the fundamental questions related to existence. At the end of Chapter 1 Garte cites nine questions that shaped his quest for truth. Each of these questions provides the theme for the subsequent chapters that form the first part of this book.

Garte's intellectual foundation was in the field of physics, later moving on to biochemistry, and the layout of these initial chapters essentially follows his career. He experiences wonder and puzzlement as he engages with the concepts of quantum mechanics, entanglement and chaos theory, and as his sense of awe increases further as he shifts his focus to biochemistry. The science of evolution provides particular fascination for him, specifically three 'origins' which Garte

regards as singularities: the origin of the universe, the origin of life and the origin of human consciousness. Garte found attempts to explain these origins through science alone unsatisfying.

As his scientific research progressed Garte found his philosophical and spiritual perceptions challenged. He rejects scientism – a belief that science will (ultimately) have the answer for everything – but is also dismissive of a 'God of the gaps' approach. He describes how he came to believe in human exceptionalism prior to coming to faith; in fact, his scientific and philosophical 'journey' proved to be a gateway to faith rather than a hindrance to it. This experience can perhaps result in Garte being too ready to jump to conclusions with insufficient rigour. For example, he states (95): 'No other animal can name anything (unless we teach them), and language is one of those key human features that is a gift from God'.

In the second part of the book Garte begins to unpack some of the implications of his faith. He begins with a foray into Christian apologetics in which he seeks to address ten questions commonly posed as a challenge to religious belief. Only three or four of these questions relate directly to the interface between religion and science; others consider broader issues such as religious wars, the plurality of religions and contradictions in scripture. The fullest discussion, covering the 'science' of the Bible, comprises nearly eight pages but the remaining issues are covered briefly, and the answers given are unlikely to convince a sceptic. The subsequent chapter deals with the more philosophical issues of love and freedom, chance and free will. Garte is on 'home ground' in Chapter 12 which discusses the relationship between evolution and Christianity. He gives a whistle-stop tour of some of the developments in evolutionary thought, such as neo-Darwinian modern synthesis and extended evolutionary synthesis. The key question for Garte is whether evolution has purpose. He concludes that it does, and that purpose is built into not only the actions of the evolutionary process but into its very fabric. Garte describes this as providential evolution – a phrase he acknowledges as theological rather that scientific.

The final two chapters of the book draw together the threads both scientifically and personally. Chapter 13 gives a brief overview of the complementarity of science and faith over the last two millennia and Chapter 14 describes how Garte 'officially' became a Christian by joining the Methodist Church several years following his personal coming to faith.

There are four helpful appendices. Appendix A provides a set of discussion questions for each chapter and would be useful in a seminar setting. Appendix B: Further Reading points to 42 additional sources of information. The list is to be commended for its breadth (including a range of authors such as Lewis, Darwin, Dawkins and McGrath) and for including some 'classic' works alongside recent publications. Appendix C: The Details of Life is a somewhat dense read on molecular biology and evolution. Appendix D is a whimsical account of the author's discovery of a lost letter by Charles Darwin which he copied to Richard Dawkins.

The Works of His Hands is not a book that rigorously tackles every interface between Christianity and Science, nor it a handbook of Christian apologetics. But it is a book that shows that science and faith each possess a beauty and wonder, and that these are complementary and not in conflict.

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Jennifer Baldwin

Through Dangerous Terrain: A Guide For Trauma-sensitive Pastoral Leadership in Times of Threat

Eugene, OR: Cascade, 2020. 104 pp. pb. £13. ISBN 9781725276857

There is much in this book I found to be interesting, enlightening and helpful in terms of understanding our susceptibility to the suffering and trauma so many of us encounter at some stage(s) in life, for which the author is to be commended. Her more holistic treatment of the phenomenon of trauma (a much over-used term in our times) is made all the more relevant and useful given the book was written from within the earliest stages of the coronavirus pandemic (1), from which crisis a media prediction was of a 'tsunami of trauma' being inevitable. Early on in the read, I especially warmed to her own views of the pandemic being something that will provoke a vast range of affects from which many will recover by way of their body's natural resilience and therapeutic capacities (10). Her message that 'Experiences of threat are not inherently traumatizing,' and her distinction between traumatic stress, which is itself part of the human's (God-given) protective toolkit, is an important message in an era obsessing with 'PTSD.' So I warmed to her exploration of trauma from both neurological and psychological perspectives. I also warmed to her sensitivity and compassion that infuses even her most technical parts of the book.

Another important focus Baldwin makes is on the understanding that humans are much more than their biology, important though that understanding is for her and for everyone involved an addressing the difficult terrain of trauma. We are also social, cultural, ecological and relational beings, capable of enormous circumstantial adaptability. In the Biblical sense, if not her own, Baldwin confirms that we humans are truly 'fearfully and wonderfully made' (Ps. 139:14). No surprise, therefore, that she recognises that we are also people who are narratively formed (9) and that narrative formation can play a significant role in bringing healing – another evolving facet of trauma therapy that she highlights.

Baldwin's engagement with, and explanation of the various features of the human neurology – the wonderful limbic system, the amygdala - our trusted gatekeeper, the autonomic nervous system, and even the polyvagal theory offers (ch. 1) much from neuroscience that pastoral carers can tap into enabling them to work tangentially with the human body's own created therapeutic mechanism – working with, not trying to take it over, a point she makes so well.

The above being said, however, I found her chapter 2 to be the weakest link in an otherwise strong book (but a chain is only as strong as its weakest link). Her early claims to an empirical base fall short. Whilst I have some sympathy with the Internal Family Systems idea in so far as it connects with the 'One Health' approach endorsed with the WHO and others, it is with her anthropology and her treatment of spirituality as a generic concept that I really struggle. As a Christian practical theologian, I struggle to find any scientific or theological basis for this concept. Whilst she gives hints of a Christian theology, Baldwin's slant in this work is for the embrace of a generic spirituality that services as therapeutic utility.

Another aspect of this work that I warmed to, ironically within chapter 2, was her focus upon the 'wisdom of the body' and our 'somatic experiencing' (51). Listening to our body, and the body's capacity to speak to us when we are in touch with it can be incredibly therapeutic, and for want of such listening we can suffer more than we need. However, some theologically minded scholars/practioners (myself included) will take issue with the degree of confi-

dence Baldwin places on the 'Self' as a synonym for the 'spirit or soul' (42) in contrast with, for instance, the Pauline anthropology found in the New Testament scriptures (for example, in Rom. 7 and Gal. 4:16-24) and the weaknesses in human selfhood that anthropology (and, arguably, our own experience) warns us we all are subject to. Therefore, a greater focus upon the Holy Spirit's indwelling would resonate more with the experience of this reviewer in the pastoral care of trauma.

There are ways for trauma carers to work comfortably using neuroscience and even a particularist Christian theology without having to adopt the syncretistic amalgam that this author does. Regrettably for this reviewer, it interrupted a potentially very useful resource. I shall no doubt add this work to my literature for both reference and training, but I will use it selectively I fear. If only parts of that second chapter could be re-worked in a future edition!

My remaining plea is for the dropping of the term 'natural disaster(s)' which recurs too frequently through this and many other books.

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Alexander Massmann & Keith R. Fox

Modifying Our Genes

London: SCM Press, 2021. 151 pp. £25.
ISBN 978-0-334-05953-0

The 2020 Nobel Prize in Chemistry was awarded to Emmanuelle Charpentier and Jennifer Doudna for:

Discovering one of gene technology's sharpest tools: the CRISPR/Cas9 genetic scissors. Using these, researchers can change the DNA of animals, plants and microorganisms with extremely high precision. This technology has had a revolutionary impact on the life sciences, is contributing to new cancer therapies and may make the dream of curing inherited diseases come true.

www.nobelprize.org/prizes/chemistry/2020/press-release/

This technology, standing for 'Clustered regularly interspaced short palindromic repeats' (CRISPR), is a type of DNA/RNA sequence that bacteria and other micro-organisms use to guide special molecular scissors (such as 'CRISPR associated protein 9' (Cas-9)) in a form of molecular self-defence - precisely cutting the DNA of invading viruses. The breakthrough that led to the Noble prize was working out that this system could also be manipulated (by changing the CRISPR sequences) to cut DNA in any cells very precisely. Once cut it is possible to insert almost any other DNA sequence, making CRISPR/Cas-9 the ideal tool for precise genetic manipulation. While genetic engineering has long been the subject of debate, it is only really with the discovery (or invention) of CRISPR/Cas9 that geneticists have the tools to make any genetic modification that they would like.

While scientifically exciting this has already led to some ethically troubling circumstances. In 2019 the Chinese Scientist He Jiankui was sentenced to three years in jail for creating two twin girls with edited genomes. Even though his intention was broadly therapeutic - so as to make them less susceptible to HIV due to their father having the condition (www.scientificamerican.com/article/crispr-babies-scientist-sentenced-to-3-years-in-prison/) - he performed the modification well outside any current ethical, safety or regulatory oversight. As a consequence, whereas previously only a theoretical creation of science fiction,

genetically enhanced humans are now (or soon to be) walking the earth.

This book is therefore appropriate, and timely, written by the recently retired Director of the Faraday Institute for Science and Religion (Keith R. Fox), and a post-doc with a background in theology and theological ethics (Alexander Massmann). I particularly enjoyed the book as Keith was also one of my Professors at the University of Southampton, where along with teaching me the fundamentals of genetics over twenty years ago, he has now been able to provide a clear and succinct update on the latest genetic technology. This multi-disciplinary combination of a Biochemist and a Theologian is well needed for an analysis such as this.

The book is divided into six approximately twenty paged chapters, although there are plenty of sub headings for reflection, and to allow the reader to catch their intellectual breath. Following an introduction putting the book into context, there is a chapter on how the technology works, a chapter on how it can be used to address medical needs, one on how it can be extended to make genetic enhancements, and then two chapters exploring broader philosophical and theological territory.

To be fair, while the technology is indeed still relatively new, many of the theological, moral and philosophical arguments are fairly well rehearsed. For instance there is clearly a difference between medical treatment and non-disease related enhancement. Likewise there is a well discussed technical, methodological and philosophical gulf between introducing genetic modifications to those who are already alive and thus potentially able to consent to the process, and the creation of 'new' modified humans through manipulating the genetics of embryos. As with any theological discussion on this topic the direction authors take is very much based on their view of the moral and theological status of the embryo. Here Massmann and Fox, while acknowledging other Christian viewpoints, take the view that implantation of an embryo is a key moment in human development. Likewise they are broadly supportive of using the alternative technology of Preimplantation Genetic Diagnosis (PGD) to screen embryos prior to implantation, rather than directly jump into modifying embryonic DNA using CRISPR/Cas9 technology.

Interested readers will need to get hold of the book in order to discover the main thrust of Massmann and Fox's arguments, but broadly speaking they orbit around the 'Nature or Nurture' debate. Clearly some people are born with more advantageous capacities in certain areas (like being able to run faster, jump higher or think harder), and clearly genes have a lot to do with this, but at the same time it is extremely difficult to untangle the interaction between our genetic blueprints and the environment within which our genes, and indeed ourselves, as organisms, function. We meddle at our own risk.

At the moment the only real solution to these considerations is caution and humility. However, we can no longer escape the fact that the technology now exists to create almost any genetic modification we can think of. Furthermore this technology has already been abused at least once. As a consequence the subject covered by this book is no longer theoretical because like it or not we will increasingly encounter and have to face the consequences of genome editing. The best Christian response is to be informed, and ideally take part in the debate, and I recommend this book as an excellent place to start.

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rity processes impact the reliability and effectiveness of medical and human participant research.

Barry David Schoub

Seeing God Through Science: Exploring the Science Narrative to Strengthen and Deepen Faith in the Creator

Eugene, Oregon: Wipf & Stock, 2019. 178 pp. pb. £19.00. ISBN 978-1-5326-8712-9

This short book, comprising 142 pages of main text, is a helpful and analytical contribution to the conversation on science and religion. Dr. Schoub writes as an Orthodox Jew with a long and distinguished career as a virologist in South Africa, and it is welcome to hear his voice from a distinct theological tradition and geographical origin. While he has hundreds of scientific publications to his name, this book is his first formal foray into the realm of science and religion. His book, he says, 'has been motivated by a need I felt personally as a professional scientist, to put forward a defense of theism from a scientific perspective' (137). In this way, his motivation is similar to that which motivated Francis Collins, whom Schoub admires, to write *The Language of God: A Scientist Presents Evidence for Belief* (Free Press, 2006).

The central argument of the book is that science is not in conflict with theistic belief, but that science actually provides evidence for the existence of God. Science raises fundamental questions about the purpose and meaning of reality that cannot be satisfactorily answered by scientific means. Science and human understanding have inherent limitations that point to a reality and a creator beyond natural knowledge. He cautions against a 'God of the gaps' kind of argument, though some readers may consider his approach to be in that category. Unlike the Intelligent Design movement, which receives no mention in the book, Schoub points to religious revelation (by which he specifically means Holy Scripture) as the source of input that transcends scientific thinking and offers the answers of ultimate meaning and purpose that we seek.

As Francis Collins coined the term BioLogos as a renaming or reframing of theistic evolution, Schoub proposes 'non-predicate theism' as an alternative to 'negative theology' (90-92) to communicate his assertion of 'the incapacity of humankind to assign attributes to God' (79). Even though God necessarily uses means of communication with us that we can (somewhat) comprehend, often in anthropromorphic language, we should avoid the assumption that God's revelation to mortal humans accurately and fully describes to us God's true nature. This humble posture fairly characterizes much of Schoub's book as he treats scientific, philosophical, and theological topics such as cosmic and human origins and the search for truth.

While Schoub does engage with many Christian thinkers in his book, I was especially edified by his significant inclusion of perspectives from Jewish scholars such as Moses Maimonides and his clear explanation of the Written Torah, the Oral Torah, and the Talmud. As an Orthodox Jew, Schoub holds that prophecy, direct revelation, and public miracles ceased after biblical/qur'anic times (in his own view, Old Testament times), though he recognizes that both Christians and Muslims may well differ on this point (82-83, 96-102). His description of prayer is as a liturgy that one performs and not a means to receive revelation (however minor) from God.

Overall, the book is stronger and more compelling on science than on philosophy or theology, though I do take some issue with his assertions that science is a purely objective pursuit (28, 129). He generally does a very good job of citing his sources, and the book has an exten-

sive—but not annotated—bibliography. The book is a bit repetitive on some points, and its emphasis on logic leaves it somewhat emotionally detached. There is very little in the book—even in the preface, acknowledgments, introduction, and epilogue—that feels personal, autobiographical, or distinctively South African, which I believe is a missed opportunity. This is an interesting contrast to the vulnerable testimony of Francis Collins in *The Language of God*. Predictably, Schoub's book falls short of the back cover's provocative claim that 'modern science is now coming to prove God,' but I do agree with him that 'the only truly satisfactory answer to the existential questions of the meaning of reality comes from the combination of both science plus revelation' and belief in God (137).

In conclusion, this book is written at a level appropriate for adults who might be open to considering faith and for the encouragement of religious believers. It will be less compelling to readers with staunch anti-evolution or anti-vaccination views. On this latter point—in words penned shortly before the Covid-19 pandemic—he offers prescient criticism of 'religiously motivated refusal to vaccinate' that leads to 'outbreaks of diseases of major public health concern' (121). I recommend this book as worthy of a home on your bookshelf alongside *The Great Partnership: God, Science, and the Search for Meaning* (Schocken, 2012) by the late Rabbi Jonathan Sacks.

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Christopher C. Knight

Science and the Christian Faith: A Guide for the Perplexed

St Vladimir's Seminary Press, New York 2020, 232pp Pb £19.99 ISBN: 978-088141-671-8

This book is specifically written for Eastern Orthodox Christians, and emphasises some of the different approaches to Science and Faith between Orthodox and Western Christian traditions. The author, Christopher Knight, is a former astrophysicist and is an ordained Orthodox theologian. In the introduction he states that the book is aimed at an Orthodox audience, and claims that it is not primarily aimed at an academic audience, but at the ordinary, intelligent believer whose formal education may have included neither science nor theology at an advanced level (17). However, this book is definitely not for the layperson! Some of the early chapters were extremely hard work and I read them with a dictionary by my side. For the non-specialist, the later chapters became more comprehensible.

The book does not give much detail on specific scientific questions (such as origins, evolution, consciousness, brain, miracles), but rather describes general principles of religious ways of addressing questions that are raised by science. In several places the author is clear about what he perceives as the limitations of Western scholars who have participated in science-theology dialogue. He claims that they 'manifest major blind-spots in relation to patristic understanding' and identifies five such aspects (35). In part this is driven by Orthodox apophatic theology, that emphasises what cannot be said about God, rather than by describing what God is. The spills over into a form of apophatic science.

There is much on this book with which I could agree. He distinguishes science from scientism, and while having a deep respect for scripture and the teachings of

the early church Fathers, he avoids the perils of a literal approach to biblical (especially Genesis) texts. He acknowledges that these reflect the science of the time, not just for writers of the biblical books themselves, but importantly for an Orthodox theologian, the Church Fathers (Basil the Great, Maximos and Gregory of Nyssa) who also wrote in terms of the science of their time. As such he acknowledges the need to 'distinguish Patristic wheat from the Patristic chaff', and to reinterpret Tradition, and the inaccuracies of the primitive science that the Fathers used to illustrate their theological understanding.

Chapter 4 describes the standard explanations of the way in which scientific theories arise and are criticised and refined, playing on the work of Kuhn and Popper. Toward the end of this chapter the Orthodox concept of *nous* is applied (first introduced in chapter 3), through which God can be known at an intuitive level and applied to Orthodox natural theology. This concept is not included in Barbour's four main characteristics of modern scientific theory (83f). It is not clear how such intuition applies to science, in which several things are actually counter-intuitive.

Chapters six and seven consider aspects of the human mind, and these begin by stressing the fundamental unity of the human person in terms of the union of body and soul. Cartesian dualism is explicitly denied. Nonetheless there is a sense of an implicit dualism in some of the following discussions and the continuing emphasis on the role of *nous* serves to highlight this. Although I think that this was not explicitly stated and is poorly defined there seems to be the assumption that there was a literal fall, with cosmic consequences and the appearance of 'natural evil'. Within this there is discussion of the phrase 'garments of skin' to describe the 'postlapsarian psychosomatic clothing of the human person', which become the focus of discussion in chapter 11. There is an implicit idealism in this discussion, suggesting the existence of a perfect human state before the fall, that was subsequently covered with the 'garments of skin', though he clearly states that death and painful diseases 'existed long before the evolutionary emergence of humans' (187). In discussion of the human mind in this world and the next, statements that both the 'body and mind are to be transformed' (135) in the eschatological state and the loss of individual personalities is difficult to align with the transformed physical nature of the world to come and run counter to most theological thinking.

In the later chapters there are some helpful thoughts on the (false) distinction between the 'natural' and 'supernatural', replacing this with an emphasis on God's immanence in all aspects of creation. He makes a good point that some simplistic approaches to God's can appear as a form of functional deism (170) in which God is an absentee landlord reduced to a 'God of the gaps' in a purely mechanistic universe. Nonetheless statements that the 'cosmos is infused by God's presence' (171) are explicitly proposing a form of panentheism that goes well beyond the Western understanding of God's moment by moment upholding of creation. This is further explored in chapters twelve and thirteen miracles and 'incarnational naturalism' that ask how God can be 'outside' the world and yet interact with it.

Overall this book may raise questions for those who already have a deep understanding of Orthodox theology and philosophy and it will challenge some of the assumptions that have been adopted from 'Western' approaches to Science and Faith. However, it is unlikely to be useful for anyone who lacks this background for whom it is not likely to resolve any perplexity, indeed it may have the opposite effect.

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Charles Hackney

Positive Psychology in Christian Perspective: Foundations, Concepts, and Applications

Downers Grove, IL: InterVarsity Press, 2021. 331 pp. hbk. £32.63 ISBN 978-08308-2870-8

Many think the science of psychology to be concerned exclusively with fixing broken people, guided by its understanding of the dark side of human nature. There is, of course, some justification for this belief. From Freud onwards, at least in its therapeutic applications of psychoanalysis and psychotherapy, psychology has been mainly concerned with assisting the emotionally damaged, or with treating the mentally ill. In social and clinical psychology too, 'the field as a whole took on a distinctly negative tone in the years following WWII…' (5). Not only were the effects of trauma on combatants and civilians eventually recognised, but social psychology tried to account for the unspeakable atrocities perpetrated most obviously in the Holocaust by the Fascists but also by other combatants then and since. How is it that apparently normal, ordinary, seemingly good people are capable of such abnormal, extraordinary, evil deeds? How come apparently moral people are so willing to obey immoral and evil orders or to separate their individual morality from their social responsibilities? Are we so fallen as a species that there is no space for our angelic side to break through let alone be studied, encouraged, and developed?

Aware of these biases and limitations, Martin Seligman launched the positive psychology movement in his 1998 Presidential Address to the American Psychological Association. Positive psychology builds on earlier, more optimistic approaches to the human condition particularly in the humanistic and existential traditions. It draws too on virtue ethics with a neo-Aristotelian approach to human flourishing. Its aim is to develop and nurture character strengths to help people grow to their full potential. Unlike a lot of twentieth century work in psychology, it is teleological in its emphasis: people orient their lives and behaviour toward desirable future states rather than responding in a positivist fashion to 'stimuli' or as their genes or hormones or physiology dictate.

In this excellent, comprehensive monograph, a must for Christian therapists, educators, clergy, academics active in the field (secular and religious), or just the interested, educated, general reader, Charles Hackney not only surveys the burgeoning field of positive psychology but does so through Christian lenses. 'Christian' here connotes a theologically informed, religious worldview, not simply a free-church or overly simplistic Biblicist 'take' on the subject matter. The outcome is a thoughtful and balanced overview of the field, providing a demonstration of just how effective and constructively critical such an approach can be. By explicitly adopting a philosophical (in this case Christian) stance Hackney astutely shows just how many of the suppositions of positive psychology are actually due to its failure to interrogate its imported secular and cultural assumptions: the individualism of late modern, capitalist society; the notion that only positive emotions and feelings are good for us; that such psychology can be morality lite or even ethics free; that the only point of a successful marriage is merely to feel good and not to be good, to take but a few examples. He creatively opens the door as a result to a still-to-be-realised, pluralist psychology based in equivalent

cross-cultural readings from other faith traditions, showing in the process just how 'western' western psychology can be if left unchecked.

Hackney's monograph comprises 24 chapters divided into sections on positive subjective experiences, cognitions, personality, applied positive psychology and, tellingly, the positive in the negative and the negative in the positive. The latter well-argued section offers a much-needed antidote to the vacuous 'accentuate the positive, eliminate the negative' *leitmotif* of much contemporary life, and helps prevent positive psychology lapsing into a facile, happy-happy Pelagianism. Another real strength is the initial overview of what a philosophy and theology of flourishing entail. Clearly written throughout, with light touch humour and replete with examples, this book makes a substantive contribution to the field. It is, as Hackney states, 'an extended exercise in second-wave positive psychology, as well as an attempt at presenting a Christian perspective on the positive psychology movement' (266). It is certainly not a self-help book, though the reader will pick up useful tips on the way.

As with any extended treatment some areas could be nuanced. The dependence of positive psychology on psychometric tests, and the criticism that the character strengths they identify may show little consistency across situations were not fully explored for example. A more socio-cognitive approach based on virtue-as-expertise in interaction with situational affordances might assist here. Similarly, while there was a nod toward the importance of the socio-political in shaping character (43, 44), there was little or no development of this in the context of, say, a Christian-friendly, postliberal, communitarian politics of flourishing and the common good - though whether this would prove too radical and catholic a move for some readers, and so best sidestepped for now, I'm unsure.

Setting such quibbles aside, Charles Hackney's book is a timely and welcome addition to an important topic: how to help people genuinely flourish. Doubtless to the surprise of many secular colleagues, it shows how much added value an intellectually defensible, Christian analysis provides when so skilfully deployed.

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Kenneth W. Kemp

The War that never was; Evolution and Christian Theology

Eugene, Oregon: Cascade Books: 2002.
228 pp. pb. £23. ISBN 978-1-5326-9498-1

The conflict thesis of religion and science has taken a battering during the last fifty years but many still believe it. Much of this will be familiar to some, but Kemp has re-packaged it in a different way as he leads from the 'War' started by Draper and White, through the Scopes trial to the various Creationism and ID trials of the last 40 years. The author says the book is a partial account focussing on the palaeoetiological sciences (2, 3) i.e. geology, palaeontology and evolution.

The heart of the book gives a historical account of particular conflicts of evolution and Christianity, mostly of the more extreme kind. More on genuine wrestling by Christian thinkers would have been helpful as for example Adam Sedgwick, Princeton theologians and Bernard Ramm. The introduction is a philosophical reflection with a succinct discussion of theology and naturalism. He concludes with recommending a 'modest methodological naturalism' for our theology and science and criticises Johnson's appeal to 'immediate divine action'. A good and

nuanced account of the conflict thesis as it began in the 19th century follows, concluding with ways of assessing the various arguments.

Despite many who claim there was conflict over Genesis and geology, the author is right to say there were none, beyond a few early 19th century Scriptural geologists. A trajectory on how geology developed from Steno in the 1660s, would have shown the gradual dawning of the realisation of Deep Time and its relation to Christianity. The presentation, which tends to flip backwards and forwards, makes it difficult to follow at times.

The chapter on the aftermath of 1859 devotes much space to the Huxley-Wilberforce episode and stresses its iconic position in the conflict thesis. Rather than consider the variety of Christian responses in the 19th century – Asa Gray is hardly mentioned – we are given four vignettes of unknown evolutionists losing their university positions.

Chapter 5 is on the first Curriculum war of the Scopes era. The account undoes some of the myths surrounding Scopes. The trial is not seen as purely an anti-evolution crusade. There was a moral side and Bryan and others occupied the high moral ground despite their poor science. Part goes back to Kellogg's visit to the German trenches in 1915, where German militarism was (wrongly?) traced back to Darwin. Bryan's rejection of human evolution was on moral grounds. Kemp regards the Scopes affair as not a battle between science and religion but rather internecine between conservative Christians and also as a three-way conflict between fundamentalism, modernism and scepticism (139). This spoils the cardboard cut-outs of *Inherit the Wind,* but brings out the complexities of inter-war American society.

Chapter 6 deals with Creationism and ID in the last sixty years, termed the second curriculum war. Much is familiar from Numbers *The Creationists.* Little is given on the renaissance of Creationism and more on legal aspects of teaching evolution as with the Arkansas judgement of 1982. The narrative moves on to Intelligent Design, which is wrongly seen as Paley repackaged. The presentation is very last century with the focus on Johnson, Behe and Dembski. There's a nod to the Dover trial of 2005. In a long section on the development of anti-evolutionist thought the difference between Creation Science and ID is clarified but omits later developments on how both Young Earth Creationism and Intelligent Design have evolved this century.

In conclusion Kemp emphasises that Scopes was over human evolution, whereas both creationism and ID challenge almost all of evolution and geology as well. He rightly says that the (187) NABT (National Association of Biology Teachers) and new Atheists add to the confusion by not distinguishing between methodological and metaphysical naturalism. He concludes this 'war' is doing damage to religion.

The conclusion quotes Pope John Paul II on the Galileo myth. As with Galileo, the Warfare Thesis fails on three grounds; it presupposes a clear demarcation between science and religion, with scientists and Christians neatly arrayed on opposite sides and, finally, theologians were always opposed to new ideas. With such distortion the Warfare Thesis is not a good lens to understand the relation of science and religion. 'The war that never was' re-surfaces the whole time – whether in churches or without. It thus needs wise engagement rather than dismissal.

This is not the easiest book to read, as at times the presentation becomes disjointed. However he does expound the complexities of the issues. As a result, this will help to give a better understanding of *The War that never was* and why

there has been conflict over aspects of science and aspects of religion.

Michael Roberts, retired priest, author of *Evangelicals and Science* (2008).

Denis R. Alexander

Are We Slaves To Our Genes?

Cambridge: CUP, 2020. 252 pp. pb. £22.99.
ISBN 978-1-108-44505-4

As someone with both a personal and professional interest in genomics and ethics ('genethics'), I found *Are we slaves to our genes?* a fascinating and informative read. Denis Alexander, a former Editor of this journal, offers an overview of the state of play regarding our understanding of the role genes might play in human behaviour. The book is meticulously researched, citing over 400 items of primary research literature, many of which were published in the last three or four years.

Alexander begins by flagging concerns that the media's obsession with a 'gene for…', coupled with the pervading 'school science' emphasis on examples of inheritance in which one trait is tied to inheritance of a particular gene, has failed to keep up with scientific understanding of genetics. As he goes on to point out, the reality is often more complex than that, with most characteristics in the body being directed by not only the interplay of myriad smaller effects due to multiple genes, but the influence of environmental factors on those genes.

The rest of the book is largely committed to examining the evidence for this 'polygenic' model in the context of behaviour. Along the way, Alexander considers the role played by DNA in mental health, educational attainment, personality, and our relationship to food, exercise and weight. Later chapters, the ones that might be of most interest to the current readership, reflect on the genetics of religiosity, sexual orientation and – the biggie - free will. The final chapter contrasts the ways adherents to a Judeo-Christian worldview and Transhumanists might reflect on what in means to be human in the light of this latest genetic research.

Alexander notes that several commonly used terms in discussing the genetic contribution to a condition have meanings that are divergent from, or more nuance than, their popular application. For example, 'heritability' as derived from traditional pedigree analyses is actually a statistical measure applicable to populations, not a measure of the genetic inheritance in an individual (although, to make things more complicated, newer molecular techniques are actually offering measures of heritability more akin to the latter definition!) Similarly, the significance of adoption studies, in which identical (monozygotic) twins have been raised apart, is somewhat diminished once you realise that as well as sharing time *in utero*, adopted co-twins have, on average, spent the first two years of their lives together, an especially important developmental window. And, as a third example, 'environmental factors' in this context means non-genetic influences, but might include other biological agents such as maternal hormone levels.

The new molecular techniques mentioned above include 'Genome-Wide Association Studies' and increasingly whole genome sequencing. Provided enough individuals are included (which is now commonly the case) then these approaches can look for associations between particular gene changes and a given trait based purely on 'blind' statistics, avoiding the skewing of data that hampered earlier 'candidate gene' studies, where prior expectations were brought to the analysis. Even then, given the complexity of influences of multiple different genes and environmental factors, it must be remembered that statistics emerging from

the new methods are 'probabilistic' (that is to say they raise the likelihood that an individual with a certain mutation will have the associated characteristic) rather than 'deterministic' (i.e. that they will be guaranteed to have that characteristic).

Overall, I found this a useful book that brought me fresh insights into a fascinating topic. I do, however, have a significant reservation. According to the preface, this volume is intended to be a version of Alexander's previous *Genes, Determinism and God* (CUP, 2017) made 'more accessible to the general reader without, necessarily, and background in genetics' (p vii). I haven't read the earlier work so I can't do a direct comparison. Regardless of this, writing a primer that starts right from the double-helical structure of DNA and the organisation of the genetic code and move the reader through to the very latest understanding of the role of, for example, epigenetics and RNA editing in gene expression *before* it even starts on the core thesis is a tough ask. Throwing into the mix introductions to cellular development, brain plasticity and the role of the microbiome and there is a danger that your whirlwind tour might leave the reader bamboozled. I'm afraid I felt this book rather fell into that trap. Coupled with this, I think there are other later chapter in which, for the target audience, less would actually have been more.

The key lessons are (a) our genome is much more dynamic and changeable than we had previously appreciated, (b) new sequencing methods are allowing us to compare the DNA of hundreds of thousands of people and this is giving researchers a handle on the role of multiple genes that each have a small influence on a particular characteristic, (c) in most cases the cause of a trait (including behaviour) is not genes versus environmental factors but rather an interplay of the two together, and we are getting better at understanding how this works at a molecular level. And the final take-home message (for which there is actually a spoiler in the front blurb of the book): no, we are not slaves to our genes.

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McCartney M., Whitaker A. & Wood A. (eds)

George Gabriel Stokes: Life, Science, Faith

Oxford: OUP, 2019. 253 pp. Hb £38.99
ISBN 978-0198822868

As a mathematician and fluid dynamicist by background, and an oceanographer by profession, I am familiar with Stokes' theorem, the Navier-Stokes equations of fluid dynamics, Stokes' law, and Stokes' research on waves. In fact, the earliest published paper that I have ever referenced in one of my own published papers is Stokes' 1847 paper 'On the theory of oscillatory waves' (For more on Stokes' contribution to water waves see Craik A.D.D. 2005 George Gabriel Stokes on Water Wave Theory, Ann. Rev. Fluid Mech. 37:23-42). Therefore, I was keen to find out more about his life and work, and his faith. This book enabled me to do so.

Most of the book is taken up with recounting Stokes' (1819-1903) life and describing his scientific achievements, with each chapter being written by a different author. There are two chapters Stokes' research in optics and one each on his mathematical and fluid dynamical studies. These show the breadth of his research interests and achievements. There is a chapter on his work as the secretary and then the president of the Royal Society, to which he had been elected a Fellow in 1851 after becoming Lucasian Professor of Mathematics in Cambridge (the chair held once by Isaac Newton and subsequently by Paul Dirac and Stephen

Hawking, among others). This involvement seems to have taken him away from research and into more administrative duties, to the detriment of his science. What I had not appreciated, until I read the chapter on Stokes and Engineering, is that Stokes also made important contributions to the safety of railway bridges. This involved doing some of the first mathematical modelling of railway bridges and also providing evidence to the court of inquiry into the Tay Bridge disaster. The latter was followed up by the Board of Trade setting up a commission to investigate wind effects on bridges, to which Stokes contributed.

For the readers of this journal the chapter that will be of most interest is that on his faith, written by Stuart Mathieson. Stokes' father was a Church of Ireland minister, and the family were evangelical Christians committed to the principle of sola scriptura. Stokes was a member of the Anglican church throughout his life. In a way that resonates with the concerns of many evangelical Christians today, Stokes was concerned about the doctrine of eternal punishments, noting that as a child he was 'so horrified at this idea of endless torments that I wished there was no God and no future state, lest I should fall into them.' (182) However, this did not cause him to lose his faith. Rather his correspondence on this topic with another Christian was compiled into a book entitled Conditional Immortality: a Help to Sceptics, which was published in 1897. His arguments for conditional immortality (his view being not that dissimilar to the position held by John Stott, that doyen of evangelical Christians in the UK) anticipate many that are prevalent today in discussing the topic of hell. Stokes also became president of the Victoria Institute, one of the sponsoring bodies of this journal, at the same time as he was president of the Royal Society and an MP for his university!

This book provided me with many insights into Stokes' life, science and faith and so amply fulfilled the promise of its title. Perhaps my background makes me somewhat biased, but I found it fascinating to read and would thoroughly recommend it as a way to learn about one of the less well known Victorian scientists who also had a clear Christian faith, the better known ones being Faraday, Maxwell and Lord Kelvin. (OUP have previously published similar books on *James Clark Maxwell; Perspectives on his Life and Work* (2014) *and Kelvin: Life, Labours and Legacy* (2008)).

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