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Reviews

Graeme Finlay
Human evolution: genes, genealogies and phylogenies
Cambridge University Press: Cambridge, 2013. 359pp. hb. £45.00.
ISBN 1-107-04012-4

Make no mistake; this is a complex technical textbook. It probes, in great detail, an extremely interesting part of human evolution, namely, how retroviruses, jumping genes, pseudogenes and the origin of new genes inveigle themselves into the human genome and how this can be used to trace back our ancestry. This is no broad spectrum introduction to human evolution, but a tightly focused, sharp insight into a branch of genetics offering perceptions that would have been unimaginable a few decades ago. Finlay writes this book as a cancer specialist, from which vantage point he develops the evidence to show how a detailed genome analysis can substantiate the argument for common descent. This is done via the evidence trail of how the human genome is sprinkled with viral genes, most of which are deactivated, but how some are co-opted into new functions. Any reader of this book will have to get used to the huge quantity of acronyms, the geneticists' shorthand for referring to genes, bits of genes and types of cells. This can be a bit off-putting, but it is worth persevering.

Part of this book is a sleuthing narrative uncovering evidence piece by piece which then can be used to infer common descent. It is a powerful way to develop the argument and is explained simply when Finlay refers to an incident when teaching undergraduates about carcinomas, a common cancer. In one essay he was marking the word 'Casanova' had been substituted for 'Carcinoma'. He uses this as an analogy for a mutation, but it was when two other essays contained the same error that the suspicion that illicit copying had occurred (descent with modification). This is a good model for cancer where, sometimes, a single mutation has occurred in a cell and so will be transmitted to all their descendants. This allows cell lines to be traced back to a single progenitor. These mutations can be used as arbiters of relatedness and hence hangs the tale of using these clues, comparing them to other animals and building up the shared history and working out when this novelty entered the genome.

As mentioned, the human genome is littered with the wreckage of past infections (and many other notable changes) and their point of origin can also be determined. By looking at various genetic features (lots of acronyms) the degree of relatedness can be ascertained. Finlay describes this in the Romanov family in a forensic analysis to determine if any of the family had survived the 1918 revolution, but the same techniques can reach much further back in time to describe relatedness of humans and non-humans. This may be a book primarily about human evolution, but it does (as it should) include a lot of other mammals right back to the split between the duck-billed platypus lineage and the one that led to humans. This is the story of genetic systems and how such a complex organisation, full of defunct and apparently useless DNA, arose and is now maintained. In this is the answer to why there are more virus genes in the human genome than genes required for making a human.

Knowledge of genes is not, however, all that is required to create a human. The final section of the book looks at systems that are grown during development. Beginning with the immune system and the reciprocity between a human and their microbiome, there is an exploration of how a human is an

ecosystem of interacting parts, human and microbe. Then there is a section on the nervous system, how plastic our brains are and how that leads to a theory of mind and what comprises a human person. This ends with the culture of stories and meaning. Well worth reading. For the general reader, however, perhaps what is most surprising is that this technical textbook on evidence for evolution is sandwiched between two very erudite and scholarly chapters on the history of evolution, the mixing of faith and science and then an ending considering what it is to be human.

With regard to this tour de force I have a couple of minor points. With my geneticist hat on I would have liked to have read some more about how the human genome is organised into its 46 chromosomes and what the implications are for that within the evolution of the great apes (particularly as there are chromosomes on the front cover). With my herpetologist hat on I would point out that placentas are not unique to the mammals as they have evolved convergently over a hundred times in a number of snakes and lizards (and a few other groups) up to and including one lizard *Trachylepis ivensii* with its incredibly mammal-like placenta. It would be interesting to see whether this species has co-opted the exogenous retroviral genes found in mammals.

This is an excellent book to consider the place of evolution and this new line of evidence. The final chapter is a worthy introduction to what is a human. I can imagine that this book could be a catalyst for some very interesting conversations and deserves a wide readership.

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Louise Hickman (ed.)
Chance or Providence – Religious Perspectives on Divine Action
Cambridge: Cambridge Scholars Publishing, 2014. 170 pp. hb. £41.99.
ISBN-13 978-1-4438-6675-0

This collection of twelve essays arose from the thirty-eighth annual conference of the Science and Religion Forum which took place in 2013 at the University of Chester. As with many conference collections of this kind, the range of topics is eclectic, even whimsical on occasion, and the level of treatment somewhat patchy, ranging from overviews of twenty or more pages to brief commentaries of ten pages or less. In some cases one felt that the author was just 'warming up' as the essay comes to a close.

Some of the more substantial essays deserve particular mention. Mark Harris has a thoughtful contribution on the eschatological question 'Will resurrection be a law of nature?' focusing on the writings of Polkinghorne, Russell and Wilkinson, suggesting that the scriptural net should be cast much wider than is often the case to include, especially, more material from the Gospels in their portrayal of the new creation. Bethany Sollereder provides a useful overview of the topic 'Divine action and evolutionary suffering', mapping out the various positions commonly taken on this challenging topic. Her creative metaphors to picture 'God's weaving of the world narrative' are helpful irrespective of whether or not one embraces the author's own open theism.

Amongst the brief essays, that of Mark Hart on 'Rowan Williams and divine action' provides a useful summary on the views of this 'classical theist'. An essay by Bertrand Souchard on 'Energy: a sign of divine action in the world?' introduces a novel metaphor, albeit one with a long historical pedigree, to express God's immanence in the created order. In both cases one only wishes that the discussion might have been

more extensive.

Occasionally one senses that the representation of views with which the author disagrees is presented in cartoonlike fashion rather than with serious attention to the breadth of available scholarship. Such is the case with Peter Colyer's representation of Calvin in his essay 'A Kenotic model of divine action'. A critique based on one or two selective quotations really won't do and the extensive contributions of the historian Peter Harrison on the positive role of Calvin's thought in the emergence of modern science act as a powerful counterbalance.

There is plenty about 'Providence' in at least some of the essays in this volume but, somewhat surprisingly given its inclusion in the book's title, very little about 'Chance'. In fact I do not think that any author provides a definition of what they think is entailed by the word. This is rather unsatisfactory for the reader with a background in science. The volume could have done with a contribution from an analytical philosopher to help bring clarification to some of the linguistic minefields with which this theological territory is littered. In the end, there is little material in this volume which actually addresses the question posed by the title.

There is a growing body of literature on this important topic and for those with a limited budget my own tendency would be to look elsewhere for the more extensive single-authored treatments already available. These include *Evolution, Chance and God* by Brendan Sweetman (Bloomsbury, 2015), or, from a rather different perspective, *God, Chance and Purpose* by David Bartholomew (CUP, 2008). Don Carson's helpful *How Long O Lord?* (Baker Books, 1990, frequently reprinted) remains a classic on the biblical understanding of providence.

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David N. Livingstone
Dealing with Darwin: Place, Politics, and Rhetoric in Religious Engagements with Evolution

Baltimore: Johns Hopkins University Press, 2014. 265 pp. pb. £26.00. ISBN 978-1-4214-1326-6

Many continue to subscribe to the myth that Darwin's *On the Origin of Species* served only to heighten an ineluctable antagonism between the devotees of science and the apologists of Christianity. This 'conflict thesis' has gained sustenance in recent years from both the 'creation science' and 'intelligent design' movements, and from the rise of the 'New Atheism'. While it is certainly true that Darwinian polemicists have caricatured the nexus between science and religion in terms of mutual hostility, scholarly enquiry has revealed that the historical picture was much more complex. Darwin's theory had its fair share of theological champions as well as opponents, and many Christians had no difficulty reconciling evolution by natural selection with orthodox belief. The question of how exactly Darwin's theory was received by his scholarly contemporaries, and by theologians and religious thinkers in particular, is the subject of David Livingstone's new monograph.

Livingstone, a professor of geography and intellectual history, has produced a work which claims to provide 'a geographical perspective' on the reception of Darwinian evolution in the late nineteenth century. The strength of his study lies in its careful attention to context, and this informs his central contention that place (and thus politics) shapes how texts are read and received. His study explores the nature of Darwinian reception in a number

of 'cognitive zones' in the British Isles and North America. However, while he stresses the importance of locale, he confines his investigation to a single religious denomination, Presbyterianism.

Livingstone shows that, while local dynamics were undoubtedly significant, the Presbyterian thinkers who struggled to reconcile evolution and religion also had much in common. They all shared, for instance, the same intellectual and ecclesiastical milieu, namely Calvinist theology and Scottish Common Sense philosophy. And what emerged out of their efforts was a form of liberal theological Protestantism.

These more 'liberal' thinkers advanced certain ideas in common. For instance, they defended a progressive revelation; the Bible, they thought, does not inform science, and the investigation of nature should be left to scientists. While they acknowledged that much common ancestry exists in nature, they were careful to emphasise that God made a special intervention in creating *Homo sapiens*. They believed that the order and equilibrium apparent in nature shows clear signs of a divine *telos*. In short, they embraced a form of theism that saw evolution as shot through with providential design.

However, Livingstone shows that reactions to Darwinism also diverged widely. His first study in contrast is between Edinburgh and Belfast. In Edinburgh, Scotland's intelligentsia swiftly embraced evolutionary theory, and Henry Drummond's popular *Natural Law and the Spiritual World* (1883) served to synthesise evolution and Christianity. The response in Belfast was very different; in 1874, John Tyndall gave a controversial address to the British Association for the Advancement of Science, which triggered fiery reactions from his audience and resulted in decades of resistance from Presbyterian apologists to what they perceived as agnostic and materialistic science. In consequence, Tyndall provoked a negative response to Darwinism in Belfast which did not manifest itself in Edinburgh.

The focus then shifts to Canada. Whereas in Montreal Sir John William Dawson maintained a consistent opposition to Darwinism, the academics at Knox College, Toronto, were far more accommodating. At this point, Livingstone helpfully explores the significance of the role played by Baconian epistemology. Some religious thinkers used the Baconian deprecation of abstract theorising as grounds on which to avoid indulging in the speculative excesses of Darwinism. The Knox Faculty, however, broke free from this embargo, and not only employed Baconian methods against biblical literalism, but also found a way of putting evolutionary metaphysics to good theological use.

Turning to Princeton, Livingstone explores the contrasting perspectives of Charles Hodge and James McCosh. Hodge emphatically repudiated evolution; McCosh's rhetoric, on the other hand, was much more eirenic. Evolution, he held, was acceptable to Calvinist orthodoxy. However, he strenuously resisted any attempt to apply natural selection in the field of ethics.

Chapter 5 deals with what was perhaps the most entangled case in the unfolding saga, that of James Woodrow; and it is here, it seems to me, where Livingstone advances his most convincing case for the central importance of place. In 1884, Woodrow, who for over a quarter of a century had held a professorship at the Southern Presbyterian Theological Seminary in Columbia, South Carolina, addressed the Alumni Association of the seminary. Ironically, Woodrow, who was a firm advocate of absolute biblical inerrancy, found himself defending evolution by arguing that science and theology are mutually exclusive, concluding it would therefore be a category mistake to allow the one domain to intrude on the other.

Almost at once, the knives were out, and Woodrow's colleague John Lafayette Girardeau became his chief adversary. Southern Presbyterianism, Girardeau insisted, must prohibit the teaching of anything 'contrary to our Church's interpretation of the Bible' (125). Indeed, even proven truths of science should be excluded if they contradicted Presbyterian standards. Livingstone excels in demonstrating that the Woodrow case was about far more than evolution: it was about the very survival of Southern Presbyterian culture.

This book, based on the 2014 Gifford Lectures, is a fine historical analysis of the reception of Darwinian evolution in the late nineteenth century and builds on Livingstone's equally splendid *Darwin's Forgotten Defenders: The Encounter between Evangelical Theology and Evolutionary Thought* (1987). The introductory and concluding chapters, which provide the framework for the case studies, show that the insights gained from this examination of Presbyterian receptions of Darwin can be usefully extrapolated to other socio-religious contexts. I believe that *S&CB* readers will find this an informative and stimulating volume which explores issues of enduring importance and relevance.

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Peter Clarke
All In The Mind?: Does Neuroscience Challenge Faith?

Oxford: Lion Hudson, 2015. 254pp. pb. £10.99. ISBN 978 0 7459 5675 6

This book is remarkable both in the range of knowledge it demonstrates and the balance it maintains. There is throughout an even-handedness, something, at times, sadly lacking in discussions of the implications of advances in science for long and deeply held Christian beliefs. This even-handedness is particularly important when writing about an unusually rapidly advancing area of science like neuroscience in which answers to some key questions must, on present evidence, remain inconclusive. A further admirable feature of the book is its accessibility to the non-specialist. With the judicious use of illustrations and diagrams the author makes technical details clear and understandable.

A lifelong career researching and teaching in neuroscience equips Peter Clarke to produce a book that can rightly claim to be up to date in its science. The author's acquaintance with the relevant cognate areas of psychology is also impressive, not just cognitive neuropsychology but social psychology. It is evident that the author is widely read in the history of Christian doctrine and, in particular, of recent debates of issues at the interface of neuroscience and Christian beliefs. The philosophical sophistication of discussions of topics like free will is impressively reassuring.

Peter Clarke recognises that discussion of specific issues such as those dealt with in later sections of the book can only properly be understood if the reader is aware of the overall picture that modern neuroscience presents, and understands its solid factual basis illuminating the relation of brain and mind. In the author's own words, '… in the wake of the scientific revolution, the "mechanistic philosophy" (as it was then called) became the predominant

worldview of Christendom. I review how the unstoppable advance of this approach caused the machine metaphor to be extended first to nonhuman animals, and then to human beings. At the same time, accumulating evidence has made it difficult to believe in any additional nonphysical element – a special vital force or nonphysical soul – interacting with the "machine". The question to be faced, then, is whether we are just machines. Are we just complicated lumps of matter? *This major question lies at the root of virtually all the themes of this book.*' (my italics) (11) He later continues, 'Thus, mechanistic thinking dominates biology and psychology, and influences profoundly the way we think about ourselves.' (19)

At the start of Section II on Modern Neuroscience he writes, 'Few today would doubt that our thoughts, desires, emotions, and actions are somehow linked to our brain activity. This chapter confirms that this is true for every aspect of our mental world – even moral judgements and religious experience. Moreover, the brain-mind connection is *causal*, not merely correlational.' (29)

Clarke gathers together into two main sections (III and IV) what he sees as central and recurring issues in recent debates about the implications of neuroscience for Christian beliefs. Section III focuses on free will, responsibility and ethics, section IV on discussions of the nature of the human person and, in particular, the nature of the soul. Clarke, in challenging the concerns of some of his doubting readers who may still be locked in substance dualism, is following a theme stressing the unity of the person repeatedly emphasised by evangelical theologians and biblical scholars in recent years, whether of the 'devotional' genre or the more scholarly. For example, Eugene H. Peterson wrote, 'We are psychosomatic beings; body and spirit are intricately interrelated.' (*A Long Obedience in the Same Direction*', p. 124.) and biblical scholar Joel B. Green when discussing the Apostle Paul's experiences in his letter to the Corinthians (2 Cor. 12: 1-4) wrote, 'Far from proving that there is an etherial self that can separate itself from our material bodies, out-of-body experiences demonstrate rather the wonderful complexity of our brains as they situate us in time and space in ways that we mostly take for granted.' ('Resurrection of the body: New Testament voices concerning personal continuity and the afterlife', in Green, J. (ed.) *What About The Soul?*, Nashville: Abingdon (2004), p. 95.) Clarke's even-handedness is demonstrated in his open minded position on this delicate topic of Near-Death Experiences and Deathbed Visions. He writes,

> The fact that many aspects of NDE's can be induced (albeit in a paler, less powerful form) by electrical stimulation of the brain or by drugs does tend to suggest that NDEs are the result of abnormal brain activity. But for the reasons discussed above this argument does not seem to me decisive, and I am reluctant to brush aside the wealth of evidence about NDEs and deathbed visions as mere illusions, when there is certainly no proof that all these experiences are illusory. It's just too easy to dismiss as illusory everything that doesn't fit in with one's worldview.(180)

At the end of this section of the book Peter Clarke, having traced out the evidence from research in areas such as electrical recordings from the brain, studies of brain damage, pharmacological effects on mind and mood, is very careful to maintain the balance already referred to when he writes, 'I have so far emphasised what we *do* understand, but there is much about the brain-mind relationship that is still a mystery. It is easy to reel off a whole string of questions about consciousness that we can't understand.' He then lists eight unanswered questions about consciousness.

Sadly Peter Clarke died in 2015, not long after the publication of this book. I

strongly recommend it as a 'must read'. No unjustified scientific triumphalism here, rather a careful, measured, realistic assessment of 'the way the world is' in light of contemporary insights from neuroscience and related disciplines into our mysterious human nature.

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Roger Trigg

Beyond Matter: Why Science Needs Metaphysics

West Conshohocken, PA: Templeton Press, 2015. xiv + 162 pp. hb. $24.95. ISBN 978-1-59947-495-3

Roger Trigg has written a beautiful little book exploding some of the myths that surround the philosophical status of science as it is often presented today, not least by those of the 'new atheist' tendency who eschew any idea of metaphysics or that science needs support of any kind from outside itself. And he has done it in a way that is accessible and easy to read for non-specialists.

Today's believers in the total adequacy of science are like the logical positivists in arguing that empirical evidence is all that counts, and like Karl Popper in affirming that theories must be falsifiable. Yet both logical positivism, which even had a problem with the reality of the other side of the moon, and Popper's falsificationism, are summarily discarded when it comes to speculation about multiverses, gigantic ensembles of universes often invoked to explain the special nature of our own universe. As Trigg says, these speculations do not become science just because scientists indulge in them. Modern cosmology is rife with this kind of speculation, especially when it comes to Max Tegmark's ultimate, maximal multiverse (his Level 4 multiverse) in which all mathematical structures have physical existence. That is the stuff of metaphysics, taking us way beyond what physics can tell us.

The real problem, which Trigg handles with exemplary clarity, is that many scientists think that science is the only source of truth, and that it can stand on its own two feet. It has all it needs within its own resources to justify its claims, just as Otto Neurath's boat is continuously repaired at sea without ever needing the facilities of a dock.

Stephen Hawking is a brilliant cosmologist, but muddled when it comes to philosophy. In *The Grand Design*, co-authored with Leonard Mlodinow, he begins by stating that 'philosophy is dead'. But a few pages later he proposes a view called 'model-dependent realism', which is unquestionably a philosophical position. As Trigg notes, all this is in an opening chapter entitled 'What is reality?', a 'quintessentially philosophical question'. Arguably, the whole Hawking-Mlodinow book is about philosophy more than it is about science. According to model-dependent realism one adopts the model which is most useful, which is a criterion more associated with pragmatism than with seeking the truth about an objective reality.

Richard Dawkins is what one might call an unreconstructed logical positivist. Science is the only reliable way to truth because it relies on empirical evidence. Dawkins treats God as a scientific hypothesis competing with science to explain the same empirical evidence. But of course it is a false comparison. Darwinian evolution might compete with Lamarckian evolution, but the competition Dawkins is interested in is really between alternative metaphysical positions, namely atheism and theism, not between competing scientific theories. Evolution explains how species came to be what they are, but

what explains evolution? What explains the success of science in giving us the theory of evolution, and much else, in the first place? What explains our human capacity to do science and understand the universe? As Trigg argues, are we not arguing in a circle if evolution explains what we believe, because it then ostensibly explains our belief in evolution itself? We need to step outside science and use our capacity for reason to justify what we believe.

Trigg helpfully clears up the controversy surrounding the famous debate between C. S. Lewis and the philosopher Elizabeth Anscombe, which relates to this point. He also clarifies the similar argument of Alvin Plantinga, explaining how both Lewis and Plantinga overstated their case, but how their basic arguments are valid when rephrased. Thus a causal, evolutionary explanation might explain the reliability of our beliefs about the danger of tigers, but the ability to do science, for example to discover the Higgs boson or dark matter, takes us way beyond what is necessary for survival.

Scientists tend naturally to be realists, and Trigg shows us the consequences when realism is undermined. That happens, for example, when the criterion for justification of a scientific theory is relaxed to simply being that it works, as in the case of pragmatism, or when science is portrayed as more a sociological practice than a search for truth about physical reality, as with Thomas Kuhn's paradigm shifts. Then relativism beckons and, not far behind, the postmodern repudiation of 'grand narratives' and the claim that there is one truth that is valid for me and another valid for you. That is certainly not what scientists believe and, were it true, it would make science pointless.

Trigg does not take an explicitly theistic metaphysical stance in this book, though the idea of God as the explanation for a contingently ordered universe is certainly mentioned. For my own part, I would see such a metaphysical stance as vastly more satisfactory than the ontological profligacy of a multiverse embracing all possibilities, which, as Trigg says, because anything that can happen does then happen in some universe, ends up explaining nothing at all.

To summarise, here is an excellent book, covering a lot of philosophical ground in an easy and accessible style, and I heartily recommend it.

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Peter Harrison
The Territories of Science and Religion

Chicago: Chicago University Press, 2015: 300pp. hb. £21. ISBN: 978-0-226-18448-7

This book is based on Peter Harrison's Gifford Lectures given before he returned to Australia after a spell as Oxford University's Andreas Idreos Professor of Science and Religion. Professor Harrison's most significant work to date has concentrated on the extent to which concepts like the fall of man and biblical literalism around the time of the Reformation led to changes in the way science was thought about and practised. The present book addresses a much broader sweep of history, from ancient Greece to the present. However, its author's previous work on the Reformation forms the book's pivot, the point at which the modern understanding of the terms 'science' and 'religion' began to emerge.

Professor Harrison's aim in the book is to track how the territories of 'science' and 'religion', by which he means the intellectual spaces that they occupy, have changed over the centuries.

It is a commonplace among historians that the word 'science' only acquired its modern meaning during the nineteenth century. Medieval and ancient historians use the term natural philosophy to denote the study of nature in order to make clear that they are not talking about science as understood by a modern audience. But Professor Harrison believes the same is true of the word 'religion'. This too, he claims, only found its contemporary meaning in the nineteenth century. And of course, if the meanings of science and religion have been fluid, the relationship between the two of them also changes over the course of history.

The book begins in ancient Greece and gives a good account of how natural philosophy was understood at that time. For the pagan Greeks, ethics was the central pillar of philosophy and the study of nature merely an adjunct. Their various cosmologies were designed to support ethical conclusions. As Professor Harrison puts it, they believed 'the moral order is built into the structure of the cosmos'. Any hostility that early Christians felt towards Greek natural philosophies was because they understood that these philosophies undergirded ethical systems that Christianity rejected. Come the early-modern period, Professor Harrison suggests, a combination of the desanctification of nature, divine voluntarism and doubts about the capacity of human reason in a fallen world led Christians to conclude that experiment was required to see the world as it really is.

However, when he turns to the meaning of 'religion', Professor Harrison is not quite so convincing. He suggests that our modern understanding of a religion as a collection of beliefs also dates from after the time of the Reformation. With reference to Thomas Aquinas and other scholastic thinkers, he tries to show that they perceived true religion as a kind of mental state of internal virtue. The creeds were not so much statements of doctrine as mantras to be meditated upon. It is unclear from this exactly what the arguments at the ecumenical councils were about if not the content of Christian belief. Nor does Professor Harrison explain why preaching the content of Christian belief was so important to the Dominicans and so strongly enforced by the inquisition.

He is back on firmer ground when he marries the two concepts to discuss what was meant by the term 'science and religion'. In fact, he shows, it hardly existed at all before the late nineteenth century. By then both science and religion had hardened into objective realities in their own right that could engage in conflict or harmony, depending on who was asking.

Like many books based on a set of lectures, this book reads as something of a work in progress where the broad lines of a thesis have been drawn, but need to be filled in to convince the reader. Copious endnotes help provide some of the detail, but it is to be hoped that Professor Harrison will provide us with the full story in due course.

James Hannam is the author of *God's Philosophers: How the Medieval World Laid the Foundations of Modern Science* (2009).

Simon Conway Morris

The Runes of Evolution: How the Universe Became Self-Aware

West Conshohocken: Templeton Press, 2015. 496 pp. hb. $39.95. ISBN 978-1-59947-464-9

Converging all the way to the (tangled) bank

A rune, saith the *Oxford English Dictionary* (no slight intended to the 'other place', from which famed palaeobiologist Simon Conway Morris hails), is a character or symbol to which is attributed a mysterious or magical significance. For our author, rampant similarities

among functional traits across living things, together with strong threads of continuity extending back from today's creatures into the far reaches of evolutionary history, are runic in that they hint at something metaphysical. They hint that the evolution of life might have traced patterns that are to some extent inherent in the nature of the universe, and thus we might be justified in thinking that much of life is predictable, even perhaps inevitable, including the capacity for thought and imagination that are instantiated in their most extreme form in our species but are built on evolutionarily well-established building blocks.

This cosmic inkling, though important enough to merit the book's title, enters into the book only fleetingly, like Wordsworth's intimations of immortality or Lewis' experiences of joy. Mainly these are presented in flanking Chestertonian bookends that draw a tantalising but necessarily only partly articulated connection between the empirical stuff and cosmic meaning (he who has ears to hear, let him hear). By weight as opposed to significance, the book is mainly a copious celebration of convergent evolution in nature—the plethora of situations where similar traits evolve independently in similar environmental circumstances. The main architecture of the book is as follows. The octopus is set forth as the epitome of convergence with vertebrates, what with its camera eye, advanced cognition, arm-like tentacles, and giant axons. The next two chapters provide historical context, argue for the ubiquity of convergence more generally, and relate this concept (too) briefly to others such as ecomorphs, irreversibility, inherence, and inevitability. Then comes the fascinating ecotour: twenty-one chapters cover examples of convergence, and to a lesser extent preadaptation, either topically or taxonomically, as follows: capturing prey, teeth, locomotion, gripping, eyes, vision, chemoreception, other senses, fungi, plants, arthropods, agriculture, flight, birds, reproduction, tetrapods, nervous systems, brains, cerebral cortex, cognition, tool use and play. Then there is a final meaty but racing chapter on intelligence, thought, self-recognition, and awareness of death, followed by a claim that this story as a whole is most consistent with universal perception of objective entities in the universe. The middle of the book sports fifty nice colour plates of various interesting organisms. There is also a wonderful nerdography at the back: I will definitely be using the index of genera… and the notes (including bibliographic information) comprise literally half the book – a few of them are chapter-length! The book might have broken a world record somewhere around here.

This volume, together with the author's previous book *Life's Solution*, represents the first time anyone has sought seriously to document instances and patterns of convergent evolution in nature. This makes these two books together a scientific monument aside from their higher philosophical aspirations. Indeed I have not read a work that reveals such an encyclopedic knowledge of organisms and their traits since George Williams's 1966 *Adaptation and Natural Selection*. There are many natural history works out there, but most can be written by knowing a few good stories. The chief and rare value in this work, and the reason why such a book hasn't been written before, is that the topic of convergence is all-encompassing and cannot be addressed with even an impressive litany of isolated examples. To tell a student that the Australian megapodes bury their eggs beneath rotting vegetation for incubation and exhibit no direct parental care, is an interesting bit of natural history. But if a student asks if that is the *only* bird that does not exhibit direct parental care, a correct answer here is much more difficult, as there are over 10,600 bird species. Very few biologists could write a book like *Runes* because to

answer the question of whether a trait is unique or shared by analogy among different lineages one must be aware of just about *everything that is out there*. Only by such knowledge can Conway Morris, aside from his specific intended lessons, convince us more generally that nature is rich but understandable, that there are millions of stories but many fewer themes. Bravo.

One of the author's motivations in laying out this panoply of convergence was a desire to counter the perception that there is an 'area of neo-Darwinian thinking' that 'insists on the randomness of evolution and the unpredictability of the outcomes'. In one place Conway Morris even suggests that this is 'received wisdom'. To this I would offer condolences and respectfully suggest that the author has been subjected to too much Gouldian flimflam from the likes of palaeontologists, systematists and molecular biologists, in other words those who do not actually study adaptation, which is the fount of convergence. Those in evolutionary ecology (who study trait evolution and the functional relationship between organisms and their environments) have no truck with this randomness-mongery. Pick up any issue of *Behavioral Ecology*, *Evolutionary Ecology*, or the several relevant papers in any issue of *Evolution* or *Proceedings of the Royal Society of London B* and the general format of the papers will be 'We predict X should evolve in this situation, and we have observed or experimentally created this situation, and indeed X happens (or doesn't)'. Conway Morris lauds R. D. Alexander for predicting multiple features of a eusocial mammal if there were one (and there did end up being one), and this was indeed a stellar case, but this is a rather typical perspective for those who study traits of organisms in ecological context. By a combination of field and lab research, evolutionary biology is constantly laying out more of that map about which Conway Morris so thoroughly and richly writes.

The book enters into metaphysics at the end, but as the author gives mainly hints and suggestions, I'll let them rest for the reader to find and handle appropriately. The book ends as it begins, at an Italian lagoon, with a confident character Mortimer—surely that same scientist who is predicted to win the Nobel Prize in 2056 for having revealed important aspects of the nature of mind and its inherence in the universe (see Conway Morris in *New Scientist*, 2006). Mortimer challenges the narrator, and the reader, to think about all this convergence and consider seriously whether it ought to change our view of the universe and mind's place in it. Most readers of *S & CB* will largely be convinced already of some robust purpose in the cosmos, and the precise degree and nature of convergence in living systems will be unlikely to make much difference one way or the other to this commitment. Back in late antiquity into the Middle Ages it was the extraordinary fruitfulness, the plenitude, the exuberantly diverse overflow of divine creativity that stirred the spirituality of the intellectual faithful contemplating nature. If today some find similar inspiration in consistently revisited patterns of such creativity in different evolutionary lineages, in the predictable map of organismal solutions to environmental challenges, so be it!

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James W. Jones
Can Science Explain Religion? The Cognitive Science Debate
Oxford: Oxford University Press, 2016. 236pp. hb. £16.99. ISBN: 978-0-13-024938

James W. Jones starts with the question, 'Can science explain religion?' Can religion be explained away, so that by explaining its origins in the human

mind, we need not take the content of any religion seriously? Religions then become the peculiar by-products of mental tools that were provided for other purposes. The theory of evolution can be invoked to demonstrate how these tools developed. 'New atheists', such as Dan Dennett to Richard Dawkins, have made great use of such arguments in confronting the obvious reality of the place of religion in human life. They have to accept the ubiquity and importance of religion in human societies, even if they try to argue that we should outgrow its influence.

In opposing such views, James W. Jones writes with a considerable knowledge of philosophy and theology, and also from the standpoint of a clinical psychologist. He tells us that this is a book for the general reader, and those new to the subject. It is lucid, effectively argued and successfully casts doubt on attempts to use cognitive science to undermine religion. Jones' central contention is that debunking assertions about religion go far beyond the actual scientific data in cognitive science and rely on a purely physicalist framework. Explaining away religion in the name of cognitive science only works if you build in assumptions about the priority of scientific explanation at the very beginning, and that begs the whole question.

As the book is not intended to depend on prior knowledge of the subject, some detailed examination of the current state of play on the cognitive science of religion (C.S.R.) ought to be necessary. Its claims are of great interest and importance. They suggest that ideas of disembodied agency, minds without bodies, life after death, divine omniscience, the presence of purpose of the world, and other themes typically central to religion, are deeply rooted in human conceptual schemes. C.S.R. can claim that religious belief is natural and becomes the default option in a way that scientific understanding is not. The former is deep-rooted in human nature, while the latter, like sophisticated theology, is the product of deep rational reflection. Religion can claim to be universal in a way that science cannot be, because it is grounded in basic human impulses.

Jones, however, makes it his priority to challenge the unargued assumptions of those who use C.S.R. to undermine religion. He never really gets to grips with explaining in detail how religion is allegedly produced by the natural operation of cognitive mechanisms. His first chapter attempts to set the scene, but is comparatively short and cursory. His second chapter about the nature of explanation is twice the length. He then quite rightly argues (97) that the arguments of those who try to explain religion away appear compelling only 'against a background in which science is the only arbiter of reality and truth'.

In dealing with physicalism, Jones very reasonably casts doubt (161) on whether 'non-reductive physicalism is really a coherent position'. It has to provide for top-down causation, he argues, and he wonders whether the position can have it both ways, trying to maintain both the reductive physicalist's tie to current natural science and the dualist's affirmation of conscious causality. Indeed, the possible incoherence lies in the inherent tension of the label of non-reductive physicalism. How can a doctrine simultaneously tie reality to the understanding of a present, not even an ideal, physics, and accept an apparently nonphysical, 'emergent', causal agency? Yet if it is physical, we seem again trapped in the possibility of reduction.

Jones also casts doubt on the idea that evolutionary mechanisms can explain how the central products of humanity such as science itself, art, politics, religion, and so on, are merely introduced as by-products of cognitive mechanisms that have evolved for other purposes. He says pithily (126): 'They are not hijacks on our basic nature, they are part of our basic nature.' Yet this glib

dismissal of important features of human life as mere by-products of evolution is a central feature of attempts to explain away religion. Another important insight is given by James's criticism of the so-called modular theory of the mind which divides the operation of the mind into separate modules, operating neurological and cognitive levels. As he points out (65), many scientific disciplines, from fundamental physics upwards, rely on 'scientific models that study an interacting system's holistic and emergent properties'. He wisely concludes that there is no reason to concentrate on religion's separate cognitive components while ignoring their interaction.

All in all, this is a balanced and sophisticated analysis of attempts to debunk religion that rely on the new discipline of the cognitive science of religion. Even so one is left feeling that Jones has not explained sufficiently the potential for C.S.R. to enrich our understanding of the part which religion plays in human life. It is a serious discipline in its own right, helping us to understand how the human mind works. It should not be overshadowed by suspect uses that might be made of it. He is, however, certainly right that it cannot, without separate philosophical assumptions, challenge the crucial claims to truth that different religions make.

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Celia Deane-Drummond, Sigurd Bergmann and Bronislaw Szerszynski (eds.)

Technofutures, Nature and the Sacred: Transdisciplinary Perspectives

Farnham,Surrey: Ashgate, 2015. 306pp. hb. £65.00. ISBN 978-1-4724-4410-3 (also available as e-book)

We live in a complex multi-dimensional world of technology, culture, environment and considerations of ethics and responsibility, and many have examined the two-dimensional spaces in which these interact. The authors of this volume attempt to create a synthesis of all these dimensions, which is by no means an easy task. But then, they do not pretend that the questions they address are either easy or unimportant. Perhaps we would all like to know 'who decides what technology can and cannot be used for' and what would give them the right to speak and what framework do we have in which to make decisions about using technology, particularly when, at the time, it *seems* to be beneficial. We may not find an answer in this book, but at least we can begin to understand why we must ask – and continue to ask – the questions. Are such questions theological issues, are they matters of faith? Not satisfied simply to accuse engineers of 'playing God', this book, by exploring the breadth of philosophical and theological thinking from classical to modern, places the question of how, when and where we use technology firmly in the realm of theology.

This is not an easy book to read and it may be tempting to give up after the introduction, if not the title. Perseverance is required and will eventually be rewarded, although not by a fulfilled understanding but rather by a stimulating and uncomfortable challenge to both thought and action. While, on the whole, the authors do ground the discussion in a spiritual context, it is not an overtly Christian one and readers from other traditions would not find

themselves uncomfortable with this book.

Each chapter is the work of a leading specialist (introduced in a comprehensive biography) and for those whose experience lies in a different sphere, some of them can be demanding. In the first section which attempts to establish a theoretical framework, the reader may find that even on familiar ground the boundaries can be pushed uncomfortably far and once on unfamiliar territory the temptation to give up is compelling, especially where the flow of the text is constantly and unnecessarily interrupted by parenthesised German or Greek words and phrases. Tellingly, we are advised, 'To philosophically educated readers it is easy to see…' (26): to others, it may not be, and it is only to be hoped that at least the conclusions of the argument are clear.

Part two ('Religious Narratives') proves to be a lot easier to read, with chapter five, exploring the thoughts of the scientists involved in the development of the atomic bomb, compelling and thought provoking reading. However, it is not just nuclear scientists who are forced to ask why do we do what we do: chapter six might just stop in their tracks many readers content with the widely understood concept of the human stewardship of creation, which 'some argue is an adaptable and elusive concept subject to contrasting interpretations, with a biblical basis that has been questioned' (106). The ensuing discussion provides satisfying food for thought.

If the reader is, at this stage, unsure as to where this book is going, perhaps chapter seven may give a clearer direction. Although the language may be unfamiliar and difficult, the world which it explores is depressingly familiar: an unequal and unjust world 'defined and managed through the fetishisation of money and commodities [in which] value is attributed to lifeless money, things and machines' and 'local, historical and individual identities are destroyed' (132). This reader at least is left with the agonised cry of why, if past philosophers understood what was happening, did we still allow it to happen? And perhaps more importantly, is there any way out? It is with some relief that the chapter concludes by pursuing a rather unexpected route pointing towards the possibility (or perhaps for the Christian, the eventual certainty) that there is.

Part three, 'Practices', a series of reflective essays developed around issues ranging in scale from village to global, could well stand on its own; references to what has gone before are certainly there but not overemphasised. Chapter nine, with the unappealing title of 'Reinventing homemaking', alone makes this book worth reading: although it begins with a feeling of justifiable pessimism about the state of the world's environment and economy, it goes on to offer a refreshing, well-argued and unexpected cause for optimism. Whether or not this is a realistic optimism is left for others to judge.

This is clearly an academic book and, through extensive footnotes and a comprehensive thirty-five-page bibliography, provides a sound basis for further study. The ideas explored in this book are important for the future and need to be considered by decision makers, both technological and political. For that reason it deserves to be widely read, but I suspect that the difficulty of much of the language will mean it will not be.

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Kyle Greenwood
Scripture and Cosmology: Reading the Bible between the Ancient World and Modern Science
Downers Grove, IL: IVP Academic, 2015. 250 pp. pb. £19.34. ISBN: 978-0-8308-4078-6

The shift away from concordism (or scientific concordism) in the American evangelical tradition is well under way. For generations evangelicals have assumed that God revealed basic scientific facts in Scripture well ahead of their discovery by modern science. Consequently, many have argued that this is indisputable proof that the Bible is indeed the Word of God inspired by the Holy Spirit. Evangelical Old Testament scholar Kyle Greenwood's *Scripture and Cosmology* is a welcome and well-argued addition to the discussion that recognises the failure of concordism. The book unfolds in three parts.

In part one 'Scripture and Cosmos in cultural context', Greenwood underlines that in order to understand Scripture, it is paramount to recognise the 'cognitive environment' of ancient Near Eastern nations surrounding ancient Israel, since these concepts 'saturated' the 'worldview' of the biblical writers and their readers (25). In particular, the prevalent understanding of the structure of the world was that of a three-tiered universe.

Greenwood begins by offering an overview of the cosmology embraced by ancient Egyptians and Mesopotamians. In using both their literature and artistic images, he outlines a world that features a flat circular earth set on foundations and surrounded by a circumferential sea (47-50). Within the depths of the earth, these ancient Near Easterners believed there was an underworld where dead individuals resided (50-55). Regarding the heavens, Greenwood asserts, 'It was nearly a universal truth that the sky was a solid structure. In Egypt, it was a flat roof, whereas in Mesopotamia it was dome-shaped' (55). Commonly translated as the 'firmament', this structure upheld a cosmic sea overhead. Greenwood labels these concepts as 'ancient sciences' (67) and correctly dismisses the notion that these ancient descriptions are 'purely phenomenological' or 'merely a metaphor' (69). To be sure, the Egyptians and Mesopotamians viewed the world from the perspective of the naked eye, but this was from an *ancient* phenomenological perspective. When they saw the sun cross the sky, they believed it was literally moving.

In what I deem to be the best chapter of the book, Greenwood then reveals that the ancient Near Eastern conception of a three-tiered universe is indisputably present within the pages of the Word of God. After employing scores of verses from Scripture, he judiciously concludes, '[T]he biblical writers wrote according to the *best scientific evidence of their time* [my italics], an observational viewpoint that was best expressed through analogy and [ancient] phenomenological language' (102). Equipped with an ancient conceptual view of nature, Greenwood then shifts the discussion from cosmology to cosmogony (102-119). He argues that since the Bible has an ancient understanding of the structure of the cosmos, then it stands to reason that it also has an ancient conceptualisation of origins. Once again, Greenwood offers convincing biblical evidence to support his contention.

In part two of the book entitled 'Cosmology and Scripture in historical context', Greenwood offers an insightful review of past Jewish and Christian responses to the emergence of new scientific theories regarding the structure of the cosmos. In particular, the spherical universe of Aristotle created numerous challenges because most interpreters were concordists. The various failed attempts to harmonise Scripture and Aristotelian science demonstrate the problem of concordism. A chapter outlining the stories of both Copernicus and Galileo further underlines the

bankruptcy of those trying to align statements about nature in the Bible with the scientific theories of the day. In dealing with Protestant reformers John Calvin and Martin Luther and their geocentric interpretation of the structure of the heavens in Scripture, Greenwood introduces the notion that the Holy Spirit accommodated in the revelatory process by allowing the writers to employ their ancient cosmological concepts.

In the thirty-two-page final part 'Scripture and Science', Greenwood integrates the biblical and historical evidence he presents in the first two parts of his book and provides an approach to fully embrace the authority of Scripture and the discoveries of modern science. He admits, 'That the biblical description of the cosmos does not comport with our modern understanding of it is not a novel idea' (189). To justify the existence of ancient science in Scripture Greenwood appeals to the notion of divine accommodation. He argues, 'Just as a father uses simple vocabulary and analogical language to communicate complex ideas to his children, so the heavenly Father accommodates his language to his children by speaking in his audience's mother tongues and also employing analogical language' (194). In this way, Greenwood frees modern readers from concordism and allows them to enjoy both the Word of God and the discoveries of modern science.

My criticisms of this book are few. Greenwood understands the ancient conception of a three-tier universe to be composed of the heaven, the earth and the seas (71). In contrast, most commentators view this structure of the cosmos to be the heaven, the earth and the underworld. Though Greenwood cites Philippians 2:5-8 (196), he conveniently overlooks verses 10-11 in his book. 'Therefore God exalted him [Jesus] to the highest place and gave him the name that is above every name, that at the name of Jesus every knee should bow, [1] *in heaven* and [2] *on earth* and [3] in the *underworld* [Greek *katachthoniōn*], and every tongue confess that Jesus Christ is Lord.' He also cites Revelation 5:13 (147), but makes no mention of the concept of three tiers in the expression 'in heaven and on the earth and under the earth' (see also 5:3).

In the final pages of Greenwood's book, he teases his readers with regard to human origins (212-219). He cites a number of late nineteenth and early twentieth century evangelical scholars who dealt with human evolution in various ways. For me this was the most disappointing aspect of the book. After establishing over 200 pages that Scripture unquestionably features both an ancient geography and an ancient astronomy, it would have been an easy step to argue that the Word of God also includes an ancient biology, in particular an ancient understanding of biological origins, including the origin of humans. Indeed, the Bible embraces the ancient concept of the immutability of living organisms as reflected by the ancient taxonomical category of creation and reproduction of plants and animals 'after their kinds', stated ten times in Genesis 1. Moreover, life is created *de novo* (quickly and fully mature) in nearly all creation accounts throughout the world, including the ancient Near East. I am sorry to say that Greenwood squandered an opportunity to assert that the creation and historicity of Adam are rooted in an ancient biology, indicating that he never existed. It may be for political expedience that Greenwood avoids the topic of Adam (he never mentions him) since he is a professor at an evangelical university.

Despite my minor criticisms, overall this is a very good book. It is well worth reading and adding to your library.

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K. W. Giberson
Saving the Original Sinner: How Christians have Used the Bible's First Man to Oppress, Inspire and Make Sense of the World
Boston: Beacon Press, 2015. 212 pp. hb. $27.95. ISBN: 978-0-8070-1251-2

People have an amazing ability to disagree with each other, and then carefully nurture the seeds of disagreement into full-grown forests of conflict. Although one might hope that Christianity could counter this, perhaps acting as a unifying force drawing together diverse people and views as they worship Christ, this seldom seems to be the case. Interestingly evangelicalism, originally the 'free market' of Christendom, is becoming ever more embroiled in cultural battles that are obscuring the line between good theology and national politics. It is a great frustration that neo-conservative political identities forged in the US are creating significant philosophical and theological distortions in the worldwide evangelical community. The evolution debate serves as a useful gauge of this as the American Christian right are a significant funder and exporter of this particular philosophy.

The evolution debate has never really been about science. Although for many years 'Creation Science' followed by 'Intelligent Design' tried to create a scientific veneer around various forms of creationism, it is encouraging that the debate is finally getting to the real source of the problem: specific worldview differences. On one side there is a community holding on to a neat (although easily abused) explanatory story, whilst on the other is a community that, whilst keen to maintain the creation, fall and redemption narrative, is none the less also keen to develop these themes in light of the best contemporary scientific scholarship. Key to this latter ambition is an emphasis on taking the biblical texts seriously instead of trying to misappropriate ancient texts to advance twenty-first century assumptions or prejudices. Good theologians (perhaps of all times) recognise the need to discover the relevant and applicable biblical truths rather than clinging to overly simplistic interpretations purely for aesthetic or political reasons. This is not to say that only knowledgeable academics can discern the truths of the Bible, but rather that as the questions asked of the text get more complex, more sophisticated interpretive frameworks are required to go beyond simplistic storylines.

But the battle for the evangelical mind is far from lost, especially thanks to the impressive activities of the BioLogos community, reminding us Europeans that there are still excellent minds and hearts in the US evangelical community. Karl W. Giberson is one of these, a teacher of science and religion now at the Catholic Stonehill College, and friend and confidant of a number of US academics who have been forced out of tenured positions for encouraging their students to embrace mainstream science. Giberson is an experienced author and comes across as a clear thinking, but concerned academic, eager to try and understand the reasons behind these concerning developments in the US Christian community.

Recognising the Creationist shift towards a more theological critique of science, Giberson's book is timely in providing a historical context behind recent debates on the status of Adam and Eve. After an introduction putting the current US debate in context, Giberson summarises the 'first man' story, laying clear the theological questions that require addressing. This is then followed by a number of chapters charting how the Adamic story has developed in Christian thought and, perhaps most interestingly for this reader, the role of Augustine in linking original sin back to Adam. Giberson's historical journey then weaves its way through the Middle Ages, enlightenment, Darwin, twentieth century racial tensions and, by chapter 10, into the roles of Price,

Whitcomb and Morris in developing twentieth century Creationism. Chapter 11 then brings the story up to date, briefly discussing the central role that evolution now plays in biology, the response from creationists (Dembski and Ross are mentioned in passing), before finishing with a description of Alexander's federal headship and how this has developed through BioLogos as an alternative to the fundamentalist narrative.

Pages 175 to 178 contain a short conclusion with the key message:

> humanity's problem is referred to as sin, blamed on Adam, and said to be present in us all through the inheritance of original sin. I have argued in this book that such a viewpoint is no longer tenable… we must not forget that the Christian tradition's long conversation about sin was primarily about what was wrong with us and only secondarily about how we got to be that way.

Giberson's concern is that if focus remains solely on Adam either we will not fully appreciate quite how fallen we are (after all we were fine until Adam came along) or, in the opposite extreme, we may confuse the concept of original sin with the historical Adam and, finding no need for Adam, also find no need for acknowledging our own inherent sinfulness. By turning the focus away from Adam, Giberson hopes a central ground focused on human redemption and transformation might be found.

This is an excellent, short and readable book. Whilst it may not satisfy those seeking an in-depth study, it does summarise many of the key historical and cultural reasons why people hold so strongly to the first man story, along with providing twenty-one pages of foot-notes guiding further reading. Although focused mainly on the US, its message is important, especially for those of us seeking to move away from the conflict hypothesis and into a more robust theology of science.

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Alister McGrath

Inventing the Universe: Why we Can't Stop Talking about Science, Faith and God

London: Hodder & Stoughton, 2015. 256 pp. hb. £16.59. ISBN 978-1-444-79845-6

Readers of this journal will not need reminding of the poverty of understanding which dominates popular discussions of 'science and religion', nor the wealth of myth-understanding which informed 'New Atheism' and its journalistic cognates. A media dream (despite its lack of substance, it was certainly a sensation), New Atheism continues to sell. It seems we can't stop talking about science, faith and God. *Inventing the Universe* is Alister McGrath's personal answer to the question *why*.

Given McGrath's prodigious output on the subject – 2015 alone had already seen a substantially revised publication of his 2004 primer, *Dawkins' God: from the Selfish Gene to the God Delusion* – cynical readers might reasonably ask *who* can't stop talking, and why 'we' *can't* stop talking about it? One might suspect the publishers' interests in keeping a conversation about New Atheism going – an intellectual product which, best before 2006, increasingly seems long past its sell-by date – but this would be uncharitable to McGrath.

His answer is simply his own story: a journey of intellectual discovery, which he repeatedly testifies was a 'narrative of enrichment', not a 'narrative of conflict'. At times the personal narrative motif is a little stretched, occasionally reading like a creative act of remembering, along the lines of Augustine's

narrative of his own conversion, or C.S. Lewis's memory of his. Perhaps these great souls have affected McGrath more than he thinks. The implication, spelled out in the ninth – and final – chapter ('Making sense of the world – making sense of life') is that the 'old' narrative of conflict, 'now seen as historically underdetermined and ideologically driven' (203), should be replaced by McGrath's narrative of enrichment, which 'denies nothing about the empirical sciences save their finality' (36), and 'respects both dialogue partners' (203).

Who these 'dialogue partners' are supposed to be is unclear: it's more like a chorus than a conversation. The 'mutually enriching dialogue' which emerges seems to have occurred within McGrath's own experience: an imagined interlocution McGrath has overheard as he has listened to, loved and in a sense *lived with* the mutually enriching voices of the extraordinary breadth of authors he has read in his intellectual career. Between Augustine and Einstein, Dante and Darwin, Medawar and Midgley, Sagan and Scruton, Wittgenstein and Williamson, McGrath the professional has remained an amateur in the truest sense. He reads like a lover torn between friends he wishes would speak, or at least listen, to each other. The frequency of citations makes it feel like McGrath is trying to get everybody in the room and get a conversation going. At times this is too quick, but the gist is familiar: *science* raises ultimate questions, *scientism* kills the conversation.

McGrath clearly thinks there is a conversation one ultimately needs to take up personally, with God. His intention is to open his readers up to the possibility of a 'religious or metaphysical enrichment along the lines found in Augustine's *Confessions*' (198), which he says is 'increasingly regarded as the most important theological text in Western Christianity' (124). I'll take his professional word on that, but I can imagine disagreement ensuing on this point. I might even venture a word in defence of scientism – if construed as a restless activity, not seeking foundations beyond or within itself, but to make do without foundations altogether.

Readers at all familiar with McGrath's output will find little new in the first five chapters of *Inventing the Universe*, except a fine dispatching of Laurence Krauss's ground-breaking use of italics to explain what he meant by a universe from nothing was 'not nothing, but rather *nothing*'(86) – namely, *something*, richly endowed with well-defined properties. Being neatly interwoven with McGrath's personal 'narrative of enrichment' makes for a highly accessible introductory read. If early chapters feel like going over old ground, it is only a mark of McGrath's impact on public understanding, and tribute to McGrath's tireless effort to keep a conversation alive where many simply think there is no conversation to be had. The standout contribution comes in the sixth chapter ('Souls: being human') which, after a hasty dismissal of soul-body dualism, develops a powerful critique of the pretensions of 'secular humanism' to stand in the noble tradition of the renaissance (130). This chapter alone is worth the price of the book, and deserves wide attention. It includes a valuable and accessible discussion of original sin, and the theological implications of Justin Barrett's 'cognitive science of religion' (125). The provocative suggestion is that religion is natural, science is not. Is this why we can't stop talking about God? A conversation starter, at least.

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John Morris
Suffering: If God exists, why doesn't he stop it?
Winchester, UK: Circle Books, 2016. 71pp. pb. £5.99. ISBN 978-1-78535-011-5

How is it that intelligent people can believe in a good and loving God despite all the wrongs and suffering in the world? This is a question that all of us have to grapple with if we are to be honest about our faith. Moreover, it surely has particular relevance for those of us with careers in science, medicine or related disciplines. John Morris guides us tellingly in this book, not least because he and his wife Mary help to care for their seriously disabled grandson, Daniel.

The book is written in plain and straightforward language and is commendably concise, honest, free from religious and scientific jargon, and very much to the point. Indeed, Martin Rees, Astronomer Royal and familiar to a number of us who are readers of *Science & Christian Belief*, comments as follows: 'One wishes that all theologians would write as clearly and succinctly as John Morris – his analysis of the "problem of evil" will enlighten believers and unbelievers alike.' Among non-believers, the writer and broadcaster, John Humphrys, has this to say: 'What makes this book work for non-believers like me is Morris's intelligent approach to the questions we have. He may not have converted me, but he entertains and stimulates. So let's call it a score-draw!' These are entirely apt comments.

Morris rejects many of the all-too-common yet inappropriate responses to particular episodes of disease, suffering and death: responses that imply, for example, that God wills, plans or allows them, or that he sends them with the purpose of punishing or in some way improving us. Nevertheless, when contemplating suffering, we are inevitably confronted with questions about the existence and nature of God. Morris finds St Anselm's ontological argument a helpful starting point to his underlying assumption that God is the greatest idea that the human mind can imagine. Yet, be that as it may, God is not just an idea; God is eternally real, personal, loving and good.

God is omnipotent, but chooses to impose limits on the use of his power. Indeed, this is so in the very act of creation. Moreover, Morris argues, an evolving, continuous creation is necessary to produce stars, heavier elements, carbon-based life and eventually us. Our universe is intrinsically one of self-development and adaptation. Only in this way could Mind eventually express love to other minds.

Both Judaism and Christianity declare through faith that God cannot be less than personal; he is affected by human behaviour and responds to it. Moreover, our human free will is genuine, if necessarily constrained. We are free-thinking people, not robots. We have the independence to act, think and behave as we choose, and in doing so become aware of a world of values, and can choose good or ill in the way we live and behave. Even so, much suffering is the consequence of the way everything has to be. This does not make suffering good in itself, although much good can arise from it. Good and bad people live together and all are susceptible to possible genetic problems, natural disasters, infections, accidents, and to the consequences of the behaviour of others. We live in an unfair world.

In this context, Morris argues that the world as we know it is the world that best reflects the way things have to be. A God who overruled cause and effect would be an unreliable God, and scientists would have no idea where they stood. A God who removed the freedom to do evil would be bound to remove the freedom to do good. We live in a hard world, but it seems that God has chosen it as the best possible environment for the emergence of strong values and happy, responsible people. The good life

is a challenging one, not an easy one. And yet, this hard world, with its component suffering, has redemptive value, uniquely and entirely affirmed by the redemptive life, suffering, death and resurrection of Christ.

Inevitably, the deepest questions on all that is wrong in the world and in us as individuals can generate no simplistic answers and must remain open. There is nothing wrong with honest and informed doubt. Nevertheless, we can gain greatly in both faith and understanding by exploring our wonderings thoroughly and sincerely. This book will help us to do so. Finally, I have read many books on the problems of evil and suffering and can think of no other that is so readily accessible on the theological, scientific, and philosophical issues involved. I highly recommend it to a wide readership. All royalties go to *Equipment for Disabled Children*.

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Jim Baggott
Origins: The Scientific Story of Creation
Oxford: Oxford University Press, 2015. 432 pp. hb. £25.00. ISBN 978-0-19-870764-6

The jacket of this book states: 'There is no such thing as an "authorized" or "official" version of the scientific story of creation, but if there was, then it might look something like this.' Indeed, apart from brief statements in the Epilogue (see later in this review), this book does precisely what it sets out to do: it tells the scientific story of creation from the big bang to the emergence of human consciousness, spanning 13.8 billion years, in a way that is suitable for a wider scientifically informed audience.

This is also the relevance of this book for the Christian reader. An overview in a single volume of current scientific understanding of the origin of the universe, the formation of the Sun and the solar system, the origin and evolution of life on Earth, and human consciousness is quite timely and useful. This also links with the increasing relevance of the field of astrobiology, which involves study of the origin, evolution, distribution, and future of life in the universe.

Jim Baggott is well qualified to tell this story. He has worked in academia, in industry, and as an independent business consultant. He is a freelance science writer and to date has written nine books about various topics in science.

The contents of this book consists of a Preface, 12 chapters, and an Epilogue. Chapters 1 to 4 have a strong physics and astronomy focus, and cover the origin of the universe in the big bang to the formation of stars and galaxies. In passing, Baggott covers important topics such as the expansion of the universe and the horizon and flatness problems, and the synthesis of the elements in the big bang, in the interior of stars, and in supernova explosions: human beings are made of star dust!

Chapters 5 to 7 cover the formation of the Milky Way galaxy, the origin of the solar system, and the formation of the planets, the Earth and the Moon, and the focus gradually shifts to planetary science and earth science. Complex molecules in interstellar space are also covered, and chapter 7 ends with the origin of water on Earth and with plate tectonics.

Chapters 8 to 10 are devoted to the evolution of life on Earth, from first life to the extinction of the dinosaurs. Chapter 8 gives an overview of the structure of DNA and RNA and the genetic code. Chapter 9 covers endosymbiosis and the origin of complex cells and multicellular organisms. The production of

oxygen in the Earth's atmosphere by photosynthetic bacteria is also covered. Chapter 10 deals with the evolution of animals and plants.

Chapters 11 and 12 give a summary of the evolution of human beings and the origin of human consciousness. This part starts with the evolution and radiations of the mammals, and continues with the evolution of the apes and the hominids. Chapter 12 gives an overview of topics related to human consciousness, including the problem of defining consciousness, the mind-body problem, neurobiology, personality, culture and language.

The overall structure of this book is very good. The chapters are arranged in a logical manner covering the main events in chronological order. In attempting to write a book like this, one might be tempted to split the book into two parts. The first part would then contain several introductory chapters where essential topics in astronomy, physics, chemistry, geology and biology are discussed in a systematic manner, and would be followed by a second part giving an overview of cosmic and evolutionary history. Baggott cleverly avoids this by discussing essential topics in these sciences in the places that he needs these.

Baggott ends his book with an Epilogue in which he draws conclusions from the narrative that he has provided. He clearly sees the evolution of unicellular life as a 'cosmic imperative' (367), following 'naturally and inevitably from the application of reasonably well-understood physical and chemical principles' (201), but there is 'nothing at all inevitable' (368) in the journey from the earliest animals to human beings. We note in passing that this view is contrary to the view expressed by Simon Conway Morris in *Life's Solution: Inevitable Humans in a Lonely Universe* (Cambridge University Press 2003).

Baggott states:

> Some will reject what this creation story tells us about ourselves, believing that we must be more important than this, that there must be more to our lives; that we're here for a purpose. By its very nature, science can't offer certainty, and there are (and always will be) gaps in our scientific knowledge and understanding in which those seeking purpose and meaning may find some solace. (368)

This statement highlights why this book and the story it tells are so relevant to Christians. Many Christians may choose to simply dismiss this story and revert to recent creationism, or try to seek for the explicit actions of God in the perceived irreducible complexity of biological organisms. However, if we want to fully understand the creation and God's role in it, we will have to look at the full picture and deal with the full historical narrative, including the contingencies of supernova explosions, plate tectonics, snowball earth episodes, and mass extinctions. Baggott provides us with a very well written overview of this narrative.

The picture that modern science seems to provide us is of God giving freedom: not only to human beings as free agents with free will, but also to nature with the freedom to self-develop. Evolvability is God's gift to the universe. However, the Bible makes clear (Rom. 8:21-22) that things in the universe aren't quite the way God intended them to be. Perhaps this cosmic and evolutionary narrative is in need of redemption. When it comes to our understanding of God's actions in the universe and the relation of Christian theology to science, Jim Baggott's final sentence (370) applies: 'We've barely started'.

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Philip A Rolnick
Origins: God, Evolution, and the Question of the Cosmos
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Evolutionary histories – whether cosmic or biological – have been outlined by their respective research communities. But widespread uncertainty remains regarding the implications of such histories for Christian faith. Theologians need to explicate these implications for people anxious to integrate science and theology. Rolnick is Professor of Theology, University of St Thomas, St Paul, Minnesota, and sets out to address this need.

Rolnick emphasises that science and Christian faith are mutually illuminating. When we see ourselves as part of creation, we are orientated toward purpose, 'toward the will and way of the Creator, toward the true, good and beautiful' (4, 170). Truth in one area enhances the appreciation of truth in the other: 'the challenges of evolutionary theory can be turned to theological advantages.' (8, 36, 103).

Rolnick introduces evolutionary theory (albeit with a few slip-ups: insects but not rodents developed resistance to DDT (17); Neanderthals were not ancestors of *H sapiens* (95)), from which he abstracts four challenges to theology. Firstly, does evolution negate divine design? In eschewing the ID movement, he perceives design in the whole 'intricate, living, responsive system' by which biological organisms developed (47). Secondly, is natural selection compatible with a God of love? Biological mechanisms are concerned with efficiency, not morality. Nevertheless, natural selection has led to greater brain size in humans, who must be born with undeveloped brains, enabling extended mother-offspring bonding and the learned entry into the realm of love (59). Thirdly, are pain and death compatible with the goodness of creation? Struggle is necessary for progress; and if our ultimate purpose is to learn to do the will of God, then biological evolution may be the necessary setting for raising the children of earth to be the children of God (75). Struggle evinces the value of life and is the training ground for faith (78). And finally, are humans unique, given that we share common ancestry with other species? Rolnick stresses physical distinctives (especially cerebral) as well as recursive language, culture (the search for beauty, truth and goodness, and our 'extra-somatic adaptations') and religion (chap. 6). We participate in both the world of natural necessity, and the realm of goodness and grace (101). Humanity is an isthmus, related on the one hand to chimps and relating on the other to God (102).

Does the author too easily speak of the creation itself, or of evolution, as an agent? 'Creation is endowed with its own creativity' (49); it is 'permitted to participate in its own ongoing design' (103). 'Evolution has provided a suitable initiation and earthly home' for us (54); it can 'tinker with what is present' (154). Perhaps I am excessively prosaic, but I would prefer to steer clear of attributing creativity to biological process – which is what materialists do when they speak of nature in pantheistic terms. (We often hear the claim that natural selection is *blind* – an inappropriate anthropomorphism when speaking of any history or process.) I am not implying that Rolnick is guilty of this silliness, because he emphasises that 'intelligent consciousness' is required of any agent (159), and that God continuously gives being to his creation (49, 109, 162).

A discussion of cosmic evolution follows. This includes an introduction to the main lines of evidence for Big Bang cosmology (chap. 7). Various theological implications are presented, but I found some inconsistency among them. On the one hand, the datable origin of the universe is said to have special sig-

nificance for the theological concept of creation (108-9, 124, 127-128, 162). On the other hand, the author allows that, in principle, theology may engage with cosmologies other than those described by Big Bang models (217, n.28). Surely, God is Creator of any physical system: whether of one universe, of many universes, or of any antecedent (quantum vacuum?) state. A survey of the cosmic fine tuning required for the existence of living organisms (chap. 8) concludes this section. Fine tuning is a 'challenge for atheists', but not for people who believe in a purposive God (108, 145).

The laws of nature point beyond themselves. The story of the cosmos implies that 'life has a discoverable meaning, value and purpose' (148). The order of the cosmos bears the stamp of the divine reason, the *Logos* of John 1 (151, 163). Belief in the divine *Logos* provides a basis for *why* science works (199). We may interpret evolution as being progressive: the laws of physics have led to the human mind that can ponder 'the original Mind, the *Logos*, through whom all things were made' (162). When we receive God's gifts – creation, Christ, the Spirit – we transcend ourselves, grow in virtue, and exceed 'reductionist narratives of cosmology and evolutionary biology' (173-6; chap. 10).

This book is suitable for laypeople and students. It tackles basic theological questions arising from cosmic and biological history. It provides a generally helpful introduction to, and a good basis for discussion of, the evolution-theology interface. Its approach is pastoral, not polemical, and its perspective gladly Christian.

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