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Book Reviews

Richard Dawkins
The God Delusion
Bantam Press, 2006,
406pp. Hbk. £20 ISBN: 0593055489

Richard Dawkins has long been famous for his popularisation of Darwinism and for his atheism. This latest book is a best-seller in both the UK and the US and has received considerable media attention. Many think that it is a timely book, given the rise of the religious right in the US and the spread of Islamic militancy. There is now a new, paperback edition with brief responses to common criticisms of the original.

As the sales suggest, this is not an academic tome (though it does have endnotes and a bibliography). It is more like a sermon or work of popular apologetics, complete with stories, illustrations and quotations mixed with personal anecdotes and digressions. Dawkins engages with the arguments of opponents when he thinks points can be scored and tries to encourage the atheist faithful; atheists are like homosexuals were fifty years ago and need to come out of the closet. Objecting to the way that religious belief is often granted automatic respect and spared from criticism, Dawkins uses lots of bold rhetoric, fine phrases and passionate polemic. Dawkins' name-calling ('dyed-in-the-wool faith-heads') and summary dismissals ('barking mad') probably generate more heat than light and, though one may admire his plain-speaking, muscular atheism, many may feel that there is too little attempt to understand believers or their arguments. When he deals with philosophy, biblical studies, and history he is just as assertive as when he deals with biology, but without such good reason. On the other hand, though Dawkins' style may not impress the sophisticated, it does gain him popularity with a certain constituency, not to mention increased publicity, sales and consciousness raising. Other atheists may be able to follow the trail Dawkins has blazed with more measured steps.

What about the substance? When all the rhetoric and homiletic padding is removed, the outlines of his case remain: the arguments for believing in God are weak, while there remains reason to think there almost certainly is no God. The Gospels are historically unreliable. Religious experience could easily be just illusion generated by our fallible brains. Contrary to the claims of Creationism and Intelligent Design, atheistic science can offer plausible explanations of life, our moral sense and belief in God, but any creator would have to be even more complicated, improbable and in need of explanation than the things he is meant to explain. Frustratingly, Dawkins does not justify this latter assertion, but many may be tempted by the claim that an omniscient God would have to be in some sense complex.

In addition, Dawkins highlights places in the Old Testament where God commands or commits what would now be seen as atrocities, and notes how religion can make people anti-science, anti-gay, violent, intolerant and reactionary. He protests at the religious indoctrination and labelling of children before they are able to understand what is at stake. He makes little attempt to note the positive effects of belief, defending himself on the grounds that others do this and that, even if religion were totally beneficial, that still wouldn't make it true.

Despite its problems, the book has succeeded in its goal of consciousness-raising. In the market place of ideas, evangelical atheism is out and proud and on sale in the supermarket. Given its popularity, apologists should seize the opportunity to argue a substantial, positive case in response. It will not do to show merely that Dawkins has an amateur grasp of

theology or to quibble about details and style. As Dawkins notes, even if he is ignorant of learned tomes on ruffled pantaloons and silken underwear, the real question is whether the Emperor has any clothes.

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John Polkinghorne

Science and the Trinity: The Christian Encounter with Reality

London: SPCK, 2004. 184pp. hb. £16.99.
ISBN 0-281-05644-7

The scientist-theologian John Polkinghorne does not need any special introduction. One of the influential figures in the science-and-religion field, he is a prolific writer. However, *Science and the Trinity* is not just another book adding to the vast literature (at least in English) on the relationship between science and Christian theology. The book adopts a specific methodology, which (unfortunately) is rather unusual in the area: Polkinghorne deliberately starts from theological insights. In doing so, Science and the Trinity provides a refreshing corrective to the too often science-dominated approach in the literature on science-theology interactions; it allows theology its own place at the table, as a fully respectable and respected dialogue partner.

As the title indicates, Polkinghorne mainly explores the implications of the doctrine of the Trinity for our view of nature and the scientific enterprise. Related christological matters also find good attention in due course. Polkinghorne addresses in particular the questions of: different models of the science-and-theology dialogue (chap. 1), the use of Scripture in shaping our world and life view (chap. 2), a theology of nature in a Trinitarian perspective (chap. 3), different conceptions of the relationship between God and the world, and their comparative strengths and weaknesses (chap. 4), the place of the Eucharist in the Christian experience (chap. 5), and eschatological issues (chap. 6).

It is a welcome consequence of Polkinghorne's methodology that he retains more of the historical Christian creed than other scientist-theologians: he maintains an ontological, and not merely a functional, understanding of the Trinity (100), the virgin birth (29ff) and the bodily resurrection of Christ (22f); he explicitly subscribes to the Nicene and Chalcedonian creeds, defining orthodox Christology (29). The book helps the reader to realise the theological richness of these traditional beliefs. Far from being a left-over from past unscientific ages, they can play a significant role in shaping today a relevant view of nature and human experience. The section on the existential and eschatological implications of the bodily resurrection of Christ (166-169) can serve as a fine example of what I take to be one of the main strengths of the book.

Although Polkinghorne retains much of the traditional Trinitarian and Christological beliefs, one has to realise that in some important aspects, his conception of God departs from the classical view. In particular, he denies divine immutability (107f) and divine foreknowledge of the future (54, 108), adopting thus a view which shows affinities with open theism. His revisionary conception of God is closely linked to his understanding of creation as 'kenosis', which in fact changes God's nature itself: Polkinghorne views the act of creation as a divine 'act of self-limitation that truly allows creatures to be themselves and to make themselves' (85). Although he rightly stresses that creation is a freely willed decision of God, which allows him to resist pantheism and panentheism (93-97), he considers that God is so deeply involved with his creation that his very nature is affected: creation implies

'God's acceptance of a temporal pole within divinity' (108).

Polkinghorne offers his revised understanding of the relationship between God and the world as an answer to what he sees as being a short-coming of 'classical theism' exemplified by Augustine, Aquinas and Calvin. According to Polkinghorne, the tradition they represent laid too great an emphasis on God's transcendence, neglecting thereby His immanence (94). However, why Polkinghorne thinks that his proposal helps to promote divine immanence, is unclear to me.

A view of creation as self-limitation, by which God withdraws in order to make room for the creatures, seems to be rather opposite to a strong view of God's presence in his creation. In fact, the kenosis view of creation implicitly rests on the presupposition that God's unlimited sovereignty threatens the real existence and causal powers of the creatures. Therefore God has to limit himself, in order to allow creation to develop freely. The Augustinian strong notion of providence, taken up by Calvin, resists such a perspective, which postulates an antithesis between God's sovereignty and the freedom of creatures. As God is the transcendent Creator of the world, his government does not in the least come into conflict with the creatures' powers to act; quite on the contrary, it is the very foundation of the created capacities and abilities. It is a misunderstanding of the Augustinian-Calvinistic tradition to think that it stresses one-sidedly God's transcendence. Although it certainly does stress God's sovereignty, it understands God's absolute power as providing the very basis of the existence and freedom of the creation. There is no need for God to self-limit himself in order to make room for the created realm, because the same unlimited power expresses itself in the works of creation and providence.

May I suggest that such a strong view of providence is also essential to correct Polkinghorne's views on divine mutability. For 'classical theism', God is immanent in creation as the transcendent Creator. The modalities of His presence are a mystery to us, and the questions Polkinghorne raises are difficult ones, which we need to think about – even if it is only to acknowledge the limits of our grasp of the relationship between God and the world. Nevertheless, it is risky to consider that the act of creation introduces a change in God himself, as Polkinghorne does. For there lurks the danger of jeopardising the prominent biblical distinction between God and the world, and between the unchanging character of God and his free acts in creation and salvation history. (For an introduction to the difficult question of divine immutability, I would refer the reader to Nigel M. de S. Cameron, *The power and weakness of God : impassibility and orthodoxy*, Edinburgh, Rutherford House, 1990, and in particular to the contributions by Henri Blocher and Paul Helm).

Polkinghorne's understanding of divine action in the world is a direct consequence, it seems to me, of the insufficient balance between divine transcendence and immanence in his thought. He knows quantum mechanics too well to commit the rather common error of appealing to quantum mechanical uncertainty in order to find a place for human freedom and divine action, in addition to the operation of natural laws. Instead he turns to chaos theory and proposes to locate human and divine action in the unpredictability of the behaviour of complex systems (83f). Although he puts forward his view with some prudence, it is not clear to me how he avoids a God-of-the-(scientific)-gaps approach to providence. But as he has developed his views on causality at more length in former books, I do not want to dwell on the issue here.

It is important to conclude on one topic which is particularly prominent in the theology dominated approach of the book under review: the role of Scriptures. It is refreshing to see that Polkinghorne addresses the issue thoroughly. His treat-

ment rests on an impressive personal acquaintance with the Bible: as an Anglican priest, he reads the whole of the New Testament and long parts of the Old Testament every year (39f), attesting thereby practically how much the Scriptures matter for his faith and his outlook on the world. Contrary to some strands of liberal theology, he does not reduce the Bible to a mere witness of mankind's spiritual experience. Instead, he acknowledges divine self-revelation in historic acts, to which the biblical authors testify (43).

Nevertheless, he does not seem to accept divine inspiration of the written Word: the scriptural texts are human writings, expressing the experience of spiritual encounter of the divine. Such a view implies that human experience (and reason) is the final touchstone of theological insights. In conscious analogy to scientific practice, Polkinghorne wants to be a 'bottom-up' thinker also in theology, starting always from human experience (28, 100). Although close attention to spiritual experience can help usefully to bridle theological speculation, it may nevertheless be asked if such a limited view of divine revelation provides a sufficient basis upon which to 'take every thought captive to the obedience of Christ' (2 Cor. 10:5).

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Michael Ruse

The Evolution-Creation Struggle

Cambridge, MA, and London: Harvard University Press, 2005. 327pp. hb. £16.95. ISBN 0-674-01687-4

In his Prologue, Michael Ruse tells us, 'I will tell a tale of evolution and religion that will hold surprises for all of today's controversialists. The full story is far more complex than any of us, including (especially) us evolutionists, have realized. The dispute is more than merely a matter of right and wrong. At some deeper level, it involves commitments about the nature of reality and the status and obligations of humans in this reality.' I think what he means is that the evolution-creation 'struggle' is not going to disappear as a result of scientific discoveries or even biblical exegesis; it has its roots in our understanding of the nature of God and his work. A significant problem is that (in Ruse's words, p. 287),

> creationism is linked with premillennialism, and premillennialism is linked in America with the moral and political threats that many people perceive as impinging on our society. I do not see creationism vanishing anytime soon. Given the horrendous events that have already happened in this new millennium, it would be naive to expect otherwise. But that is no excuse for inaction. Those of us who love science must do more than simply restate our positions or criticize the opposition. We must understand our own assumptions and, equally, find out why others have (often) legitimate concerns. This is not a plea for weak-kneed compromise but [for] a more informed and better-informed and self-aware approach to the issues.

To which I reply with a heartfelt 'Amen'. A characteristic of science is that its conclusions are always provisional. We may be confident in our understandings, but we must be prepared to change in the light of fresh information. Likewise biblical *interpretations* should be open to change if new data emerge. This is seemingly more difficult for biblical exegetes. Notwithstanding that few (any?) Bible scholars defend slavery nowadays, at one time it seemed an apparently impregnable doctrine. There are perhaps more prepared to maintain that Creation took place six to ten thousand years ago, but the vast majority

agree with the consensus brought about by geological discoveries that the Earth is billions of years old.

Where Ruse's book is particularly helpful is in putting the evolution-creation debates in context. His starting point is not the 'scriptural geology' of the early nineteenth century nor the *Origin* in 1859, but unresolved conflicts dating back to early post Reformation times in the seventeenth century which he argues led to the deism of the eighteenth century. It well complements Ron Numbers' history *The Creationists* (reviewed in S&CB 6: 71): Ruse concentrates on debates whilst Numbers is more concerned with the debaters. Ruse emphasises the shift in science from treating evolution as an inevitable progression upwards to a process studied in its own right, a change he has documented previously in detail (in *Monad to Man*, 1995; *Mystery of Mysteries*, 1999; and *Darwinism and Design*, 2003). This change he traces from evolutionism as a philosophy in the way propounded by Erasmus Darwin, notoriously by Herbert Spencer, and then in different ways by the likes of Julian Huxley, Teilhard de Chardin, Bill Hamilton and Ed Wilson, to evolution as 'hard science', divorced as far as possible from sociological and political influences.

Ruse shows how evolutionism has been fed and moulded by an eclectic host: Hugh Miller, Cardinal Newman, Alfred Wallace, D.L.Moody (who preached on the 'Four Great Temptations': the theatre, Sabbath-breaking, Sunday newspapers, and atheism including evolution). He considers the distractions of Adventist thinking expounded by George McCready Price and its flowering in the biblical hyperorthodoxy of 'flood geology' by John Whitcomb and Henry Morris; the accusations of naturalism put forward by Alvin Plantinga and Phillip Johnson which have sprouted into William Dembski and Michael Behe's 'intelligent design'; and the 'frenzied polemics of Richard Dawkins and others'. He argues positively (p. 283) that 'one can be a methodological naturalist and a metaphysical supernaturalist at the same time, and, contrary to Johnson, this is not a stupid or inconsistent position. Many serious Christians have gone this route in the past century, including Ronald Fisher, Theodosius Dobzhansky, and Simon Conway Morris. Whether or not one accepts all that they say about the nature of life's history, they are in no sense scientifically inadequate or religiously insincere in arguing as they do.'

The Evolution-Creation Struggle is not a manual providing resolutions to deeply held positions nor a pastoral guide for nurturing bruised evolutionists or seething creationists; rather it is a series of excavations of inadequate and confusing assumptions by a philosopher who professes no religious commitment but who has thought and read deeply about the issues involved. I recommend it as a valuable account of how we have got to where we are and as a possible signpost for going forward.

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Robert John Russell (ed.)
Fifty Years in Science and Religion: Ian G. Barbour and his legacy

Aldershot: Ashgate Science and Religion Series, 2004. 353pp. pb. £15.00.
ISBN 0 7546 4118 X

This *Festschrift* from twenty international contributors is dedicated to Ian Barbour, whose pioneering work in the 1950s-1960s is credited with single-handedly creating 'science and religion' as an interdisciplinary field of academic study. Since that period, Barbour has made notable contributions to many of its aspects during a remarkable career. Without doubt, this volume is of personal, historical and academic interest to readers of *Science and Christian Belief*. Perhaps a majority, especially scientists,

will already be fully signed-up to *critical realism*, which here is credited as Barbour's grand idea. Certainly most will now fully agree with, and be partly indebted to Barbour for a strategy of constructive interactions between science and religion, or specifically Christian theology. However, some – like the reviewer – are uncomfortable with Barbour's general religious philosophy, with its background of process thought and panentheism, together with strong tendencies to one-directional traffic: remoulding religion(s) according to the latest scientific findings.

From the outset, Barbour has been rather hostile to the Augustinian and Reformed vision of the sovereignty of God over the universe, which for many is the presupposition for the intelligibility and feasibility of the entire scientific enterprise. This latter foundation is strong in other constructive scholars from the same era, such as T.F. Torrance. Differences over process thought are clarified elsewhere by Polkinghorne (*Scientists as Theologians*) and by others in Part 4 of the present volume. Moreover, theologians such as Kathryn Tanner have contended that Christian talk of reconciling claims of God's sovereign power with the creatures' own capacity for free action is indeed coherent when it conforms to certain rules for discourse about the transcendence and creative agency of God. Arguments to the contrary distort the import of traditional Christian claims.

Nevertheless, there are numerous ways in which students of this field must be profoundly grateful to Ian Barbour, always finding a clear-eyed view on numerous issues grounded in knowledge, insight and irenic intellectual integrity. Several contributors analyse his developing perspectives on methodology, including his famous fourfold typology of: conflict, independence, dialogue and integration. Nancey Murphy, in a seminal chapter, contends that Barbour's characteristic *via media* could be more apposite if *theology* rather than religion was taken as the appropriate dialogue partner with science, since this exists on a parallel logical level. By contrast, religion – as the penumbra of theology's umbra – allows rather too much in the way of diffuse thought and practice. Murphy contends that Barbour often seeks a midpoint between positions that are not in any sense on a spectrum.

The two longest parts of the volume deal respectively with Barbour's contribution to theological and ethical issues (part 3) and theological perspectives on his work (part 4). Part 3 includes significant analyses and critiques of Barbour's interest in a panentheistic metaphysic by Philip Clayton, who suggests that he should leave open a larger place for doctrinal considerations in his thought about God. Further treatments of issues in Physics and Cosmology by W.R. Stoeger and R.J. Russell are at a very high level and are of widespread interest. Several insightful contributions follow on Life Science issues by W.M. Richardson, M. Hewlett and Ted Peters.

Ian Barbour has a consistent concern for the ethics of scientific research and ensuing technologies. These aspects are also treated by R.L. Shinn, J.N. Scoville and C. Southgate. Finally in part 4, three pairs of scholars provide theological assessments in relation to process thought, Roman Catholic theology and Buddhist theology. These are indicative of the depth and breadth of interest generated by an outstanding scholar and religious thinker.

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Francis S. Collins

The Language of God. A scientist presents evidence for belief

London: Free Press, 2006. 295 pp. hb.
ISBN 978 0 7432 8639 8

This is an elegant account of the determination of our DNA code by the head of the Human Genome Project. Francis Collins has exceptional qualifications in biology for the task he undertakes in this book. There is a brief description of school days during which the author was raised in a liberal family where his ability to learn was encouraged. Considering himself an agnostic on entering university Collins embarked on his intriguing journey from atheism to acceptance of the Christian faith because this seemed more rational than disbelief. The author accepts that both scientific and spiritual values can coexist in his world-view.

It is from this position that Collins discusses the fascinating story about the astonishing complexity of DNA and the methodical unravelling of the mysteries of the human genome with its 3.1 billion letters. The author concludes that this cryptographic four-letter code was known only to God and describes it as the language of God. The author explains lucidly the complexities of sequencing of the Human Genome that has a universal application to life.

Collins considers that the eternal God is not threatened by discoveries about the natural world. It was the Almighty who set physical parameters just precisely right to allow the creation of galaxies, stars, the periodic table of elements, the planetary system, and life in its endless forms. Whereas family studies demonstrate relationships so also human genetic studies have now shown our relatedness to the rest of the living things in God's good creation. So Collins shows that our DNA profile closely resembles that of the chimpanzee and mouse.

Collins describes how DNA studies provide an outline of the interconnected tree of life confirming human descent from a common ancestor. The author sees this explanation meeting the Creator's requirements for an ordering of the natural world. Biology and medicine the author believes would be impossible to understand without considering this relatedness of all living things. Moreover Collins explains why Darwin's framework of variation and natural selection is correct. Here the term 'theory of evolution' does not imply uncertainty. Collins rejects a materialistic Darwinian interpretation, accepting the Christian world-view that is based on faith in God and that also respects science.

Collins then challenges the reader to face the issue of science and her/his attitude to the Christian faith. In his lucid style he tells why the principles of his faith complement the dictums of science. Science itself is trustworthy, progressive and self-correcting. Collins then outlines the options available to the individual. Some people have resorted to agnosticism and atheism, often aggressively using evolutionary theory against theistic beliefs.

The author then discusses 'creationism' and the beliefs of those committed to a literal interpretation of Genesis. It is a blunder, Collins says, to mistake the Holy Scriptures for elementary textbooks in biology, astronomy, geology or anthropology. Collins considers 'creationism' hopelessly flawed and incompatible with an understanding of today's science. Likewise the author sees 'Intelligent Design' as confusing the unknown with the unknowable, the unsolved with the unsolvable and consequently it does not qualify as a scientific theory. The author, with great care, shows why these two latter postulates, often sincerely held by some Christians, do not equate with an appreciation of the truth in scientific findings.

Theologians need to be more informed about the findings of science. We should acknowledge the unimaginable intelligence and creative genius of God and so

Collins posits an alternate concept called 'Science and faith in harmony' or BioLogos, the word of life. This term emphasises the web of both the biological sciences and the *Logos*, emphasising that truth is Truth. I highly recommend this book to all readers of this review as I found it a pleasure to read and would suggest that it be bought, read and then given to someone commencing academic studies.

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Alister E. McGrath

The Order of Things: Explorations in Scientific Theology

Oxford: Blackwell, 2006. 255pp. pb. £20.99. ISBN 1-4051-2555-1

McGrath's great strength is his determination to assimilate into theology the insights of science such as those of Piaget in psychology and Darwin in biology resulting in his 'Explorations in Scientific Theology'. His encyclopaedic knowledge and the depth and detail of his enquiry makes his one of the most exciting and original enterprises in contemporary theology.

He begins by affirming that the 'basic assumption of a scientific theology is that there can be a fundamental synergy between the working methods and assumptions of the natural sciences and Christian theology.' If this assumption is invalid, then Dawkins is right, 'science has eliminated God', dialogue between the two is impossible and the exploration is invalid. (21).

So he must first deal with the criticism of Dawkins that a scientific theology is intellectual nonsense (chapter 2). In *The God Delusion* (2006 – see p. 54f) Dawkins complains that McGrath can only repeat 'page after page' what he affirms here, that 'science can only work with naturalistic explanations' and therefore is 'incapable of adjudicating the God-hypothesis' (29); therefore Dawkins is not justified in using science as grounds for his atheism. McGrath develops his natural theology on the assumption 'that nature itself is capable of being *interpreted* in a variety of ways, all of which can be regarded as *legitimated* by the natural sciences, and none of which are actually *necessitated* by them' (30, italics mine). If all Dawkins is doing is interpreting nature in atheistic terms on the evidential basis of (legitimated by) science presumably McGrath would be happy: but what irritates McGrath is that he goes on to use it in a dogmatic denial of God – just as Dawkins is annoyed by the 'blind faith' of theists. At least neither of these contestants seems content with what Dawkins calls the 'poverty of agnosticism'! Both McGrath through his explorations in scientific theology and Dawkins on the basis of Darwinian evolution seek the evidential support of their own positions regarding the God-hypotheses and therefore, in a real sense, is not science being used as an adjudicator?

These essays (working papers) build up the case for a scientific theology from historical precedent as well as on the basis of scientific methodology in a way which is both exciting and fascinating, breaking new ground in our understanding of the relationship between the two.

In chapter 6 McGrath challenges the advance of Darwinism beyond the bounds of biology by pointing out, for example, the 'flawed analogy between genes and memes' (148) or 'cultural replicators' – and pounds away at the faulty logic which links these two concepts. Whereas genes are essentially molecular/chemical structures which contain codified information, memes *are* units of information residing in the brain which infect the mind 'leaping from brain to brain' and can spread like a viral infection; so whereas genes carry information, memes are the information itself – software not hardware.

The confident claim of a 'universal Darwinism' to provide a 'theory of every-

thing' is supported by its 150 year history not only in its mimetic understanding of the transmission of cultural ideas but its huge impact on political history and ideology, in economics as well as laying the foundation for new disciplines such as sociobiology and evolutionary psychology, interpreting ethical behaviour (see L. A. Dugatkin, *The Altruism Equation*, Princeton 2006), quite apart from giving devastating critiques of religion. Small wonder Dawkins can speak of the equivalent religious vision of nature as 'puny, pathetic, and measly' in comparison with the boldly brilliant one of science. (49). So it is that McGrath takes on the challenge of the goliath of atheism wielding the same methodological weapons to great effect.

He first points out that we must recognise that reality is *stratified* – a fact lost in the heyday of Renaissance classical thought that insisted on one universal methodology, the inductive reasoning of empirical science, to be applied essentially at the physical level alone. McGrath believes that this same empirical methodology which has given us an understanding of biological evolution may also be used to understand the evolution of doctrine as well by a 'sort of analogy between doctrinal development and biological evolution.' (156). This is to be understood as a maturing of ideas rather than a betrayal of the past, so that, even though doctrine may evolve according to the Darwinian paradigm, 'a discernible pattern of Christian truth… (remains)… embedded, like a genetic code, in the inspired text of scripture itself'. (117).

Taking the considerable evidence provided especially by Conway Morris of 'convergence' at work within the processes of biological evolution – which indicates that 'the emergence of certain possibilities might be *inevitable*' (157) – he argues that likewise, in the evolution of doctrine, there are found to emerge 'islands of stability'. This leads him to ask, for example, is Chalcedon an inevitable development of New Testament Christianity (156), in that the emergence of certain doctrines might be unavoidable? Christian doctrine as well as biological evolution is full of examples of 'developments waiting to happen' (162) (cf Dyson's, 'The universe knew we were coming'!).

Apart from this evolutionary model, he finds Piaget's scientific methodology (chapter 7) most helpful as its analytical method enables us to understand how new information is assimilated into existing conceptual schemes, such as cultural and doctrinal norms, and how the information becomes modified in the process (historical examples he gives of this process are Pelagianism, Ebionitism and Christ as hero in Anglo-Saxon culture); this process in turn slowly modifies the norms themselves. Eventually a new dynamic equilibrium is reached (islands of stability) which, though still open to modification, gives us 'the best fit' (182) for the present.

Chapter 8 is a fascinating consideration of the human process of 'Ordering the World'. As science seeks to discover order in a world 'characterised by regularity and intelligibility' (184) – despite the ubiquitous presence of contingency – cannot theology also see the idea of 'ordering' (*nomos*) as playing its part not only in the doctrine of creation but also in the economy (*eco-nomos*) of salvation where the divine household of God (*oikonomia*) – the existing church – is undergirding the 'entire trajectory' from creation through salvation to consummation? (185)

In chapter 9, in the light of his reasoning so far, McGrath asks whether systematic theology should be set in stone or subject to the process of *iteration* – of repeated modification and evaluation until a satisfactory degree of doctrinal maturity, and stability is reached (i.e. closure) through a process of convergence (195) made on the basis of historical observation and theoretical reflection.

In conclusion (chapter 10) he argues that a scientific theology must begin with what is observed and this is 'the observable social reality embodied in human history' (206), the actuality of the church, the starting point for an empirical theological methodology. But can an empirical methodology deal with social entities as it does so successfully with physical entities? (207) – hopefully so if reality is stratified. McGrath argues that there are brute facts and social facts. The church is a social fact and no less real for that. (216). His conviction that 'ontology determines epistemology', that the factual nature of the object determines our understanding of it not vice versa (the position of critical realism), is fundamental to his methodological reasoning.

It may be going too far to describe McGrath as the new Athanasius but, by enabling Christian doctrine to find a home within the concepts and methodology of contemporary science, he is doing what Athanasius did for the fourth century church in formulating its historic beliefs in doctrinal statements couched in the language and thought forms of the Greek philosophy of his own time, embedding them in his contemporary world, as McGrath is doing for us today.

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Celia E. Deane-Drummond
The Ethics of Nature

Oxford: Blackwell, 2004. 256pp. pb. £20.99. ISBN 0-632-22938-8

This book is a work of scholarship. The author has read very widely and shares the harvest with her readers. Each chapter has an average of one hundred references and the recommended further reading list, 'Selected Bibliography', occupies ten pages of small print. Here is a wonderful feast for some, an indigestible surfeit for others.

The book is more comprehensive than its title suggests. As might be predicted there are chapters on the Environment, Animal Ethics, Biotechnology Ethics and the Ethics of Gaia. Less expected are chapters on Cloning, Feminism and the Ethics of Nature and on Psychology and Moral Agency. Knowing, however, that the author sits on the Human Embryology and Fertilisation Authority makes clear why she has needed to tackle the first two of these issues in detail for herself.

Each chapter is an in-depth study with claim and counterclaim from different authors being assessed, with merits and faults evaluated. My favourite chapter is Animal Ethics where the author charts a skilful course between the Scylla of disrespect for animals (wrong) and the Charybdis of vegetarianism which she considers unnecessary.

Those who want a quick fix of easily digested information will find the author's approach too much for them. There is not a bullet point to be seen. But for those who want a literature review and critique of any of the topics of the Chapter headings listed above here is an excellent gateway to their subject.

Deane-Drummond criticises most of the authors to whom she refers. None produce an ethic that is satisfactory from both a Christian and a pragmatic stance. She herself returns time and time again to the writings of Thomas Aquinas and his 'virtue ethic'. He taught that it is only by cultivating the virtues of humility, love and prudence, directed by God given wisdom, that we can develop proper ethical attitudes. She defends Aquinas from accusations of hierarchism because he had a limited understanding of biology and from his anti-feminism, because he was a child of his time. His contribution is to stress the importance of our cultivating wisdom and the virtues if we are to make progress in our struggle with current ethical dilemmas affecting all aspects of the natural world. True indeed; but we are taught that the fear of the Lord is the beginning of wisdom so

that is where we need to start, a point perhaps taken for granted by the author.

The final chapter 'Towards an Ethic of Wisdom' summarises some of what has gone before and includes a brief mention of the wisdom of the cross and from that the possibility of hope and joy. This gives Christians an opportunity for a robust and hopefully joyful approach to the many gloom-laden issues with which we are faced to-day.

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Niles Eldredge

DARWIN discovering the tree of life

New York: WW Norton & Company, 2005. 256pp. hb. £23.
ISBN 0-393-05966-9

Written for the 200th anniversary of Darwin's birth Eldredge's book is a lavishly illustrated and well indexed presentation of Darwin's life and the implications of his theory.

Eldredge reckons that the heart of his book comes in chapters 3 and 4 where he analyses Darwin's thoughts as revealed in the private notebooks he kept whilst developing his theory. This contains material about whether science is advanced by induction from facts or testing of hypotheses, and also reveals Darwin's ability to generate ideas which he sometimes abandoned but were confirmed much later.

The first two chapters include a useful biography of Darwin including insights about his scientific ambition and anxiety to avoid ending up as a clergyman, and puts Darwin into the context of thought at that time of the nineteenth century. After the chapters on the notebooks there is a chapter 'Evolution after Darwin' showing how evolution has been confirmed in some of the modern divisions of biological science. Thus there are passages on fossils, embryology, and genetics. Darwin is regularly hailed as a genius in the chapters on his notebooks but Eldredge has to admit in this chapter that further research has altered Darwin's theory. Species were supposed to change very gradually through the ages under the pressure of natural selection to become a different species. Apparently the fossil record shows by contrast how stable a species is; evolution requires more than natural selection alone. There needs to be extinction, often through catastrophe, and isolation before natural selection can have its effect on a species presented with new opportunities. This section concludes with a description of how a modern study of the finches of the Galapagos Islands has triumphantly demonstrated the origin of new species as habitats change.

The first and last chapters of the book deal briefly with the philosophical implications of evolution. This helps to explain why Darwin hid his ideas almost as a guilty secret for twenty years before being forced to go public by Wallace's description of Natural Selection in 1858. In those early days of biological science it was thought that species were specially created (by God) with man as top species, and Darwin feared being seen to undermine the dignity this was supposed to give mankind. Eldredge acknowledges that many religious scientists have readily accepted evolution and gives a brief description of how its ethical implications have been developed. The malign application through the eugenics movement is acknowledged but the main influence Eldredge sees coming from the theory is that it firmly unites us with the rest of the animal kingdom.

The creationists are tackled in the final chapter. They are given another rehearsal of the main evidence for evolution. The believers in Intelligent Design are regarded as another sort of creationist, but they get their own rebuttal in a description of the development by intelli-

gent designers of the cornet! Eldredge believes that creationists are driven by their literalist approach to the Bible, and by the desire to see man responsible to a creator for his behaviour, but for him there is no need for a deity behind our laws.

A recent survey of a thousand students showed that 14% were still creationists. The anniversary this book is designed to celebrate comes in 2009 at which time there will no doubt be renewed criticism of creationism by scientists. This book is a good summary from a secular viewpoint of the evidence for evolution with more than enough about how Darwin developed his theory, and a brief treatment of the social ramifications of Darwinist thinking.

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Joel B. Green & Stuart L. Palmer (eds.)
In Search of the Soul: Four Views of the Mind-Body Problem
Downers Grove: IVP, 2005. 223pp. pb. £10.76. ISBN 0-8308-2773-0

It is clear to both Christian and non-Christian philosophers that recent physicalist and materialist theories of mind pose a potential threat to traditional Christian conceptions of the human soul and as Christianity still concerns itself with the salvation of the soul in the light of this challenge it needs to be clear about what exactly is being saved. *In Search of the Soul* exists as a response to this challenge. Four views are presented here ranging from quite classical dualist theories to the more physicalist conceptions that largely embrace recent work and may be termed what J. P. Moreland would call 'complementarian' theories of mind. This immediately reveals the diversity that exists in terms of Christian responses. Each contributor has the opportunity to respond to the other theories and this is one of the book's great strengths.

Stewart Goetz offers a theory of Substance Dualism that is arrived at in the main through introspection. Introspection convinces him that he is essentially a soul, and not a just a physical entity, a conviction, he says, he shares with most of the people in the world. His position is not compelling. Much of what he says runs into the same difficulties that Descartes' dualism does, especially the issue of psycho-physical interaction; just how, it is objected, do two radically different kinds of substance have any commerce with each other? Goetz argues that we cannot know that the soul does not have causal powers over the body; he believes that the soul can influence the neurons in the nervous system. Again, this is not compelling and would have little impact on physicalist philosophers. It is an argument based on ignorance and it is hard to seriously see how this fits in with the method of introspection. That the soul may be influencing millions of brain cells seems very unlikely and unnecessary. Also, as William Hasker points out in his response to Goetz' position, the method of introspection can bring another person to a completely different position. Peter Van Inwagen, for example, arrives at a conviction that he is a physical animal through introspection. Goetz knows this and states that, he at least is in the majority. He says, 'Van Inwagen's belief strikes one as puzzling in a way that mine does not' (56).

William Hasker offers a theory of Emergent Dualism. The idea of 'emergence', Hasker says, is 'when elements of a certain sort are assembled in the right way, something new comes into being' (76). Hasker offers examples where something like this clearly happens; the formation of crystals is one example. That the conscious mind could so emerge is more controversial but a quite attractive idea. The reason he terms this theory a 'dualist' one is that the soul on this account remains ontologically distinct from the body. One difficulty this theory

may run into for Christianity is that, if the body is logically distinct, but necessary for the mind to emerge, what kind of post mortem existence can the mind enjoy? Hasker deals with this through an appeal to God's power. God can sustain such a soul without the need for the body (and presumably allow the body to take over the job at the resurrection). This raises many questions. Some Christian philosophers and biblical scholars have abandoned the idea of a disembodied soul altogether, emphasising the 'self' rather than the soul.

Nancey Murphy and Kevin Corcoran offer materialist views. Nancey Murphy's paper most reflects recent work emerging from current scientific disciplines. For Murphy, the mind is nothing over and above the brain but neither is it ontologically reducible to the brain; for Murphy, the mind does enjoy causal powers. Murphy's position, whilst not really argued philosophically here will not be the most attractive to most Christians; nor does it take very seriously what David Chalmers calls the 'hard' problem of consciousness. Kevin Corcoran's 'constitutional' view is perhaps the most compelling and rigorous; Corcoran writes with an honesty and humility that is refreshing. The constitutional view shows that the human person cannot be reducible to the body but neither is it identical with it. Such a view tends to 'dissolve' rather than 'solve' the mind-body problem.

The book overall is an important one and clearly shows that Christians need not feel themselves too defensive over these issues. It will be of interest to students of philosophy of religion and Christians involved in the human sciences. Contemporary theories of mind rarely satisfy the demanding questions to do with such issues as qualia and intentionality or the unity of consciousness. It is certainly refreshing to see Christian thinkers involved in the debate at this level.

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William Paley (edited by Matthew Eddy and David Knight)

Natural Theology

Oxford: Oxford University Press, 2006. 342pp. pb. £8.99. ISBN 0-19-280584-3

'In crossing a heath, suppose I pitched my foot against a stone, and were asked how the stone came to be there… But suppose I had found a watch upon the ground… the inference we think is inevitable, that the watch must have had a maker…' So begins *Natural Theology*, whose words are taken by Dawkins in *The Blind Watchmaker* (once found in the fiction section of a bookshop). Probably few have read *Natural Theology* but now no one has the excuse not to own a copy as the editors and publisher have done a great service.

Far too often Paley's design is discussed, dismissed or deified without any clarity of what he said. Paley's work is hardly original as he synthesised a strong argument for design from many contemporary sources, and here the excellent footnotes provided by the editors help us to identify those sources. Suffice it to say that to Paley everything, whether biological or astronomical, is designed. However, he does not seem to notice that some biological structures are not very well designed (like my neck which aggravates me at times!), but this reflects his over-optimistic view of the world. In fact, Paley's TOTAL design is at odds with Intelligent Design, which has a tendency only to ascribe Design to certain things, e.g. Michael Behe's argument on blood clotting being designed but not haemoglobin.

Much of the book focuses on the design of living things and astronomy, but the last four chapters focus on the deity. To

me the most interesting chapter is 26 *The Goodness of the Deity*, where Paley presents his very optimistic theodicy. He minimises pain and suffering, which is interesting as he suffered from much illness. He seems to regard death as being always present (259) rather than something introduced at the Fall. Here he does not follow John Milton in *Paradise Lost*, but rather is typical of many theologians of his era who accepted pre-Fall death and suffering, even if they were agnostic on the age of the earth. In fact, Paley (39) seems to reject an old earth, even though by 1800 most educated Christians had accepted geological time.

The editors have provided a very useful introduction and give a good short historical background to Paley's work. However I do question whether Evangelicals prevented his preferment, as they were simply too thin on the ground during Paley's lifetime. Limitations of space prevented an exposition of Paley and Intelligent Design and why the latter is not Paley revived.

All in all, a very useful book and essential reading for any interested in design. And the price-tag is less than a bar meal!

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Arthur Peacocke

Creation and the world of science – The reshaping of belief

Oxford: Oxford University Press, 2004. 401pp. pb. £14.99 ISBN 0-19-927169-0

The late Arthur Peacocke was a highly influential figure in the field of Science and Religious belief for many years, and was the winner of the 2001 Templeton Prize for Progress in Religion. In 1979, he published a seminal book, *Creation and the world of science – The reshaping of belief*, that arose out of The Bampton Lectures that he gave in 1978. In the book he mapped out in some detail the critical issues in the dialogue between science and religion, and explored how theology could be greatly enriched by advances in modern science rather than undermined by them. The importance of the book to the field can be judged by the fact that more than twenty-five years on it has merited a new paperback edition (2004). This reproduces the original text but also includes some supplementary notes that outline the author's current position on the key themes in the light of significant developments that have occurred over the past twenty-five years, particularly in molecular biology and cosmology. I have to confess that I had never read the book before being asked to write this review, and so was pleased to be forced into doing so now! However, it proved to be a hard read and to review it adequately is a daunting task.

The author begins by considering the relationship between Science and Theology as the two books of God's revelation, before looking at current theories of the origins of the cosmos and how this fits with the biblical concept of creation. There are several chapters on how we should understand chance in the creative process and how this relates to God's being integral to his creation. Peacocke suggests that through the apparent randomness of the big bang, the quantum world and evolution, God is able to explore the infinite possibilities in the cosmos that ultimately lead to the emergence of a stable universe in a corner of which life and ultimately human kind evolve. He concludes that in this apparently random process, God is immanent in the world that he is still creating, yet transcendent, the world subsisting and existing in him (what Peacocke defines as pan-en-theism). In this way he is communicating himself to mankind who is thus able to discern his meaning and purpose. In these chapters Peacocke considers the anthropic principle and Dawkins's concept of the selfish gene, which, when first written in 1979 were seminal contributions to the field. He concludes these

chapters by reflecting on where Jesus fits into the picture; the bottom line appears to be that he is the perfect expression of what God intended man to be and the ultimate means by which God communicates to man.

The final two chapters are entitled 'Man in Creation' and 'Creation and Hope'. The first of these is a consideration of what man's role in creation should be and includes a consideration of ecological and environmental issues as God's agent in preservation, stewardship and fulfilment of His creation. The second looks at how humanity can maintain hope in the face of a universe destined for destruction. God's immanence in creation and its ultimate expression in Jesus as God incarnate are seen as the key. The supplementary notes included in this new paperback edition add nothing of substance to the original text, but do bring to the reader's attention a considerable amount of more recently published material relevant to each chapter.

Overall this is a scholarly tome that is definitely of greater interest to the specialist than to the general reader. There are many helpful insights to be gleaned, but there is also a great deal that I would describe as opaque and indigestible. As a result I sometimes found myself unclear as to the main points being made and was therefore unable to retain as much of the argument as I would have liked. That is probably more a reflection on me than on the quality of the writing, but it does highlight that this book is only for the serious reader. Some chapters ended by providing a summary or conclusion that I found helped me to recall the main points that had been made, and it is a pity that this pattern was not followed in all eight chapters. I was also left wondering whether the author's arguments give sufficient weight to the word of God revealed in scripture, especially in relation to chance and God's sovereignty in creation, and what it means for Jesus to be God incarnate. In summary, I am glad to have read the book and to have it on my shelves for reference, but I would only recommend it for those people who have the time and inclination for serious study.

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Ted Peters, Muzaffar Iqbal and Syed Nomanul Haq (eds.)

God, Life, and the Cosmos

Aldershot: Ashgate, 2002. 404pp. hb.
ISBN 0 7546 0883 2

This book is an excellent representative of a rare species: a Christian-Muslim dialogue on science and religion in which theologians and philosophers from both religious communities contribute an academic series of chapters on a broad range of topics. Part 1 is dedicated to philosophical, historical and methodological issues, and the introductory scene-setting essay by Muzaffar Iqbal (founder-president of the Center for Islam and Science) provides a very useful overview of the tensions and challenges facing the contemporary Islamic world in engaging with modern science. Iqbal looks back to an era in which Muslim natural philosophers were as well known in educated European circles as Christian, quoting Chaucer's description of his Doctor of Physic in *The Canterbury Tales*:

> Well knew he the olde Esculpius
> And Deyscorides, and eek Rufus,
> Olde Ypocras, Haly and Galyen,
> Serpion, Razis and Avicen,
> Averrois, Damascien and Constantyn,
> Bernard and Gatesden and Gilbertyn.

As Iqbal points out, of the fifteen authorities quoted, there are five Greeks (one of them mythical), seven Muslims, one Frenchman and two Englishmen – and this is written in the 1390s by a man who was a public servant, a courtier, and a diplomat trusted by three successive

English kings. But within a century of Chaucer, writes Iqbal, 'that appraisal was going to change. Islam and Muslims were going to be cast out of the European memory as major players in the advancement of science and their role was to be delegated to second class citizenship – a position that was to remain firmly entrenched in western scholarship for almost 500 years and only yielded to a revised appraisal toward the end of the twentieth century' (28). This volume represents a valuable contribution to that reappraisal.

In the second chapter of Part 1 Ibrahim Kalin helpfully maps out three views of science in the Islamic world, outlining the ways in which these views are promoted by a variety of different scholars. Ted Peters then gives a brief overview from a Christian perspective of the various 'warfare' and 'consonance' models for describing the relationship between science and faith, before Muntansir Mir engages in a more direct analysis of the contrasting engagements of science and religion within the Christian and Islamic worlds. Citing such authors as Donald MacKay and Ted Peters, Mir concludes that Muslims have much to gain by examining the various ways in which Christian authors have tackled the science-faith dialogue, and criticises the notion that there can be such an entity as 'Islamic science', suggesting that the phrase 'is of doubtful validity for the simple reason that to speak of Islamic science is to provincialise science; it is to grant that there can be Christian, Hindu, Taoist, and other brands of science'. Other chapters in Part 1 draw comparisons between Sufi and Confucian thought; explore the question of science and theism; and focus on the importance of mathematics in classical Islamic culture. In some particularly interesting comments on science in the contemporary Islamic world (168-169), S. Nomanul Haq reflects on the way that science thrives in cultures in which other aspects of the culture are likewise thriving: '…burgeoning scientific creation and scientific growth have never been found in a culture that otherwise happens to be intellectually stagnant. Language, philosophy, literature, history, the arts, all of these disciplines have developed hand in hand with science, or rather, science has developed in a very productive reciprocal relationship with these disciplines, forming with them a vital cultural whole. It seems, then, that more important than advanced equipment and massive laboratories is an attention in the contemporary Islamic societies to extra-scientific and meta-scientific questions.'

Part 2 focuses on cosmological issues, always of central interest to both the Christian and Islamic worlds. In this section Ahmad Dallal provides a survey of the central role played by the astronomical sciences in the Islamic world from the ninth to the sixteenth centuries: 'Many of the mathematical sciences were originally developed to facilitate astronomical research. Various disciplines and belief systems intersected and interacted in astronomy, including physics and metaphysics, as well as mathematics and religion. Islamic/Arabic astronomy was also culturally a hybrid (Babylonian, Indian, Persian and Greek), and intimately connected to politics (astrology, dynastic legitimitisation).' In Chapter 9 Mehdi Golshani tackles the more theological questions that arise from the interactions between cosmological theorising and the Qu'ranic doctrine of creation, and those unfamiliar with the Qu'ran will find the selection of creation texts cited here a useful resource. Golshani also helpfully engages the Islamic discussion in dialogue with contemporary Christian thought. Two chapters by authors writing from a Christian perspective complete this section. Philip Clayton writes on the question of divine action in the world, with a focus on emergentism, and Mark Worthington on 'Christian Theism and the Idea of an Oscillating Universe'. As Worthington points out, the idea of an oscillating universe itself is nothing new, and was suggested by Greek thinkers such as Empedocles who maintained that the universe is continually being main-

tained and destroyed. The theory continues to attract strong defenders and equally strong detractors, partly for scientific reasons but, as Worthington points out, both sides of the debate have drawn heavily on theological resources to stake out their positions. Origen embraced a cyclic cosmology in the third century and tackled its theological implications in some detail. But in the twentieth century Eddington, a Quaker, objected on the grounds that 'from a moral standpoint the conception of a cyclic universe, continually running down and continually rejuvenating itself, seems to me wholly retrograde', remarking that 'it seems rather stupid to keep doing the same thing over and over again'. Overall Worthington concludes in this historically rich chapter that the Christian world has, like Eddington, been generally averse to the idea, whereas there is greater scope for its acceptance within Islamic thought.

The final Part 3 is entitled 'Life, Consciousness, and Genetics'. Audrey Chapman maps out the main ethical concerns raised by the applications of contemporary genetics and suggests some practical ways in which a Christian-Muslim dialogue on the topic could be nurtured. Ebrahim Moosa provides a fascinating chapter on the notion of the body in the light of Islamic jurisprudence, concluding that 'contemporary Muslim legal practices in the realm of bioethics employ premodern *epistemes* to address issues emanating from a totally different epistemological perspective'. Moosa suggests that in practice bioethical decisions in the Muslim world are largely made based on instrumentalist reasoning and looks to the day when 'Muslim legal theory can be updated and reconstructed so that Muslim legal thought can meaningfully engage with relevant contemporary issues'. This final section of the book is completed by Nancey Murphy who presents a Christian perspective on human nature, highlighting in particular the question of non-reductive physicalism and the problem of free will.

Some of the chapters in this compendium simply present either a Muslim or a Christian perspective in isolation without really engaging with the ideas presented by the other religion. The most useful chapters are those that reflect serious dialogue, highlighting the similarities as well as the differences. As often seems to be the case in such exchanges, Islamic interests still remain very dominated by the concerns of the early medieval period. Fascinating as these are, the challenge now for Muslim scholars is to give more attention to the engagement of Islam with contemporary modern science. As one who taught the biological sciences in universities in the Muslim world for fifteen years, I was always struck by the enormous gulf that exists, both physically and ideologically, between the laboratory and the faculties of Islamic theology. Whilst that gulf can equally exist in the western context, Gould's notion of 'non-overlapping magisteria' seems particularly applicable in this context. There now needs to be a serious attempt by Muslim thinkers to bring the science-religion dialogue firmly into the twenty-first century and to find ways of building bridges that embrace contemporary mainstream science. Let us hope that *God, Life, and the Cosmos* leads on to other volumes that will continue to make progress with this agenda.

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Denis Noble

The Music of Life – Biology Beyond the Genome

Oxford: Oxford University Press, 2006.
xiii + 153 pp. hb. £12.99.
ISBN 0-10-929573-5

The 'blurb' on the back cover of this little book asks the well-worn question 'What is Life?' Whether Denis Noble actually

gets near an answer is a matter of opinion and indeed, he might regard it as a meaningless question. However, it does not actually matter whether the question is answered: the book is well worth reading for other reasons. Essentially, *The Music of Life* is described by the author as a polemic in support of systems biology, in which he argues that a reductionist account of living organisms, especially a reductionist account based on genes, is totally inadequate. Nobel Laureate Barbara McClintock is credited with saying that 'The problem with studying bits of nature is that we come to understand nature only in bits' while the feminist philosopher Carla Fehr suggests that: 'Separating reductionism from mechanism allows us to hold onto the… view that science should explain how things work, without mandating methods and approaches that reduce the objects of scientific investigation to their smallest parts. Mechanism without reductionism decenters reductive methods, and so creates intellectual space for a plurality of methods that may engage the world at a variety of levels of organization.' I am sure that Noble would be in agreement with both of them. His main postulate is that living organisms, and especially multi-cellular organisms, consist of a complex array of interacting systems with top-down, bottom-up and horizontal control mechanisms, all of which are in turn, capable of further interactions. The postulate is developed by exploring a number of themes, each illustrated by a musical metaphor, relating to different systems and levels of activity, ranging from the molecular to the whole person. I will focus here on a selection of those themes.

The first chapter, 'The CD of life: the genome', deals with genes and genomes and what they can and cannot do. He quotes extensively from Dawkins's *The Selfish Gene* and invites us to consider other 'readings' of Dawkins's text. This leads to a strong rejection of genetic determinism but he adds that Dawkins himself is not really a genetic determinist: it was, according to Dawkins, other people who put that spin on *The Selfish Gene*. We might argue that a text which suggests that the 'purpose' of life is to replicate genes is almost certain to be interpreted that way but in any case Noble leads us firmly away from that view of genes. The genome is not, to use a phrase loved by the media, the blueprint for life. Rather, it is more like a database from which the cell can select, or, in the metaphor of the chapter title, a CD from which the listener can select digital information to be translated into sound. Genes are thus reduced from being all powerful to being essential but by no means sufficient. Noble goes on in Chapters 2 ('The organ of 30,000 pipes') and 3 ('The score: is it written down?') to look at the context in which genes work and at what he regards them as actually doing. His discussion of 'cooperation' between genes is especially revealing, presenting us with unimaginable numbers of possible interactions. Only a tiny fraction of these actually occur but nevertheless, the simplistic idea of a 'gene for this and a gene for that', again loved by the media, is for the most part untenable. This analysis also shows us the inadequacy of the statement that humans differ from chimpanzees in only a handful of genes: according to Noble, because of possible interactions, adding one gene to 30,000 increases the number of possible functions by 10^{287}!

Available space does not permit detailed discussion of all of the chapters and so I 'fast-forward' to Chapter 9, 'The opera theatre: the brain'. This is a fascinating chapter. The author suggests that the human brain is the most complex object in the universe and he engages the reader in a fascinating discussion about the relationship between the brain, mind, thought, consciousness, free will and our understanding of 'self'. He rejects any ideas based on dualism, on the ghost in the machine, and ascribes personhood, our awareness of self, to the functioning of the whole being. This includes thinking about how much of the

physical being we need in order to experience an awareness of self.

The final chapter, 'Curtain call: the artist disappears', links the idea of self to spirituality. There is a strongly Buddhist flavour here: Noble talks about the practice of meditation as leading to a state of 'selflessness' and thus, in Buddhist terminology, reaching enlightenment or spiritual awareness. But that spiritual awareness is not an awareness of a supernatural God, it is an awareness of the essential nature of 'being', a property that can be ascribed not just to humans but to anything in nature, including inanimate objects. He goes on to say that some forms of Buddhism embody 'little or no metaphysics… [they are]…just a code of practice: a religion one might say, without beliefs. And, as such, it contains no possibility of conflict with science.' The chapter's title thus becomes ambiguous: the author himself specifically 'signs out' at the end of the book but his arguments prior to that have, at least to his satisfaction, made the hypothetical artist, God, disappear. Thus, according to fictional aliens he uses in telling the story, 'Things just "are". They don't need a creator. There is no "God" as a person…' and, in the words of a fictional scientist in the same story 'At last… I have found a treatment of the spiritual that makes sense.'

Overall, this is a well-written book which, as a biologist I found easy to read and very much enjoyed (even though I obviously disagree with Noble's conclusions about the existence of God). He makes very extensive use of analogies, metaphors (and argues that we cannot communicate without metaphors), thought experiments and stories. Even though some of his musical analogies are a little stretched the style mostly works very well (at least for me; I can think of one or two scientific friends who would find the style quite annoying). The illustrations and analogies draw extensively on the author's knowledge of western and eastern music and culture in general, Chinese, Japanese and European languages, philosophy and Indian cooking. The author thus comes over as a very cultured man, although I am not sure that I agree with the interpretation he puts on Wittgenstein's most famous saying (and, incidentally, Wittgenstein was a Cambridge, not an Oxford, philosopher: p136). Perhaps the impression of being very cultured is created deliberately, but the wide range of material used as illustration certainly helps the reader to understand the subject. Finally, at £12.99, *The Music of Life* is within the reach of most pockets; many readers of this journal, especially those who have some biological knowledge, will find the sum well spent.

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Ted Peters & Martinez Hewlett

Can you believe in God and evolution?: a guide for the perplexed

Nashville, Tennessee: Abingdon Press, 2006. xi+99 pp. pb. $12.00.
ISBN 0-687-33551-5

This book addresses the situation in the USA. The authors (respectively a Lutheran theologian and a Roman Catholic university biologist) state in their Preface that their concern is about possible consequences of the 'war over evolution' for young people in schools and churches: 'Our fear is that they may begin to identify their Christian faith with anti-Darwinism and, worse, anti-science' (vii). It might be thought that the book is thus not relevant elsewhere. But that would be a mistake, because the crusading anti-evolutionists are exerting considerable pressure in other countries. For example, in 2006 an organisation circulated all UK secondary schools with curriculum materials advocating intelligent design.

The book is an abridgement and update of the authors' *Evolution from*

Creation to New Creation (Abingdon Press 2003). Clearly the readership the authors have in mind here is ordinary church members and teachers with no special scientific or theological background. They write clearly and simply, explain unfamiliar terms and provide a glossary and endnotes.

The answer they give to the question in the book's title is an emphatic 'Yes'. While they show considerable sympathy towards and understanding of Christians who are young Earth creationists or believers in intelligent design, they seek to point out fundamental flaws in those viewpoints. Less sympathy is shown towards beliefs at the other end of the spectrum they define relating to creation, such as deism, naturalism, evolutionism and ontological materialism.

In fourteen short chapters all the important relevant issues are considered. There is a useful historical survey, including an outline history of modern science, an account of how ideas about evolution developed and a description of the development of fundamentalism and creationism. There is also a brief treatment of such offshoots of evolution as Spencer's social Darwinism (and modern sociobiology), Huxley's agnosticism and Galton's eugenics (leading to Hitler's programme of eliminating the 'unfit').

Throughout there is an emphasis on good science: because all truth is God's truth, Christians are urged to espouse the best that the scientific method can offer; and in the biological realm, evolution is the best science at present. The authors insist that science is intrinsically neither atheistic nor materialistic. However it is pointed out that science is not fixed. What is on offer is the current best model. So, without uncritically accepting Darwinism, they say 'liberating the fertile science of the Darwinian model requires separating it from the ideologies in which it frequently comes packaged' (ix).

In the discussion of intelligent design the views of the main protagonists are described, and it is pointed out that design differs from both purpose and construction. The classic theological viewpoint on creation is maintained throughout, distinguishing primary causation from secondary causation. On the question of whether creationism and intelligent design are genuine science, it is stated that 'a valid scientific model must be both explanatory and predictive. It must be fertile in that it suggests all kinds of experiments that can be done to test the model. It must result in a productive research program that leads to new knowledge about the natural world. Finally it must ultimately be subject to falsification, if sufficient data warrant this…. Intelligent Design is not only bad science; it is not even science at all' (49). The view is accepted which sees the universe as open to development and self-organisation, along with God's sustaining purpose: 'an inner *telos* or purpose or design does not stand up and advertise itself in a scientifically observable way. We will not attempt to locate purpose or direction or even value *within nature*. Instead, as Christians, we affirm a divine purpose *for nature*.' (77)

Having espoused theistic evolution, the authors ask the question why theistic evolutionists are frequently unheard, and suggest three reasons: 'First, theistic evolutionists do not have a united front. Theistic evolution is a collection of a variety of conscientious attempts to synthesise science with faith. Second, theistic evolutionists do not have wealthy individuals and institutes bankrolling a public promotion program. They're invisible. Third, their respective church communities undervalue their creative contribution. Churches tend to ignore the theistic evolutionists in their midst' (57).

Overall the book does what it sets out to do, that is to demonstrate effectively, but without excessive detail, that there is no genuine reason preventing Christians from believing in God and also accepting evolution. It should be very useful to any-

one who is facing that question themselves, or wishes to help others who are bothered by it.

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Brent Waters

From Human to Posthuman: Christian Theology and Technology in a Postmodern World

Aldershot: Ashgate, 2006. 166pp. pb.
ISBN 0-7546-3915-0

Do you want to live for ever? This is not a rhetorical question, an answer is required, either biological, theological or preferably both. The question was the title of a Channel 4 documentary on 3 February this year that examined the proposals of Aubrey de Grey, described as a computer technician by his employers at the University of Cambridge. He is promoting a programme of research devoted to the indefinite extension of the human life span. It must be said that the whole scheme of de Grey received very short shrift from some scientists actively working in relevant areas of research. If you want more details try typing SENS into your search engine.

Where are we going you may well ask? Well, we are going to the other side of the Atlantic where Brent Waters, the author of the book being reviewed, is showing that a number of philosophers, theologians and information scientists are giving the question of the extension of the human life span very serious consideration.

A foundational theme of this book is that whereas in the twentieth century science had displaced religion as a culturally dominant and formative force, in the postmodern twenty first century the world is increasingly being dominated by information technology. The benefits and evils of our increasingly technological lifestyle have been extensively written about many times and it is commonplace to say that we are now beginning to control our own evolution. The transition now taking place from an industrial to an informational society for example is just another stage in our cultural evolution. It is Waters' contention however that this transition gives us the potential to move beyond mastery over nature to transformation of nature. We are changing from *Homo sapiens* into *Techno sapiens*, from humans into post-humans. This theme is examined from three points of view, philosophical, technological and theological.

There is an extensive discussion of Katherine Hayles' book *How we become Post Human* which majors on the rapidly developing fields of cybernetics and information theory with its underlying goal of exerting maximum control over the future course of human evolution. A post human vision that arises is 'if humans can become pure information then they can also achieve immortality.' I am reminded of an early quotation from Norbert Wiener to the effect that he saw no reason in principle why a human being could not be transmitted down a telephone line. A major issue here is, of course, the question of the essential nature of life and personhood. Progress in robotics, artificial intelligence and artificial life, together with the dualistic and reductionist assumptions from postmodern philosophers and theologians, seem potentially to remove all barriers dividing life and inanimate matter.

There is, in Waters' view, a fundamental shift taking place in the way we view reality. Neuroscience and genetic engineering, for example, are radically increasing our mastery over nature but the working assumption is still that we are encountering natural environments and processes consisting of delineated objects and organisms. Developments in regenerative medicine are placing us on a slippery slope which we will have great difficulty in negotiating. Violating the functional purposes of these things to

achieve chosen objectives often requires moral as well as engineering decisions, e.g. in the present conflict of views on the appropriateness of cloning embryos for stem cell research.

In contrast postmoderns regard all objects and organisms as essentially patterns of information that can be reorganised with various technologies. The perceived boundaries of various objects and organisms are not definitive but highly malleable and may be erased and redrawn at will. The postmodern paradigm is that there is no objective reality against which human identity is shaped and measured, but only information to be interpreted and re-configured.

As Waters points out, the postmodernists are hoist with their own petard. If humans become cyborgs with enhanced information processing abilities and unlimited experiences of living in a world of virtual reality, there will be no restraints, moral, ethical or historical. There will be no restraints because restraints require a meta-narrative and the postmodern does not recognise any meta-narrative. How can they determine the right way to design their cyborgs and the future?

The author looks critically at various attempts to answer this fundamental question and finds all of them wanting. In particular he condemns postmodern theology as 'only postmodern discourse with a Christian dialect', not being able to make any normative claims for human destiny against which human desires and conduct can be judged.

After four chapters of giving the reader an intimidating view of what promises to be a science fiction future Waters ends with two chapters in which he puts forward an alternative response to what he sees as a gathering threat to the 'human' race. This is firstly a return to a theology with a foundation in biblical Christology, building on the work of Oliver O'Donovan which will be relatively uncontroversial to most readers of this journal. Secondly and more intriguingly he takes up an idea from Albert Borgmann that faith communities should be able to provide a counterforce to our dominating, materialistic technoculture. This last chapter offers only 'some rough outlines of an alternative form of moral discourse'; the reader is left wanting more.

The book gives concentrated information on postmodern thinking in the USA with a good index and extensive references.

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