In This Issue:

FOR FULL CONTENTS SEE FOLLOWING PAGE

CONTENTS

NOTES ON CONTRIBUTORS

Philip Bligh, onetime Head of Applied Physics at Kingston Polytechnic/University, was more recently Rector of Holy Cross Anglican Church, Canberra, Australia.

Sjoerd Bonting is a retired biochemist and theologian, is the author of Creation and Double Chaos: Science andf Theology in Discussion.

Peter Colyer is Fellow of the Centre for Christianity and Culture of Regent's Park, Oxford, and Secretary of the Science and Religion Forum.

Jay R. Feierman is editor of *The Biology of Religious Behavior: The Evolutionary Origins of Faith and Religion* and retired Clinical Professor of Psychiatry, University of New Mexico.

Tom Green is a doctoral student at the Faculty of Divinity, University of Cambridge, working on Max Müller and Swami Vivekananda.

David Grumett is the author of Theology on the Menu: Asceticism, Meat and Christian Diet and previous books on de Lubac and Teilhard de Chardin.

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

EDITORIAL

I write this looking forward to the Conference in honour of John Polkinghorne in Oxford in July, of which a notice was enclosed in the last issue. The meeting, July 7-11, 2010, is at St Anne's College, Oxford, and the Clarendon Laboratory. For further information visit: www.ianramseycentre.org.

So I take a moment to reflect on the contribution of Sir John, whose work will be familiar to all readers of this journal. He is of course a scientist of great distinction, as at home at CERN as in Cambridge, where he was Professor of Mathematical Physics, Dean of Trinity Hall, and President of Queens'. But for those of us labouring in and puzzling over the science-religion debate it is John's lucid and adventurous theology for which we must chiefly be grateful. It is a contribution which has brought him the Templeton Prize as well as many other honours.

Of his very many books I would single out two as being particular contributions. The first is his *Science and*

Providence from 1989 (republished by the Templeton Foundation Press 2006?). Polkinghorne's position on divine action – invoking the openness and indeterminacy of chaotic systems as a possible causal joint – has been so much criticised that it is hard to remember how generative and constructive the suggestion was (as a counterpoint to the proposal for quantum-level non-interventionist divine action). Beyond that Polkinghorne's willingness to defend much of the classical picture of God's providential action helped to keep the debate, which has been such an important element in the science-religion conversation, in touch with the concepts of miracle and answered prayer.

It is important to add that, as I understand it, Polkinghorne fully accepts the criticism that the mathematics of non-linear systems is deterministic, but concludes, having inferred that it is a very probable candidate for the causal joint, that this determinacy must be an approximation to a profounder and more subtle reality. This is an interesting move in the divine action debate, but it is also an interesting type of move at the interface of science and theology. I am reminded of Philip Clayton's conclusion that the theist must take a certain type of line on the mind-brain debate.

The second book I single out is *The God of Hope and the End of the World* (2002). Eschatology is the other area in which Polkinghorne has made great contributions, and, again, what is refreshing is his commitment to a classical Christian conviction about the new creation. I might not

agree with all his conclusions, but the lucidity of his exposition is an absolute model.

Having chosen two books, I quickly want to add a third, this time edited by Sir John. *The Work of Love: creation as kenosis* was also published in 2002, and it remains a very important collection of essays. Again, the underlying concept has been subject to some important criticisms, not least by Sarah Coakley within the volume itself, but the array of contributors is formidable and it is a work to which I continually return.

But it is not only Polkinghorne's writing that has been important to the science-religion community. It is as much his eloquence as a communicator that has been important. I remember his coming to Exeter to lecture back in 1992, and how he was equally at home in a seminar for physicists, a public lecture on quantum theory, and a small gathering of theologians. When I asked scientific colleagues whom else I should invite, their response was – get Polkinghorne back! It was a great pleasure when he later accepted an honorary degree from the University. I also recollect a conversation on the radio between Polkinghorne and Richard Dawkins, and John's sheer unflappability and reasonableness of tone, which has done so much to undermine many prejudices against religion. His insistence that both science and theology stem from 'motivated belief' has been an important emphasis for many.

Lastly I would want to acknowledge personally John's consistent courtesy and encouragement over many years. I look forward to celebrating his 80th birthday, and hope the event will be very well supported.

The Arthur Peacocke Essay Prize

It is a great pleasure to report that Katharine Martin, a former student of mine, was highly commended in this competition, and awarded membership of the Forum and a free place at the Forum's conference, joint with ESSSAT (see report following). I congratulate Katharine, and hopes she will long sustain her interest in and engagement with the debate. Thanks too to Dr Louise Hickman for looking after this competition.

REPORT OF THE 2010 CONFERENCE – JOINT WITH ESSSAT

Edinburgh, 7-11 April, 2010

This was a one-off event. ECSTs I-XII were organised by the European Society for the Study of Science And Theology (ESSSAT) alone, and those from XIV onwards almost certainly will be too. But when Celia Deane-Drummond asked me to stand for election, as her successor in the SRF chair, she urged that I should capitalise on having positions in both societies to strengthen links between the two. The opportunity to share this conference seemed a peculiarly appropriate way. So ECST XIII was run jointly by ESSSAT and SRF. ESSSAT's tradition is more lavish, with longer meetings accommodating far more contributed papers (accessible on the web to paid-up registrants), and international invited speakers paid non-trivial honoraria. So we knew the SRF attendance would be the smaller of the two, but could scarcely have foreseen the financial crisis, which amplified the cost disparity by Sterling's slump relative to both Euro and Dollar.

Those SRF members who nonetheless attended enjoyed, as much as the overseas visitors, a most pleasing venue, with residential, excellent eating and all lecture accommodation within five minutes of one another, overlooked by the craggy heights of Arthur's Seat. Only on the final evening did we go to the old city, for an ecumenical service (Orthodox, Catholic and Protestant) in

St Giles Cathedral with Polish cellist and Scottish organist; a New College reception; and the conference dinner entertained by clarsach players and a Celtic storyteller.

The intellectual work which earned these rewards was led by five fine plenary speakers on the theme 'Is Religion Natural?'. Ilkka Pyysiäinen (Helsinki) opened with a quietly serious survey of the field from the standpoint of an agnostic religious anthropologist. Then Justin Barrett (USA/Oxford), Christian cognitive scientist and extrovert presenter, delivered the Gowland Lecture, chaired by Kenneth Wilson, about such matters as western children's concepts of God. Next day Mona Siddiqui (Glasgow), gently humanist scholar of Islam, elicited a response of matching depth from SRF's Roger Paul. That evening Christian Schwöbel (Tübingen) lectured under the Gifford banner on 'The religion of Nature and the nature of Religion'. On the final morning Lluis Oviedo (Rome) surveyed the meeting in asking whether we need to naturalise religion. His respondent was another known to SRF members, at least if they were in Cambridge last Sept – David Fergusson, who had been our official Edinburgh host. To him, perhaps more than many others, we owed best thanks.

The meeting will have no like again. But I am assured by many rewarding words and letters of thanks that those able to come had a rewardingly memorable experience.

Neil Spurway

NEWS OF FUTURE CONFERENCES

The Forum announces **a one-day workshop on September 4, 2010**. This will be an opportunity to review the current state of the science-religion debate, and also to inform the construction of the third edition of:

God, Humanity and the Cosmos: a textbook in science and religion

A chance then both to explore where we have got to in our explorations, and to help the contributors to the textbook to make the new edition of the best resource it can be.

The Queen's Foundation, Birmingham, 10am-4pm. £35 for the day including coffee, lunch and tea.

Enquiries to:

ADVANCE NOTICE – 2011 CONFERENCE

This will be held at Cumberland Lodge, Windsor on September 26- , 2011. The title of the conference will be 'Inspiration in Science and Religion'. This will be a joint conference with the Lodge, a Christian organisation committed to vigorous debate of issues of topical concern, and promises really well. Put the date in your diary!!

REVIEW ARTICLE

Norman C. Nevin (Ed.), Should Christians Embrace Evolution? Inter-Varsity Press, 2009; pp. 192; paperback, ISBN 978-184474-406-0, £9.99.

REVIEWED BY CHRISTOPHER SOUTHGATE

I was deeply saddened to receive this book. The title will appear bizarre and ridiculous to most of those outside the faith, and if they turn to the last page and read the editor's answer to the title question, 'a resounding no' their worst fears about Christianity will be confirmed. In my view the head-in-the-sand resistance to one of the most robust complexes of theory in contemporary science does great damage to the credibility of the Gospel – it also impedes constructive reflection on the creative work of a God who used the long and pain-filled processes of evolution to give rise to the astonishing biosphere we know today, and also to the human being, one of the most remarkable of its creatures.

A mischievous gremlin on my shoulder tells me that one might equally entitle a book 'Should Christians embrace heliocentrism?'. After all, to assert that the earth goes round the sun is contrary to common sense, and to certain passages of Scripture, read in a certain way, such as the account of the siege of Jericho. The scientific establishment is uniform in its heliocentrist tyranny, which right-thinking biblical Christians should resoundingly resist. The discovery of stellar parallax,

which seems to confirm heliocentrism, came long after the theory was propounded (just as the revolution in biology caused by the discovery of the structure of DNA, which has done so much to extend and empower evolutionary descriptions, came long after Darwin's work). These new-fangled discoveries are clearly suspect, and must be susceptible of other explanation. And so on.

The sub-title of the book is revealing: 'biblical and scientific responses'. I lectured last year on evolution and suffering to a group of Orthodox Christians, and was somewhat bemused when a vigorous discussion started up as to what the Fathers thought about these matters. To my vast relief a distinguished scholar sitting in the back row eventually rescued the day by pointing out that it was no good asking the Fathers about evolution, because they knew nothing about it. Likewise, it seems to me, there is no point in looking for a 'biblical response' to something of which the biblical writers knew nothing. That is simply not an appropriate use of, or understanding of, the Christian Scriptures.

That is the perspective with which I came to this book. What then did I find inside it? Several chapters based on a very conservative biblicism, which takes the Bible to be a single coherent narrative of creation, fall and restoration, and Adam and Eve to be historical figures with Adam the 'federal head', whose sin meant that sin was imputed to all his descendants. For this approach to have credibility, the authors would have to concede that this understanding is a hermeneutical choice, and recognise that there are many other equally plausible

choices. (For instance, Paul Fiddes shows in his excellent *Freedom and Limit*[1] that the Bible does not fall neatly and unambiguously into this 'U-shaped' narrative curve.)

Interestingly, the principal conversation partner – target would perhaps be a better term – of most of the contributors is Denis Alexander's recent *Creation or Evolution – do we have to choose?*[2] Although sympathetic to almost all of what Alexander has to say in his book, I had some sympathy with the criticisms of his own suggestion re Adam and Eve, namely that they were Neolithic figures whom God 'adopted' by giving them revelation of the full possibilities of human life in relationship with God, in other words that they were the first representatives of *homo divinus*. This position, also espoused by R.J. Berry, and deriving, so Michael Reeves alleges, originally from John Stott, seems to me an awkward fudge, trying to retain the federal headship of Adam so as to justify literal exegesis of Rom 5. A full-blooded mythological reading of Genesis 2-3 is surely to be preferred, along with a theology that accepts that the image of God, however understood, evolved gradually in the human.

The doctrine of God suggested by the literal readers in the book in question, whereby the deity imputes sin to all humans on the basis of one sin by one supposedly

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[1] Paul S. Fiddes, *Freedom and Limit: a dialogue between literature and Christian doctrine* Macon, Ga>: Mercer University Press, 1999.

[2] Denis R. Alexander, *Creation or Evolution: do we have to choose?* Oxford: Monarch Books, 2008.

historical primordial human, seems to me profoundly difficult, and deeply unappealing. But so determined are the authors upon their hermeneutical strategy, and the rejection of genre-sensitive, contextually-aware readings (preferring, at least in the case of Alistair McKitterick, to impute authorship of Genesis to Moses) that these difficulties are glossed over. For them *the* narrative of the Bible and of Christianity, must be that of literal Adam and literal fall of all creation, in order to defend the cosmic reach of Christ's atoning work and its restoration of the Edenic state of creation. (Whether the Bible actually teaches a restoration of an Edenic state is to say the least highly doubtful, and whether Rom. 8.19-22 can be as easily pressed into the service of this narrative shape as David Anderson implies, is also distinctly dubious, not least because it was *God* who, the passage almost certainly alleges, subjected the creation to futility.)

Towards the end of the book are a series of short chapters questioning classic evolutionary positions on homology and the evidence of molecular genetics. I was startled, to say the least, at the assertion that the genetic evidence casts doubt on the common ancestry of the human and chimpanzee. This is unlikely ever to be the easiest interpretation of the evidence. Much was made in various chapters of recent findings to the effect that some at least of so-called 'junk DNA' turns out to have structural functions. I am not in the least surprised by this, and indeed would tend to expect it on evolutionary grounds. So this case, while acting as a cautionary tale about pronouncing too confidently that a particular

sequence is a 'molecular fossil' without a current function, does not offer any particular comfort to the creationist either. The chapter on the origin of life, the area of biochemistry in which I am currently at work, showed no great appreciation either of the difficulty of this type of research, or of its present state.

The only philosopher or theologian with any claim to distinction among the contributors is Steve Fuller from Warwick, whose book *Science vs. Religion* was recently reviewed in this journal. Fuller offers a rather odd piece, focussed on intelligent design, and dubiously connected to the rest of the volume. Moreover, he nowhere defines what he means by 'ID'. I have noticed in other contexts that those seeking to defend ID often do so by blurring the concept out to include inferences about design which any theist would be inclined to support. [What seems to me to be distinctive about ID, and therefore the claim on which it must stand or fall, is that certain phenomena in the biological world (such as the bacterial flagellum) *cannot* be explained naturalistically, and therefore *must* be explained by invoking the direct action of a designer. ID arguments must therefore stand or fall, philosophically, scientifically and theologically, by this claim, and cannot derive any support from instances in which an explanation in terms of design may be held in parallel with a naturalistic explanation within science.]

Fuller makes much of the tyranny of the scientific establishment, but offers nothing that might support this distinctive claim about intelligent design. He then devotes the second half of his chapter top commenting on

theodicy, without, seemingly, considering that the sort of special divine action that ID implies would make the problem of theodicy in respect of evolution far far more acute than it would otherwise be. This is indeed one of the major theological (as opposed to scientific) objections to ID.

I was recently asked by a young creationist what my 'black swan' was. In other words, what single finding would cause me to abandon my belief in evolution? I have since been told that I should have said, 'an Ordovician rabbit'. I have also reflected that I should have asked her what *her* black swan would be. But in my pedantic way I simply insisted (with Duhem and later Quine) that major complexes of scientific theory are not falsified by a single observation. They are *replaced* only when the anomalies within them seem intolerable *and* another theoretical framework is competent to take its place. This is a point often missed by theologians critical of evolution. There are many unresolved questions within neo-Darwinism, as is proper to an evolving theory. But the only alternative framework to neo-Darwinism is some variant of creation science, and all such frameworks are so riddled with intolerable anomalies as to be inconceivable as replacements.

The contributors to this volume correctly identify the status of the human being and the issue of evolutionary suffering as the two greatest problems that Darwinism poses to the Christian theologian, but because of their naïve reading of Scripture they are able to offer no help with the former, and cannot even begin to engage with

the latter. Indeed this sort of publishing only deflects energy and attention away from proper consideration of these crucial issues. I give some references below which will help readers of this journal with such explorations.

This rag-bag of bits of varyingly competent science and hermeneutically-naïve fideism will equip no Christian to enter the conversation with the contemporary world, still less to give a plausible account of the faith that is in him or her. The best that could happen is that it sends such a Christian back to consider Alexander's book, or perhaps even better Peters and Hewlett's careful study of these questions in *Evolution form Creation to New Creation* [3].

Recent resources engaging with evolution and theology:

Attfield, Robin, *Creation, Evolution and Meaning*, Aldershot and Burlington, Vt. Ashgate, 2006.

Barton. Stephen C. and Wilkinson, D. (eds.) *Reading Genesis after Darwin*, Oxford: Oxford University Press, 2009.

Bennett, Gaymon, M.J. Hewlett, T. Peters and R.J. Russell (eds.), *The Evolution of Evil*, Göttingen. Vandenhoeck and Ruprecht, 2008.

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[3] Ted Peters and Martinez J. Hewlett, *evolution from creation to new creation: conflict, conversation and convergence*, Nashville, Tn.: Abingdon Pr, 2003.

Cobb, John B. (ed.) *Back to Darwin: a richer account of evolution,* (Grand Rapids, Mi. and Cambridge: Eerdmans, 2008.

Deane-Drummond, Celia, *Christ and Evolution: wonder and wisdom,* Minneapolis, Mn.: Fortress Press, 2009.

Domning, Daryl. and Hellwig, Monika, *Original Selfishness: Original Sin in the Light of Evolution,* Aldershot and Burlington, Vt, Ashgate, 2006

Gregersen, Niels. 'The Cross of Christ in an Evolutionary World.' *Dialog: A Journal of Theology*, 2001, 192-207.

Haught, John F. *God after Darwin: a theology of evolution,* Boulder, Co.: Westview Press, 2008edn.

Hoggard Creegan, Nicola. Article: 'The Groaning of Creation'. *Colloquium* 41/2. 2009, 216-22.

Lamoureux, Denis. *Evolutionary Creation: A Christian Approach to Evolution,* Cambridge. The Lutterworth Press, 2008.

Northcott, Michael S. and Berry, R.J. (eds.) *Theology after Darwin,* Milton Keynes, Paternoster, 2009.

Murphy, Nancey. 'Science and the Problem of Evil: Suffering as a By-product of a Finely Tuned Cosmos' in *Physics and Cosmology: scientific perspectives on the problem of evil in nature* ed. N. Murphy, R.J. Russell, and W.R. Stoeger SJ. Vatican City, Vatican Observatory and Berkeley, Ca., Center for Theology and the Natural Sciences, 2007, 131-52.

Murray, Michael.J. *Nature Red in Tooth and Claw. Theism and the Problem of Animal Suffering,* Oxford. Oxford University Press, 2008

Rolston, Holmes., III. 'Naturalizing and Systematizing Evil' in *Is Nature Ever Evil? Religion, Science and Value,* ed W.B. Drees. London and New York. Routledge, 2003, 67-86.

Southgate, Christopher, 2008. *The Groaning of Creation: God, Evolution and the Problem of Evil,* Louisville, Ky. Westminster John Knox Press, 2008

Webb, Stephen.H. *The Dome of Eden: A New Solution to the Problem of Creation and Evolution*, Eugene, Or. Cascade Books, 2009.

REVIEWS

Mark Graves, ***Mind, Brain and the Elusive Soul: Human Systems of Cognitive Science and Religion.*** Ashgate, 2008; pp. 244; hardback, ISBN 978-0-7546-6226-6, £ 55.00.

REVIEWED BY JAY R. FEIERMAN

Through a weaving together of a dozen or so highly technical fields of knowledge in the physical and biological sciences this book attempts to re-define the human soul to be more compatible with modern science. Can that be done without losing the literal meaning of the term by people of faith? On page 1 of Chapter 1 the book also claims to answer the big question, "What does it mean to be a human person?" That is a big goal for someone whose previous book was *Designing XML Databases* (2002)! Let's see how well these goals are achieved.

In chapter 1 the author makes it quite clear that the brain by itself cannot explain mental activity, and the mind does not exist without a brain. That crudely means that if one squashes a brain, there is no longer a mind. Yet, for people of faith, such an activity does not eliminate the soul. In leading up to the author's solution, he deftly leads the reader through the history of philosophy of mind and the various theological and philosophical problems and solutions related to the mind body problem through the centuries. The usual cast of characters comes forth: Aristotle, Plato, Aquinas,

Descartes, James, and many other familiar more modern names.

Before getting into the more touchy issue of the soul, Graves asks "How do the mind and body affect each other?" (p. 4). He explains that for philosophers, "it seems impossible that causal relations should exist between two completely different realms – the physical realm of extended material objects and the mental realm of mind" (p. 4). Yet, he seems to have at least showed his hand by rather assuredly saying, ". . . every time one decides to act, the mind influences the world" (p. 4). But so much with the mind body problem; the more interesting issue is the elusive soul. According to Graves the human soul has form, which he defines as "the configuration, shape, or essence of an object" (p. 205).

Under the heading entitled "Soul as Form of the Body," which implies a type of monism, Graves says "When people talk of 'soul' they typically refer to a separate essence of a person that may or may not leave the body upon death" (p. 7). Graves says that "I focus on integration and a systematic synthesis of aspects of the soul where both science and religion lay claim, namely the soul as it inhabits the body . . . and . . . I take a systems approach to science" (p. 11) to accomplish this task.

To resolve the confusion the author calls on cognitive science whose practioners he says sometimes have conflict among themselves because they "forget they study cognition, not the physical brain" (p. 7). Through Venn diagrams Graves attempts to show the relationship

between Psychology, Computer Science, Neuroscience, Philosophy, Religion, Linguistics, and Social Science. There is a small portion in the center of the diagrams where all these disciplines interact, which presumably identifies the content of this book.

We are then told reassuringly again that "A theological theory of the soul as the form of the body, which science appeared to dismiss, may prove a fertile basis to adapt for a coherent, complete, and accurate understanding of the person" (p. 21). A theological theory? That sounds more like science. The author then says, "As far as I know, this book presents the first scholarly attempt to relate religion and computer science other than artificial intelligence" (p. 22). How many people are going to understand religion, computer science, philosophy, psychology, theology, systems theory, biochemistry, biophysics, neuroscience, and a handful of other highly technical sciences enough to follow where he's going with this idea?

Graves then says, "However, the broad range of topics just mentioned – modeling systems of relationships as constraints; categorizing real possibility in dynamic forms; relationship between individuals as community; and using semiotics to relate natural and mental relationships, especially learning, memory, and decision making and their unifying biological basis in brain – might not unify. But they do unify, and like the five blind people each trying to describe an elephant by touching one part, they unify by each providing a perspective on religion's contribution – the human soul" (p. 23). If these

diverse topics (and sciences) have woven a unifying pattern, it is not one that is easily discernible and applicable to the soul of faith, at least for this reviewer.

Much of the book is devoted to giving the reader new knowledge by a series of short-courses in all these highly technical specialties. Many of the new technical terms are defined but without a background in these highly specialized areas there are no pegs on which to hang the new knowledge. A page later, one could easily get lost in techno-babble jargon. In addition, the usefulness of some of the scientific minutia to understanding the soul is questionable. Some examples include the physical chemistry of DNA on pages 54 and 55, of calcium ions on page 88, and details of the biochemistry of cyclic AMP on page 165.

The author tries to derive faith by which the soul is known through emergent systems engineering. But is that really necessary? Reading much of this argument reminded me why I didn't want to become an engineer and why eating is more pleasurable than looking at recipes. I wanted the answer to the most important and interesting aspects of the human soul: how it survives the destruction of the human brain. The answer I was looking for never really came. Instead, Graves says, ". . . as I use 'soul' it refers to a systems constellation of constitutive relationships regardless of emergent level. A rock, mountain, or lake may have a 'soul'" (p. 206). That's not a soul with which people of faith can easily identify.

One aspect of the book I did like addressed in part what happens when one's body dies if not a part of an

eschatological end of the world. On page 220 Graves rephrases, "when does life end?" as "when does a human system cease having an effect?" Physically when decomposed. Biologically, shortly after death when all cell function ceases. Psychologically, when autonomic sentience – response – animation ceases, such as brain death. Culturally, when no cultural system responds to the person, which may occur before or after individual death. Transcendently, a person may never live, or if continued in the interpretation of a community, never die." I asked myself why the rest of the book couldn't be as easy to follow and understand. Also, if that is what life after death really means, how many of us are going to be a Newton, Einstein, or Darwin who continue in the interpretation of the community after their own physical death. That is not the same thing as maintaining personal consciousness after death. And what does it mean to be a human person? That obviously cannot be derived through science alone.

In summary, this book is a highly technical argument by which the human soul can be reconciled with science. But reader beware that the human soul that is so reconciled is not going to be easily recognizable by people of faith. That may or may not be an issue of importance to some readers.

David L. Gosling, ***Science and the Indian Tradition: when Einstein met Tagore.*** Routledge, 2007; pp. 208; Hardcover, ISBN 978-0415402095, £75-00.

REVIEWED BY TOM GREEN

At the heart of this book, as the subtitle suggests, are the discussions about science and the nature of the universe between two Nobel Prize winners, Albert Einstein (1879-1955) and Rabindrananth Tagore (1861-1941), which took place in 1930. While Einstein remains perhaps the most celebrated of all scientists, Tagore, who won the literature prize for his poetry in 1913, is now seldom read outside of his native Bengal. One of the most laudable aims of this book is its attempt to bring to light not only the scientific interests of religious figures such as Tagore, who was prominent in the Hindu reform movement known as the Brahmo Samaj, but also to celebrate the remarkable achievements of some of the greatest modern Indian scientists, not all of whom have been given the credit that is their due.

Gosling leads up to his study of these pioneers of modern Indian science and the meeting between Einstein and Tagore by setting out the historical background to the development of modern science in India. A chapter on 'Science in India's intellectual renaissance' describes how the decision of the British to promote education through the medium of English, and the enthusiasm for science of prominent Indian reformers provided the context in which science was able to take root,

overcoming traditional scruples over, for instance, the use of cadavers in medical schools. Particular attention is given to the attempts of Hindu religious reformers to find, in the classical Indian philosophical traditions of Vedanta, a form of religion which would be compatible with a scientific world-view, not least because this is the heritage which Tagore brought to his discussions with Einstein.

The next chapter takes us back to the classical Vedantic roots of the thought of these nineteenth-century reformers with succinct descriptions of the teachings of Shankara and Ramanuja, and then, rather incongruously, an interesting account of the efforts of modern Indian Christian theologians to reconcile science with religion. This is followed by a fairly brisk summary of science in pre-colonial India, from the earliest engineering feats of the Indus Valley civilization, through the great advances in mathematics and astronomy in the classical period, up to the development of the study of medicine and the natural sciences under the Mughals, which precedes a survey of science in Europe up to the discoveries of Einstein. After a chapter on relativity and subsequent developments in physics up to the present day, which is perhaps a little hard-going for the layperson, we come to the most impressive part of the book which deals with the religious beliefs of Indian scientists.

The lives of the great Indian scientists of the late nineteenth and early twentieth centuries which Gosling recounts here make for fascinating, and at times, inspiring reading. P. C. Roy and J. C. Bose not only made

important discoveries within their fields, but also contributed to the burgeoning nationalist movement with the boost to Indian prestige brought by their scientific achievements. The religious convictions of these and other leading scientists are examined, and we learn, for instance, that J.C. Bose approached his research with an almost mystical sense for the discovery of unity of all things, leading him to attempt some quite unusual experiments upon response phenomena in plants, while Meghnad Saha, who made important contributions in astrophysics, utterly rejected the authority of the Vedic scriptures and his friend Tagore's belief in God. The majority of the scientists covered here seem to lie between these two extremes; finding some religious significance in their work, whilst not being guided by it to the same extent as J.C. Bose.

A similar impression is given by the sociological survey of the religious beliefs of present-day scientists across India in which the majority of respondents seem not to find much conflict between science and religion or to have felt moved to discard their religious views because of their pursuit of science. This brings us to what is stated on the back cover as one of the principal aims of the book; to show that 'the Hindu, Muslim and Christian philosophical traditions have nothing to fear from scientific theories […]; indeed they may be mutually compatible.' When he shows that historically and in the present day, scientists in India have been and are able to reconcile religious belief and scientific practice and at times have even been inspired by their religion, Gosling

hopes to provide evidence against Western sceptics (that favourite bête noire, Dawkins, is mentioned on several occasions) and religious fundamentalists who contend that there can be no understanding between religion and science. The dialogue between Einstein and Tagore seems to be taken by Gosling as a shining example of good practice for future interactions between religious people and scientists, but if even the most metaphysically-minded of physicists and religious believers can seem to be 'talking almost at cross-purposes' (147), as one of Gosling's informants claims, then we might reasonably fear that the chances of a productive conversation between the majority of religious believers (who are far more traditional than Tagore) and the majority of scientists (who are far less open to the transcendent than Einstein) would be slim indeed. Nevertheless, this book gives us an important insight into the terms of this discussion in a tradition which seems to have avoided much of the rancour of the culture wars of the West.

Charles Foster, *The Selfless Gene: Living with God and Darwin*. Hodder and Stoughton, 2009; pp. xviii + 270; paperback, ISBN 978-0-340-96436-1, £11.99.

REVIEWED BY CHRISTOPHER SOUTHGATE

My first thought on picking up this book was one of dread. The author is a barrister and judge, who originally studied veterinary medicine at Cambridge. But the blurb

makes no reference to any theological training, and I therefore feared a rather slight, Dawkins-bashing engagement with the crucial and highly topical conversation between evolution and Christian theology.

So I should say at once that I was very pleasantly surprised by the book. Foster writes it, he says, because he is 'angry and worried' (xiii). He fears that people will be misled by Dawkins, whom he describes as being 'on the extreme jack-booted right wing of evolutionary biology' (xiii). But if anything he is even more concerned at the prevalence of the 'scientifically naked' views of creationists and supporters of intelligent design. He wants the reader to avoid these empty extremes and engage properly with both disciplines, and he is reasonably successful at this. Moreover, the book is written fluently and accessibly, and could be devoured easily on a longish train journey.

I particularly admired the non-technical exposition of evolutionary theory that occupies Ch.1. Foster then gives a competent summary of the positions of 'North Oxford' (Dawkins) and 'North Kentucky' (creationism), tracing the roots of such views back to T.H. Huxley on the one hand and Seventh Day Adventism on the other. Ch. 3 looks carefully at classic objections to the integrity of the evolutionary account offered by contemporary science, making it clear why creationists' objections simply lack substance.

Threaded through these early chapters are hints that natural selection, enormously powerful explanation though it is, is not the whole of the story. Foster points to

the very widespread occurrence of co-operation, even self-sacrifice, in the natural world. He rightly concludes that someone committed to a strict evolutionary paradigm would be unable to see genuine altruism even if the evidence were there in front of them. For Foster this abundance of self-giving points to 'another force operating alongside natural selection: a force that is an ally of real community and real altruism; a force that rejoices in beauty for its own sake' (111). I make a similar move, perhaps rather more cautiously, in recent work.

Ch.5 is a fairly standard account of the debate about the evolutionary origin of religion. In Ch. 6 Foster returns to Genesis and offers a careful reading of the creation accounts there. One of the strengths of the book is that he takes the Bible very seriously, while being sensitive to the genres that formed accounts such as Genesis 1, and 2-3.

By Ch. 7 Foster is ready for the great challenge that evolution poses to theology, that of the sheer extent of suffering and waste in evolution. He makes over the next two chapters a workmanlike effort at this very difficult problem. But it is here that one wishes he had spent more time with the contemporary literature in the field, in particular the work of Arthur Peacocke, Denis Edwards, John Haught, Neil Messer and myself. I was left concluding that too much energy had been expended on the debate with creationists, and not quite enough reflection had been devoted to this great theological problem. Foster is quite dependent on a few articles in the collection *Animals on the Agenda* edited by Linzey and

Yamamoto – an important book, but not quite enough of a mainstay in tackling evolutionary theodicy.

Foster properly rejects certain traditional moves, such as negating the reality or moral importance of animal suffering, or assigning it all to the sin of the first humans. He is also able to reject Holmes Rolston's view that the recycling of the matter of animal bodies constitutes their redemption. And he rightly questions a process-type theodicy based only on God's co-suffering with creatures. Interestingly he makes the same move I have myself made in various published writings – extending Ivan Karamazov's objections to the cosmic system to cover animal as well as human suffering.

Foster comes down to three solutions – an appeal to mystery, an appeal to necessity, and a primordial cosmic struggle. Mystery does not take one far. Necessity he thinks does not constitute an adequate theodicy, so that too is rejected. (Here he makes a wrong turn in my view, not recognising that necessity might be an important element in a theodicy, but incomplete by itself.) That leaves him with cosmic struggle, in other words with an appeal to a primordial dualism, for which he drafts in C.S. Lewis in support. But on the next page he has to ask himself:

> Could God have stopped the corruption? We must presume that he (sic) could…If God could have excised this primordial cancer without free will being at stake, why did he not do it? We do not know. We are given no hints. All that we can say is

> that because he is love, he loathes it; because he is peace, he is at war with it; because he is ingenious, he can bring good things even out of bad; because he is almighty, he will ultimately triumph over it.' (184).

Foster here undoes a lot of the good work he has done in earlier chapters. He dissects out the scientific account into the good 'blueprint' and the 'coffee spilled on it', whereas in earlier sections he has shown ably that the narrative of evolution by natural selection hangs together and is all of a piece. He also moves into extremely questionable theological territory by supposing that the alien power has such influence over the creation, and when confronted with the simple, obvious question about why God does not undo the corruption Foster retreats into mystery after all. Although well aware of the biblical passages that seem to speak of God's care for and co-operation of the predator, Foster offers no reconciliation between those texts and his (questionably biblical) dualism. This is my concern about his not having gone deep enough into the key theological issue.

However, the book ends with a very capable chapter on human evolution, which I would certainly recommend to my students as pre-reading. (Here the great omission was Wentzel van Huyssteen's Gifford Lectures, published as *Alone in the World?*) So there is much to commend in this book. I wish I thought it would convince more creationists and Dawkinsites than it in fact will.

Joel B. Green, ***Body, Soul, and Human Life: The Nature of Humanity in the Bible.***
Paternoster and BakerAcademic, 2008; pp. 240; paperback
ISBN 978-1-84227-539-9, $ 24.95

REVIEWED BY SJOERD BONTING

The author is a New Testament scholar, who additionally did graduate work in neuroscience. The purpose of his book is to bring together the insights from neuroscience and biblical teaching on the human person.

Chapter 1 (Bible, science, human person) Green presents here the views of a great number of theologians on anthropology, but without giving the biblical views. Then follows a section 'Why Science Matters', where I miss arguments for the possibility of a dialogue between theological and scientific insights. Green extensively discusses the arguments for accepting the existence of the soul, and finds it strange that science cannot work with this concept. If he would have substituted 'mind' (including religious thought) for 'soul', he would have found that both theology and science can address this concept.

Chapter 2 (What does it mean to be human), particularly what makes us different from other primates. Interesting is Green's conclusion that for Peter *sarx* means life as it reflects and/or pertains to this world, *psyche* the same to the world to come. Humans are not 'human' on account of their purported possession of a 'soul', says Green. Holy behaviour includes family and community

respect, religious loyalty, economic relationships, workers' rights, social compassion, judicial integrity, neighbourly attitudes and conduct, sexual integrity, exclusion of idolatry, racial equality, and commercial honesty (Lev. 19; Ps. 8:5-9; Ps. 144:3-4; Heb. 2:6-9; 1 Peter 1:15-16).

Green sees these texts as christological more than anthropological. Christ is the image of God in the sense that (1) he represents God to the creation in the way that the first human beings were called, but failed, to do; (2) he enables humans to achieve the directedness to God of which their fallenness had deprived them.

In the end Green rejects the 'soul' as an 'ontologically distinctive possession of humans', since the Genesis accounts of human creation do not provide a basis for this. He also states that science and Scripture do not provide the same portrait of the human person, although he has not yet presented the scientific story.

Chapter 3 (Sin and freedom). This is the only chapter that offers a substantive presentation of neuroscientific insight. Green illustrates the limitation of 'free will' with the case where a brain tumor may have led a man to sexual misbehaviour through a loss of impulse control rather than a loss of moral knowledge. Genes are a necessary but insufficient contributor to human behaviour: "they provide the lines on the page, but do not determine what will be written."

His famous experiment led Benjamin Libet to argue against 'free will' in favour of 'free won't': we do not consciously cause a voluntary finger movement, but we

are capable of stopping it before it happens. Similar experiments led Daniel Wegner to state that conscious will is an illusion. Disorders of volition result from lesions to the orbitofrontal and prefrontal cortex. Subnormal activity in the prefrontal cortex may lead to a 'sick will' (inactivity, lack of ambition, autistic behaviour, depressed motor skills, behavioural inhibition). Neuroscientists claim that both nature and nurture sculpt the brain. Decision-making is embodied, but not in simple bottom-up terms as our neurobiological profile is itself in a state of ongoing formation and reformation.

Green then discusses the relation between free will and sin from biblical texts. Peter depicts sin as a power, as 'worldly cravings that wage war against life' (1 Pet. 2:11). Because of the work of Christ we can avoid sin (2:16; 4:1-3). We are capable of choice, though the capacity for transformation is God's gift. God has 'given us new birth', a transformation to a new way of thinking, feeling, believing, and behaving, an eschatological salvation by means of Christ's resurrection.

James sees sin as the child of desire; friendship with the world is enmity with God. He recognizes temptation (*peirasmos*) as a trial to be overcome (1:2-4).

Paul describes sin as enslavement to be replaced by enslavement to God's righteousness (Rom. 6:19). In Rom. 5:12 Paul expresses the universality of sin rather than the idea of original sin. In Rom. 5-6 he promises not 'remission of sin but liberation from our enslavement to sin'.

Green concludes that if I am constrained by my biology, this is nothing more or less than being constrained by myself. He claims, without solid arguments, that the relative indeterminacy of human behaviour is due to the complexity of neuronal processes.

Chapter 4 (Being human, being saved) deals with conversion and repentance (*metanoia*). Green mentions Andrew Newberg's scanning studies of meditating monks and rightly concludes that we see here the biological substrate of spiritual experience. However, he cannot point to the biological substrate of *metanoia* for the simple reason that no one has been able to scan a person in this situation. He briefly mentions the phenomenon of 'neural plasticity' (the formation of new neural connections) in the newborn and London taxi drivers, but in the latter only enlargement of the posterior hippocampus is found. Again, no findings of new neural connections during *metanoia* have been reported. The chapter is concluded with a study of *metanoia* in Luke and Acts.

Chapter 5 (Resurrection of the body). This final chapter gives an extensive biblical study of the ideas about life after death but without any references to neuroscience and the so-called near-death experiences of persons reanimated after heart failure. Green concludes that Jewish belief saw the human person as a psychosomatic unity without liberation of an immortal soul from the mortal body upon death.

Green doubts the existence of an intermediate stage between death and resurrection. Notwithstanding the parable of the rich man and Lazarus (Lk. 16:19-31), where the rich man is suffering in Hades, while Lazarus is in a blissful state in Abraham's bosom. Yet, says Green, "we would be ill-advised to imagine that Jesus speaks in this account of disembodied existence in a place and time that stands between this life and the next." He questions whether there is actually any time elapsing between death and the last day, as this idea is based on our earthly clock time. He disregards the idea that the intermediate state would provide a period of spiritual growth preparing us for eternity life.

In a study of the resurrection body, Green concludes that the post-resurrection Jesus is neither a reanimated person, nor a disembodied immortal soul. According to Paul we have in this life a *psychikos* body - with all its imperfections - and in the next a *pneumatikos* body (1 Cor. 15) and nothing of the earthly body is immortal. Green concludes from 1 Cor. 15 and 2 Cor. 5:1-10 that there is no basis for "a disembodied, human existence in an intermediate state" (177). Could it not be that Paul is simply not speaking about an intermediate state?

I agree with Green's final lines: "the capacity for 'afterlife' is not a property of humanity, but is a divine gift, divinely enacted. It also underscores the reality that, in eschatological salvation, we are not rescued from the cosmos in resurrection, but transformed with it in new creation" (180).

On the whole, the book is strong on biblical exegesis but weak on relating this to neuroscientific insights.

Alister E. McGrath, *A Fine-Tuned Universe: The Quest for God in Science and Theology*. Westminster John Knox Press, 2009; pp. 288; hardcover, ISBN 978-0664233105, £17.52.

REVIEWED BY JAMES HANNAM

This fine book, based on Alister McGrath's 2009 Gifford lectures, should be read by everyone who is interested in the interface between science and Christianity. In the first half of the book, McGrath lays out a sensible framework within which the fine-tuning of the universe in particular and natural theology in general can be examined. The second half is a case study, based primarily on biology, to illustrate how the principles in part one might be applied in practice.

These two contrasting halves mean that this a book which makes some demands on its readers. Those who come to it from McGrath's popular works (such as *The Dawkins Delusion?* or *The Twilight of Atheism*) may find it more hard-going than they had anticipated. Academic theologians will breeze happily through the first half but may find the discussion of the chemistry of adenosine triphosphate during photosynthesis from the second half more difficult. Nonetheless, no one can be but impressed by the breadth of McGrath's learning. And readers

should rise to the challenge of his erudition because McGrath's central argument about the use and abuse of natural theology is an important one.

As is well-known, the apologetic uses to which Christians have put nature vary through time. In late antiquity and the Middle Ages, the bestiary tradition sought to draw moral and scriptural lessons from animals and plants (for instance, the beaver's alleged behaviour of biting off its testicles to misdirect a hunter was said to illustrate the way that the Christian man must cast off his sin to escape the devil). By the sixteenth century, the message had been reversed. No longer was religious knowledge used to illuminate nature. Now nature provided evidence for the truth of religion. Thus we find Elizabethan authors like Thomas Maplet and Henry Howard commending people to study the natural world so that "they may be moued at this working of God in these such his inferiour Creatures." This line of thought developed into the classic design argument of eighteenth-century natural theology which Newton appended to his *Principia* in the *General Scholium* (1713) and was brought to perfection in William Paley's *Natural Theology* (1802).

But after Darwin, we have always been led to believe, the wheels to come off the natural-theology project. McGrath wants to use the phenomena of fine-tuning to produce a new natural theology which is both more and less ambitious than the original. It's more ambitious because it is explicitly Trinitarian; but unlike Paley, it keeps its sights lower since it is not in the business of

proof. Instead, following Charles Pierce and others, McGrath sees natural theology as seeking out surprising facts which, when viewed through a Christian lens, turn out to be unsurprising or even expected. A universe equipped with laws of physics that are fine-tuned to allow for the appearance of intelligent life is simply the most obvious example.

In the second half of the book, McGrath looks at some of the surprising facts about the chemistry of life such as the properties of water, convergent evolution and the mechanism of DNA. He also carefully delineates what evolution can and cannot explain. In particular, it cannot explain the appearance of the process that made it possible in the first place.

Finally, McGrath takes us back to St Augustine to take a look at 'emergence'. A property of system is emergent if cannot be predicted from the underlying properties of the system's constituent parts. One simple example is that the ductility of gold is not something that anyone could figure out from a study of gold atoms alone. A more complex and controversial example is that consciousness is not something predictable on the basis of the properties of neurons. Emergence remains a field where science has made little progress because its usual methods of reduction and simplification do not work. McGrath examines this area through St Augustine's concept of "rational seeds", often mistakenly thought to be a precursor to evolutionary theory. Emergence is another surprising fact that a theistic viewpoint makes rather less startling.

A Fine-Tuned Universe is a short book and occasionally betrays its origins as a series of lectures in appearing rather cursory. In particular, this reviewer found little in McGrath's results that seemed to be the result of a Trinitarian rather than simply theistic perspective. And the second half of the book is very much a work-in-progress. But McGrath has written in more depth elsewhere and promises to continue his reflections in future publications. On the strength of this book, we have much to look forward to.

Peter S Williams, *A Sceptics Guide to Atheism, God is not Dead.* Paternoster, 2007; pp. 299; paperback, ISBN 978-1-84227-617-4, £12.99.

REVIEWED BY PHILIP BIGH

We are indebted to the New Atheists (NAs), as they have been called, for setting the Science and Religion debate on fire by their vigorous denouncement of religion.

Williams' book, by its very title, is written to undermine the self assuredness of this relatively small but articulate and high profile band of militant atheists. It is Dawkins' best seller *The God Delusion* (2006) that is often the main focus for the Christian response and Williams is no exception in this; but other main contenders, such as Harris, Hitchens, Grayling and Dennett, also come into his line of fire. He selects out

their most salient criticisms of theism (mainly Christian) and, with an unrelenting battery of well chosen quotations from the religious press and downloads from the internet, seeks to undermine their arguments as much by the weight of opinion he levels against them as by the rational arguments he weaves around them.

The trouble is that Dawkins *et al* are strong on rhetoric and weak on reasonable discussion. Williams refers repeatedly to their technique of setting up straw men who it is all too easy to knock down. But, as he provides us with their most iconic quotes, we see that Williams finds himself inadvertently doing likewise!

As they determine to resurrect the nineteenth century conflict between science and religion, Williams first addresses their criticism that religion is the 'root of all evil' (Chapter 3). Look at the atrocities done in its name. Without religion there would be no suicide bombers! (p. 62). And the doctrine of hell is 'an extreme example of mental abuse as sodomy is of physical abuse. (Dawkins p.77) There is much use made of this powerful emotional reasoning. (Williams points out that Dawkins' picture of reality as 'pitiless indifference' (p.80) can be no less damaging mentally).

At the heart of their attack on religion is their affirmation that religion is the 'greatest threat to rationality and scientific progress' as it is 'impervious to reason' (Dennett, p.62). Dawkins' famous definition of religion as 'blind trust in the absence of evidence, even in the teeth of evidence" (p.72) seems to haunt the pages of this book.

The NAs philosophical (no-metaphysics) position is that of naturalistic reductionism, and so Williams must addresses their 'nothing-buttery' arguments (chapter 4), in particular that religion is 'nothing but' a Darwinian adaptation to promote successful survival. So 'there is no necessity for God as science explains everything' (Atkins p.137). Therefore all attempts to reconcile faith with science 'are assigned to failure and ridicule' (Hitchens p. 119). Science is 'the search for an exclusively naturalist explanation' (p.120). This leads into chapter 6 and their claim of a significant absence of evidence for a belief in a God - inevitably so if all evidence has to be scientific. But Williams *et al* argue that often we must go beyond the borders of science (empirical evidence) in order to explain adequately our experience of reality, as science 'is not sufficient for all our cognitive needs' (Hartshorne p. 140). Belief in God may be *warranted* for people grounded in experience beyond that of scientific experimentation (Plantinga). Williams makes much of Plantinga's 'properly basic beliefs' for a noetic world - that brains working reliably and 'normally' give us essential truth and 'insight' on which the whole of our rational understanding is based (including that of science and atheism). If so we can put our trust in human reason and thus in Natural Theology in that there is evidence in the natural order of things through the use of natural reason and experience for God's presence in his world (chapter 7) .

When the NAs venture into philosophical territory we soon see why Hume the empiricist, sceptical of

metaphysics, and Kant with his distinction between the objective 'starry heavens above' and the subjective 'moral law within' are two of their most popular philosophers (but see page 183). Williams contests with the evolutionary biologists on the whole question of moral values which they hold are merely subjective assertion and not objectively true or false (p.80). As Dawkins himself concedes: "It is pretty hard to defend absolute morals on grounds other than religious ones" (p.190).

Dawkins in complimented for taking on the philosopher but limits himself to demonstrating the 'vacuous' nature of the arguments of the two famous medieval philosophers Anselm with his ontological argument and Aquinas' five ways version of the cosmological one (The modern design arguments in terms of 'anthropic' and 'many worlds' models and Dawkins' opinions on these are discussed on pages 191ff.). It is not difficult for Williams as a philosopher to demonstrate how Dawkins misrepresents both of these. Plantinga believes that 'many of his arguments would receive a failure grade in a sophomore philosophy class' (p.212).

Williams affirms that truth claims should be taken seriously if they have empirical (scientific) support. It is therefore appropriate that he has provided an appendix summarising the empirical evidence for truth claims about Jesus as an historical figure. And it is good to be reminded that it was scientific evidence that eventually persuaded one of the great atheistic philosophers of the

20th century to become a turncoat (Anthony Flew) and the physicist, Paul Davies, to remain an agnostic.

This is an invaluable book to have on the shelf as an up to date reference for key issues, quotations and characters in this great debate. It will probably make one more sceptical about atheism as Williams deftly exposes the Achilles' heel of these more virulent of advocates. On reading it one can only agree with Warburton that "Confident assertion is no substitute for argument." (p. 121)

Constance M. Bertka (Ed.), ***Exploring the Origin, Extent, and Future of Life: Philosophical, Ethical and Theological Perspectives***. Cambridge University Press, 2009; pp. 336; Cloth, ISBN 978-0-521-86363-6, £65-00.

REVIEWED BY CHRISTOPHER SOUTHGATE

This is a most interesting and diverse collection of papers, which will stimulate a wide variety of readers. It stems from a consultation sponsored by the American Association for the Advancement of Science, and it is good to see AAAS promoting a dialogue on 'Science, Ethics and Religion'. (Sad to say, I am not sure I can see the current Royal Society doing the same.) Funding was also obtained from NASA and the Templeton Foundation.

The first section is on the origin of life itself. In her introduction the editor notes the importance of the

debate, not least as a focus of the altercation between evolution, creationism and intelligent design (ID), and concludes that astrobiology is the ideal discipline for expanding our vision and developing interdisciplinary dialogue. Disappointingly, in what was evidently a massive editorial undertaking, there are a couple of errors in her own piece. She refers to a 'theist spiritualist' meaning a spiritually-aware theist, on p. 8, and on the same page misspells 'magisteria'.

Robert M. Hazen provides the scientific background, stressing the sheer difficulty of this type of research, not least because, on Earth at least, fully evolved cells would quickly have competed out all proto-biotic entities. It may be, however, that on Mars, or Europa, this process may have progressed only part of the way. Hazen claims that everyone agrees that liquid water is a necessity. In this regard it would have been good if he had noted the suggestion of Terrence Deacon that key precursors of cellular life – Deacon proposes an entity called the autocell – may have developed in non-aqueous environments. His point is that water is so reactive as to make the evolution of most known biological macromolecules very difficult.

Hazen notes the classic difficulties over concentration – how are the reactants to be sufficiently localised for complexity to emerge – and chirality, and the familiar controversy over the priority of metabolism or self-replication. (Readers of this journal will recall the proposal of my colleague Andrew Robinson in a review

article in 2007 that another key property to emerge is semiosis, the interpretation of signs.)

James E. Strick notes the changing definitions of life from Aristotle onwards. It is a fascinating part of the dynamic of this debate that a clear definition still eludes the scholarly community. But it is agreed – ID fraternity excluded – that there is a naturalistic explanation of the emergence of life. Iris Fry explores this, and the character of the ID alternatives. ID is also a concern to Ernan McMullin, in a piece I particularly enjoyed. He properly points that ID proposals – 'strong' and 'weak' alike – underestimate the resources of the scientific imagination. McMullin goes on to explore the richness of the Christian tradition, with a particular emphasis on Augustine's understanding of *rationes seminales*. Not, as McMullin has to admit, that Augustine would have envisaged the transformation of species. Rather one would have to point to a weaker consonance with evolutionary theory – clearly Augustine did defend a gradualist view of origins, for which the causal resources were there from the beginning.

The origin of life is one of the many interests of Celia Deane-Drummond, former chair of the Forum. She also rejects ID – design is inferred from faith, rather than preceding it. She is attracted by Simon Conway Morris's emphasis on convergent evolution which, she claims, 'suggests constraints in the biological processes that are not amenable to merely physical explanation' (101). It is not quite clear why she should think this. When the constraints are better understood a naturalistic

explanation will emerge; theists will continue to want to hold alongside this a theological explanation. Deane-Drummond goes on, more helpfully, to speak of God 'resonating with life, luring life towards a particular future as affirmed by God' (101). This 'resonance' she thinks might be termed God's wisdom. She concludes her essay with a familiar appeal to the importance of prudence, and on not giving up on the search for wisdom.

The volume now moves on to the extent of life. Lynn J. Rothschild points to the bleak future for life on Earth – long before the expansion of the Sun overheats our planet, the migration of the Moon will lead to a profoundly unstable climate. However, she is more positive about possible emergence of life on other bodies – a cold water geyser was reported on the Saturnian moon Enceladus in 2006. And on the Jovian moon Europa she sees no 'show-stoppers', parameters outside the range known for ecological niches on Earth.

Carl P. Pilcher and Jack J. Lissauer explore the quest for life beyond the solar system. The problem of course is what to look for (a more recent book, Paul Davies' *The Eerie Silence: are we alone in the universe* (Allen Lane, 2010), claims we are looking in the wrong places). Much depends what phase life has reached – ozone would be a very interesting sign, but was absent from Earth's atmosphere until around 2.2 billion years ago. Steven J. Dick explores the history of thought about the extent of life. This was very interesting material. While Aristotelian thought was dominant it was hard to think of more than

one centre at which the elements might concentrate. But Dick recounts how the thought of first Ockham and then Oresme broke out of this limitation. This surely prepared the way for Copernicus' model (though Dick does not remark on this). The Copernican universe decentred the Earth both in terms of physics and also by implication for biology. The further question then arises as to the implications for the doctrine of redemption.

Mark Lupisella considers issues of epistemology, ethics, and worldview. In particular, he considers whether we are in a position to safeguard the ecological integrity of any life we might discover. Also, how many negative results would justify us in classifying a place as lifeless? He then breaks open questions of value – in particular the assignment of intrinsic value to extraterrestrial organisms and/or places. Margaret Race points out that there has been inadequate consideration (outside the SETI community) of the implications of discovering extraterrestrial life. Cynthia Croysdale considers what might be the implications for our understanding of God and creation. She is attracted to the picture found in Polkinghorne, Peacocke, Haught (and also Rolston) of God as the communicator of information.

The last section of the book was of particular interest to me. Chris McKay considers the proposal (which originated I think with James Lovelock) that Mars might be 'terraformed'. McKay considers that Mars could be warmed to Earth-like temperatures in as little as 100 years. However, to engender an oxygen atmosphere might take 100 000 years, so McKay concludes that Mars

could never support a significant population of humans. Turning to ethics, McKay makes a plea for the intrinsic value of Martian life, more particularly if it proved to be of independent origin from terrestrial life. Kelly C. Smith however takes issue with schemes based on intrinsic value, and argues for a ratiocentric ethic. Smith points out that this ethic, which considers most non-human entities to be only of instrumental value, may well lead to very similar conclusions to an intrinsic-value-based scheme (Holmes Rolston's analysis of the range of types of instrumental value would have helped here). However I felt Smith's grasp of the science was weaker than McKay's – he asks whether there is no way of maintained the native Martian environment, at least in part, short of blocking terraforming. To which the answer is almost certainly that there is no way, so profound would the change in planetary environment involved in terraforming have to be.

Richard Randolph offers a Christian theological ethicist's take on the subject. He makes an interesting move in positing God's 'preferential option of life' (286) – that God prefers, values and privileges life over non-life. (The Nicene Creed would have helped him here.) He derives from the Genesis narratives a servant-steward model of human vocation – a distinctly contentious reading, especially when he cites T. Hiebert's view that in the Garden the human 'is viewed more an ordinary member of the community of life than as a privileged being set apart from it.' But a very interesting and helpful move of Randolph's is to consider our potential impact

on possible Martian life in terms of predation. He concludes however that if Mars did prove to be lifeless (I note how difficult that would be to establish this) then there would be a Christian encouragement for a project to promote life on it.

The book ends with a welcome reminder from Francisca Cho that the narrative of creation and life propounded by the three great monotheisms is only one type of story, and that both Greek and Asiatic philosophies and religions operated out of very different narrative understandings.

I congratulate the editor on pulling together such a fascinating volume, which could not fail to inform anyone interested in any aspect of the subject.

Alejandro García-Rivera, *The Garden of God: A Theological Cosmology*, Fortress, 2009; pp. xiv+157; paperback, ISBN 978-0-8006-6358-2, £14.99.

REVIEWED BY DAVID GRUMETT

When a young physicist working for Boeing in Seattle, Alejandro García-Rivera was one day moved from his routine work onto a project shrouded in secrecy. As he booted up his new computer, he discovered it to be the Air Launch Cruise Missile project, developed to visit catastrophic nuclear destruction on fellow humans and engulf the world in hellish conflagration. This experience marked for him the beginning of a conversion to a new theological cosmology.

Theologians from Augustine onwards have been comfortable with the image of the city. The city is a construction of human ideas, art, engineering and politics. As a metaphor it is overused, however, with the natural context of human life and theology thereby forgotten. The modern sprawling city so often no longer mediates cultural, natural and spiritual life but exhibits postmodern dislocation, social exclusion and unsustainable consumerism. Furthermore, what has been built quickly can be flattened just as rapidly as tastes or economic circumstances change.

García-Rivera argues that the time has come to replace the city with a more ancient biblical image: the garden. Primordial to human reflection, the image of the garden captures better the staggering complexity of the relationships on which human life rests and the consequent necessity to discover natural processes and work with them, rather than against them or in ignorance of them. He writes: 'Gardens are not manufactured but cultivated, their craft a collaboration between ourselves and the earth. They are not so much designed but discovered. The key to cultivating the garden of God is the discovery of those "centers" which issue forth beauty as abundant life.' (p. xi) Associated with these centres, the garden possesses intrinsic value, and should therefore be cared for and cultivated.

This vision also requires greater attention to the Cosmic Christ, who rules not only in human hearts but over the whole of the created order. García-Rivera is here greatly inspired by Pierre Teilhard de Chardin, although

recasts his christology by paying more attention to the Ascension as inaugurating Christ's cosmic reign. He also gives greater recognition to the Holy Spirit's role in effecting Christ's return into the world and the Church. Moreover, Teilhard's great emphasis on temporal eschatological progression is corrected by heightened attunement to place. As is noted, his little-studied aesthetics provide significant resources within his own theology for this.

Of particular interest is the defence and development of a theory of forms to undergird this theological aesthetics. Significantly, the classic understanding of a form as the original in a noumenal realm of multiple instantiations in the visible world is by no means incompatible with Darwin's view of living beings composing discrete species. A static view of nature can certainly no longer be defended, but a key point in the Neoplatonic theory of forms, it might be added, is that change is fundamental to the phenomenal world. Modern experience of change and transition points to an 'entanglement of beautiful living forms' (p. 127).

Part of the work of gardening involves attention to materiality, which is often sidelined in favour of more abstract interpretations of spirituality. Gardening is a co-creative enterprise with God, a 'work of the imagination that one can actually enter' (p. 119) in which humans trans-form matter and place. Gardening frequently does not succeed, however, and the garden is a place of limitation, failure, suffering and dying. But it is equally a place of 'remarkably controlled spiritual creativity of

great beauty' (p. 124). A 'garden discipline' is 'part technology and part art, a discipline of creative receptivity to the ground of the world out of which such a place is made … aimed at producing living forms of remarkable beauty and a beauty that forms our lives' (p. 125).

García-Rivera is a deft gardener, clearing much ground in limited space and planting his own vision beautifully and carefully. Many of these areas deserve further cultivation, not least that of form, instantiation and participation. Yet this in no way detracts from what is, in itself, an important and bold design that should encourage theologians to step outside some of their inherited constructions into a greener space.

PUBLICATIONS BY MEMBERS OF THE FORUM

Edward Echlin, *Climate and Christ,* Blackrock: Columba, 2010.

Michael Poole, *The 'New' Atheism,* Oxford: Lion Hudson, 2009.

BOOKS RECEIVED FOR REVIEW

Margaret Barker, *Creation,* London and New York: T&T Clark/ Continuum, 2010.

William P. Brown, *The Seven Pillars of Creation,* Oxford: OUP, 2010.

Jay R. Feierman, *The Biology of Religious Behaviour* Santa Barbara: Praeger, 2010.

Steve Fuller, *Science,* Durham: Acumen, 2010.

Jitse van der Meer and Scott Mandelbrote (eds), *Nature and Scripture in the Abrahamic Religions,* Leiden: Brill, 2009 (4 vols.)

The Editor welcomes offers to review these publications. Please contact him on c.c.b.southgate@ex.ac.uk

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