

Book Reviews

James A. Secord

*Victorian Sensation: the
Extraordinary Publication, Reception,
and Secret Authorship of Vestiges of
the Natural History of Creation*

Chicago: University Press of Chicago,
2001. xviii + 624 pp. hb. £22.50.
ISBN 0-226-74410-8.

Vestiges was the publishing sensation of 1844. Bringing together facts and ideas from astronomy, geology, embryology, phrenology, anthropology, and linguistics, the anonymous author expounded the first popular theory of evolution to appear in English.

James Secord's large and ambitious book traces the story of *Vestiges* from its inception to the posthumous unveiling of Scottish publisher Robert Chambers as the author. But it is more than just a 'reception study': it is packed with insights into many aspects of Victorian culture, from hack journalism to fashionable society, from scientific education to the intricacies of Scottish church politics.

We tend to assume that doctrines of evolution were deeply shocking to the Victorians, but initial reactions to *Vestiges* were surprisingly favourable. Prince Albert read the book aloud to Victoria; an elderly admiral gave a copy to his daughter; and William Gladstone, then a Tory and a Tractarian, found he could reconcile it with his beliefs. In early speculation on the identity of the author, the prime suspects were a Tory baronet and a Whig countess. In the 1840s evolution was not universally seen as fatal to religion and social order.

Yet *Vestiges* failed to win support in one crucial area: the scientific community. The book was riddled with errors and misjudgements, which betrayed its author's lack of scientific credentials. For scientists, it was an intrusion on their professional domain, and a threat to

their hard-won respectability. While few expert responses were as virulent as that of Adam Sedgwick, who savaged the book in the *Edinburgh Review*, the general verdict was firmly negative. Pondering the implications for his own unpublished ideas, Charles Darwin resolved to take his time, and reinforce the factual basis of his theory. He would not be another 'Mr Vestiges'.

In an age of intense religious beliefs and conflicts, it was inevitable that religious views would influence reactions. *Vestiges* itself was not overtly hostile to religion. It envisaged a process of evolution by divine law, in which each new form emerged as a pre-ordained development from its predecessor. For some devoutly Christian thinkers, including Gladstone, this was sufficient to save the book and its author from the imputation of infidelity. But for those described by Secord as 'evangelicals' (including the evangelical wing of the Church of England, most English non-conformists, and the Scottish Free Church), the scheme of *Vestiges* left no place for the Christian message of sin and redemption. The book was all the more dangerous for its veneer of piety. Opposition was fiercest in Scotland, especially when the Edinburgh gossip began to point to Chambers as the author. The 'evangelicals' organised a campaign of lectures, sermons, and publications to counter the threat. But even here the hostility should not be exaggerated. A boycott of the Chambers publishing house was considered but rejected (293). The only tangible impact on Chambers himself was to prompt him to withdraw his candidacy for Lord Provost of Edinburgh (295). This falls some way short of martyrdom.

It is impossible here to do more than hint at the scope of this immensely rich and entertaining book. Admittedly there is a danger of overstating the importance

of *Vestiges*. Viewed in extreme close-up, any object will dominate the landscape. On a broader view, it assumes more modest proportions. I note, for example, that in all the published correspondence of Darwin, Lyell, Hooker, Huxley, and J. S. Mill, comments on *Vestiges* would fill only a page or two. But this should not detract from the value of Secord's study. Everyone interested in Victorian Britain should read it.

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W. A. Dembski and J. M. Kushiner, (eds)

Signs of Intelligence: Understanding Intelligent Design

Michigan: Brazos Press, 2001. 224 pp. pb., US \$12.99, ISBN 1-58743-004-5

This collection of fourteen papers on 'intelligent design' includes contributions by well-known authors like Michael Behe and Phillip Johnson. A number of interesting papers, such as those on cosmology and the philosophy of science will have to pass without further comment, in order to address the core issues. I shall offer comments on selected quotations under three headings that are recurring themes throughout the book:

The concept of Intelligent Design. Dembski's introduction sets out 'What Intelligent Design is Not' and uses the word 'intelligent ... simply to refer to intelligent agency (irrespective of skill or mastery) and thus separates intelligent design from optimality of design' (7). It is then puzzling to be told that 'Optimal design is perfect design and hence cannot exist except in some idealised realm' (7). I confirmed with an engineer that what I thought engineers meant by optimal design was not perfection but whatever was most conducive or favourable to a particular end, given the constraints of certain fixed conditions. But this view seems to be assigned to ID – it 'fits our ordinary experience of design, which is

always conditioned by the needs of a situation and therefore always falls short of some idealised global optimum' (8). Reading on, we are informed that 'Just because we can always imagine some improvement in design doesn't mean that the structure in question was not designed' (9). In addressing the problem of evil Dembski points out that 'Design by intelligent agency does not preclude evil. A torture chamber replete with implements of torture is designed' (9), while 'Philosophical theology has abundant resources for dealing with the problem of evil' (10). Finally, 'The design theorist is not committed to every biological structure being designed' (10) and the search for design is claimed to be 'Not Religiously Motivated' (12) – something which I question.

Taking the preceding assertions all together, one is left wondering what value any establishment of the ID programme might have for Christianity. If the universe might have been designed, but 'we can always imagine some improvement in design'; if, like a torture chamber, design theory allows that it might have been designed by a malevolent agent; and if some biological structures might not have been designed at all, we appear to be handling a very slippery concept indeed. Certainly the writer recognises that 'the good that God initially intended is no longer fully in evidence', but we have no means of knowing what the world would have been like if humankind had not sinned but exercised its full managerial responsibility. I left the introduction with a growing sense of unease.

The target of concern. As expected, this book displays a deep antipathy to evolution by natural selection – 'you can have God or natural selection, but not both ... given natural selection, God would be redundant' (44); 'Darwinian just-so stories' (20); 'a widely disputed theory, one that is facing ever more trenchant criticisms' (17); 'an a priori commitment to metaphysical naturalism' (25); 'the

purely naturalistic Darwinian mechanism' (103) are among its descriptors. In support of this view, quotations by Lewontin, Dawkins, Sagan, E. O. Wilson, Provine and Ayala are supplied.

The phrase 'methodological naturalism' recurs in connection with science. 'Naturalism' carries several meanings but, as I have reported before in these pages, five philosophical dictionaries confirm that 'Naturalism' is generally understood to mean that 'ultimately nothing resists explanation by the methods characteristic of the natural sciences'. By contrast, 'Intelligent design ... is a movement more compatible with Christianity than any form of naturalism, be it metaphysical, methodological, or theistic. ... Theistic naturalism ... allows God to do only what secular science will allow him to do' (89). Certainly, 'naturalism' is a metaphysical belief but, although held by some scientists, it is not entailed by the scientific enterprise. Science studies the natural world, but has no competence to make the metaphysical assertion that the natural world is all that there is, nor that 'all that there is' is amenable to the methods of science. Hence 'methodological naturalism' goes far beyond being a methodological assumption of science and should be scrapped. It hardly needs saying that, consequently, 'theistic naturalism' is an oxymoron.

There is a tendency in this book uncritically to accept an atheistic view of science put forward by certain scientists in the name of biology; and then to fight a crusade against evolutionary biology as inherently atheistic. Take for example, 'The neo-Darwinian explanation ... excludes the causation unique to intelligent agents' (55). 'Traditional scientists never have a need for the divine or supernatural hypothesis' (81), and the view of 'the orthodox scientific doctrine that humans and all other living things evolved by a naturalistic process in which God played no discernible part' (27). It is important not just to accept

unsubstantiated assertions that science is naturalistic or that chance and random necessarily mean accidental and unplanned. There also seems to be a pervasive assumption that processes which have natural explanations, like natural selection, rule out God and only that which exhibits the property termed 'irreducible complexity' has any 'theistic mileage'. This appears to be an unwelcome return to that ubiquitous scoundrel, the 'God-of-the-gaps'. The real target of concern should not be science, perhaps biology in particular, but illegitimate extrapolations into metaphysics of an atheistic flavour.

The idea of 'irreducible complexity'. The idea of *irreducible complexity* (Behe) or *specified complexity* (Dembski) (55) is an integral part of ID theory. 'An irreducibly complex system', according to Behe, 'cannot be produced directly by numerous, successive, slight modifications of a precursor system, because any precursor to an irreducibly complex system that is missing a part is by definition nonfunctional' (94). He cites a mousetrap as such a system, since if any part is taken away it no longer catches mice. Other writers refer to meaningful sequences of letters or numbers. However, Behe recognises that 'Mousetraps are one thing, biochemical systems are another' (94). By acknowledging this Behe enters a minefield. Nobody disagrees that a mousetrap and Paley's watch point to intelligent design. But the components of these artifacts are unlike those of biochemical systems whose constituents are living, can undergo mutations and can reproduce with variation. Complex structures may arise whose components may themselves have served different functions *en route* to their present state. The pivotal question is 'how could one know that such a structure was irreducibly complex?' Could new research indicate otherwise? *Research News and Opportunities* (June 2002) records a debate in which 'Ken Miller ... highlighted that of the clotting pathway – a Behe-ian molecular machine that should

fail if any of the components are removed. However, recent research shows that both whales and dolphins lack some of those components, and their blood still clots.'

Finally, Behe declares, 'Although an irreducibly complex system can't be produced directly, one can't definitely rule out the possibility of an indirect, circuitous route' (94). But surely indirect circuitous routes are encountered in natural selection; and if an irreducibly complex system may result from this process, what has been the point in juxtaposing natural selection and ID in the first place? Why not just accept, as I have exemplified elsewhere, that random changes + selection are possible design strategies – even among human designers?

Complexity theory is presented as undergoing development: 'We must be able to map a mathematically rigorous definition of irreducible complexity ... if the concept is to have any empirical bite' (212f). However, in the case of a biological system, is this a possibility? How would one know that such a definition was mathematically rigorous and how could one arrive at any certainty that the system concerned exemplified irreducible complexity?

Conclusion. In case of misunderstanding, I *do* believe in a universe planned and designed by God, in which, despite human sin and managerial failure, Romans 1:20 applies. It is claimed that 'This volume shows that the smart money is on [intelligent] design' (23). From the way ID is explicated in its pages, I have my doubts.

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Michael Ruse

Can a Darwinian be a Christian? The Relationship between Science and Religion

Cambridge University Press, 2001.

242pp, hb. £16.95, US\$24.95.

ISBN 0-521-63144-0

This is an interesting book, not the conventional sort at all, not a book to promote Darwinism nor full of arguments about creationism. Rather it is a serious and closely argued account of the issues which Darwinism raises for the Christian, primarily at the philosophical level. That is not to say it is a difficult read, although it needs attention and thought, for it is written in a rather breezy, straightforward style which I found attractive. Professional philosophers will no doubt have their criticisms, but as a working scientist I found the elucidation of the ideas central to this debate most helpful. Finally, its greatest attraction is that the author makes a serious attempt to position himself between the protagonists, to explain Darwinism without guying it, to explain Christianity without guying it, so it is not a polemical book – as has become far too common in this area.

The author's own position is plain: 'Let me be open. I think that evolution is a fact and that Darwinism rules triumphant. Natural selection is not simply an important mechanism. It is the only significant cause of permanent organic change. I stand somewhere to the right of Archdeacon Paley on adaptation and design. I see purpose and function everywhere. I am an ardent naturalist and an enthusiastic reductionist, and those who disagree with me are wimps.' (ix)

But to the book. First he describes Darwinism, both historically and the current position, and the lines of argument that have led to its near universal acceptance. The writing is clear, easily understood and serves as an appropriate backdrop to the second chapter in which he describes Christianity, laying out orthodox belief in

a fair and balanced way. He moves on to the crucial question of origins of human beings and of all living creatures, summarising how current scientific understanding might impinge on Christian faith and in particular the advent of creationism triggered by the book *Genesis Flood* by a Whitcomb and Morris in 1961.

In the chapter on Naturalism, Ruse squarely faces the problem of miracles. As he says (94) 'Darwinism is the theory committed to the ubiquity of law. How can it be reconciled with a world picture so obviously committed to the breaking of law?' Are miracles violations of natural laws? Ruse discusses the objections and outlines a position in which miracles represent God's unusual intervention in a world where God upholds all. But this does not convince everyone: many Darwinists slide into atheism and others reject Darwinism because this seems to be its inevitable consequence.

In the chapter on Design, Ruse first describes the proposition by Paley that the watch demands a watchmaker, then its refutation by Dawkins who 'regards Darwinism not simply as proving that the argument from design does not work but as proving that atheism is true'. (114) Ruse then describes the response of Michael Behe who introduced the notion of 'irreducible complexity'. 'Some organic phenomena are just so complex that they cannot have been produced by blind unguided law. That is just a fact of Nature' (115). Ruse criticises this position and also that of its natural consequence – intelligent design, concluding that these counter proposals offer no more than 'a freshened up version of the old "God of the gaps" argument for the Deity's existence'. (122)

The next chapter on Pain starts again from Dawkins, quoting him as saying 'The universe we observe has precisely the properties we should expect if there is, at bottom, no design, no purpose, no evil and no good, nothing but blind, pitiless indifference. DNA neither knows nor cares. DNA just is. And we dance to its

music.' (131) Ruse explains the responses which Christians have brought forward over the years, but his discussion then takes an interesting twist, for he says (134) 'Darwinism, a science which so stresses physical suffering, looks to Christianity, a religion which so stresses physical suffering and the divine urge to master it.' That is, it is not that Christianity does not meet the stress that Darwinism inevitably lays on struggle and pain, but that it opens a door for the Christian response.

There follow two important consecutive chapters on Christian Ethics and Social Darwinism. If E. O. Wilson can talk about replacing one myth (Christianity) with another myth (science), then indeed we have competition, and all of us are aware of the current trend to base an inclusive ethical structure on the universal findings of science. Ruse argues against Darwinism being able to produce a single set of moral values, and also that there is nothing in any moral implications of Darwinism that makes Christian faith impossible.

But what about the impact of sociobiology? Writers from E.O. Wilson to Dawkins have made claims for the origin of morality from Darwinism; especially in Dawkin's book *The Selfish Gene* (1976). But Ruse takes an interesting and, to me, original line of arguing that the Christian need not be fearful of such ideas, saying: 'Evolutionism rather clarifies and justifies the Christian position than detracts from it. God wants us to love each other, but this is not simply a question of God's unbridled whim. He is concerned that we express our humanity in the fullest and most fruitful possible way. Since God has made us as social animals that means above all being in loving friendship relationships with others.' (202)

Finally Ruse turns to Freedom and Determinism, covering in a few pages a very wide range of topics: original sin, free-will and predestination, the biology of original sin, genetic determinism, lev-

els of desire, and Christian freedom. Ruse argues that the ideas that stem from evolutionary theory are compatible with Christian ideas. He concludes in an Epilogue 'Can a Darwinian be a Christian? Absolutely! Is it always easy for a Darwinian to be a Christian? No, but whoever said that the worthwhile things in life are easy? Is the Darwinian obligated to be a Christian? No, but try to be understanding of those who are. Is the Christian obligated to be a Darwinian? No, but realise how much you are going to forswear if you do not make the effort, and ask yourself seriously (if you reject all forms of evolutionism) whether you are using your God-given talents to the full.' (217) This is a stimulating book and well worth reading.

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S. M. Walters and E. A. Stow
Darwin's Mentor: John Stevens
Henslow, 1769 – 1861

Cambridge: Cambridge University Press, 2001. 338pp. Hb £40
ISBN 0-521-59146-5

Henslow's claims to fame are that he nurtured Charles Darwin's scientific abilities and later chaired the notorious debate at the British Association where Thomas Huxley felt insulted by Bishop Wilberforce.

This book gives a thorough account of the scientific and Anglican environment of Cambridge in the earlier part of the 19th Century and shows how Henslow later used his science and faith to improve his parish in Suffolk. The family were not great journal writers but there is enough material available for the authors to give a satisfactory account of Henslow's marriage and something about his brief time in politics.

Henslow's relationship with Darwin began when the latter went up to Cam-

bridge University. Darwin was not a keen scholar but Henslow's lectures seem to have intrigued Darwin who also attended Henslow's soirées and field trips so enthusiastically he became known as 'the man who walks with Henslow'. After his graduation Darwin remained friendly with Henslow who was sufficiently impressed by him to suggest him as the naturalist to accompany the voyage of the Beagle. The rest, as they say, is history.

Henslow had been an enthusiastic collector of shells before going up to Cambridge, where he had to study mathematics as there was no general science degree available. The book describes the various people who influenced Henslow, some of whom were still significant when *The Origin* was published. We learn that science was in a rudimentary state at Cambridge with very few professors of science and that Henslow obtained the Regius chair of Botany without having published anything in the subject.

There is a chapter devoted to Henslow's faith and how it related to his science, especially as he and his colleagues reacted to *The Origin of Species* in 1859. Henslow, like many others, thought it plausible but that speculation had gone beyond the evidence. Henslow was sufficiently confident of his faith to be open to whatever truth seemed to be revealed in the natural world and he and his colleagues seemed to have abandoned a literal reading of Genesis years before *The Origin* came out.

The development of the new Botanic Gardens in Cambridge gets a whole chapter which is surely more than enough space, but the last part of the book describing his ministry in deepest Suffolk should be of wider interest.

Henslow obtained the lucrative living of Hitcham and moved there in 1839 shifting his interest away from the university at the same time. Hitcham, like the rest of rural England, was in a sorry state with most of the inhabitants illiter-

ate and living in hovels. Henslow's first reaction was to start a cricket club! Subsequent projects included a coal club, clothing club and sick club; he rebuilt the school and established allotments. Most of this was against the opposition of the farmers and seemed to need regular support from the rector's stipend. He did not make enemies of the farmers but took whatever chance he had to use his scientific knowledge to improve their farming practices.

The book is well illustrated, and so thoroughly documented with a chronology of Henslow's life, dramatis personae, notes and index that the general reader can keep track of Henslow and his many contacts in Victorian society.

This is an intriguing account of how an important but not eminent Christian encouraged Darwin, made his mark on scientific education and improved the lives of ordinary people in rural England.

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Peter J. Bowler

Reconciling Science and Religion: the Debate in Early-Twentieth Century Britain

Chicago and London: The University of Chicago Press, 2001. 479 + xiii pp. Portraits. hb. £25.50. ISBN 0-226-06858-7

The debates between science and Christianity in the Victorian age have been endlessly rehearsed in the last three decades, and one turns with relief to an account that really begins in 1900. To be sure the legacy of nineteenth century thought is still there, and exerting a considerable influence in the years leading up to World War II. The scientific naturalism of Huxley et al. became increasingly unpopular, together with its associated 'conflict' theory', but a reconciliation between non-materialistic science and liberal theology began to take place. It depended upon a continued belief in

progress and a conviction as to the purposefulness of the created universe. These two items of belief were direct descendents of, respectively, Darwinian evolution and Victorian natural theology.

In this immensely detailed book the author presents an account that shows a historian's proper degree of objectivity and accuracy. It may be favourably contrasted with the purple prose occasionally emitted by partisan promoters of one side or another of the science-religion debate, often rewriting history for their own purposes. The ample bibliography not only discloses Peter Bowler's erudition but also provides a valuable resource for those who wish to explore some aspects further. Nor is it only the great and the good that are paraded before us. As he says, such a study 'must take account of the literary second-rate as well as the elite' (23). Among many familiar characters we are also introduced to the delightfully dotty Bernard Acworth. An ex-Naval type, he took an especially low view of transport by air, and attacked it with as much gusto as that with which he delivered his diatribes against evolution around 1930. Yet here also is a roll-call of well-known 'celebs' like R.J. Campbell, J.S. Haldane, J.A. Thomson, Joseph Needham, E.W. Barnes, William Inge, Charles Raven, William Temple, Bertrand Russell, H.G. Wells, C.S. Lewis, Dorothy L. Sayers and so on, – names from the past that conjure up a variety of responses, favourable and otherwise (according to preference).

One of the most important general points to emerge from Bowler's story is the relatively subsidiary role of science in the development of unbelief in the 1930s and beyond. In this respect Britain differed from the USA, with its extreme fundamentalism and notorious 'Monkey trials'. Here, the great opponent of traditional religion was the Higher Criticism that soon clothed itself in the garments of so-called 'Modernism'. This movement is fully covered. We all accept a measure of cultural relativism today, but never so

naively and self-consciously as these people with their subjugation of all things controversial to the 'modern mind'. Whether in Nonconformity or in the Anglican Church their devotion to modernity let them lose much of the great intellectual and spiritual heritage of the past, and sometimes it was science that was invoked to deliver the *coup de grace*. Yet, in the fullness of time, just before World War II, modernism entered a period of 'catastrophic decline'. Its achievement had been to create a 'denatured and abstract form of Christianity that had little attraction for anyone who wanted a religion of personal salvation' (246). And with that downfall went the only chance 'for making changes to the faith that would have rendered it more credible to the majority of contemporary scientists' (286). Whether that faith needed changing, or merely presenting in fresh ways, is a question with which evangelicals have wrestled ever since.

The role of evangelicalism is well portrayed, and clearly owes much to the seminal studies of David Bebbington. Many classics are cited but I did not discover any reference to Leopold Clarke's *Evolution and the Break-Up of Christendom*, and while R.E.D. Clark is mentioned in connection with his *The Universe and God*, his rather more relevant *Scientific Rationalism and Christian Faith* was absent. Perhaps because it was a little late in his story Bowler does not refer to the foundation of the Research Scientists' Christian Fellowship (predecessor of Christians in Science).

Great care has been taken with all aspects of the text, but one may spare a wry smile of sympathy for an author who finds this rendering of one of his sentences 'His [Christ's] Resurrection in a glorified body gave us hope of our own immorality....'! (222). Such lapses are extremely rare and the book can be warmly recommended as a pioneering study of the relations between science and religion in Britain.

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Robert John Russell, Philip Clayton, Kirk Wegter-McNelly and John Polkinghorne (eds)
Quantum Mechanics: Scientific Perspectives on Divine Action, Volume 5

Vatican City: Vatican Observatory Publications and Berkeley, CA: Center for Theology and the Natural Sciences, 2001. xxvi + 345 pp. pb. £24.40 (\$21.95). ISBN 0-268-03978-X

This is definitely not a book for people new to the dialogue between science and theology. Although the field of quantum mechanics and its relevance to questions of divine activity is surveyed in its pages by several acknowledged experts in the field, it is not a survey. Perhaps because it is written by experts, the book does not yield a consensus view on the topic. Nor does it offer easy or superficial answers of the kind that might satisfy certain types of religious believer. Above all, it does not pretend to be an introduction to the topic. On the contrary, several of the chapters demand a more than passing acquaintance with the mathematical formalism of modern quantum mechanics.

So much for what it is not. While it is neither an introduction nor a survey, this volume does offer a comprehensive overview of the field in the form of a collection of at times quite diverse opinions. The fifteen essays have been gleaned from the fifth of a series of international research conferences co-sponsored by the Vatican Observatory and CTNS. Inevitably it has all the strengths and weaknesses of a collection of conference papers. At times exploratory, even tentative, its contents give the reader a sense of eavesdropping on researchers at the cutting edge of thought in this area. On the other hand, it can be repetitive and the reader has to negotiate the content with none of the signposts and warnings

against blind alleys that you would find in a textbook or introductory survey.

The volume begins with a section which introduces the scientific and historical context of the topic. However, even at this stage, philosophical and theological interpretation are unavoidable. This is clear from the first chapter, where Abner Shimony asserts the reality of the quantum world, and it is further reinforced as Raymond Chiao draws philosophical and theological conclusions from his account of experimental evidence for quantum nonlocalities. Michael Berry completes the scientific introduction by exploring chaos and the limits of the quantum realm. The historical context is provided by Ernan McMullin's account of parallels between the current debate over the interpretation of quantum mechanics and the conflict between formalism and ontology in early astronomy.

The second main section of the book explores philosophical issues in quantum mechanics. While the contributors are in broad agreement over the issues, there is no comparable agreement regarding the answers. Indeed the full range of interpretations of quantum mechanics is on display here. William Stoeger defends the Copenhagen interpretation; James Cushing presents a hidden variables approach; Jeremy Butterfield offers a many worlds approach; and Chris Clarke adopts a consistent histories view of the topic. The interrelatedness of the philosophical and the theological is particularly clear in Michael Redhead's critique of nonlocality in quantum mechanics.

The final section of the book turns its attention directly to what the contributors see as the theological issues. In this section, I felt most at home with John Polkinghorne's cautious, even sceptical, view of the possibility of drawing conclusions about divine action from quantum mechanics. In contrast, Philip Clayton defends the legitimacy of such interpretations. Somewhere between these two positions is Michael Heller's attempt to draw analogies between quantum

mechanics and theology. Thomas Tracy rehearses the importance of physical indeterminism for accounts of divine providence. Finally George Ellis and Robert Russell offer divergent approaches to human and divine action – Ellis in terms of emergent properties and Russell in terms of 'bottom-up' divine action.

In conclusion, this is a valuable overview of the current state of thinking about the role of quantum mechanics in the development of a scientific perspective on divine action.

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Kirsten Birkett

The Essence of Darwinism

Kingsford, NSW: Matthias Media, 2001.
142pp. pb. £6.00. AUS\$18.50
ISBN 1-876326-39-5

It does not seem all that long ago that for many Christians, the supposed conflict between theories of evolution and our faith was simply of historical interest – a dispute long past out of which we had all grown and matured. However, in recent years there have been renewed rumblings of disquiet, fuelled by atheistic reductionists on the one hand, and Christian fundamentalists on the other. In the UK it culminated in early 2002 in the stance taken by Emmanuel College, Gateshead, claiming its right to teach 'creationism' as an alternative theory of origins. It seemed that after all, the conflict was not over. And yet many Christians see no problem theologically; if God chose evolution in some form to bring about his creation, then so be it. But the issue will not rest. Kirsten Birkett, in *The Essence of Darwinism* asks why and finds answers in two main areas. In the first place 'we cannot be detached and objective about our origins' (118). Secondly, on both sides of the argument peo-

ple are often asking different questions from the ones they think they are asking: 'we simply cannot divorce [evolutionary theory] from our ideas about meaning and the purpose of life' (116).

This easily read introduction to evolution starts with the history of evolutionary theory and describes some of the political hijacking of its ideas that accompanied its popularisation in the non-scientific world. In the section on 'Darwinism and Religion' Birkett summarises the way in which evolutionary concepts first came to be perceived as anti-Christian both because of their association before Darwin's time with proponents of social engineering and revolution, and because of their later association with the emergence of science as the cure-all to society's ills, that accompanied the rise of nineteenth century religious scepticism and secular social reforms. Darwin himself wanted to distance himself from his evolutionary predecessors, but to present his theory in any form meant treading on the toes of ecclesiastics who had aligned themselves on the side of Paley's Divine Watchmaker. It was also socially risky, and the shock with which the eventual unveiling of his theory was received even by the scientific community proved his fears to be well founded.

Having set Darwin's original theory in its historical context, Birkett describes how it has changed in the light of modern population genetics and molecular biology. She discusses the rise of Christian fundamentalism and the arguments of those she calls 'religious evolutionists', in particular Dawkins, Wilson and Gould. The last part of her book examines the issue of the 'religious' aspect of evolution, why despite our best efforts, religion always creeps into the debate somewhere. Birkett explores people's quest for meaning and purpose and draws attention to the atheist's difficulty in the absence of a loving God, in explaining why humans are special. Atheism has to deny our difference from the rest of the natural world and to create a pseudo-

religious awe of science which is then used to deny or discredit true religious faith. She discusses the dangers of Christians' aligning themselves with particular scientific viewpoints on theological grounds, drawing attention to the developing nature of scientific thought in response to new data. She emphasises the importance of adopting a theory of origins that best fits the known facts and does not confuse science with ideology.

Her concluding guidance for reading Genesis is admirable and useful, but an additional consideration of biblical accounts outside Genesis that articulate the significance of God's creative activity would have added a further perspective and would enable the discussion to go beyond the 'old chestnuts' of the meaning of days and the order of creation events. Another quibble is that in searching to see if Birkett had referred to the contribution to early evolutionary theory of Alfred Russel Wallace (she doesn't), I flipped to the back of the book only to find that there is no index.

Birkett has written an excellent primer. She has appealed to non-scientific readers by guiding them through her ideas by careful linking themes from chapter to chapter, and advising which parts can easily be omitted without losing the plot if they find the detail too technical. On both sides of the Atlantic, there are popular communicators who encourage Christians without specialist knowledge to find security for their faith in questioning the scientific aspects of evolution. Birkett adopts a far healthier approach by de-coupling spiritual and scientific paradigms.

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Steven Weinberg

Facing Up: Science and its Cultural Adversaries

Cambridge, MA: Harvard University Press, 2001. 283pp. Hardcover. US\$26, £17.95. ISBN 0-674-00647-X.

Steven Weinberg is a leading theoretical physicist. He deservedly won a Nobel Prize for his part in finding a unified description of electromagnetic forces and the 'weak' force, one of the two short-range forces which prevail in the atomic nucleus. Unlike gravity and electromagnetism, these intranuclear forces are not encountered in everyday life – though they hold the nucleus together against the mutual electrostatic repulsion of the protons, and without them the universe would look very different. Weinberg has written the best textbooks of their time in the two principal fields of fundamental physics, relativity/cosmology and (recently) quantum field theory. He is also a gifted essayist who has written good books explaining physics for the layperson. These books are notable for their absence of amateur philosophical and theological speculation. Would that other scientists, whose talent has also gained them a public platform, showed equal restraint!

Here, now, is a collection of Weinberg's thoughts on those 'missing' topics: science, society and religion and the relations between them. Weinberg believes that science conveys truth about the world, and he is strongly secular. He stoutly advocates and defends both of these positions. Concerning scientific truth, I appreciate his vigorous and well-crafted arguments against postmodernists who hold that science is in some sense merely a 'social construct'.

But I doubt that secularists will be able to hold the line against the postmodernists, because this clash is ultimately a collision of two religious world-views. Weinberg's secularism comes from the Enlightenment, with its optimism that man will find the laws of nature

(and indeed the laws governing man). Further back, the idea that comprehensible laws of nature exist stems from the Judaeo-Christian belief that God put order in his creation, and that God created humans in his image so that we can understand that order; the beauty of those laws reflects the character of the creator. (Weinberg gives no reason why beauty should be such an important quality of physical law.) Science arose in a Christianised society – it would never have grown under Eastern systems which doubt whether there is any meaning in nature (or life). Today, that doubt has been taken up by the postmodernists. They are the intellectual facet of a wide-ranging reaction against the failure of Enlightenment secularism to deliver the goods: though the West is affluent and powerful, its people are not happier for it. (Weinberg himself has written that 'the effort to understand the universe is one of the few things that lifts human life a little above the level of farce, and gives it some of the grace of tragedy'.) Many today have turned to Eastern mysticism, overtly or in assimilated forms such as the New Age movement. In contrast to secularism, this postmodern viewpoint is profoundly pessimistic. As well as doubting meaning, it doubts the concept of truth, and doubts even that the creation ('reality') exists. Once enough people who hold these views get elected, science will have to fight for its life at every level of the curriculum. To win, I believe that science will have to acknowledge deeper roots than the Enlightenment and look to its motivation in revealed religion.

The same contradiction arises in Weinberg's short essay on Zionism. He applauds the Jewish State as a beacon of Enlightenment values in a backward area rife with religious fundamentalism. But it is precisely the Jews' practice of their religion, which holds that they are a divinely chosen people granted a particular piece of land, that has maintained Jewish identity through 1800 years of dispersion and motivated the return to Palestine.

These essays are reproduced in chronological order, and run from 1985 to 1999. The early ones in particular include many good summaries of theoretical physics for the layperson; the tone of defence and counterattack against post-modernism enters around 1996. In that battle I stand with Weinberg – but I think more is at stake than he realises.

Anthony Garrett has done postdoctoral work in theoretical physics at three universities and is a technical editor.

W. Mark Richardson and Gordy Slack (eds.)

Faith in Science: Scientists Search for Truth

London and New York: Routledge, 2001.
206 pp. pb. £12.99/US\$15.95.
ISBN 0-415-25765-4

‘Science and the Spiritual Quest’ was a programme started in 1996 by the Center for Theology and the Natural Sciences in Berkeley, California, with funding from the John Templeton Foundation. In 1997 sixty distinguished scientists met in Berkeley under the aegis of SSQ. This book consists of edited interviews conducted by Gordy Slack and Philip Clayton with twelve of these people (ten men and two women), of whom eight live in the USA (five in California), two in the UK, one in France and one in Iran. They include five Christians, two Jews, two Muslims and three less easily categorised. In broad terms there are five physicists, three biologists, three working in information technology and one psychiatrist; two are Nobel Laureates.

In his foreword Ian Barbour briefly reviews the diverse views about religion held by scientists, the religious questions raised by science, and the recent rapid growth of interest in the interactions between science and faith. There is no index, but a list of over thirty books for further reading is appended. The spelling is American.

The interview method has worked well, bringing out not only each individual’s particular viewpoint, but also the interaction between their scientific work and their religious beliefs and practices. The beliefs vary from the conventionally orthodox to the highly unorthodox, so it is surprising to find so much agreement among people holding different beliefs, working in different disciplines, about the relationship between science and faith, naturally alongside some significant divergences of opinion. One of the Muslim authors points out that in this field there are relatively few differences between adherents of the three Abrahamic faiths. Many themes recur: the inadequacy of a ‘God of the gaps’; the recognition of order in nature; the significance of the anthropic principle in indicating a designer; the limitations of scientific knowledge; the importance of avoiding excessive dogma in both science and religion; the similarities between science and religion; the acceptance of biological evolution (but not the atheistic philosophy derived from it); and the significance of emergent properties in describing human characteristics.

I will single out two contributions for specific comment. Anne Foerst is Professor of Computer Science and Theology at St Bonaventure University in Olean, New York and a Lutheran minister. Her description of work on ‘Cog’, a humanoid robot intended to imitate humans as closely as possible, was particularly thought-provoking, raising such questions as when one would feel it appropriate to baptise a robot. I was specially impressed with the unassuming approach but considerable profundity of the views of John Rodwell (Professor of Plant Ecology at Lancaster University and an Anglican priest), who *inter alia* points out the importance in taxonomy of naming, comparing it to a devotional act reifying part of God’s creation. He criticises the church for being insufficiently interested in God’s world, and calls Darwinism a ‘set of myths that help us make sense of the natural world’.

Overall this is a successful book which will probably give some new insights to every reader, different ones in each case.

John Bausor is a retired science educationist.

Carolyn M. King

Habitat of Grace: biology, Christianity and the global environmental crisis

Adelaide: Australian Theological Forum, 2002. 235 pp. pb. \$NZ32.50
ISBN 0 958639981

I found this an interesting book. It started as an M Phil thesis for the University of Waikato and then grew into a doctorate. This academic origin means that there are ample references supporting the many issues discussed which allow the reader to follow up any particular matters of interest, but the text still flows easily and fluently for those who wish to take in the whole span of the arguments. The central points addressed are the religious aspects of the environmental crisis and the visionary faith that the author believes the churches must find in order to face it.

The environmental crisis is widely recognised in such problems as global climate change, ozone depletion, deforestation, loss of biodiversity, over-fishing, water scarcity, acidification, and excessive use of pesticides. This requires a response from the Christian Church which believes in the world as the creation of a loving and incarnational God. Carolyn King looks at the way the Church has gradually become interested in the environment. Globally, bodies such as the World Council of Churches and the Anglican Consultative Council have attempted to find ways to alleviate the problem. United Nations conferences and initiatives by the 'green' Non-Governmental Organisations have also made their contribution, but despite the talking and good intentions, little has happened at the national and practical levels to resolve the crisis.

Given the New Zealand origins of this work, it is no surprise that a number of the cases used to illustrate the arguments considered stem from that country. But the author's study leave in Oxford and the wide range of references included mean that there is a broad spectrum of topics and thinking. The chapter on the tragedy of the commons is a case in point, where the problems of the conflicts between the best strategies for the individual and the overall interests of the community at large are amply demonstrated by New Zealand's policies and politics. The conclusion is that there needs to be a bringing together of personal and public interests; a function that could be fulfilled by the Christian world view, but which is not achieving that objective.

This leads on to a consideration of human nature and the roles of natural and cultural selection in human behaviour. There is helpful analysis of the views of Dawkins, Gould and others in discussion of the concept of the selfish gene, and the surrounding issues arising from Darwinian evolution theory. For the benefit of ordinary Christians and the mixed readership of this book who may not be familiar with all the concepts underlying the scientific aspects involved, there is an appendix describing the workings of natural selection, and also a glossary of the terms which occur throughout the book. The author's conclusion in this section is again that the contemporary Church should be able to provide both an understanding of human nature and a theology that encourages people to trust one another and thereby contribute positively and rationally to the environmental debate.

The chapter on the theology of creation includes a thoughtful examination of the concept of the integrity of creation, with the opposing factors related to the dynamic nature of the world and the conflicts that can often arise between individual interests and those of the community or ecosystem as a whole. The various

views held by Christians on the doctrine of creation, and the relationship between God and his world, are still being debated in the Church. Carolyn King sees a need to recover the concept of stewardship from dominion over nature to service to nature. She argues for Christians to concentrate on attacking the causes of the environmental crisis rather than the symptoms of it, and to become fully engaged in the debate with a sound understanding of conservation biology.

[The Australian Theological Forum website is www.atf.org.au. Their books are distributed in the UK and Europe by SCM Press]

Dr Ray Gambell is the former Secretary of the International Whaling Commission

Stenmark, Mikael

Scientism: Science, ethics and religion

Aldershot: Ashgate Science and Religion Series, Ashgate Publishing Limited, 2001. 152 pp. pb., £16.99, ISBN 0 7546 0446 2; hb., £40.00, ISBN 0 7546 0445 4

The author starts by addressing the question 'What is scientism?', both 'within academia' and 'within broader society'. He identifies seven forms of scientism and then sets out, in the rest of the book, to 'scrutinize critically' four of these forms, 'expressed as four scientific theses':

T1 The only kind of knowledge we can have is scientific knowledge.

T2 The only things that exist are the ones science can discover.

T3 Science alone can answer our moral questions and explain as well as replace traditional ethics.

T4 Science alone can answer our existential questions and explain as well as replace traditional religion. (18)

The claims of Crick, Dawkins, Hawk-

ing, Sagan, E. O. Wilson and others are used to exemplify the positions under review. Stenmark examines possible ways in which cases might be argued for the four theses before evaluating their strengths and weaknesses. In his examination of T3 & T4 he looks at three possible projects, A, B, & C. The first of these consists of attempts which have been made to formulate a scientific explanation of morality, while B and C are dubbed, respectively, the 'debunking project' and the 'replacement project'. The points are tightly and fairly argued and the conclusion of the book is that the four theses, when weighed in the balances, are found wanting.

The structure of the book is very good, as is the content. The reader is carefully led through a detailed set of arguments and helped to assimilate the key points by judicious recapping – but never to the point of being tiresome. The style is lucid and my admiration of the succinct way the author rebutted many of the standard arguments of the scientific expansionists grew as I worked through the book. I shall certainly list this book as a 'must' for my students. It deserves a wide readership for, as the author concludes, 'A lesson to be learned from this study is, therefore, that the public has to be more suspicious about what is claimed in the name of science and scientists themselves need to be less naïve about the impact of their own ideological beliefs or value commitments on their scientific theorizing.' (142)

I do not wish to detract in any way from my recommendation of this book, but I will make three small points. First, I am uneasy about the phrase 'methodological naturalism' for reasons which I detailed in an earlier review in this journal (13.1, 91) and repeated in a later review. Second, Crick's 'astonishing hypothesis' contains the phrase 'nothing but a pack of neurons' which is incorrectly quoted as 'nothing but a pack of *neutrons*' on pp 8, 21, 23, 30 & 127. Happily, the final quote on p. 133 gets it right!

Finally, in common with quite a lot of writers, the attempt to derive *ought* from *is* is referred to on several occasions as the *naturalistic fallacy*. But didn't G.E. Moore mean by this term an attempt to define *goodness*, the fundamental – and *non-natural* – concept of ethics by identifying it with *natural* concepts, such as pleasure?

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Edward Grant

God & Reason in the Middle Ages

Cambridge: Cambridge University Press, 2001. ix+397 pp. pb.

£15.95/US\$22.95. ISBN 0-521-00337-7

This book is the sequel to the author's *The Foundations of Modern Science in the Middle Ages* (1996). The new presentation is designed to appeal to both the academic and general reader. It addresses important issues. As described by Professor David Lindberg on the cover, the book adopts two objectives: first it 'demolishes the myth that portrays the Middle Ages as ignorant, superstitious, and irrational'; secondly it 'reveals the medieval origins of the spirit of inquiry often thought to be a defining feature of the modern world'. Grant indeed portrays the medieval period as a veritable 'Age of Reason'. Conceptual breakthroughs that are traditionally linked with the Scientific Revolution or the Enlightenment, Grant attempts to relocate to a substantial degree to the period before 1500. A third point of emphasis is that this remarkable medieval achievement was made possible by the emergence of the university system, which gave a platform for the development of philosophy, natural philosophy and medicine as professional disciplines independent of theology. Grant is at his most enthusiastic when retailing case histories to illustrate the flowering of the

'scientific temperament' which, he urges, is one of the most compelling aspects of the medieval legacy. In Grant's eyes this major paradigm shift would not have been possible without the determined commitment of the natural philosophers to resist the 'entanglement', 'infiltration', or 'intrusion' of theological issues into the domain of natural philosophy.

As perhaps is evident from the above summary, Grant writes from a partisan perspective. His greatest indignation is reserved for the final lengthy section of the book, in which it is suggested that deprecation of the medieval past has become a habit of the western mind. No stone is left unturned to locate examples of this prejudice, as for instance indicated by the paragraphs on Jimmy Reid, identifiable to UK readers as the former Scottish Communist leader, but known to Grant only as a journalist. Grant's catalogue of ignominy is unlikely to convince his readership. It is of course accepted that scholasticism in its various forms was a target for attack among the humanists and religious reformers, but generations of scholars, including those addressing the radical reformation, have strongly emphasised the positive influence of scholasticism and other medieval traditions. This perspective is not confined to recondite sources, but is central to accessible presentations such as Steven Ozment's *The Age of Reform 1250-1550* (1980). In fact, the mode of constructive analysis pioneered by scholars like Etienne Gilson and Anneliese Maier has become the norm. The main danger of recent times is not denigration of the medieval past, but the misguided medievalism of Duhem and his followers, who have prosecuted a campaign of the uncritical idealisation of the medieval precursors of the modern sciences.

Grant draws close to the mainstream in his conclusions concerning the emergence of the academic disciplines. He provides insight into some incisive pieces of scientific thinking. However, as a guide to medieval thought in the province of nat-

ural philosophy, this account remains a very partial perspective. Great names such as Grosseteste or Cusa are excluded, perhaps because they were bishops rather than academics, or even because such figures were guilty of mixing up their science and theology. Also, because of the criteria of selection, almost completely excluded in this book are the expositors of Neoplatonism, Stoicism, or Galenism, while Muslims and Jews, if mentioned at all, lurk on the outer margins of this account.

The viability of the Grant thesis depends on its consistency of its findings of the specialist literature. His conclusions are not well supported by recent research. For instance, Joseph Ziegler's recent study of Arnold of Vilanova, which specifically addresses the relationship between academic medicine and theology, decisively concludes that 'the institutional demarcation of disciplines...failed to curb reciprocal movements between medicine and theology' (*Medicine and Religion c.1300*, 274). Also, Amos Funkenstein's ambitious *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century* (1986) assumes a seamless interpenetration of ideas in the spheres of speculation relating to God and nature. Nobody will contest Grant's great scholarly distinction, but it is doubtful whether this new book is entirely the best way of contributing towards a balanced understanding of the medieval mind.

Charles Webster, All Souls College, Oxford, writes on religion, science and medicine.

Norman M. Ford
The Prenatal Person: Ethics from conception to birth

Oxford, England: Blackwell Publishing, 2002. 256 pp. pb. ISBN 0 631 23492 6

The author, a Roman Catholic priest, approaches this difficult topic showing an in-depth understanding of the bioeth-

ical issues concerned with foetal and newborn clinical medicine. The book is attractively presented with a sound binding and a clear typeface. The table of contents, index, bibliography, notes which accompany each chapter with their references, glossary and definitions are comprehensive making this a reader-friendly book.

Writing from his perspective, a Catholic Judaeo-Christian moral tradition, Norman Ford provides a wealth of information as guidelines relevant to foetal medicine. Bioethics and the significance of the person are clearly explained in the introduction and contrasted with the alternative utilitarian principles found in the writings of Peter Singer. Ford holds that we are dealing with a person from the time of conception and the dignity afforded to this person is dependent on the value given them by our creator, God.

In Part II Ford applies the principles outlined to issues arising during intrauterine life. Here he shows a sound knowledge of the problems confronting the clinician making decisions in this field. I will limit comment to one matter relating to IVF methodology. When a multiple foetal pregnancy occurs selective reduction contributes to, and may be necessary for, the survival of a remaining foetus. Ford would counsel otherwise, allowing the death of all the foetuses (66) rather than the selective survival of some.

There is a detailed and helpful discussion on pre-implantation genetic diagnostic techniques, now an integral part of IVF procedures. Ford mentions cystic fibrosis and the carrier state of this recessive disorder (125, 126, 137) but does not explore further the major contribution these procedures have made in this situation. The author does not explain that it is now possible for parents who both are carriers to have a normal baby that does not have the genetic defect. The affected zygotes are destroyed. This is an important advance.

Ford quotes the Second Vatican Coun-

cil; 'Life once conceived must be protected with the utmost care...' Many would agree. This statement seems to determine the author's attitude to the clinical management of a foetus with anencephaly (an absence of a brain). This gross abnormality can be detected early in pregnancy, is incompatible with extra-uterine existence and normally termination of pregnancy is offered. In the author's view justice and the duty of reasonable care rules out such an approach. He would be supportive of the mother through to about thirty-three weeks gestation when delivery of this infant would be facilitated, defined as an accelerated birth which is not an abortion. This resulting death would then be attributed to the lethal defect present, not to the early delivery and failure to offer normal care. Many would find this approach unacceptable. In cases of rape the author accepts that prevention of a pregnancy is acceptable.

Ford is to be commended for facing many of these issues, including those concerned with foetal tissue use and newborn organ transplants. He feels that in both situations the donor's interests should dictate care until life ceases, not the needs of the recipients. Many other matters are discussed such as embryonic stem cell research, foetal treatments and gene therapy.

I enjoyed the opportunity to review this book. Ford achieves his aim of providing a reasoned approach to ethics related to foetal life and does not avoid those matters where the guidelines become fudged. His book is therefore strongly recommended for study by medical staff, health professionals, students of theology and ethics, and families, or for use in church discussion groups. It has a place in college and community libraries. I believe its usefulness would be enhanced by the concurrent reading of the writings of Professor Gareth Jones on related issues.

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P. Harrison

The Bible, Protestantism, and the rise of natural science

Cambridge: CUP, 2001. 313 pp. pb.
£16.95. ISBN 0-521-00096-3.

This is the paperback edition of a book that was not reviewed in this journal when it was first published in hardback in 1998. The author is Professor of Philosophy at Bond University in Australia. His thesis regarding the rise of modern science has had a generally positive reception and will be of interest to readers of *Science & Christian Belief*. The essence of it is that the Protestant approach to the interpretation of texts, which was a central feature of the Reformation, was 'a major catalyst in the emergence of science' (8).

The Protestant Reformers rejected the allegorical interpretation of the Bible that was practised by many of the early Christian theologians and became commonplace in medieval times. Instead they gave primacy of place to the 'natural, grammatical meaning' of the text as intended by the original author. Harrison argues, with a good deal of supporting evidence, that the allegorical reading of written texts led to an allegorical reading of nature. Natural creatures were seen not as significant in themselves but in what they symbolised. Nature was studied for the edification that could be gained by seeing creatures as similitudes, parables and metaphors of moral and spiritual truth. With the change in the way texts were interpreted came a change in the way nature was viewed. 'The assertion of the primacy of literal reading ... entailed a new, non-symbolic conception of the nature of things. No longer were objects in the natural world linked to each other by sets of resemblances. As an inevitable consequence of this way of reading texts nature would lose its meaning, and the vacuum created by this loss of intelligibility was gradually to be occupied by alternative accounts of the significance of things – those explanations which we

regard as 'scientific' (114). Harrison charts the rise of these alternative explanations.

Since the 1930s historians have recognised that there was some link between the Protestant Reformation and the scientific revolution. Various attempts have been made to establish what the causal links might have been. Harrison is careful, though, not to claim too much for his thesis, putting forward the change in how the Bible was interpreted as one of a range of factors that contributed to the rise of modern science. The evidence he produces suggests that it was an important factor.

In a review of the book in *Isis* David Lindberg described it as 'a learned book, enormously ambitious, clearly and elegantly written, copiously documented, subtly and persuasively argued'. That is a fair statement. The clear, elegant style of writing makes it a very readable book despite the detailed, learned argument. Some of the detail also makes it fascinating reading. It is a book that is well worth reading by anyone interested in the phenomenon of the rise of modern science.

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Hans Dirk van Hoogstraten
Deep Economy: Caring for Ecology, Humanity and Religion

Cambridge: James Clarke & Co., 2001.
192 pp. pb £17.50 ISBN 0-227-67965-2

The author defines his objective to find the root causes and final solutions to our present ecological crisis. Many environmental ethicists believe that economic actions are the fundamental agent in environmental problems, yet there seems to be a reluctance to tamper with the system to achieve change.

The book begins by analysing the ethical and economic thought of Aristotle and Adam Smith in the context of the post-

Christian culture where market-orientated economy has become dominant. For Aristotle, economics concerns the fundamentals of the community and social order, and capital accumulation is considered unnatural. Adam Smith took the opposite view, so that the creation of wealth is seen as a benefit to the whole community. Economy's purpose is the creation of profit or surplus value. This gives freedom to use, exploit and exclude. This is the main reason that environmental and humane measures are limited when economic interests are at stake. But it is not the accumulation of wealth in general, but the particular growth of individual wealth that drives the commonwealth's engine, leading to a steadily widening gap between the very rich and the very poor.

Van Hoogstraten devotes a chapter to the work of Herman Daly and John Cobb and their discussion of the fields of economy, theology and philosophy. Not all organisms have equal value – a human being is of more intrinsic value than other species, but Daly and Cobb favour interrelatedness as a moral and critical standard with the potential for redirecting the economy towards the community, the environment, and a sustainable future. The role of money and the conjuring tricks of banks in transforming natural, intrinsic value into monetary value is viewed as commodity production and exchange, leading to surplus value and profit. The stimulation of wealth in the rich First World countries is achieved by exploiting poor countries, including their natural resources.

The third chapter identifies and discusses what the author considers to be Western culture's central problem, that of dualism. He outlines the ancient Greek and Hebrew roots of Christian culture, noting that Lynn White asserts that Western society's dominance over nature originated in the creation beliefs of the Judaeo-Christian tradition. This separation and humanity's break with nature are analysed by Van Hoogstraten to suggest

that White ignores the economic pathway followed by Western society from the end of the Enlightenment, incorrectly separates Christianity from other cultures, and falsely locates Western dominance in Judaism rather than in the Christian interpretation of the story. He reviews the dualism of the Greek and Judaeo-Christian thinking which led to human domination over nature, considering each in turn and focusing on the issues of sexuality, politics and kingship, and the combination of the two heritages. Dualism is now commonplace in Christian culture and continues to have considerable influence, as it has had from the formulations and thinking of Augustine, Aquinas and Luther.

In Greece, children were sacrificed to the gods, but the ancient Hebrew culture, as shown by Abraham, refused to continue this tradition. Nevertheless, van Hoogstraten sees widespread acceptance of child sacrifice in high birth rates resulting from high mortality rates, so that the child is sacrificed for the well being of the wealthy world powers. He reviews feminist writing on population and reproductive rights, and compares the economic effects of birth and mortality rates in the rich and poor countries. This leads to a discussion of their deep economic and environmental effects, and the way in which humans protect themselves by creating money.

The author believes that our aesthetic attitude towards life, encouraged by mass production and consumption, means that we do not know how to handle the resulting problems of pollution and waste. The desire to 'have' leads to debt and guilt, effectively paid for by nature. We give ourselves rights but we must also protect nature to prevent over-exploitation, without giving rights to other species.

The answer to these problems is, for the author, a new third wave of enlightenment based on knowledge and bringing connectedness between critical thought and social relations and actions. This is not an easy book to read; it intro-

duces many novel ideas of thought and interpretation of our world's present dilemma. But van Hoogstraten sees a religious perspective in both ecology and economy, which he believes must be brought to the fore. Only the First World has the power and the resources to bring about this change of thinking and action. We all face this challenge; van Hoogstraten offers an insight and new approach to the debate.

Ray Gambell was the Secretary of the International Whaling Commission.

David Swift

Evolution under the Microscope. A scientific critique of the theory of evolution.

Stirling: Leighton Academic Press, 2002. 432pp, pb, £10, ISBN 0-9543589-0-2

The author of *Evolution under the Microscope* is a hydrologist. He claims to write 'firstly for biologists because it is primarily they whom I want to challenge to take a fresh look at the facts'.

I am a biologist. I hope I am capable of looking freshly at facts. But I have to confess that David Swift's book pushed me back to the debates around at the end of the nineteenth century, rather than giving me a new understanding of the present. His book is a compendium of examples which Swift does not believe could have evolved through natural selection. He cites R.A. Fisher's *Genetical Theory of Natural Selection* (unusually for an anti-evolutionist) but he would have done well to refer to Fisher's 1954 essay 'Retrospect of criticisms of natural selection' as well. In that essay, Fisher reviewed three types of objection: 'the first is opposed to evolutionary theory of all kinds, while the second and third... can only be evaded by evolutionists of other [non-Darwinian] schools by postulating a creative power in living matter equivalent to the ingenuity of a benevolent creator. They are all, in somewhat different ways, *difficulties less of reason than of imagi-*

nation' (my emphasis). It is worth noting also that Fisher dealt with the possibility that this demolition was mere naturalism in his Eddington Memorial Lecture *Creative Aspects of Natural Law* (1950).

The heart of Swift's thesis is his chapter on 'Chance and necessity' where he expounds what he calls 'the improbability of macromolecules', reminiscent of Michael Behe's theme in *Darwin's Black Box* (1996) which centres on 'irreducible complexity', another difficulty less of the reason than of the imagination and which has been heavily criticised by many commentators.

The danger of *Evolution under the Microscope* is that, like Behe's book, it will be taken up and quoted by anti-evolutionists as providing 'scientific' warrant for the inadequacy of Darwinian ideas. It does not. Although Swift is reasonably well-read (judging by his extensive bibliography), he fails to give proper credence to the flexibility of genetic output in terms of new genetic material and the resulting possibilities of fresh variation (mutation is much more than base change, which is Swift's definition, p.131). Indeed he speaks of the 'prohibitive improbability' of the acquisition of new 'useful' genes (p.230). For example, he dismisses *hox* genes in a single paragraph (p.327). He does not discuss the debates around and subsequent resolution of Haldane's 'cost of selection' calculations (p.148). He confuses 'convergence' with 'coevolution' (p.250). He is wrong to claim that evolution involves 'substantial advancement ... through the progressive assimilation of small improvements' (p.296).

I normally enjoy books with which I disagree because they challenge and make me examine my own preconceptions. I confess that reading David Swift's book became a melancholy chore. I cannot recommend it.

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Alan W. Fowler

Modern Medicine and The Bible

Bridgend: Ortho Books, 2002. 240 pp. pb. £6.00. ISBN 0-9529114-4-2

Alan Fowler is a retired orthopaedic surgeon who has had a long-standing interest in the building of bridges between the study of the Bible and various scientific disciplines and has written three books on this subject. The first book of this trilogy was *A Drama of Creation* which sought to harmonise the Genesis record of creation with palaeontology. The second book, *Exploring Bible Language*, was concerned with biblical semantics. The third volume of the trilogy is the subject of this review. As the title, *Modern Medicine and the Bible*, indicates, it seeks to build a bridge between Bible teaching and medical science.

There are a number of distinct themes running through the book. The first is that 'the human body, like that of all other animals, is perfectly designed for the purposes for which it was created' (1). The second occupies over a third of the book and maintains that the Bible lays down the basic principles for living a healthy life. The third suggests that modern medicine is increasingly providing support and validation for these biblical principles. The fourth theme is that modern medicine is able to shed light on many of the medical conditions and incidents that are mentioned in the Bible; while the fifth takes the form of the provision of medical opinion and advice by the author related to the topics he discusses.

The text of the book is divisible into five parts. The first part is concerned with human diet which is described as 'probably the most important determinant of health that we can control' (3). Arguing from the form of their teeth, the author concludes that humans are designed to be neither carnivores nor herbivores, but omnivores. He maintains that this is confirmed by the depiction in Genesis of Adam and his family as gar-

deners and farmers. More specific guidance is given in the dietary laws of the books of Leviticus (Lev. 11) where certain members of the animal kingdom are described as unclean and unfit to be eaten as food. Modern medical opinion certainly confirms some of these laws, but it must be said that the identity of a number of the animals, particularly the birds and reptiles, is uncertain.

The second part of the text deals with hygiene, both physical and mental. Procedures for the control of infection, including the safe disposal of excreta under camp conditions (Deut 23:13) and measures to prevent the spread of the contagious disease *tsaraath* (?leprosy), are discussed. A chapter is devoted to the significance and treatment of fever. Four chapters are concerned with mental hygiene, including such topics as education, the influence of television and the cause and treatment of depression.

Sex and sex-related matters occupy the third part of the text, whilst an account of the various forms of alternative medicine is given in the fourth part. The fifth and final part of the book contains a miscellaneous collection of topics including demon possession, euthanasia, near-death experiences and the medical aspects of crucifixion.

This summary of the contents of the book will reveal how widely the author ranges on a miscellany of topics, both medical and biblical. He is a trustworthy guide on most of them, although his views may not always be medically orthodox. For instance, he suggests in his chapter on fever that the form of treatment of fever in adults is 'to go to bed with plenty of blankets and hot water bottles, take hot drinks and raise the body temperature' (87). However, there is no doubt that he has established his claim that modern medicine has an important role to play in supporting and validating the principles for living a healthy life, which are to be found in the pages of the Bible.

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John Habgood

The Concept of Nature

London: Darton Longman and Todd,
2002. xii + 188 pp. £10.95.
ISBN 0 232 52439 4

This book is an expansion of the author's University of Aberdeen Gifford Lectures in 2000. He records his indebtedness to William Temple's book *Nature, Man and God*, based on his 1932-4 Gifford Lectures. Habgood's concerns are, by his own reckoning, rather different: not only have the times changed, but he notes the almost total absence from Temple's work of a clear definition of the word 'nature'. This then forms the starting point for *The Concept of Nature*.

Chapter 1 (Words and Things) begins with a historical exploration of the multiple and overlapping meanings of the word 'nature'; he illustrates need for clarity with reference to his experience as chairman of a Department of Health committee on xenotransplantation (a word that my spellchecker argued with me about!). This is set in the context of our increasing power over nature: '... questions about how we are to recognise and respond to the givenness of nature in general become increasingly urgent as our powers to override it seem set to increase beyond our ability to assimilate the changes' (p.22). Also, in the context of a dominant question that surfaces repeatedly in the book, is nature 'given' or 'constructed'?

Chapter 2 (Studying Nature) centres on the use of the word 'nature' in the natural sciences, and questions assumptions underlying a purely naturalistic approach to the description of reality. He argues that a holistic investigation of nature involves a range of disciplines involving different levels of understanding. To suggest that mathematics might

lead us to ultimate reality through an understanding of the fine structure of matter is misleading because even mathematics has an ambivalent status as both invented and discovered.

Chapter 3 (Respecting Nature) asks the questions: is there a 'natural world' to be conserved, or a balance of nature to be respected? Is there an intellectual basis for environmentalism? Here his experience of working with the World Council of Churches is made to throw light on the difficulty of defining the 'integrity' of creation, and he suggests that for Christians a more fruitful approach is one based on God's love for his creation and the costliness of its redemption.

Chapter 4 (Following Nature) explores whether there is a natural moral law of universal application. He concludes that there is not, but that there are universal values to which appeal can be made, citing John Finnis' sevenfold categories: life, knowledge, play, aesthetic experience, sociability, practical reasonableness, religion. He then uses these to look in broad outline at matters of sexual ethics, including homosexuality (p.107ff.). The discussion is conducted with his characteristic care, and avoids premature decisions. Thus he can state:

In a generally tolerant culture it is difficult to know for certain what underlies an individual's sexual orientation, how far it is genetically driven, how far external pressures contribute to it, and whether there is a real element of personal choice ... It is small wonder then that the public discussion of homosexuality in recent years has frequently been confused and inconclusive, and that public debate should have centred on pieces of legislation which are largely symbolic.' (p.109f.)

Chapter 5 (Improving Nature) explores how humanity has striven to 'improve' nature, whether by artistry in landscaping, or in breeding programmes, and in modern genetic manipulation techniques. He is at the same time critical of

attempts to show that human aspirations to 'improve' creation are to usurp the place of God, and realistic about the human capacity to overreach ourselves, a capacity which he links to the biblical understanding of sin.

Chapter 6 (Nature's God) is a final chapter which relates the foregoing discussions to traditional beliefs about God. It ends with a discussion of nature and grace, and suggests that, far from these being opposites, nature may have incarnational significance as a means through which the grace of God can be discerned and received.

Altogether this is a carefully argued book, cautious in reaching firm conclusions but offering much food for further thought on all the issues the author touches upon.

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John Polkinghorne

The God of Hope and the End of the World

London: SPCK, 2002. xxi + 154 pp. hb. £15.99. ISBN 0 281 05494 0

While most Christians still focus on the question of the *beginning* of the universe and of life as the major area of debate with science, an increasing number of non-Christian scientists have begun to focus on the question of the *end* of the universe and its philosophical implications. The reason for this is the realisation that the meaning of a story is often only fully apparent once its end is known.

For three years an interdisciplinary group of scholars met under the auspices of the Center of Theological Enquiry at Princeton to consider how Christian eschatological hope about the end of the world might best be expressed today in the light of modern knowledge. The outcome of these meetings was a book of essays, *The End of the World and the*

Ends of God, TPI, 2000, edited by J. C. Polkinghorne and M. Welker. Those essays are demanding reading, and Polkinghorne was given the task of writing a more accessible volume. The result, though drawing from the essays, is not a condensation or digest of them. Though informed by the discussions of the whole group, it expresses Polkinghorne's own conclusions and beliefs. The outcome is a book that should be accessible to a wide readership and may well encourage some to tackle the more demanding earlier volume.

Polkinghorne's approach is one that bears emulation. He begins by considering what the physical sciences have to say about the eventual end of the cosmos and of life on earth, which will come about long before the end of the cosmos as the sun expands into a 'red giant' star. The attempts of some scientists to provide (meta-)scientific 'eschatologies' are shown to be inadequate. There is an insightful discussion of 'hope' from a psychological perspective and brief consideration of claims arising from paranormal experiences. Consideration is then given to some issues arising from general culture. The value of this opening section of the book is that it ensures that what follows addresses the issues and questions that non-Christians are asking today, and also identifies some relevant points of contact for dialogue between Christians and non-Christians.

The central section of the book is a survey of relevant biblical material. This is a 'broad sweep' approach drawing out general concepts and not a detailed study of biblical passages. Polkinghorne sides with the majority of scholars who have concluded that in the teaching of Jesus and the New Testament writers there is an 'inaugurated eschatology'. In other words, we can experience something of the age to come now, but there is still an 'age to come' at some time in the future of God's choosing. He defends the historicity of Jesus' resurrection and sees in it the firm basis of hope for the future because

it demonstrates the faithfulness and love of God towards those who trust in him. Jesus' resurrection body gives us a glimpse of the nature of the new creation, which appears to be both continuous and discontinuous with the old. My only quibble with this section is that very little is said about the theme of the Second Coming of Christ beyond the comment that it is 'the symbol of the final vindication of the Lordship of Christ' (62).

In the final section of the book Polkinghorne seeks to give an intelligible exposition of Christian hope that is relevant in our current context. A number of themes that have their roots in the earlier sections are key elements in this: God's faithfulness and love as the only sure ground of future hope; the psychosomatic unity of human beings and its implications for understanding life after death; the combination of continuity and discontinuity between the present creation and the new creation; the place of temporal process in the two creations. He is not afraid to express his views on some controversial issues, such as the state of people between death and resurrection, the purgative nature of judgement after death, the nature of Hell. These are issues that many evangelicals will want to debate with him. Again, there is no real discussion of how we might think about the Second Coming of Christ in modern terms.

Polkinghorne says, 'Ultimately the issue is whether we live in a world that makes sense not just now, but totally and for ever. The thesis of this book is that Christian belief provides the essential resource for answering this fundamental question' (xiii). This is one reader who thinks that he establishes his thesis. For that reason, it is a book well worth reading and pondering.

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K. Helmut Reich

Developing the Horizons of the Mind

Cambridge: CUP, 2002. 222pp. hb.
£40.00. ISBN 0-521-81795-1

K. Helmut Reich's latest monograph concerns itself with human reasoning. The work is in the tradition of other philosophers and psychologists who have attempted to solve the apparent cognitive conflicts or bifurcations our thinking runs us into. Reich offers a new theory, Relational and Contextual Reasoning (RCR) that seeks to avoid the pitfalls and limitations that other thought forms encounter in addressing complex and seemingly paradoxical issues, or when two or more theories seem to be competing for the same explanatory space. He says that 'a fully developed RCR is a specific thought form which implies that two or more heterogeneous descriptions, explanations, models, theories or interpretations of the very same entity...are both "logically" possible and acceptable under certain conditions...' (12-13). Typically, these issues have centred on 'nature versus nurture' debates, the Mind/Body problem, and debates between science and religion concerning the origin of the cosmos; the very issues that RCR is applied to in the book. Applying RCR is done through an eight step methodology that seeks to underline relations between conflicting theories to arrive at a synopsis and a greater insight into the nature of a given explanandum.

RCR theory is also 'postformal'. This is basically Reich's way of stating that the logic of RCR is not to be confused with formal binary logic; he defines logic as 'principles or rules governing the proper use of reasoning' (92). This is not to say that binary logic has nothing to say or that Reich is attacking it in any way. It is simply that binary logic is inherently invariant with respect to space and time, and 'context' (or so it could be argued) and is therefore not ideally suited to addressing issues and conflicts where context and relations are of vital importance, and do indeed vary.

Reich compares and contrasts RCR with other forms of thought such as Piagetian Operations, Cognitively Complex Thought and Analogical Thinking and reveals that RCR shares many 'components' with these, but differs from them in that it has its own logic. But RCR is however a further development on the same continuum of forms of thought; its trivalent logic giving it a better edge in dealing with conflicting issues. Reich however is not part of the 'idealist' tradition; he is a 'critical realist'; critical realists accept that there is a real world 'out there' that exists independently of human thought, but strongly critique human powers in *knowing* that world.

The book does not limit itself to theory. There is a long section on the empirical research Reich has undertaken that reinforces his claims for RCR, and the whole of the second half of the book is dedicated to the application of RCR.

Though very well researched and well written, the book is a difficult read and the eight-step methodology of RCR often very difficult to follow. Reich himself encourages the reader to keep going. The book will be of interest to those concerned with religious belief and religious doctrines. As he says, these doctrines are often held to be 'irrational' or 'understandable to believers only, if at all' (120). His research findings are that those who reason at the level of binary logic have more difficulty in understanding the doctrine of the Trinity than those already exercising a measure of RCR in their thinking (123-5).

There is something intuitively worthy and honourable in what Reich is trying to achieve. We have long known that 'the heart has reasons that reason knows not of', and that binary logic is better suited to mathematics, say, than solving 'nature versus nurture' debates; nor will binary logic ever be the real motivating factor when it comes to our belief commitments or day to day decision making. But one is left feeling that many of our conflicts

whether cognitive or political (Reich is interested in both) are not primarily the result of our reasoning at all. It is the human *condition* that is at issue. It is in this sense that, when it comes to real conflict, new forms of reasoning might just be beside the point.

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W. Mark Richardson, Robert John Russell, Philip Clayton & Kirk Wetger-McNelly (eds)

Science and the spiritual quest: new essays by leading scientists

London: Routledge, 2002. 264pp. pb.
£12.99. ISBN 0-415-25767-0

This book results from meetings held in 1997 as part of the Science and Spiritual Quest (SSQ) project, which sixty leading scientists attended (I am not sure what 'leading' means and no list of attendees is given). Whether the book's sixteen essays are representative of the views, or spread of views, of the whole group is unclear. The essays seem to be very much individual perspectives. Of the sixteen essayists, eight are physicists, while the rest are a mix from the biological, medical and computer sciences, and one philosopher. Their 'spirituality' ranges across Christianity, Judaism, Islam, Hinduism to agnostic and atheist. The term 'spirituality' is used in a broad and ill-defined sense. The book aims to be a 'dialogue' between science and spirituality and the essays are 'accessible and crafted with the non-scientist in mind. Some are more difficult than others...' (x). I would agree that some are very readable and illuminating, others are somewhat obscure and some even 'off-the-wall' (one author admits to being 'light hearted' (51)). Each essay is preceded by an interview between its author and an editor, and there are editorial introductory and concluding chapters.

The book addresses the usual gamut of SSQ questions – evil / suffering and a God of love, free will and determinism, the complementarity or otherwise of science and religion, science and ethics, the purpose of life and the universe, Christianity and Darwinism, and so on. I found nothing startlingly new here. There is common ground among those writing from the Islamic, Judaic and Christian perspectives, in terms of God as creator, and having these essays together in one volume is interesting. It is possible to pick apart some of the arguments in some of the essays, but that requires another book! In any case, generally the authors are tentative about any conclusions they draw and see them as subject to revision as better understanding develops in the future.

This last point is a 'strand' running through the book. As noted in the conclusions '...for these scientists, being religious can never be pursued at the expense of high quality science.' (p.258). It appears that if it came to a choice between science and religion, for many contributors science would 'win'. However, for some science seems less crucial than religion. Thus the physicist Cyril Domb might abandon science if offered a million dollars to do so, but would not break the Sabbath if offered the money (p.65). I would take a similar view, my science is more provisional than my faith.

Somewhat surprisingly, those essayists writing from a Christian perspective make little reference to Jesus. While this makes for common ground among the so-called Abrahamic faiths, it underplays the differences (the Christ event presents a unique challenge to SSQ).

There are plans for SSQ II, which will add to the Western monotheism focus of SSQ the traditions of eastern religions, animism, paganism, nature spirituality and humanistic spirituality (p.259). The concluding chapter states, 'It is as if a vast wave of interest in the overlap regions of science and the spiritual quest

is growing, overturning past prejudices and animosities as it races forward' (p.260). This seems a rather overblown claim, as SSQ is probably unknown to the majority of scientists (it was to me before reviewing this book) and to the world at large it is probably of little consequence (whether it should be or not is a moot point). Therefore, while at times making interesting reading, I do not think that this book, or the SSQ project, are likely to have the impact that the editors seem to hope for.

There is a companion volume of interviews with scientists involved in SSQ: Mark Richardson & Gordy Slack, *Faith in science: scientists search for truth*, London: Routledge, 2001. (Reviewed on p. 78 of this issue of *Science & Christian Belief*.)

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Neil Messer (Editor)
Theological Issues in Bioethics: an Introduction with Readings
London: Darton, Longman and Todd, 2002. 286 pp. pb. £14.95.
ISBN 0-232-52441-6

Here is an unusual book. Neil Messer, now Professor of Theology at Lampeter, has assembled a series of extracts from a wide range of writers who put forward their individual views on various aspects of bio-ethics. The chapters cover a broader than usual spectrum of topics: life, death, our bodies, health, health economics, doctor/patient relationships and our attitude to both the natural world and the animal kingdom. The book's focus is theology with scientific factors given little explanation, but at the conclusion of each chapter there is a vignette based on a real life ethical dilemma with questions to consider arising from the readings.

Each chapter consists of relevant passages from two or three Christian

authors from differing theological positions with Roman Catholic, Eastern Orthodox and Evangelical representatives plus contributions from Feminist and Liberation theologians. Some, such as Stanley Hauerwas and the late Paul Ramsey are well known, but others much less so. In a future edition more information on the various contributors would help to set their pieces in context.

With such a broad selection of authors we are exposed to a wide range of views and no doubt if all the authors were in a conference together there would be arguments. But the disputes would be over detail and priorities. What comes over is the degree of agreement on the Christian essentials such as justice and the value and dignity of each individual in God's sight. In fact the only confrontational readings are papers taken from *Science and Christian Belief* (1993) where Oliver Barclay and Andrew Linzey take very different views on Christian attitudes to animals.

Most of us are aware of the Roman Catholic stance on bioethical matters but the Eastern Orthodox extracts gave me new insights with their spiritual emphasis and focus on kingdom ethics. Likewise we need also to listen to the Liberation theologians with their warnings on the potential harm ill-considered introductions of high technology could have on those living in the developing world. As a clinical geneticist I particularly enjoyed feminist theologian Karen Lebacqz's musings on the status of the embryo, based on the work of Thielicke and her splendid essay on the disempowerment experienced by becoming a patient, whether one is a hospital consultant or an unemployed immigrant woman. John Hull's piece 'A Blind Person's Conversations with the Bible' in the chapter on 'Health, Disease and Wholeness' brings a welcome perspective from a person with an impairment that need not be a disability.

The paucity of science is a little surprising, particularly in view of the

author's previous life as a molecular biologist, but perhaps there is no real need for theologians to get mired in biology. There are many books on bio-ethics but most focus on technology and there is a great need for sound theology – for theologians to be aware of the issues and to make their distinctive contribution to these problems that will face most of us at some time in our lives. Here is material with a God-centred stance. Much of it is old, William May on covenantal relationships remains fresh although Paul Ramsey's discussion on resource allocation seemed dated, but there are new insights too and the book provides a good foundation for the rising generation of theologians to build on, both pastorally and in research. For those of us who work in science the book provides a healthy confrontation to our pragmatic and often materialistic outlook and can be recommended as a means of widening our horizons.

It is well referenced and indexed with a useful glossary of both scientific and theological terms.

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John Jefferson Davis

The Frontiers of Science and Faith – Examining Questions from the Big Bang to the End of the Universe

IVP (Downers Grove, Illinois), 2002.
200 pp., pb. US\$15.00.
ISBN 0-8308-2664-5

John Jefferson Davis is a Professor of Systematic Theology and Christian Ethics at Gordon-Conwell Theological Seminary, although his first degree is in Physics. He has a strong track record of publications on the interface between science and faith in both theological and scientific journals, and his achievements have been recognised on more than one occasion by the Templeton Foundation, including the Award for Quality and

Excellence in the Teaching of Science and Religion (1998). In *The Frontiers of Science and Faith* Professor Davis uses his expertise in physics, theology and philosophy to the full as he addresses ten topics related to the impact of new scientific research on traditional Christian doctrine. As the author himself states in the preface, his basic presupposition is that 'the results of modern science, properly understood, are no threat to Christian faith. Christian faith and scientific method are understood to be complementary ways of knowing God's creative work, each having its distinctive ways of knowing, methods and areas of validity.' Each chapter is a separate essay and several have already been published as independent papers, including three in this journal. This is apparent in the style of writing that is somewhat academic, with extensive references as detailed footnotes. As such, I found it quite hard going in places and a little disjointed; it is certainly not a book for bedtime reading. But what of its contents?

The first chapter is a consideration of 'Genesis 1:1 and Big Bang Cosmology' in which it is argued that Genesis 1 speaks of a real beginning to the universe, an *ex nihilo* creation, just as does modern cosmology. Even if, in the distant future, there emerges a 'theory of everything' it will still be God who 'breathes fire into the equations' and gives meaning to the universe. Chapters 2 and 3 tackle issues related to Quantum theory. The first of these, 'Quantum Indeterminacy and the Omniscience of God', considers such issues as whether God can know the future at the same time as we possess free will and our actions have significance. If God is outside of time, how can he be religiously available within his creation? He suggests that an analogy for the immanence and yet the transcendence of God is the particle and wave characteristics of an electron. He concludes that we as creatures have a voice and a vote but God has the veto. However, no consideration is given as to how God imposes his will and direction on a

quantum universe. Chapter 3 continues the theme with some repetition and is entitled 'The 'Copenhagen' Interpretation of Quantum Mechanics and 'Delayed-Choice' Experiments: New perspectives on the Doctrine of Predestination'. Professor Davis explains how recent experiments in quantum physics seem to indicate that the past is not fully determined until the experimental measurements are complete. 'In the quantum world, an event is not fully actual until it has been brought to a close by an irreversible measurement. The past is not cast in stone or fully determined or actualized until the experiment is over' (64). He concludes that God's intentions can respond to our actions so that 'election' only becomes predestined after we make our free choice.

Chapter 4 presents some 'Theological Reflections on Chaos Theory'. After an introduction to the origins and major features of chaos theory, the limitations this imposes on our ability to predict and control the future are noted. The author suggests that chaos theory does not fit well with determinism and reductionism, but rather allows for complexities such as religious experience that cannot be predicted by any scientific process. He goes on to suggest that chaos theory may help to explain how God can create using the 'chance' processes of evolution. Through the constraints (laws) the creator imposes, chaos theory provides an infinitely fertile mechanism through which God can bring into being the rich variety of his creation. However, this line of reasoning would seem to run the risk of moving away from theism towards deism. Chapter 5 is entitled 'Does Gödel's Proof Have Theological Implications'. For those of us with no knowledge of Gödel's Proof, it is explained that Gödel demonstrated an inherent limitation in the axiomatic method, that a proposition can neither be proved nor disproved from within a system. After some philosophical excursions Professor Davis concludes that 'Gödel's theorem has helped to make it more clear than ever that the notion of

truth cannot be reduced to the notion of probability. Theology has its own distinctive voice and need not be forever preoccupied with justifying itself in the language of Euclid and Einstein' (101).

In chapter 6 the author considers 'Artificial Intelligence and the Christian Understanding of Personhood' and concludes that what is critical to personhood is not intelligence and logic, but relationships, especially with God in whose image we are created. Personhood is ethics laden and exhibits moral values whereas research into Artificial Intelligence (AI) is usually conducted without reference to moral and ethical values. Indeed, the scientific method itself cannot provide the moral framework needed to address the ethical questions posed by AI research.

Chapters 7 and 8 address issues relating to the creation of the universe and life as we know it. Chapter 7 poses the question 'Is 'Progressive Creation' still a helpful concept?', referring to a view propounded by Bernard Ramm that God intervened in a direct way at various stages in the creative process that otherwise continued under the general direction of the laws of nature that he had instigated. It is noted that this fits well with the long periods of stability in the fossil record, followed by periods of rapid and explosive change (punctuated equilibria). It can also be reconciled with the biblical texts. However, to many readers such an approach might appear to be nothing more than 'God of the Gaps' in different clothing, and the author provides no arguments to counter this conclusion. Chapter 8 is entitled 'The Anthropic Principle – or Designer Universe' and reminds the reader just how incredibly finely tuned the fundamental constants in physics and cosmology are that have allowed our stable universe to come into being and provide the conditions for life to evolve on this planet. It is concluded that in reality 'the anthropic principle' can only have two viable explanations. Either an astronomical number

of universes have come into being and we are in a small corner of the one stable one where conditions are right for us to evolve by chance (the many worlds hypothesis) or our universe was purposefully designed and created. The author argues that Occam's razor would favour the latter, especially so when issues such as the origins of religious experience and moral awareness are also considered. Essentially one might conclude that the 'Anthropic Principle' is really the Design Argument with God airbrushed out.

Chapter 9 is entitled 'The Search for Extraterrestrial Intelligence and the Christian Doctrine of Redemption' and considers how God might bring redemption to any intelligent life forms that may exist in other parts of the Universe. Would each situation require its own incarnation and atoning death or would Christ's death on the cross in our world suffice as a cosmic redemptive act? The author argues from passages such as Col. 1: 19-20 that it would. Although discussions about life elsewhere in our universe have a long history and are receiving increasing attention again today, this chapter struck me as especially speculative and of limited value. I also remain unconvinced that it is valid to interpret the Bible, that God used to reveal himself to men and women in the context of this world, to any hypothetical situation in some other world.

The final chapter of the book looks to the end of the universe under the title 'Cosmic Endgame: Theological Reflections of Recent Scientific Speculations on the Ultimate Fate of the Universe'. The author concludes that thermodynamic considerations demand that there is no escape for the universe from either total collapse or infinite expansion. Recent expressions of cosmic optimism by people such as Dyson, Barrow and Tipler are shown to be flawed. They appear to be overstepping proper boundaries when they attempt to use the methods of physics to argue for conclusions that are metaphysical and religious by nature.

The history of the science-religion relationship indicates that both disciplines are best served when theologians do not attempt to derive empirical results from their religious texts and when physicists do not presume to settle issues of value, meaning and purpose by the scientific method (173).

Many of us would heartily agree and would not restrict our criticism of scientists to physicists alone! The author concludes that, faced with the inevitable demise of the universe, it is divine revelation and not science that seems best equipped to bring hope into this situation. Although not in disagreement with his conclusions, I was surprised that there was no consideration of the more likely scenarios for the end of the world, or at least life as we know it, in the much nearer future than any 'big crunch'. There is plenty of evidence that massive changes in global weather patterns and cataclysmic geological disturbances have occurred quite regularly in the past and would be predicted to occur again in the not too distant (geologically speaking) future with dire consequences for the human race.

My overall opinion of this collection of essays is that it is a valuable contribution to the Science-Faith interface, but I am not sure at whom it is targeted. In my view, its rather academic style and content make it unsuitable for the reader with a general interest in science and religion whilst each chapter is probably of insufficient depth to attract the specialist reader or serious academic. As someone somewhere in between, I found it a book that I learned from and am pleased to have on my shelves, but it has not moved my thinking forward very much and would not be a priority purchase.

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William H. Lazareth, (Editor)

***Hope for Your Future: Theological
Voices from the Pastorate***

Eerdmans, 2002. 223pp.pb.

£11.99/US\$16.00. ISBN 0-8028-4961-X

One can do nothing but applaud the initiative behind this book, as a project. It has emerged from an American based *Pastor-Theologian Program* that began in The Center for Theological Enquiry in Princeton and developed nationally and ecumenically (as reflected in the contributors) to attempt to bridge the gap between theology and the church. Its stated purpose being: *to encourage the church to regain its theological substance.*

This volume emerges from the research year 1999-2000 where the theme for exploration by participating Pastor-Theologians was 'Theology, Science and the Future'. It consists of twenty nine edited research essays around eschatological themes aimed to educate and stimulate pastors and congregations to think 'Christianly' in a world of science and faith. As the title of the book implies, its focus is primarily eschatological. As such it will be of most interest to those reading in this field.

If your greatest strength can also be your greatest weakness, this book is a case in point. The eschatological umbrella under which these essays are collected proves to be a rather broad canopy. Possibly the best way of reviewing this book is to review where it goes and then to ask the question – do you want to go there? In chapter one the writers consider the biblical passages that concern the end of the world. In chapter two we are musing over the eschatology of Kierkegaard, Tillich, Aquinas and Luther. Chapter three explores the eschatological hope of the Christian meta-narrative. Chapter four is on more traditional ground in looking at the relationship and interaction of science and theology. Chapter five explores selected cultural expressions of general revelation

in medicine, poetry, genetic research, music and arts. By chapter six you arrive exhausted at essays analysing the church as an eschatological community.

The contributions in chapters 4 and 5 are probably the ones that will most directly interest the readers of this journal. Here the implications of the programme's decision to bring eschatology alongside science/theology debates are seen most clearly. In chapter 4 writers choose different approaches to the now well-rehearsed debates. Coleman (107-112) depicts science and theology as 'sibling rivals' in the quest for ultimate truth. Paul Wee (100-106) argues that we break any 'cycle of conflict' by the exchanging of fundamentalist reductions in favour of more modest representational claims for science and theology. Chapter 5 then takes on some of the contemporary issues where science and eschatology meet, and here the book is at its best. In the spotlight are questions about medical progress and intervention (can it really be seen as an outpouring of the Holy Spirit?); alternative healthcare; the genome project and the 'playing of God'; science, theology and language as culture moves away from reductionist explanations of truth in favour of the depictive and poetic. This is interesting material.

So, who might want to read this book? If you are looking for theological stimulation on eschatological themes this book is a useful launching point. Positively, it is dealing with a huge area in manageable chunks and in that respect it meets its remit perfectly. However, due to its wide-ranging content and the brevity of the contributions it is neither an easy-reading introduction nor an in depth exploration of the main themes. It left this reader needing more about less – which perhaps serves to confirm the validity of the programme.

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Robert Song

Human Genetics: Fabricating the Future

London: Darton, Longman and Todd, 2002. 144pp. pb. £8.95.
ISBN 0-232-52393-2

The developments in human genetics over the last fifty years raise a number of ethical issues that are now familiar topics in the public debate. Now and again so-called 'new' issues seem to arise, but on closer inspection they are almost always just slightly different versions of old issues.

In this book Robert Song gives an overview of the ethical issues that are currently at the forefront of the public debates ranging from stem cells and cloning to behavioural genetics. For each of the issues the standard liberal arguments are presented and dissected and it is explained why they are so attractive to large groups of people in modern societies. Various possible counterarguments from within the Christian tradition are discussed, and it is shown where they are weak and unconvincing.

Personally I find the last chapter of the book to be the most interesting, provocative and rewarding. In it the author develops a Christian counter-narrative to the narrative of scientific and technological inevitability that characterises present Western societies. He traces the roots of the technological narrative to Francis Bacon and shows that it relies on two central considerations for its power: 1) the elimination of suffering and 2) the expansion of choice. Against this narrative a possible Christian alternative can rely on the eschatological idea that the necessities of the world are not final, and that living by the technological narrative involves a sinful bondage to nature and technology. But just stating this cognitively is clearly not sufficient. The Church as the Body of Christ has to live this counter-narrative. As the author points out, this will involve a specific, lived re-conceptualisation of those ideas

about reproduction and celibacy, the importance of genetic relationships and the role of the disabled in the Body of Christ that we have taken from the technological narrative in which we have been immersed for hundreds of years.

The science in the book is up to date and the author is very careful in pointing out where science-fact turns into science-fiction in scenarios predicting future developments in human genetics.

Despite its brevity this is a very insightful book and it can be recommended without reservation to anyone interested in these issues. It would also be an excellent basis for a reading and discussion group.

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Hans Schwarz

Creation

Michigan & Cambridge, UK: Wm B Eerdmans Publ Co, 2002, 254 pp, pb
US\$29, £19.99. ISBN 0 8028 6066 4

At a time when Evangelicalism seems reluctant to face issues confirmed by the sciences and bringing a variety of beliefs to their understanding of the scriptures, this book is a welcome addition to my library. In it the author examines the relationship between theology and the truths unravelled by scientific studies, connecting both to the biblical narrative and a faith in God the Creator, Sustainer and Redeemer.

The book has a Contents page, Preface, Introduction, then three major parts examining in detail the concepts of Nature without God, the World in Scientific Perspective, concluding in Part III with a discussion about regaining a Christian faith in Creation. Three Indexes follow listing names, subjects and scriptural references. The text has comprehensive footnotes and a clear typeface. The book has a sound binding.

Professor Hans Schwarz is a theologian of the German Lutheran tradition. He expresses ideas that are easily grasped by the reader. Introducing the theology of the primeval history of Genesis, Hans Schwarz deals with the postulate, held by some, where, with one instantaneous act of creation a perfect universe results and the need for a creator's ongoing involvement in this creation appears to vanish. The author displays an in-depth understanding of philosophical and scientific ideas as they impinge on theology.

Following publication of the *Origin* Charles Darwin's idea of 'survival of the fittest by means of natural selection' was the basis for a scientific approach to the study of Nature. Following that, his name was associated with evolution. Asa Gray, botanist, could see that these concepts would be seen as atheistic. Other readers at that time understood Darwin's writings as an implied attack on the Christian faith, in spite of the fact that Darwin acknowledged a Creator and never claimed that humans were descended from monkeys.

In the following decades there was a retrenchment by many Christians and some theologians because they concluded that in Darwinism design was removed from the study of living things, and that was atheism. Other Christians understood that there was no conflict with design or theology, and Darwin's theory might not endanger their faith. Even in the seat of orthodoxy, the Princeton Theological Seminary, Hodge did not reject this new theory of evolution. In all these matters Schwarz presents a lucid discussion of the issues influencing the scientific and religious climate of the time.

American conservative Christian movements were becoming prominent in the early 20th century and with the pub-

lication of 'The Fundamentals' an apparently authoritative anti-evolution stance emerged. In contrast, in Europe a more militant attitude accepted many of the findings of emerging science. It could be asked whether the demarcation between these protagonists and antagonists has mellowed since then? Schwarz provides a balanced review of the main figures in these historical debates including those from a German perspective, which reinforces the idea that an understanding of nature remains incomplete without God's revelation in the Scriptures.

In his discussion of the primeval narrative of Genesis 1:1 – 2:4a Schwarz presents a thoughtfully researched treatise based on theology and science. Many would agree with him that it is not possible to force modern science into these events without destroying the theological intent of the writer where he brings God and the world into a relationship. The author understands that the message of Genesis is that God is the Creator of everything. He emphasises that the Christian hope is not based on science or the denial of the findings of science but on God's self-disclosure in Jesus Christ the Lord.

I found this book informative and a pleasure to read and reflect upon. I unhesitatingly commend it to readers of this journal. The book is based on the author's extensive knowledge gained by a careful study of the issues influencing an understanding of the truth found in the early chapters of Genesis and that established by the scientific study of nature. It would be a valuable addition to church, community and educational institute libraries.

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