

Reviews

Alister & Joanna McGrath
The Dawkins Delusion: Atheist fundamentalism and the denial of the divine

London: SPCK, 2007 78pp. pb. £7.99.
 ISBN 0-281-05927-6 on cover;
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Alister McGrath, who wrote most of the text, has backgrounds in molecular biophysics and theology. Joanna's backgrounds lie in experimental psychology, clinical neuropsychology and psychology of religion. Their book 'sets out to do one thing, and one thing only – assess the reliability of Dawkins' critique of faith in God' (p.xiii). 'Although written in the first person for historical and stylistic reasons, the views and arguments set forth are those of both authors' (p.xiii). On the 'assumption that Dawkins has equal confidence in all parts of his book', the writers' policy is to 'simply challenge him at representative points' (p.xii).

Alister McGrath's and Richard Dawkins' spiritual journeys have taken them in opposite directions, the former having been an atheist as a young man, his free thinking leading him to become a Christian. Both firmly believe in rationality, which supports Stephen Jay Gould's view that 'Darwinism is fully compatible with conventional religious beliefs – and equally compatible with atheism' (p.13).

The book addresses four questions, namely, 'Deluded about God?', 'Has science disproved God?', 'What are the origins of religion?' and 'Is religion evil?'.

'Deluded about God?'...

... starts by correcting Dawkins' astonishing notion of religious *faith*. How many religious believers would recognise anything remotely like their own position in Dawkins' perception of something more accurately termed credulity? The

authors follow this item by addressing Dawkins' *argument from improbability* (p.9) for the non-existence of God and his *infinite regress* assertion posing the question 'who made God?' The criticism of the latter claim could have been extended to questioning how Dawkins' assertion about sequences (temporal) of cause and effect in an infinite regress could be extended to God, since space-time comes into being with the universe. A good point is made by asking where the idea of a GUT (Grand Unified Theory) would fit in with Dawkins' argument. His reiterated and puzzling assertion of *God as a scientific hypothesis* (p.6) could usefully have received a little more attention since so much of his cohort of beliefs is precariously underpinned by this philosophically-odd claim. The next section, however, fleshes out some consequences of his mixing up different types of explanation (C.A.Coulson's *God-of-the-gaps*), bringing this examination of five key issues to a satisfactory close.

'Has science disproved God?'

Dawkins' view of the nature of science is identified as a 'late flowering' of 'doctrinaire positivism' (p.18); as 'atheist fundamentalism'; and as 'unswervingly committed to this obsolete warfare model' of the interplay of science and religion. The authors point out that Dawkins' position of denying any limits to science and his 'dogmatic insistence upon the atheist implications of Darwinism is alienating many of the theory of evolution's potential supporters', much to the delight of some members of the Intelligent Design movement who see Dawkins as helping their cause. 'One of the greatest disservices that Dawkins has done to the natural sciences', say the McGraths, 'is to portray them as relentlessly and inexorably atheist. They are nothing of the sort.'

'What are the origins of religion?'

The treatment of this third topic starts with a challenge to Dawkins' portrayal of the origins of religion along the lines of anachronistic 'wish-fulfilment' with all its circularity of argument. 'It begins from the assumption that there is no God, and then proceeds to show that an explanation can be offered which is entirely consistent with this. In fact, it is basically an atheistic reworking of Thomas Aquinas' 'Five Ways...' (p.31). Furthermore, an evolutionary explanation of the origin of religion has no atheistic mileage in it. Something may have evolutionary advantages and still be true.

Some space is then allotted to a critique of Dawkins' narrowly circumscribed, 'very cognitive' description of religion, one which should more reliably 'make reference to its many aspects, including knowledge, beliefs, experience, ritual practices, social affiliation, motivation and behavioural consequences' (p.29). The chapter concludes by looking at 'two of the most unpersuasive, pseudo-scientific ideas', namely the 'virus of the mind' and the 'meme'.

'Is religion evil?'

One of the strengths of this book is its concentration on issues arising from Dawkins' handling of the Bible and academic theology. This final section is a model of economy in countering diverse claims about religion being evil and its displacement by a world of atheists being so much better. The authors point out that collecting an almost exclusive list of evil deeds committed by religious people while barely genuflecting to the countless deeds of love and kindness sponsored by religious beliefs is hardly the way to inspire confidence in the factual base of such asseverations. Extensive empirical evidence on the motivations of suicide bombers, for example, points to a fundamental motivation which is political. Religious beliefs appear to be neither necessary nor sufficient to generate such people (p.50).

To interject a personal note, I first encountered Dawkins' views when his otherwise excellent 1991 Royal Institution Christmas Lectures were characterised by intrusive anti-religious interjections. These appeared singularly inappropriate in an educational series for young people who were offered no alternative viewpoint and the practice seemed to sit uneasily with Dawkins' views about the putative 'indoctrination' of children by religious mentors. He and I engaged in a published written debate in 1994/5¹ and on reading *The God Delusion* (twice) I was struck by a sense of déjà vu. Many arguably valid criticisms of Dawkins' anti-religious arguments have been published over the intervening years, but the arguments themselves seem little changed. The kindest interpretation of this would be that the strength of his arguments has stood the test of time. Readers of the McGraths' book must judge for themselves.

I am tempted to wonder whether the words of the Oxford theologian and historian, Aubrey Moore, about Darwinism, may turn out to be applicable to Dawkins' crusade against religion, which, 'under the disguise of a foe, did the work of a friend'.²

In summary, the McGraths' book is hard-hitting, devastatingly perceptive, but fair. The authors do not suffer bad arguments gladly. They conclude that 'For the gullible and credulous, it is the confidence with which something is said that persuades, rather than the evidence offered in its support' (p.64). Asseveration is not the same as argument. Their book is a very compact rebuttal, in 78 pages, of key assertions and arguments

1 The Poole Dawkins Debate [Google] or www.cis.org.uk/resources/dawkins.shtml

2 Moore, A.L. 'The Christian Doctrine of God', in Gore, C. (prin.ed.) *Lux Mundi*, 12th edn., London: Murray (1891), p.73 cited in Peacocke, A.R. *God and the New Biology*, London: J.M.Dent & Sons (1986), p.83.

in *The God Delusion*. It is a useful complement to Alister McGrath's earlier book, *Dawkins' God: Genes, Memes and the Meaning of Life*.

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John Cornwell

Darwin's Angel – An Angelic Riposte to The God Delusion

Profile Books 2007 168 pp. hb., £10.99.
ISBN 978-1-84668-048-9

Richard Dawkins' best selling *The God Delusion* is polemical, rhetorical and keen to assert the right to ridicule religion. How might believers respond? In this book, John Cornwell, ex-Seminarian, historian and author and Director of the Science and Human Dimension Project at Jesus College, Cambridge, decides to use a light-hearted literary fiction. He writes in the person of Dawkins' guardian angel, who was previously assigned to Darwin and Mendel. This device sometimes adds humour, while at other times it fades from view. Cornwell's book is free from academic apparatus (no indices, bibliography, nor end notes) but literate and academically informed. Indeed, Cornwell complains that the Dawkins book is 'as innocent of heavy scholarship as it is free from false modesty'. It fails to engage relevant academic works. For example, Dawkins' claim that Jesus' call to love one's neighbour originally governed only relations between Jews is exposed as dependent on a single, questionable source, and is contradicted by the evidence of the primary texts.

Dawkins is used to such criticisms, and usually responds that one doesn't have to engage in serious study of, e.g., astrology in order to disbelieve it. On its own this response would not meet his angel's complaints, since Cornwell suggests that the god Dawkins disbelieves in isn't the one

most theologians describe. For example, in response to Dawkins' central argument that a creator God would have to be even more complex and in need of explanation than the things he is invoked to explain, Cornwell notes that theologians have seen God as simple and more akin to mind or thought than a great science professor in the sky. He finds it ironic that Dawkins complains that theologians have made no attempt to answer his objections when he hasn't even made a modest attempt to engage academic theology. Dawkins' allegation that believers are encouraged not to try to understand the doctrine of the Trinity is refuted by the many books in Divinity Faculties trying to do just this. Here we might note that the less anthropomorphic, more sophisticated forms of belief to which Cornwell adverts are not without philosophical problems of their own, but Cornwell later suggests that a less literal, more imaginative, experiential approach to religious belief would be less likely to generate unbelievers than rationalistic attempts to prove God.

More generally, Cornwell suggests that Dawkins does not really understand his subject matter, and that study of the sociology of religion would help him see that religion is not best seen as a (failed) attempt at a scientific hypothesis. Darwin's angel criticises Dawkins for an over-literal lack of trust in the power of imagination to explore reality, such as we find in poetry. He accuses Dawkins of sounding as though he would prefer to substitute a series of case-notes on senile dementia for *King Lear*. From examples like this one may worry that Cornwell, like Dawkins, crosses the line between criticising arguments and criticising their author. On his website, Dawkins gives six examples where he suspects Cornwell's presentation may be, not merely mistaken, but 'wilfully mendacious'. Most of these struck me as minor rather than fundamental errors, but might one expect higher standards of intellectual debate from an angel?

Overall, *Darwin's Angel* does more than enough to show that *The God Delusion* is not the irrefutable demolition of religion some think, and provides plenty of ammunition for those seeking to do battle with its arguments. (Indeed, I think it seems more precisely targeted against the specific arguments of *The God Delusion* than does the McGraths' *The Dawkins Delusion*?) The angel does not provide a fully developed, positive apologetic, but he has offered a useful and amusing riposte to Dawkins.

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Francisco J. Ayala

Darwin and Intelligent Design

Fortress Press, 2006, pb 116pp. \$7.00.
ISBN 13: 978-0-8006-3802-3

Francisco J. Ayala

Darwin's Gift to Science and Religion

Joseph Henry Press, 2007, hb 237pp.
\$24.95. ISBN 13: 978-0-309-10231-5

John C. Lennox

God's Undertaker – Has Science Buried God?

Lion, 2007. £8.99.
ISBN 978 0 7459 5303 8

This cluster of three books approaches Darwinism from two very differing perspectives, provided in turn by an evolutionary biologist and a mathematician. Francisco Ayala is Professor of Biological Sciences at the University of California, Irvine, and his pocket-book sized *Darwin and Intelligent Design* provides a useful introduction and overview of the main ideas of evolutionary theory and of the Intelligent Design (ID) movement. In fact more than 70% of the book is given over to a description of evolution, an important backcloth for those who wish to assess ID from a properly informed position. As one would expect from this author, the science is right up-to-date, presented clearly and succinctly, and the

language is kept accessible for the non-specialist. In the section on ID, the author provides some of the political background on the Dover trial, and critiques several core ID concepts such as 'irreducible complexity', pointing out that evolution provides an adequate albeit incomplete explanation for the existence of complex entities such as the bacterial flagellum. In fact, as Judge Jones remarked in his summing up at the Dover trial: 'ID is not science and cannot be adjudged a valid, accepted scientific theory' (99-100). As the author concludes in his final chapter entitled 'Belief', all truth is God's truth and our task is to describe and understand the natural world and the origins of biological diversity to the best of our ability: 'Truth cannot go against truth' (104). This is a great book for those with little background in biology who need a straightforward, brief introduction to evolutionary theory.

Ayala's *Darwin's Gift to Science and Religion* is a much meatier book which gives a fuller and broader overview of Darwinian evolution. The author starts with 'Intelligent Design: The Original Version', referring now not to the modern ID movement, but to the arguments from design used by Paley and others in the first half of the nineteenth century. Ayala points out that Paley begins Chapter XXIII of *Natural Theology* with the claim that 'Contrivance, if established, appears to me to prove... the personality [Paley's emphasis] of the Deity, as distinguished from what is sometimes called nature... Now that which can contrive, which can design, must be a person' (21). Those who find the ideas of ID proponents attractive today, might do well to meditate on such texts, and consider where they led the Church when, later on in the century, Darwin pointed out that all such 'contrivances' (which we now call adaptations) can potentially be explained by the process of natural selection.

Darwin's Gift, however, is mainly about explaining evolution, not about theology, nor mainly about ID. Different

chapters cover the main themes of natural selection, the evidence for evolution, human evolution and the basics of molecular biology. In a chapter entitled 'Follies and Fatal Flaws', Ayala surveys some of the common objections to evolution, including the idea that 'it's only a theory', and the flawed idea that if evolution cannot currently explain the existence of some entity in biology, then it must be 'designed', which is dubbed the 'Two-Explanations Fallacy' (143). The chapter then provides a potent critique of ID, greatly extending the arguments briefly introduced in *Darwin and Intelligent Design*, and this time including a discussion of the mechanisms of blood clotting and the evolution of the eye. In the final chapter the author then returns to the question of the relationship between evolution and the idea of God as creator, pointing out the curious irony that ID proponents agree with materialistic scientists and philosophers that Darwinian evolution is intrinsically atheistic. In sharp contrast Ayala surveys the statements of those scientific societies, church leaders and theologians who consistently declare that evolution is perfectly compatible with Christian theism. In both of his books reviewed here, Ayala has some particularly pertinent things to say also about so-called 'imperfections' in biology. Those who re-heat Paley's ideas for the twenty-first century have to face the fact that from an engineering perspective many entities in biology are far from perfect in their design. Thankfully, however, Christians do not worship a heavenly Engineer (no disrespect to earthly ones intended), and evolution provides rather obvious and coherent explanations for such 'imperfections' which both creationists and ID proponents struggle to explain.

Both books by Francisco Ayala are warmly recommended, though if you buy the second one, then you will not need the first. I wish I could give an equally warm recommendation for *God's Undertaker* by John Lennox, but this is unfortunately more problematic. This is very much a

book in two halves. In the first 75 pages, the author gives a generally good overview of the limitations of science and the fact that science itself is unable to address the really big questions of life, such as why something exists rather than nothing, and why science itself is possible. Lennox points out that science itself was nurtured within a Christian world-view and there is nothing intrinsically 'naturalistic' about science, suggesting that the term 'methodological naturalism' is unhelpful as a way of describing the scientific enterprise, for all scientific descriptions for the theist are, by definition, descriptions of what God has done and continues to do. The author's critique of reductionism, presentation of the inherent intelligibility of the universe and discussion of the anthropic principle are well presented, amply illustrated with useful quotes, and contribute to a strong first half of the book.

It is once the author moves from the physical to the biological sciences in the second half (58% to be precise) of the book that things start to go seriously downhill. Lennox begins to build up a picture of 'atheistic evolution' as a purely 'naturalistic process' and it soon becomes apparent that it is Darwinism which is the main target. The term 'Intelligent Design' (ID) is introduced without definition, so it is only as the chapters progress that it becomes clear that the author is using the language of ID in the same way as its US proponents, such as Dembski and Behe. As with these writers, Lennox exaggerates the alignment of the biological theory of evolution with naturalistic philosophy (two very different things), in order to highlight Darwinism as a target for religious attack. The author's own advice given earlier in the book, to see the whole created order as reflecting God's design, is somehow lost in this second section, where the possibility that God might choose to bring about biological diversity through the process of evolution, as maintained by those holding to both mainstream science and theology, is oddly ignored.

Many of the traditional creationist and ID red herrings litter this second section. 'It can be highly dangerous to think outside the evolutionary box' (97). Really? I can think of no better guarantee for someone's future career in the biological sciences than to publish a solid peer-reviewed paper that challenges a currently held theory: it is every scientist's dream scenario. But to publicise one's doubts about a well-established theory in any branch of science without the solid backing of good papers in reputable journals is of course dangerous for one's career, and rightly so, for criticism without evidence or justification is always a risky path to pursue in academia.

Unfortunately Chapter 7, 'The nature and scope of evolution', presents a smorgasbord of misrepresentations and straightforward errors, too long to list here. The peppered moth story has been up-dated by Michael Majerus (2007) and its evolution remains a good exemplar of natural selection in action. The idea of natural selection is not a 'tautology', nor is it in the same class as 'Freudian psychology and astrology' (102); it is a theory with real explanatory power. Natural selection is not about the 'strong' and the 'weak' (103), but about reproductive fitness, which is not the same. The terms 'microevolution' and 'macroevolution' are not being 'increasingly used' (106); if anything the reverse is the case as the advent of genomics is leading to their decline with the realisation that some species are virtually indistinguishable morphologically but are genetically very distinct (like the worms *C. elegans* and *C. briggsae*, which have 800 unique protein-encoding genes each out of their complement of 20,000, and last shared a common ancestor about 100m years ago). Yet the author cites in support of his points on micro/macroevolution rather ancient literature, one (long discredited) citation even dating back to 1942. (107). The fossil data are misrepresented and the 'model sequences' of speciation found in the fossil record are far more impressive than the author seems aware: in particu-

lar, the evolution of the tetrapods from fish, the evolution of mammals, the evolution of the whale (a mammal that returned to the sea from land via *Pakicetus*, *Ambulocetus* and the fossil whale *Basilosaurus* which retains a complete mammalian hind limb), the evolution of elephants and horses, the evolution of turtles and many other examples besides. Nor in this volume do we hear of speciation in plants by polyploidy; the chromosomal inversions that have led to speciation in insects such as mosquitoes; ring speciation events (as in the Herring Gull and Californian salamanders); nor anything of the remarkable cichlid speciation of the African great lakes. The author even questions common descent, when the inheritance of 'fossil' genetic sequences in our genomes in the form of pseudogenes, retroviral insertions and transposons, together demonstrate our own common ancestry with the apes beyond any reasonable doubt.

The last few chapters of *God's Undertaker* are devoted to a discussion of the origin of life and of information. The author is only too aware of the dangers of the 'god-of-the-gaps' type of argument, but believes the origin of information to be a 'gap in principle' in contrast to a 'gap in knowledge'. It is not clear why this should be the case. The mathematical arguments presented here in an attempt to demonstrate that the origin of biochemical information is 'impossible in principle' are deeply flawed because they are based, like so many of Dembski's arguments, on the premise that proteins or long stretches of DNA self-assemble by a purely chance process. But no one believes that, so the arguments represent tilting at windmills, the assumption being that the stages leading to living matter occurred incrementally; it is precisely how those incremental changes were preserved and reproduced that represents one of the fascinating research challenges of the origin of life field. Indeed, there have been some remarkable advances in the field over the past decade, though there is no doubt at all

there is a huge current gap in our scientific knowledge at this juncture. Does that matter theologically? It would seem odd if some theological conclusion hinged upon our current scientific ignorance about something. The author suggests that 'design' is the answer, but the answer seems vacuous in explaining anything or in generating a research programme. Perhaps this century, perhaps the next, the knowledge gap will slowly close, and surely Christians should see that 'closing' as part of our glad worship to the God who is the author of the whole created order, not as a threat to a poorly founded argument for God's existence.

The antipathy to Darwinism that is still displayed by some Christians, even by some academics like the present author, whose book appears to present some form of episodic creationism, is truly puzzling. For as Francisco Ayala points out, there is a great irony in the observation that supporters of ID and creationism agree with writers such as Richard Dawkins that evolution equates with atheistic materialism. It would surely be much more fruitful for people of faith to baptise the evolutionary account of origins into the biblical doctrine of creation, which is, after all, what Christians have been doing since 1859.

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Sjoerd L. Bonting
Creation and Double Chaos:
Science and Theology in
Discussion

Minneapolis: Fortress press, 2005. 275 pp. pb. \$22.00. ISBN 0-8006-3759-3

What does it mean to speak of God as Creator? Some Christians have been quick to seize on scientific Big Bang theories of Creation as supporting traditional Christian views. To them it seems self-evident that God made the universe

out of nothing, and that whilst science can trace the universe back ever closer to its origins, the moment of creation remains in the province of God and the theologians. Bonting is rightly hesitant about such claims.

The novelty of Sjoerd Bonting's approach is that he claims not only that the theological tradition of *creatio ex nihilo* is unhelpful from the perspective of modern science, but also that it has proved barren theologically. Bonting is an Anglican who has worked extensively in both science and theology. He is not afraid to quote a few equations for his theological readers, or to introduce technical scientific arguments in support of his theology. His book is an attempt to redefine the doctrine of creation. Why has the Church insisted on *creatio ex nihilo* when the doctrine has few biblical foundations, and contradicts virtually all of the creation myths from other religions? By contrast, for Bonting creation is not the making of something out of nothing, but the shaping of a meaningful creation out of a pre-existing chaos. Is this any more than a restatement of old dualist theologies? Bonting claims to have moved beyond Gnosticism and its like because his 'chaos' is a condition rather than something material in itself. The biblical imagery of the slaying of Leviathan or holding back the chaos of the waters stands behind his presentation. The Creator God first makes the cosmos out of the primeval chaos and then continues creating in his battle with elements of chaos that survive the initial creation. Chaos will only be abolished on the last day at God's glorious consummation. Once his scheme is in place Bonting attempts an impressively comprehensive account encompassing the problem of evil, divine action, Christology and sin. All find their theological place in the, as yet untamed, chaos.

Does Bonting convince? His picture is of a continuing creation with God constantly battling to wrest order out of chaos. Compare this to traditional Chris-

tian pictures of a broken world redeemed in Christ. There are problems with the old stories, not least that science finds original perfection as alien as original sin. Unfortunately Bonting's view cannot but marginalise the person and work of Christ. We do not have to accept the caricature of a drama set up simply so that Christ is the answer, to recognise the brokenness of our lives and our world. Sin is not simply the consequence of God's incomplete mastery of chaos but represents radical failure on the part of humankind. Biblical scholars tell us that the story of God's dealing with his people begins not with any creation story but with Israel's sense of redemption. Out of that relationship comes the desire to explain the whole world as God's Creation. Israel and later the Christian Church may indeed have only slowly understood the radical nature of God's dealings with his world. But – as Christians have traditionally retold the story – once God's redeeming love has been understood, then the claim of *creatio ex nihilo* becomes central. It is not simply a way of speaking about Creation; rather it makes claims about the nature of God and God's relation to his people. Only when we view the doctrine from the perspective of salvation can we properly understand its place within the whole dogmatic drama.

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Bernard Carr (ed.)
Universe or Multiverse?

Cambridge: Cambridge University Press, 2007. xiii + 517 pp. hbk. £45 (US\$85). ISBN 0-521-84841-5

Bernard Carr was the co-author in 1979, with Martin Rees, of one of the earliest papers on what came to be known as the 'anthropic principle', whereby a number of the fine-tunings of the constants of physics and initial conditions at the Big

Bang were identified as seemingly necessary for life. In this edited volume Carr, now Professor of Mathematics and Astronomy at Queen Mary, University of London, explores with his fellow contributors the issue of whether the universe we inhabit might not be one of many existing universes. The fine-tuning would be explained as just something likely to turn up somewhere sometime if the parameters across such a 'multiverse' vary from one universe to another.

The contributors to the volume are mainly cosmologists and particle physicists, though a couple of philosophers are also present. Theology is not explicitly represented as a discipline, although one of the astrophysicists, Bill Stoeger, is a Jesuit priest, and philosopher Robin Collins gives a 'theistic perspective'. A healthy feature of the book is the widely differing views of the contributors, which makes for a fair assessment of the state of play in what is a highly speculative area of physics. This variety relates both to the differing versions of multiverses which are espoused, and to the acceptance or denial that multiverses are scientific at all.

Interestingly, the religious views of the contributors, which are rarely made explicit, differ too, and there is no one-to-one correspondence with differences over the multiverse. For example, Carr sees no contradiction between God and a multiverse; Steven Weinberg is an atheist who advocates a multiverse; Leonard Susskind sees his string theory landscape as removing the need for a designer; Don Page is an evangelical Christian who is in favour of the Everett quantum-splitting version of the multiverse; Robin Collins is happy with a multiverse since it would reflect God's infinite creativity; and George Ellis is a Quaker who thinks the whole multiverse idea is not science at all.

In one of his chapters, Bernard Carr notes (83) that the fine-tuned parameters were not predicted by any theory at the time of his seminal paper with Rees, nor

are they today. Hence the multiverse proposal, the chief alternative to design. And the multiverse is supposedly given credence by, albeit speculative, 'universe-generating' theories such as quantum-splitting (Brandon Carter, Don Page), black hole branching (Lee Smolin), eternal inflation (Andre Linde) and string theory (Leonard Susskind).

In a brief review I can only give a flavour of some of the discussion and points of dispute by way of example. So let us consider what many cosmologists regard as the most puzzling of the anthropic coincidences – indeed the biggest problem for cosmology – namely the value of the cosmological constant, Λ . This was the term originally introduced by Einstein into his equations of general relativity in order to obtain a static universe, but abandoned with the observed expansion of the universe and triumph of the Big Bang theory. Until recently Λ was taken to be zero. However, observations of distant supernovae indicate that the universe may be accelerating, a fact which is explicable on the basis of a small and positive value of Λ . Moreover, physicists think they know what Λ is, namely the energy of the quantum vacuum. The trouble is that the calculated value is 10^{120} times the observed value and only a value close to that observed is compatible with life.

Steven Weinberg attempted to explain the low value on the basis of a multiverse in which Λ is randomly selected for each individual universe. In that case the value of Λ in our particular universe should be typical for that of life-bearing universes, and not too low. This is part of a wider consideration that our universe should not be 'too special' (more 'optimally biophilic' in Paul Davies's terminology) for life, only special enough, on the multiverse hypothesis. This 'principle of mediocrity' (the term coined by Alexander Vilenkin) is really the only way of getting any handle on whether a multiverse will do the trick. Otherwise, given the speculative physics and impos-

sibility of testing the models, we are no longer doing science, as pointed out by Ellis.

Weinberg himself acknowledges (32-33) that the probability that Λ would be as low as it is on the basis of a multiverse is a bit low. Paul Davies agrees (492) and Frank Wilczek calls the accuracy of Weinberg's prediction 'not overwhelmingly impressive' (48). Vilenkin, however, thinks that Λ is satisfactorily explained by a multiverse. But then Wilczek also points to further parameters which are too special, for example the proton lifetime which is more than 10^{22} times the age of the universe. And Davies says that the electric charge is fixed to 11 significant figures, much too special for life (492-493).

Some of the contributors, notably Page and Anthony Aguirre attempt to get a grip on what is the besetting problem with the whole discussion, namely that there is no adequate 'measure' on the space of possible universes. Until such a measure is in place, talk about probability is at best vague.

While Stoeger is right that an ultimate explanation in terms of a Creator is not impacted by a multiverse, there do remain serious questions for a theological perspective. These include the problem of human identity (briefly alluded to by Carr), and the goodness or otherwise of universes which might arise from a random universe generating mechanism. It seems to me that this debate has a lot of mileage in it yet, at all levels – scientific, philosophical and theological – and this book is an essential acquisition for those requiring an up to date account of the various physical proposals and their problems.

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Ted Peters and Nathan Hallanger
(eds.)

God's Action in Nature's World: Essays in Honour of Robert John Russell

Aldershot: Ashgate, 2006. 246 pp. hb.
£40. ISBN 0 7546 5556 3

Among participants in the current dialogue between theology and the sciences, Robert John Russell is well known, not only as a creative thinker and writer, but also – through his leadership of Berkeley's Center for Theology and the Natural Sciences – as a teacher and enabler. The demands of the latter role have, perhaps, left less time for writing than Russell might have liked. His contribution has still, however, been a significant one. Whether pondering on the creative interaction of the two disciplines, on the notion of divine action, or on the implications of cosmology for our theological world-view, he has subtly and impressively developed the kind of view articulated by those of an earlier generation who have most influenced him, such as Arthur Peacocke and Ian Barbour. In this book, after an excellent overview of Russell's work by Ted Peters, fifteen leading participants in the dialogue summarise and analyse their views of Russell's contribution to our current understanding.

In part 1, the interaction between the disciplines is addressed by William Stoeger, Nancey Murphy, Philip Clayton, Wentzel van Huyssteen and Heup Young Kim. While the Asian perspective of the last of these poses important questions about the specifically western and Christian presumptions of Russell's approach, the most telling criticism raised in this section is, perhaps, that of the validity of Russell's version of critical realism: the notion that the languages of science and of theology, because of the similarities between them, really do describe at least 'something like' what is 'out there' in reality. Stoeger, for example, observes that Russell's scheme relies largely on the version of this position defended by people like Peacocke and Barbour, which has been criticised by Ernan McMullin,

among others, as descriptive rather than being properly rooted in an explanatory account of human rationality. For Stoeger, this criticism is at least partially valid; while 'we can make a strong case for the legitimacy of theological knowledge,' he says, 'it should be apparent that critical realism as it pertains to theology is more problematic and depends on rather different conditions than the critical realism of the natural sciences.' In a complementary way, Murphy regards scientific critical realism as a thesis that is 'confused' because 'it illegitimately attempts to use a (discredited) philosophy of science to do the work proper to epistemology'. Nevertheless, she argues, Russell's methodology does not actually depend on critical realism, but on other factors which allow much of his approach to remain legitimate.

In part 2, the question of divine action is addressed by Kirk Wegter-McNelly, Ian Barbour, Charles Townes, John Polkinghorne and Wesley Wildman. In most of these chapters, Russell's version of the prevailing 'causal joint' account of 'special' divine action – which affirms a kind of temporal interference with the world while denying that this requires any setting aside of the laws of nature – is examined primarily in terms of the quantum mechanical mechanism proposed by Russell. Wildman, however, broadens this discussion in an important way, rightly noting the way in which current discussion of divine action is dominated by a 'personalistic theism' which represents 'a distinctively Protestant deviation from the mainstream Christian view, preferring the Jerusalem to the Athens side of the famous tension that has dominated Christian theology from the beginning'. Russell's God, Wildman claims, is 'a being among other beings, whose action in the world is properly subject to the quest for its mechanism, the causal joint that links the divine intentions to the created world'. What happened, he asks rhetorically, 'to the classical doctrines of aseity and immutability, the affirmations that God is self-contained and does not

change through acting or feeling? What happened to God as the ground of being or being itself, as pure act and first cause? How does Russell deflect the classical intuition that God as a being can be no God at all but merely an idol of the human imagination?

Part 3, with its focus on cosmology, contains contributions from George Coyne, Arthur Peacocke, Lou Ann Trost, Paul Davies, and Noreen Herzfeld. Here, perhaps, it is the contribution of Davies that stands out, for, in addressing the challenge of the multiverse hypothesis, he not only provides an excellent introduction to the topic, but also points out a philosophical issue that is rarely addressed in this context: that of simulated consciousnesses in a simulated world. The problem here, he points out, is that, if we include these simulated universes in the ensemble that constitutes the multiverse, as some suggest we should, then any given 'real' universe with world-simulating technology could simulate a vast number of 'fake' universes. Thus, fake universes would proliferate and greatly outnumber real ones. A randomly selected observer is therefore more likely to inhabit a fake, rather than a real universe. By implication, our universe is very probably a simulation. But if it is a simulation, then the application of physical theory to unobserved regions/universes is invalid, because there is no reason to suppose that the simulating system will consistently apply the observed physics of our simulation to other, unobserved simulations. Thus, subject to the assumption that consciousness has a physical basis, the multiverse hypothesis contains the elements of its own invalidity!

The three controversial examples that I have given – one from each of its sections – indicate what a stimulating and challenging book this is. It is not simply an examination of the work of one important participant in the current science-religion debate, but also – perhaps unintentionally – a fascinating introduction to that debate as a whole. For the general

reader it is not, perhaps, an easy read, but then, neither should it be. All too often, 'science and religion' writing has been dominated by what is essentially a kind of apologetic on behalf of a particular brand of religious belief. It requires, however, a level of philosophical investigation that does not make simplistic assumptions about what science is or about what it is that religious believers believe (or at least should believe.) Here – albeit in short chapters that do not allow full development of their arguments – the field is, as it should be, *analysed* at the level of sophistication it deserves.

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Science and Religion in Schools Project

Millwod Education Trust, 2006.

The materials developed from this major and well resourced project represent a novel engagement with the spheres of science and religious education.

The Science and Religion in Schools Project has published guides for both Primary (Years 3-7) and Secondary Schools (Years 8-11 and 11-13), which include accompanying CD-ROMs. The use of electronic data storage provides scope for further development and opens the door to a range of classroom applications. These include the use of worksheets, power point presentations and video clips. The project seeks to stimulate open-minded and balanced discussion. The project considers Buddhism, Christianity, Islam, Sikhism and Hinduism as well as topics such as language and culture. It is also supported by a web site to be found at: www.srsp.net. Within the project materials, there appears to be a high degree of academic rigour, with concern shown towards the communication of philosoph-

ical ideas and concepts. The project also has a helpful degree of reference to the development of scientific thought.

An educator using the CD-ROMs may need to spend time mastering the structure and content divisions of the electronic files. But books are provided to support the discs and these help in the navigation of the various units.

In the staff resource booklets, there are helpful glossaries, which highlight the scope of materials developed to stretch the most intrepid student. In the Primary support booklet, the resource materials do not shy from reference to anthropic coincidences, epistemology, inductive method and logical positivism among other topics.

Within the education philosophy of the project, there are clear underlying attempts to engage with a variety of teaching and learning strategies. Use of visual images is found within the Powerpoint slides. I imagine, for example, that the use of Venn diagrams could well be helpful to students investigating views about God and miracles. Another example of visual stimulus would be the inclusion of 'video' clips showing interviews with stakeholders in a range of fields and with different perspectives. Additionally, attempts to facilitate the use of techniques such as the use of question webs as a means of encouraging thinking skills through active dialogue is to be applauded. The use of role play techniques, such as 'Hot Seating', where students are encouraged to answer questions in character, also appears to add diversity to the delivery style. Hence kinaesthetic as well as auditory and visual learning styles are engaged.

When questions are asked about alien life and artificial intelligence, this reviewer senses a freshness of approach that may engage many classes. Through thought-provoking assumptions, it is easy to see how discussion and debate could be stimulated and so build a culture of participation in the classroom.

Included in the materials is scope to work with a high proportion of 'open' questions.

Curriculum planning is an important part of departmental responsibility within schools. This resource seeks to address these aspects too. For example, the Primary booklet highlights links to the Non-Statutory National Framework of RE (QCA) and the Science National Curriculum. Given the very recent changes in the Science and RE curricula, the ability of the project to update resources electronically may prove useful.

Here is a resource that has relevance to more than science and religion courses. I could see it being a useful tool in the preparation of assemblies, cross-curricular lessons, and in, for example, sections of the International Baccalaureate 'The Theory of Knowledge' and the recently published 'Perspectives on Science' AS course, published by Edexcel.

Overall, the SRSP is a well resourced project, thoughtfully put together and touching on many areas of best practice in teaching philosophy as applied to the areas of Science and Religion; I would recommend it as a useful tool for the teacher in the preparation and development of innovative learning experiences.

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R. J. Berry (ed.)

Environmental Stewardship: Critical Perspectives – Past and Present

London: T & T Clark (Continuum), 2006.
348 pp. pb. £34.99. ISBN 0-567-03018-0

With this fascinating volume, R. J. Berry provides readers with yet another invaluable resource for addressing the relationship between Christianity, science and the environment. The emeritus professor of genetics at University College, Lon-

don, and stalwart of Christian creation care brings together a collection of 26 essays on environmental stewardship, among which are four essays originally prepared for a conference organised by the John Ray Initiative in 2000 and seven chapters written especially for this volume. Berry himself writes an engaging, critical introduction that serves both as an indispensable guide to the issues raised by the book's various authors as well as a call to informed and passionate 'environmental stewardship' – whether it goes by that name or not.

A particularly pleasing feature of the book is the inclusion before each essay of a paragraph that briefly describes the author, gives the details of original publication, summarises his or her contribution and, in many instances, tells readers where else in the book they can find responses to that author's perspective. A relatively wide spectrum of views is represented, including those opposed to using the term 'environmental stewardship', although non-Christian religious approaches are only mentioned in passing. All of the authors agree on the need to care for the environment, however differently they might define that care.

As is to be expected of such a diverse collection, the contributions are uneven in quality, and there is lots of overlap: readers will tire of hearing over and over again, for example, about the origin of the term 'stewardship' and how it came to be applied to environmental issues (although even here the differences in emphasis, and occasionally in fact, can be revealing). The need to impose some sort of organisation on a selection of essays originally written for different contexts also proves to be a challenge only partially met; many chapters could as easily or perhaps better have appeared in a different section from that in which they appear. A chronological treatment would probably have been preferable, but of course it could have misled readers into assuming that time has meant progress. As Martin Holdgate's sobering assess-

ment of the results (or lack thereof) of the World Council of Churches' 1991 initiative, *Caring for the Earth*, reveals (242-243), it clearly has often not, at least in practical terms. As it stands, it is in fact unfortunate that despite some distinguished contributors (and with the notable exception of Michael Northcott's essay), the conceptually weakest of the book's five sections is that dealing with 'Applications'; this reader could not help but draw the conclusion that there remains far too little connection between the theory and practice of environmental stewardship.

What is most striking about the book may be the constant recurrence of the same themes and questions. Most of the authors, for example, are keen to stress that non-human creation carries intrinsic value; only a handful prefer to place the emphasis solely or primarily on the natural world's value for human beings. The related question of humankind's place within creation emerges in every essay of the book, although on this issue there is much less consensus. How much power and responsibility do human beings actually have on the earth, and what is the relationship between human activity, the environment and the deity? Many of the differences in approach turn out to derive from the different answers authors would give to these questions. Finally, though it is not always as explicit, there is the recurring question of what the aims of environmental stewardship ought to be and for whom the natural world is to be stewarded. Future generations? Humanity in general? God? Berry acknowledges in his introduction that the concomitant question of the contribution of Christian eschatology to determining the aims of stewardship is addressed only superficially in this volume. Murray Rae's excellent essay, which among other things demonstrates what can be distinctive about a Christian approach, begins to hint at an answer by tracing the biblical link between creation and redemption.

No doubt such questions will continue to gather urgency in the years to come, and the need to transform theory into practice will become even more acute. For those looking to join this important discussion or who are just curious about what 'environmental stewardship' means within a broadly Christian context, this book is now the best place to become acquainted with the historical, theoretical and critical work that has been done to date.

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Nick Spencer and Robert White
Christianity, Climate Change and Sustainable Living

London: SPCK, 2007. 244 pp. pb. £9.99.
ISBN 978-0-281-05833-4.

Of the making of books on religion and the environment there would appear to be no end. Month after month they come. To avoid needless repetition they would seem to need to fulfil one of two criteria. Either they are for a specialist audience, or at least one that is different from usual. Or they tackle a highly specific agenda, concentrating on one aspect in detail. It is to the great credit of these authors that they are *not* side-tracked into wider issues of environmental science or theology, but they deal with one major problem (climate change). This is rightly presented as a challenge to sustainability, a challenge that is shown to be completely compatible with a faith that takes the Bible seriously and therefore demands urgent attention from all Christians.

The trouble with climate change is that it has become a political football or favourite topic in 'green' propaganda. Consequently it is either taken as inevitable by many people, or else ignored completely by the fearful. Nei-

ther of these reactions is satisfactory and it is up to Christians to declare the biblical response, even though it happens to be also that of many world leaders. It is high time for churches to recognise their responsibility to include decisive action in this area as just part of their God-given agenda. This book may well help many to do that. After a brief introduction it is divided into three parts, entitled 'The nature of the problem', 'The biblical perspective' and 'The Christian response'.

In the first part there is a good explanation of the Greenhouse Effect, and a parade of the main offending chemicals. Obviously carbon dioxide is given the greatest prominence, though its effect is less than that of water vapour. This is largely derived from the oceans at present, but if (for example) hydrogen-powered vehicles become much more common this may no longer be the case. More spectacularly, the variations of CO₂ concentration over historical time are related to the rise in global warming over the last few decades. Clearly human beings are responsible, though one graph (p.23) rather suggests that this is merely an effect of rising populations. However the book later and with good reason ascribes the rise to 'the indiscriminate burning of fossil fuels – oil, gas, and coal'.

Amongst the culprits is nitrous oxide, N₂O (a well-known greenhouse gas). Some readers may wonder how it could possibly arise from burning of fossil fuels, since these contain negligible amounts of nitrogen. Some years ago it was suggested that catalytic converters on cars were responsible for nitrous oxide (taking nitrogen from the atmosphere), though recent work has shown this to be very small. The gas is also stated to come from 'fertilizer use', where burning of biomass or natural decomposition of nitrogen-rich soils, especially grasslands, are seen as largely responsible. However the real problem with N₂O (and other nitrogen oxides) is not its role as a greenhouse gas but rather its reaction (by a complex

mechanism) with atmospheric oxygen molecules to produce ozone. That is the third most important greenhouse gas, after carbon dioxide and methane.

Having encountered considerable snow in Yorkshire on Easter Sunday, 2008, I was foolishly tempted to ask ‘what price global warming?’ The book occasionally slips into this approach when it repeatedly refers to events like the heat wave of 2003. However, what matters is the general pattern, and we should probably be wise not to place too much emphasis on single events. But it is quite right to remind us that scientific evidence predicts dire effects quite soon if the Greenhouse Effect increases. These include temperature rise, extreme weather events, sea-level rises, and threats to food, water and health.

The answer to these crises lies in the concept of sustainability. This means not living beyond our means, both individually and globally. Particularly this involves conserving our finite reserves of fossil fuel in terms of domestic energy use, travel and overall consumption. It has clear implications for lifestyle, and social and business practice. How can this be achieved, and is it even desirable? And so we come to answers in the second part of the book ‘The biblical perspective’.

The question ‘why care?’ is given short and trenchant answers in the light of biblical thinking. All Christians need to ponder the issue carefully in the light of these answers. It is when we come to ‘the biblical vision for sustainable living’ that some eyebrows will be raised. A complete chapter presents Isaiah 40-66 as such a vision. This matchless passage – perhaps the richest in the whole Old Testament – has been captured to present a manifesto for a special kind of life, sustainability. To be sure, the last part of Isaiah does show us a wonderful picture of a world where the will of God is done. That, imply the authors, is a world where sustainability also reigns. Perhaps that is so, and there are quite a few references to the material world in the passage.

Yet, who is to say that sustainability is to be found in the second half of Isaiah? Does not his vision transcend our present world? Is it ‘not yet’ for the prophecy to be fulfilled? Once upon a time (in the 1930s for example) some scholars saw the meaning as political; the prophet (Isaiah himself or a later author) was writing in post-exilic times and was encouraging Israel to persevere, to welcome Cyrus, and to rejoice in the imminent demise of Babylon. Later, other more evangelical scholars revived the Messianic emphasis here; Isaiah 53 being one of the great prophecies of Jesus Christ, God’s suffering servant. Today, we can see that both approaches may be valid, and also that this is a superb example of multilayered apocalyptic literature, where details must not be pressed. The visions of a modified countryside, trees in the desert, or a lion lying down with a lamb may be taken at literal face value, or they may in some wonderful way be emblems of the infinite grace and power of our God who redeems in Christ Jesus. They *may* be intended to present a vision of sustainable living, but not a trace of evidence shows us this to be necessarily so. It would be unwise to assume that, and then use them as a basis for sustainability. There is always a danger of assuming what one wants to prove.

This questionable use of Isaiah is far from typical of the whole book. Spencer and White offer us an erudite account of the contemporary problems and a Christian response to them. They cite biblical attitudes to jubilee, wealth, trade, roots, Nature and Sabbath, and vulnerability. Each has much to say to us all and they are explained with great care. All of this is in Part 2, yet the rest of the book has another surprising title ‘The Christian response’, being chiefly about practicalities. It begins with yet another ‘vision’, one of sustainable living today. Maybe this reflects the plurality of authorship. It enunciates eight principles for sustainable living and is followed by another chapter full of sensible down-to-earth advice.

The book ends with a short note about 'Further engaging' and includes organisations like The John Ray Initiative and TearFund. Full indexes and 255 references complete the book. These, in conjunction with its length, make it likely to be a formidable challenge for non-academics to read, and its style and content show it rather as a serious contribution to the technical literature on climate change. It does tend to repeat itself fairly often, a feature of books authored by several writers or even a committee, though limited repetition has its virtues. However, it is warmly commended to opinion-formers, politicians and other persons of action for its efforts to place the physical problems of climate change within a clear Christian context. It deserves every success.

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Enzo Tiezzi

Beauty and Science

Southampton: WIT Press, 2005. 118pp.
hb. £39. ISBN 1-85312-740-X

Enzo Tiezzi is an eminent ecologist and Professor of Physical Chemistry at the University of Siena. His concern is with the excessive mathematisation of science, its tendency to see the world only as a collection of parts and not as a whole, and therefore an inability to perceive its beauty. If we cannot recover an ability to connect reason with feeling and emotion, he sees only a descent into disaster.

It is a theme explored by several other writers of the past twenty years, and Tiezzi adds little to the thoughtful and readable argument of (say) *Science, Creativity and Thought* by Bohm and Peat (Routledge, 2nd edition, 2000). It is in fact hard to discern anything approximating to an argument in Tiezzi's book. That is actually by design: the chapters are anecdotal, meditations on the sub-

jects of form, colour, flavour, scent, and so on, liberally sprinkled with references to examples of the Earth's wonders as noted by Tiezzi during an impressive array of visits to exotic locations. (Given his forebodings about humanity's role in global warming, he seems strangely unconcerned at the depth of his own carbon footprint.) From this allusive approach a few themes can be perceived: ideas suggested by medieval alchemists, by modern films and poetry, or by Native American beliefs and rituals are positive; those associated with modern science and technology are almost invariably negative. (The exceptions are those that touch on the work of the modern gurus of complexity.) He also appears to have a rather touching faith in homeopathy and zodiacal signs.

Clearly, many would agree with Tiezzi that something has gone sadly awry. The golden future promised by post-war science and technology has certainly not materialised, and science is increasingly seen not as the remedy, but as part of the problem. However, what should we do about it? Tiezzi has some laudable things to say about the importance of sustaining what he calls 'natural capital', but there is no clear programme of action. If he has a solution at all, it is an acceptance of evolution as the governing paradigm for everything. Darwin's theory has been hijacked by the idea of progress, Tiezzi maintains, but we should repudiate such notions and embrace the fundamental role of chance and the lack of purpose in the Universe.

I suspect many conventionally scientific readers will give up in exasperation well before the end. However, reviewers do not have that choice, and the book is at least thought-provoking. Here are two thoughts. Firstly, Tiezzi may (unwittingly?) have shed some light on the true nature of Darwin's theory. Rather than seeing Darwinism as the pinnacle of modern science, we should view it as the recrudescence of an older world-view. Whereas Enlightenment science was

anthropocentric and teleological, Tiezzi (and Darwin) signals a retreat to a world where humans are nothing special and in which 'chance, more than end, is the rule' (31). Secondly, if Tiezzi wants to be a consistent Darwinist – i.e. if he really believes this – he is faced with a paradox: he clearly esteems some ends more highly than others. So what are his criteria? Darwinism gives him no basis here beyond the bare calculus of survival. Tiezzi's problem is expressed by a quotation: our error, he avers, is 'to believe that the earth was ours, when we are really the earth's' (94). He has overlooked the third possibility as expressed in Psalm 24. For those who want to explore these topics further, Alister McGrath's *The Re-enchantment of Nature* (Hodder, 2002) is a much surer guide.

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Jane Maienschein

Whose View of Life? Embryos, Cloning and Stem Cells

London, England: Harvard University Press, 2003. 342pp. hb. £18.95
ISBN 0 674 04170 8

The author is a professor at the Arizona State University. Jane Maienschein's expertise is in the history of developmental biology. The author has written extensively on the subject of embryos, stem cells, cloning and related research from a United States' perspective.

The book has a sound binding, clear, readable type-face and an excellent illustration of stem cell functions, both *in vivo* and *in vitro*. There are seven chapters outlining and explaining the history of research in these birth technologies within the context of scientific advances. The author outlines the political strictures controlling the current scene in her country. Maienschein writes an excellent

account of the historical development of cell theory and suggests the directions that future genetic research may take.

The debate on the ethical issues surrounding human embryonic stem cell research is often influenced by strong religious views about life and the soul of the embryo. The Bible, from which Christian teaching is derived, is not the basis of many of these beliefs.

Maienschein does not clearly show that although life is there from before conception, personhood is not. The author says that 'personhood' was not applicable to the unborn in the United States legislation of 1973. This latter concept of personhood would have overcome the recurrent ambiguity concerning this matter as it is difficult to ascertain from the book when the embryo does become a person.

The author explains how the human stem cells are obtained from the blastocyst about Day 5 of development of the cultured embryo in the laboratory. As the harvesting of these cells results in the rupture of the 'egg shell' further development of the embryo is stopped. Maienschein shows that these stem cells are *undifferentiated* and thought capable, under defined conditions, of forming any one of the 200 cell types of our bodies. The author says, however, that only research will show their potential to alleviate human disease.

The author discusses many matters relating to the abortion issue with an excellent description of the Human Genome Project. Many would agree with Maienschein that ethical matters relating to reproductive cloning must be assessed with the greatest care.

The author discusses the restraints imposed on human embryonic stem cell research in the United States resulting from the present Presidential ban on these studies. Hence the frantic search for alternative sources of stem cells both from adults and other animal sources. This to some would seem a waste of time when it delays making difficult but rele-

vant decisions. None of these other sources of stem cells can be equated with the value of those from a human embryo. Maienschein discusses the needs of a significant section of the community who oppose the demands of a pro-life group where compromise would not seem possible.

The author emphasises that the human embryos used as sources of the stem cells are those unneeded in the reproductive technologies of In Vitro Fertilization programmes and ultimately will be destroyed. The reader should assess whether the minute mass of cells of the blastocyst can justifiably be equated with a fetus or with personhood! Under natural conditions only about 30% of blastocysts will implant in the uterine wall about day 9-10 of life.

I do not agree with Maienschein that humans have been recombining DNA for millennia with the selective breeding of animals and plants. The author has some useful comments about who owns the embryo. The ethics and lack of legislation in birth technologies and related stem cell issues in the United States, described in this book, seem inadequate. The lack of rules would be unacceptable in many other developed societies.

This book will be of help to selected readers of the Journal interested in the history of these birth technologies in the United States. Maienschein shows a willingness to engage others on any matter concerned with these new birth technologies. The author suggests that research on stem cells be allowed for the first two weeks from conception. Clinical decisions, however, ultimately rest with a medical practitioner and this deficit shows in the book's opinions and comments.

Human embryonic stem cell research may offer significant benefits for society. As the book was published in 2003 recent progress in this field in other countries must be sought elsewhere. For those needing a current book on these matters

I suggest they read *Designers of the future: Who should make the decisions?* by Professor D. Gareth Jones (Monarch Books, 2005).

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Keith Ward

The Big Questions in Science and Religion

West Conshohocken, PA: Templeton Foundation Press, 2008. 281 pp. pb. \$16.95. ISBN 1-59947-134-3

The book certainly lives up to its title. Among the ten questions that it addresses are such issues as Do the Laws of Nature Exclude Miracles?, Is Science the Only Sure Path to Truth?, Has Science Made Belief in God Obsolete? In framing his replies, Keith Ward writes in his customary clear and lively style. Over the years he has made a particular study of comparative theology, seeking to discern the commonalities, and to analyse the differences, in the accounts of the nature of ultimate reality given by the great world faith traditions. A particularly valuable feature of the present book is the way in which his responses to the big questions seek to take account of the variety of stances adopted not only by the three Abrahamic faiths, but also by Hinduism, Buddhism and the Eastern Religions (Confucianism and Taoism). This alone would be sufficient to make the book worthy of serious attention by anyone concerned with issues of science and religion. Surely one of the most challenging problems for contemporary theology is how to understand the inter-relationship of the world faiths. Their apparently diverse accounts of sacred reality can be particularly perplexing, and even unnerving, when contrasted with the universal unanimity of scientific opinion in relation to the physical understanding of a well-winnowed regime.

Ward came to theology from philosophy and he always writes in a manner that is careful and sensitive about philosophical matters. This, together with the attempt to accommodate the variety of stances taken by the world faiths, often results in the employment of a rather abstract terminology. Phrases such as 'a reality of wisdom, compassion and bliss' or 'Supreme Objective Goodness' are frequently used to express belief about the nature of ultimate reality, although language relating to the more personal kind of theism that is appropriate to the Abrahamic faiths is not absent from the text either. In fact, a central theme, present in almost all the answers, is an emphasis on the self-limited character of scientific discourse and the consequent inadequacy of its impersonal account, bracketing out questions of value. By itself, science describes a kind of lunar landscape view of reality, a world populated by self-replicating, information-processing systems, but with no persons in it. Ward is robust in asserting the poverty of an impersonal account and the indispensability of taking with the utmost seriousness all forms of personal experience. He rightly emphasises that science has not established the closure of its own world view. A discourse based solely on publicly accessible facts can only be part of the story of the richness of reality. Conscious experiences, and the insights gained by introspection, are not to be neglected. Despite the somewhat abstract form of some of his argument, Ward is happy to point out that 'The basis of biblical faith is not inferential reason but personal encounter'.

This is an excellent book and, in view of current attacks on the reasonableness of religious belief, a timely one. It will be of real interest to all readers of S&CB.

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Daryl P. Domning & Monica K. Hellwig
Original Selfishness: Original Sin and Evil in the Light of Evolution

Aldershot: Ashgate, 2006. xi + 213 pp.
Hb. £45.00. ISBN 0-7546-5315-3

This book is a dialogue between a Roman Catholic palaeontologist (Domning) and a Roman Catholic theologian (Hellwig). The dialogue takes place within the context of the Roman Catholic understanding of the doctrine of original sin. Nevertheless it is of relevance and interest to non-Catholics, but they will need to do some transposing into their own theological context.

The book consists of four parts. The first consists of a chapter by Hellwig on 'The classic teaching on original sin'. Part Two is entitled 'Why the pre-critical understanding of creation and original sin is no longer tenable'. Among other things this contains helpful chapters on 'How Darwinian evolution works' and 'Objections to the Darwinian view of nature'. In a chapter entitled 'No more Adam and Eve' Domning draws on F. Ayala's work on the diversity of the *DRBI* genes in humans to argue that it is scientifically untenable to hold that all humans are descended from a single pair of parents existing at any time during the past 6 million years. There is a thought-provoking chapter on 'How suffering and death fit into evolution'. Domning's conclusion in this part is that 'evolution intrinsically shows predictable trends, ones that can be objectively defined as "progress"' and that 'theology today has no alternative but to accept evolution as the method God used to create the wonderful diversity of living things on this planet' (92). Hellwig's response is fairly short. She says that Genesis 2-3 should not be taken as a literal account of the origins of humans and of human sinfulness. The important message of these chapters is what is said about the nature of the world as we know it. In essence she expounds the classic 'free-will defence' of the origin of evil and

suffering in this world.

Part Three is entitled 'Toward a new understanding of original sin'. In it Domning argues that selfishness, defined as an instinct for self-preservation, plays a fundamental role in organic evolution. This is part of our genetic inheritance. However, he insists, 'Genetic influences on behaviour do not (at least in beings with free will) amount to genetic *determinism* of behavior' (108, Domning's emphases). In fact 'culture' has become a more important and efficient means of passing on information than DNA and so humans are no longer mere 'vehicles of DNA' (115). In becoming self-conscious beings humans have crossed a crucial divide. 'We are beings with free will, responsible for our moral choices and no longer limited to acting on our instincts' (118). So, what was an amoral instinct for self-preservation becomes a moral issue for us when it leads us to disregard the needs of others. Hellwig's response is disappointingly brief and does not really engage with the heart of Domning's argument.

In Part Four Domning presents his new proposal for understanding original sin in terms of 'original selfishness'. Because of our evolutionary past all humans have a tendency to selfish behaviour. With the appearance within the evolutionary process of self-consciousness and free will humans were faced with the choice of whether or not to behave selfishly without regard for the situation and needs of others, that is, whether to behave morally or immorally. In fact we choose to behave immorally. This leads to the universal need for sal-

vation which is the essential assertion of the doctrine of original sin. Domning argues that his proposal does not contradict Genesis 2 & 3, 'the essential spiritual insight of the creation account – that humans and humans alone have a moral dimension to their actions, and have chosen to act immorally (that is selfishly) from the very dawn of their existence – contradicts nothing that science knows of human origins'. (140). He leaves theologians to debate 'whether descent from a literal Adam is still necessary to account for the universality of the free will which makes possible the moral dimension of human actions' (141), though he thinks it probably is not. He returns to the subject of evil and suffering and seeks to make sense of it in terms of the 'free process defence' argument which has also been deployed by John Polkinghorne, among others. Hellwig's response is again very brief and does not engage with Domning's new proposal head-on.

Unlike many scientists who write on theological topics Domning gives evidence of having read what some leading theologians have written on the doctrine with which he deals. His treatment of Scripture is a bit superficial – he tends to work with the options of 'literal or myth'. However, he presents a well-argued, thought-provoking proposal which deserves further debate by both scientists and theologians.

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