

Book Reviews

J. R. S. Fincham and J. R. Ravertz
Genetically Engineered Organisms: Benefits and Risks

Milton Keynes: Open University Press, 1991, 158pp. pb. £7.50

This is a report of a working party of the Council for Science and Society, and is a compact sized paperback which is succinctly written. It principally discusses the environmental release of genetically engineered, or modified, organisms (GMOs), but it also discusses several other issues associated with genetic engineering.

It is divided into 10 chapters. There is a good index so that topics can be easily referenced, and it presents key references (about 4-10 per chapter), which include some 1990 papers. There is an 8 page glossary to explain some of the words, and the scientific techniques are well explained using figures, so that it is accessible to any graduate, and also to people who know some basics of biology. It describes up-to-date techniques, so may be useful to people who are not familiar with these.

All the chapters are short in size, which makes it easier to read. The first asks the question, how safe are GMOs. It is well-balanced, discussing the concerns about safety. The degree of risk raised by the introduction of a new variety of crop, or animal, or a new species, depends on the organisms themselves. For example, a species capable of growing in many types of habitat has more potential to spread into the environment than one with a strictly limited ecological niche. Other factors that are important are the presence of predators of the GMO, and its ability to compete with wild species in that area, in the case that it spreads over

a large area. Most GMOs are not good competitors in the wild, so even if they spread they would not survive, but special caution is required when dealing with a GMO with higher survival chances. The genes may transfer to a wild species, via gene transfer or by crossing between the GMO and a wild species. The ecological effects of the introduction of the gene, and/or the GMO into an environment need to be assessed. In the final two chapters of the book, risk assessment is discussed, and a call is made for the encouragement of more systematic biological research and ecological research, in order to provide more knowledge on which to be able to predict the risks of introducing specific GMOs.

Between the first and last two chapters of the book, more science is discussed. DNA is introduced, then the use of GMOs for specific purposes; industry, agriculture, plants, animals, vaccines, and a 24 page section on human genetics which, though its size is limited, is an introduction to many uses of genetics in humans. DNA fingerprinting is discussed, and the use of restriction fragment polymorphism patterns for use in genetic mapping and screening also. Some mention of the human genome project and gene therapy is also made, and the ethical issues.

The sections on the nonhuman GMOs are more comprehensive, and they are the major purpose of the book. Genetically engineered vaccines are said to be the organisms with the most major impact on human life in the near future. One could say that this book, while discussing the range of current research, is a bit conservative in places as to the time period in which it predicts their introduction. Some sent-

ences should not be taken out of context, for example on p. 83, 'it is difficult to see, at least in the next few decades, any great benefit from genetic engineering to the breeding of farm animals in their conventional roles', but they mention the introduction of disease resistance genes as one important area. Some would say that there will be some significant applications of genetic engineering to farm animals within a decade, such as the use of growth hormone genes to make leaner meat, or the use of genes to improve wool production from sheep. However, as they do, the different possible options need to be balanced, for example the use of vaccines versus disease resistance genes. In the same chapter, some of the ethical issues are introduced, for example the issue of animal rights and ecological risks. The book is written by scientists, and thus we could expect more discussion of science than ethics, and also reliable science.

The most important contribution of this book is the discussion of the risks and ways of controlling the risk, of introducing GMOs to the environment. The applications of GMOs are also well discussed, but can be found in other popular books. The discussion on the release of GMOs is better than other popular books that are on the market. As the first GMOs have begun commercial sales, and as the number of field tested GMOs expands rapidly, this is an important topic itself. The tone of the book is very matter-of-fact, which is also good to see in a book intended for popular discussion of genetic engineering.

Darryl Macer

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Michael Poole

Miracles: Science, the Bible and experience

Scripture Union, 1992, 128pp. £4.95

The author is a Lecturer in Science Education and has appropriately targeted this book primarily at senior school pupils, though it could have a much wider use.

This target has led the author to start the book with an account of a 'miraculous' healing of a much-prayed-for person and to start each of the following 12 short chapters with an imaginary discussion in which different people raise different points of view, usually in one sentence each. The chapters then discuss these points of view in turn, subjecting each to careful expansion and criticism.

The result is an easy read, though the thought is far from superficial. There is a good discussion of the nature and definition of miracles, why some people rule them out *a priori*, and what exactly is being claimed by Christians.

There is a very useful stress on the fact that God is at work all the time, bringing about the regularities of nature. In this context miracles are seen 'not as evidence that God is acting where he does not normally act, but as indicating that he is acting in ways, and for purposes, that are different from normal' (p. 22).

The early chapters clear the ground on science and miracles, deism, the 'God-of-the-gaps' and related issues. There is discussion of David Hume's views, mention of logical positivism and Karl Popper, and fuller treatments of the virgin birth and resurrection of Christ. There is a pastoral aspect especially in a chapter on 'When miracles don't happen', with a perhaps too-brief treatment of the problem of the consequent suffering.

Poole is well read and quotes appropriately from Bertrand Russell, Atkins, Dawkins and others, putting their positions alongside a reasoned

Christian response, drawing in various Christian authors as he goes along. Altogether a useful short treatment, which does not pretend to be a definitive book.

Oliver Barclay

Dr. Barclay is a founding Editor of *Science and Christian Belief*.

Ian Bradley

God is Green: Christianity and the Environment

Darton, Longman and Todd, 1990, x + 118pp. pb. £6.95

A glance at the shelves of any bookshop indicates that the environment is a topic of great public interest and concern. This is not however an issue which has received much attention from Christians. Indeed, Christianity has a rather poor image in the eyes of many in the environmental movement. At the extreme, some environmentalists consider that the Judaeo-Christian tradition is to blame for the world's environmental problems—encouraging despoliation of nature under the banner of dominion over the creation. Perhaps the best known exponent of this view is Lynn White, who has argued that western Christianity is essentially anthropocentric, viewing the world as existing purely to be exploited by our species, whereas ancient paganism and eastern pantheism are claimed to encourage a respect for the natural world.

Bradley begins by summarising the criticisms which have been laid at the door of Christianity and then spends the remainder of the book answering the charges, arguing that Christianity is in fact a very green faith which 'has been distorted by alien influences and the relentless selfishness of the human species'. In the first three chapters, he identifies elements of traditional Christianity which have been 'major contributors to the environmental crisis': the idea that nature exists solely

for man's benefit; the portrayal of God as totally transcendent; and the idea that the natural world is wholly profane and therefore fair game to be exploited. He argues that each of these is a distortion of the message of the bible and the teachings of the early church. In the final two chapters, he argues that Christ will redeem and lift up the whole world (not just mankind) to glory and explores the role of humans in the world as 'stewards, artists, mediators, priests and redeemers of the world'. In a final postscript he gives some suggestions of how churches might become 'greener'.

It is certainly true that our selfishness often leads us needlessly to destroy that which God has declared to be very good, and that the church has too often adopted an unbiblical dualism between the material and the spiritual. Bradley provides a useful summary of some of the ways in which this has happened and identifies a number of thinkers who have held different views. When he comes to discuss the transcendence of God, I start to become less comfortable. He expresses a strong preference for pantheism and process theology as the route to recover the green heart of Christianity. It is probably true that the balance in the church's teaching between God's immanence and his transcendence has not always been correct, and that we need to be reminded of God's continual involvement in sustaining creation. To respond to this by trading the God of the bible, who is both transcendent and immanent, for the finite God of pantheism and the gradually developing God of process theology is certainly to go too far, and takes us dangerously close to syncretism as evidenced by the comments about the dance of Shiva on page 44.

As well as having reservations about some of this book's content, I find aspects of its style very frustrating. A major part of Bradley's methodology is to present a series of quotations from those who he considers to have held on

to 'the green heart of Christianity' when most around had lost the sense of this. This involves sources as diverse as St. Kevin of Gandalough, Teilhard de Chardin, Charles Wesley and Donald MacKay, all quoted with equal, and somewhat uncritical, approval. The author also has an annoying tendency to make sweeping statements about both science and Christianity, without providing detailed arguments in justification of his case. Examples of this include 'the discovery of a unified field in physics and a phylogenetic field in biology suggest a deep unity and harmony at the root of all being' and that 'the whole campaign to move away from intensive high-input farming towards organic husbandry' ... 'receives powerful endorsement from the Scriptures'. Amongst other things, the style of the book makes it difficult to summarise in a review.

We certainly need to respond to the critique of Christianity made by sections of the green movement by examining our views on the environment in the light of scripture, and by modifying our individual and collective behaviour where necessary. We also need to challenge the neopaganism which is at the heart of some sections of the green movement. For example, the large scale forest clearances and mega-herbivore extinctions caused by prehistoric societies in the UK, New Zealand and elsewhere demonstrate that paganism and pantheism are no guarantee of ecologically correct behaviour, quite apart from any theological reservations which we have about neopaganism. This book provides some contribution to thinking on the subject, but in the end disappoints.

Alastair Grant

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Andrew Linzey (Editor)
Cruelty and Christian Conscience: Bishops say no to Fur.

Lynx Educational Trust, Nottingham, 1992, 63pp. £4.50

The nub of this booklet is a statement by 40 Bishops of the Anglican Churches in UK pledging themselves not to buy or wear fur. It is preceded by an article by the Editor on 'The Christian case against cruelty' and another on the fur trade. It is followed by a collection of relevant quotations. Linzey defines cruelty as: 'the intentional, unnecessary and unmerited infliction of pain and suffering', with some discussion of what the word unnecessary should mean. He concludes that: 'It can never, never be possible to profess Christ and inflict cruelty on any living being ... this must be gospel.'

Oliver Barclay

Dr. Barclay is a founding Editor of Science and Christian Belief.

I. Stewart and M. Golubitsky
Fearful Symmetry, Is God a Geometer?

Penguin, 1993, xix + 287pp. First published 1992, pb. £6.99

God occurs in the title but not in the Index. The reason is simple. This is a book about geometry, not God. It shows how often in nature symmetric causes can have asymmetric effects, a phenomenon called symmetry-breaking. It occurs in crystallographic forms, snow crystals, spider-webs, the convection of heat, etc. The phenomena thus discussed are very well illustrated, and the book includes four pages of colour plates. Although written by two mathematicians, equations do not occur, making this a very attractive volume for the general reader.

Peter Landsberg

Peter Landsberg is Professor of Mathematical Sciences, University of Southampton, U.K.

R. J. Berry (Editor)
Real Science, Real Faith (Sixteen leading British Scientists discuss their science and their personal faith)

Monarch, Eastbourne, 1991, 224pp. pb. £8.99

The authors who write here are men and one woman who have made their mark (often a very eminent one) in different science and engineering disciplines—among them physics, biology, biochemistry, botany, evolutionary genetics, brain science, psychology, meteorology and history and philosophy of science. For the most part the contributions consist of personal testimonies of how the writer came to evangelical faith and of its bearing on their practice of science. There is naturally a strong professional slant to them, and accordingly they will be of great interest to younger men and women who are considering careers in these disciplines. A few testimonies are a little lightweight; others move into serious apologetic discourse, especially in the psychological and biological contributions. The series ends with an outstanding essay (*Science and Christian Faith Today*) by the late Donald MacKay, to whom generations of young (and older) scientific workers owe such a debt of gratitude. This was originally published in 1960 as a small booklet, and its inclusion here was a very happy idea. This collection can be recommended especially for senior pupils at school and for undergraduates starting their courses. There is a Bibliography at the end, a list of books for Further Reading, and a general Index.

D. C. Spanner

The Revd. Professor D. C. Spanner has retired from plant biophysics, and is a non stipendiary minister in the Anglican church.

S. Weinberg
The Discovery of Subatomic Particles

Penguin Books, London, 1993, xxx + 222pp. £9.99

This 1983 book has now been issued as a paperback. It is a good buy in which an American Physics Nobel prize winner gives us his view of the history of the discovery of the electron, the nucleus, the neutron, the neutrino, strange particles, etc. He mentions that he was on a visit to Cambridge in 1962 and in 1975. Fascinated by what he saw, and by the good record of discovery in this area by British scientists, notably J. J. Thompson, James Chadwick and Ernest Rutherford, he paints a detailed, even intimate, picture of how these discoveries were achieved. He tells us some details which may not be widely known. For example that Pierre Curie did not mention the Rutherford-Soddy theory of radioactive decay in his survey of research on radioactivity even though he was at the Royal Society meeting at which it was first announced (p. 115). The author also draws attention to Millikan's method of selecting only 'good' experimental runs for his 1911-publication connected with the discovery of the electric charge on the electron (p. 96). For those wanting some more detailed information there are also eleven Appendices of theory. The success of the book is due to the ease and penetration with which the author handles this exciting piece of history. Note that there is little or no explicit discussion of religion or God.

Peter Landsberg

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Anne Primavesi

From Apocalypse to Genesis: Ecology, Feminism and Christianity

Burns & Oates, 1991, xi + 324 pp. pb. £8.95

Orthodox Christians will not find this an easy book to read. In its pages Primavesi challenges some dearly held assumptions about the Bible and Christian doctrine in the name of environmental responsibility and liberation from gender oppression.

The twelve chapters are grouped into four main sections, dealing in turn with an ecological paradigm; a Christian paradigm; the relationship between ecofeminism and Christianity; and, an ecological reinterpretation of Genesis 1-3.

In Part 1, she gives a very good account of the implications for any world-view of taking the environment seriously. She also spells out very clearly the relationship between dualism, domination of the environment, and sexism (or, more accurately, gender oppression in a patriarchal society).

Part 2 opens with a comparison between biblical and environmental apocalyptic. She then turns to an examination of the hierarchical structures which are so entrenched in the Church. If her target were the patriarchal institutions of the Church I would have few difficulties with her analysis. However it soon becomes apparent that she believes the problem lies at a deeper level: it is not that the churches have betrayed the Gospel in their accommodation to dominant social values but, rather, that the Gospel itself is part of the problem.

This analysis is continued through Part 3 (where she focusses on the dominance of male metaphors in Christian liturgy and theology; and on the patriarchal bias of the canon) and becomes the basis for her re-reading of the Genesis texts in Part 4. She suggests that the fall/redemption interpretation of orthodox Christianity lies at the root of both sexism and the environmental

crisis. In her re-reading of Genesis 1-3 Eve becomes the heroine who is not satisfied to remain in ignorance because of the unreasonable demands of a tyrannical deity (God is presented as the villain of the piece, and the serpent becomes the agent by which we are enlightened). The eating of the fruit is not about sin, but about our coming of age. She does not deny that evil enters into the story but she shifts its appearance to Genesis 4 where, she claims, it emerges from the structures of early human society.

The overall impression left by the book is that, if you wish to take the environment and women's experience seriously, you must be prepared to undertake a radical revision of Christian belief. However, there are a number of not very well hidden agendas in this book. For example, some of her categories of reinterpretation are drawn from New Age discussions of these issues. Specifically, her contrast between 'power-over' and 'power-from-within' arises from the radical feminist witchcraft of Starhawk. Similarly the concepts of fall/redemption and creation theology are drawn from Matthew Fox (who may be a Dominican priest but is emphatically not a Christian theologian!) and perpetuate his distorted account of western Christian attitudes to nature (contrary to Fox, the best of orthodox theology sought to maintain the fall/redemption and creation emphases in tension, e.g., Irenaeus).

More importantly she uses a cloak of environmentalist and feminist concerns to cover what is, in effect, an extreme liberal Christian agenda. Her enemy is fundamentalism. But her account of fundamentalism is suspiciously broad: anyone who maintains the ultimate authority of the Bible, the reality of personal sin, and the possibility of salvation through faith in Jesus is pilloried as a fundamentalist!

Jesus is de-divinized: to be fully human he must have shared in our structural sinfulness (including sexism).

Greater emphasis must be put on the Spirit (though trinitarian theologians may bridle at her consistent use of 'it' to refer to the third Person of the Trinity). Consistent with this stress on Spirit is a shift from revelation to personal experience as the basis for spirituality and theological reflection—and if cherished doctrines disagree, so much the worse for them. For Primavesi, the Bible is in no real sense divine revelation. Rather it is the culturally relative expression of the religious experience of a dominant male élite. She suggests that the ecological and gender problems of Christianity stem from the narrowness of this base of experience. But will broadening the base to include the experience of (privileged white) women solve our problems? Or will it, as I am inclined to believe, merely result in the fragmentation of theology and spirituality, thanks to the acid of relativism?

Lawrence Osborn

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R. L. Numbers
The Creationists

A. A. Knopf, 1992, 460 pp. hb. \$27.50

Van Till et al.
Portraits of Creation

Eerdmans, 1990, 286 pp. pb.

Van Till (ed.)
Science held Hostage

IVP (USA), 1988, 190 pp. pb. £6.50 (UK)

Studies of Creationism almost always create more heat than light. Here are three which can be unreservedly recommended, because they emit light.

Ronald Numbers has produced an exhaustive and definitive history of Creationism. The volume is well-structured and chronological, with excellent documentation, but no bibliography. At times the book becomes

unwieldy as it groans under the weight of information. The publication of *The Genesis Flood* is not surprisingly the key event, and Numbers discusses comprehensively its forbears—notably George McGready Price, and subsequent developments.

To summarise, all Creationist roads lead back first to McCready Price, a maverick Seventh Day Adventist and ultimately to Ellen White and her extra-biblical visions. The unusual alliance of Adventists and Missouri Lutherans from the 1920s is traced out and the drawing in of other Evangelicals after 1961. Morris and Whitcomb are the key people here. Numbers does not restrict his discussion to young-earthers, and many others e.g., Kulp, Ramm are discussed in relation to strict Creationism. Two things Numbers (or anyone else) does not explain are, first the change in Evangelicals from 1911 to the 1920s and secondly why many Evangelicals on both sides of the Atlantic have rejected old-earthism, whether a Scofield-style Dispensationalism or Concordism, in favour of Creationism since 1961.

Numbers' treatment of 19th Century Creationism is less helpful, and the first chapters would have been best omitted and Ellen White taken as the start. Though he stresses that Creationism in the Age of Darwin was old earth creationism, it confuses the issue to start with Agassiz and Dawson, and even G. F. Wright, as Creationism, as we know it, does not derive from them. In the 1860s young earth creationists were so rare that in the wake of controversy over Darwin and *Essays and Reviews* the highly orthodox evangelical Richard Main in *Replies to Essays and Review's* wrote, 'Some school-books still teach to the ignorant that the earth is 6,000 years old . . . No well-educated person of the present day shares that delusion.'

G. F. Wright, the subject of the second chapter, rejected Darwinism in the 1900s after embracing it so warmly

earlier. Numbers concludes that this rejection was theological. However, much of the geological plausibility of Evolution was shattered by short estimates of the earth's age, following Kelvin, of down to 20,000,000 yrs. My reading of Wright is that his partial rejection of evolution was as much scientific as theological. Further, Wright remained a conventional geologist, accepting completely the Geological Column. However he more and more came to adopt the shortest possible geological timescale. I feel Numbers is trying to show that the authors of the *Fundamentals* of 1910-11 form a bridge between the old earthism of the 19th century and later young earth developments. Neither Wright, Orr, B. B. Warfield, H. G. C. Moule or many others can be shoehorned into a convenient scheme.

Numbers has not said the last word. but he has given an excellent history which leaves unanswered the question WHY? Why have many Evangelicals moved from old-earthism to young-earthism in the last 30 years? To me that question is not only historical, but pastoral and ecumenical as several of my neighbouring churches are young-earth in orientation. A right understanding of history will help us with the other two, so Numbers has done a great service.

The other two works are composite efforts sponsored by Calvin College. They represent some of the best scholarship Evangelicals have to offer. Howard Van Till is a convinced Evolutionist, to the dismay of some in the Christian Reformed Church; Davis Young is a geologist who does not accept Evolution.

The title *Portraits of Creation* implies a literary approach, but we are offered a clear scientific exposition, contemporary and historical. Young on 'The Discovery of Terrestrial History' gives an excellent account on the history of Geology, followed by a brief study of the geology of the Colorado

Plateau. Young demonstrates that only 'conventional' geology gives an explanation and that flood geology fails completely. Van Till takes over on *Cosmic History and the Character of Natural Science*. His discussion on competence and integrity (p.138ff) are very pertinent and refer the reader to *Science held Hostage* on Creationism. John Stek on 'What says the scripture' provides an excellent biblical and theological base. The book concludes with five useful principles on how we should proceed.

Science held Hostage must be one of the best short semi-popular treatments on *What's wrong with Creation Science AND Evolutionism* and will draw hostile fire from both Henry Morris and Richard Dawkins. The critiques of Creationism and Naturalism have a very obvious difference. Four chapters devastate Creationism scientifically as they consider various Creationist contributions of astronomy and geology. The chapter on 'The Legend of the Shrinking Sun' is a model of how Creationism goes wrong, taking a tentative and controversial preliminary report, and ignoring all subsequent modifications and retractions. The author concludes 'the solar shrinkage report became the legend of the shrinking sun'—the vehicle of misinformation and unwarranted conclusions'. The following chapter 'Footprints on a dusty moon' discusses the oft-quoted claim that the thin dust layer on the moon points to a young moon and thus to a young earth. The mis-readings and misunderstandings of this claim are clearly presented and the final sentence sums up the flaws of Creationism. 'The continuing publication of those claims by young-earth advocates constitutes an intolerable violation of the standards of professional integrity that should characterize the work of natural scientists.'

The Evolutionism of Sagan, Dawkins and fellow believers is challenged as a belief system and an unjustified projection from science. The book con-

cludes with an epilogue on Folk Science.

In conclusion, at the very least, order the first two from the library and buy the third to lend.

M. B. Roberts

The Revd. Dr. Roberts is vicar of Chirk, Clwyd, and a former geologist.

David R. Hall

The Seven Pillories of Wisdom

Mercer University Press, Georgia, 1990, 137 pp. hb. \$18.95

'This book is an argument about arguments. I propose to examine seven arguments that have been used from time to time by New Testament scholars during the last century and a half'. So the author begins his Introduction, and it must be conceded that he fulfils his intentions admirably. Even if what he has written leaves a somewhat devastating impression, his style is so moderate, witty, reasonable and well-referenced that it can hardly offend those who are at the receiving end of its critical impact. It is a model of how this sort of critique should be presented. The author is evidently very well read, and (what would have pleased C. S. Lewis) his references are culled from authors of widely different specialities. We find here Richmal Crompton (*Just William*), G. K. Chesterton, Thomas Beecham, Conan Doyle, Herbert Butterfield, George Elliot, Bernard Lonergan, Dorothy Sayers, Karl Popper, Thucydides, and P. G. Wodehouse, as well as a host of the most influential NT critics. This is important, since the methods of the critics cry out to be assessed by ordinary intelligent, educated men and women in accordance with the canons of commonsense. I believe that many such would be very unimpressed were they to become sufficiently acquainted with the methods of the critics, who in many ways seem to be such an in-bred community.

The seven pillories are tenanted as

follows. The first holds up to public gaze the Argument from Up-to-Dateness, never so thrusting as in these days of rapid change and (not least) of the aggressive psychological warfare of high pressure advertising. Next comes the Argument from Probable Certainty, a curious phenomenon in these days when everything is interpreted in terms of evolutionary development, and the currently favourite biological mechanism is one which brings into being the most im-probable results! (so Richard Dawkins). Next comes the Argument from Primitive Culture. 'Strauss believed that the gospel writers were incapable of writing history as we understand it, of distinguishing between fact and fantasy'; yet an acknowledged authority on ancient history, Robin Lane Fox a self-confessed atheist, has written that 'long before Herodotus . . . we must reckon with the world's first historian, who told a tale of court politics and family warring' (the annals of David's court, a millennium before the gospels!). The Argument from Silence is the next to be good-naturedly but effectively pilloried; appositely enough it is preceded by a quote from Conan Doyle: ' "The dog did nothing in the night-time". "That was the curious incident", remarked Sherlock Holmes'. Then comes the Argument from Creative Background: we are what we eat, so the source of the gospel narratives is just their cultural background, creatively used of course (A. T. Hanson's recent commentary on John? see *The Prophetic Gospel*, reviewed in *Churchman* 1-1993). The Argument from Consistency is number six, and turns on the demand that a man (such as Paul) must always speak or write in a style recognizably his own, always consistent with what he has used before. This argument settles easily into the pillory, computer statistics and all! I myself remember reading that Beethoven's last quartets could never have been positively identified as his on their internal evidence, so different were they from anything he had previously composed. The last pillory

is reserved for the Argument from Specialization. Too many critics, as C. S. Lewis complained, read closely only the New Testament, and so have no standard of comparison with which to compare it. Its narratives therefore can with disastrously mistaken ease be simply written off as fictional, the critics blithely unaware of the anachronism they are committing (see his *Fern Seed and Elephants*).

The last chapter is one of the most telling. It masquerades as a brief article 'reprinted by kind permission from the *Journal of Twentieth Century Studies* 90/3 (January 2090); 361–365'. It is entitled *A Reappraisal of Rudolf Bultmann in the Light of Form Criticism*. It quotes a Beijing University study (Eccles 12:11–12 etc.) on doctoral dissertations, 'that most characteristic of twentieth-century scholarly art forms', by Prof. P. H. Dee. It then proceeds to minutely analyse Bultmann's views on John 2:1–11 by serious form-critical methods. The result is hilarious, but horrifying—horrifying because it shows very plausibly how tragically wrong can be the conclusions drawn by the use of such schemes.

This small book is to be greatly welcomed. I would like to see it in paperback form and in the hands of every theological and religious education student. It can do nothing but good. There is a Bibliography of 8 pages, and an Index of Names and Subjects of three. It is very well-produced.

D. C. Spanner

The Revd. Dr. D. C. Spanner is a non-stipendiary minister, and former plant biophysicist.

A. Campbell, G. Gillett and G. Jones

Practical Medical Ethics

Oxford University Press, 1992, 177 pp. pb. £15.00

This book lives up to its title and tackles medical ethics in a direct and

practical way. Theoretical concepts such as beneficence and autonomy are mentioned only briefly but these principles are clearly brought out as the practical issues are faced.

The first chapter considers different starting points from which to decide on what is right and what is wrong. The authors do not put forward specific claims from Christianity or other world religions but base their ethic on the Hippocratic declaration and their primary concern for the well being of the individual. Conflict between the good of the individual and that of society is however fully explored in the chapter on Medicine and Society.

There are chapters on the usual ethical topics in medicine, of life before birth, euthanasia, medical research and psychiatry. Early on comes a somewhat unexpected chapter on the human body. This covers issues such as the procuring of cadavers, research on the clinically dead and organ transplantation. One of the authors is an anatomist and it is appropriate that ethical thinking should start in the preclinical arena. For each area of medicine the authors provide excellently chosen case histories or other anecdotes as starting points from which to dissect out the relevant ethical issues. The case histories are all true to life and it is good to see how ethical principles can act as guide posts in messy human situations.

It is a pity that there is so much reference to New Zealand law and practice. The authors all come from that country but for UK readership New Zealand law seems somewhat remote. There is however an interesting appendix explaining the Maori understanding of health and the implications of hospital care and investigation on such a person. Similar attitudes are present in other native peoples and need to be taken into account by those providing Westernized medicine for them.

For some reason the important subject of advances in genetics is relegated

to appendix III where a few pages of largely factual material are provided. Any future edition should have a full chapter on Clinical Genetics. Your reviewer, being a geneticist, may be prejudiced but this does seem an important omission.

Overall the book can be recommended as a readable, student-friendly way in to medical ethics. It should be particularly useful for non clinicians who teach medical and para-medical students as it focuses on real issues and provides plenty of illustrative and discussion-starter material.

Caroline Berry

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Ernst Mayr

One Long Argument: Charles Darwin and the Genesis of Modern Evolutionary Thought

Allen Lane, London 1991, 195 pp. hb. £17.99

Ernst Mayr is one of the senior statesmen of Evolutionary Biology. He is now Alexander Aggasiz Professor Emeritus of Zoology at Harvard University, and the holder of numerous prestigious awards. One of his major interests has been the history and philosophy of his subject, so this present book promises to be a worthwhile one. The title, 'One Long Argument', is from Darwin himself; it was his description of the famous book of 1859. Mayr writes in an easy and pleasant style, and while he does so from a position of unbelief, he is never rabid or aggressively polemical. He paints on a wide canvas and with broad brushstrokes, dealing not with the minutiae of the subject but with its more philosophical aspects. Some of his more interesting chapters are as follows. *Ideological Opposition to Darwin's Five Theories* (or what would more commonly be called the five elements of his theory: Evolution as such, Common descent, Multiplica-

tion of species, Gradualism, and Natural Selection) lists not only the religious opposition (centering on God as Creator and Man as special) but also that from certain secular mind-sets: belief in Essentialism, in causation as interpreted by the physicists, and in the reality of final teleological causes. He has some interesting things to say on these, especially on Darwin's shift from essentialist thinking to population thinking. It is a thousand pities that Darwin (the remark applies also to Mayr) neglected to examine the evidence for the reputedly biblical view of things with a fraction of the care which he devoted to the study of nature; he might have kept his faith if he had. *The Struggle against Physicists and Philosophers* is an interesting chapter, but it is surely rather behind the times; one would have liked to know what Mayr thinks of the Anthropic Principle, and of the theory of Chaos. The author does not seem to be aware of the potentially revolutionary nature of these modern developments. *Darwin's Path to the Theory of Natural Selection* is a clear account of how Darwin came to change his view of things. Mayr separates the process into four areas: the realization that individuals are unique ousted the essentialist view; hard inheritance replaced soft (Lamarckian) inheritance; the balance of nature is dynamic rather than static; and a gradual loss of his Christian faith. *What is Darwinism?* maintains that Darwin's 'one long argument' (which surely defines Darwinism) was not about natural selection as some modern authors have claimed, but about his conviction that evolution can be fully accounted for by natural agencies. It was this conviction that bound the early followers of Darwin together; even Lyell and T. H. Huxley were not persuaded about natural selection. Weismann comes in for high praise in *A Hard Look at Soft Inheritance*; he was a more consistent natural selectionist than Darwin himself. Of course, natural selection suffered a major eclipse for a long time; and this brings Mayr to *The Second Darwinian Revolu-*

tion with geneticists and naturalists reaching a consensus in what has come to be called the Synthetic Theory, in which natural selection has become the favoured, orthodoxy. The last chapter, *New Frontiers in Evolutionary Biology*, deals briefly with objections to the new Synthetic Theory and with such newer developments as Molecular Biology, Punctuated Equilibria, and Sociobiology. The author ends with 'The basic Darwinian principles are more firmly established than ever'.

This is not an epoch-making book; rather it is the mature reflections of a senior evolutionary biologist at the end of a productive life. It left me with surprise that a man so fortunate as Mayr repeatedly was should see nothing except chance and undirectedness in the career opportunities that came to him. But then he has no one to whom he can give thanks. Belief in Providence is productive of many blessings!

There is a table of References of ten pages, a Glossary of eleven, and a general Index of five. There is a central section of ten pages of illustrations, mostly portraits.

D. C. Spanner

The Revd. Dr. D. C. Spanner is a non-stipendiary minister, and former plant biologist.

E. G. Nisbet

Leaving Eden: To protect and manage the Earth

Cambridge University Press, 1991, 358 pp. hb. £27.50, pb. £9.95

'Leaving Eden examines the causes and consequences of global change, with particular emphasis on the interaction of nature and human behaviour'. This statement in the book's preamble is an accurate description of this informative and wide-ranging examination of global environmental change.

Leaving Eden consists of nine chap-

ters and an appendix on atmospheric chemistry. Don't be put off by this last item; it is in the appendix, and not overly long, so that the rest of the book is accessible to the intelligent, albeit scientifically oriented layperson. The book is really in two halves. The very brief opening chapter (4 pages) is followed by three substantial accounts of the processes in the natural Earth, the causes of change, and the consequences of change. Then comes a short (10 page) mid-way chapter entitled 'To manage the planet' followed by three detailed analyses of what to do about global change: reducing the impact—the means to generate and conserve energy, managing the Earth's vegetation, and the management of man. The final chapter is again very short (7 pages) and draws conclusions about the way forward on the theme of a new global economy.

Each chapter has its own helpful reading list with some 700 additional references and further reading just before the good index. Sections are numbered to no great purpose since cross-referencing is infrequent. Numerous tables, maps, diagrams and graphs and a smattering of black and white photographs augment the text.

The early chapters of *Leaving Eden* are a *tour de force* describing the great global processes which control our atmosphere, oceans, and vegetation—essentially the physics, chemistry, and biology of the planet—and what is disturbing these controls. The well-written accounts of changes in atmospheric composition which highlight, for example, the risk of increasing methane and the appalling delay in the early 1980s when records of ozone depletion were explained away as due to inaccurate instruments, appear accurate in fact and details, if sometimes more subjective in interpretation. This is confirmed by Nisbet's treatment of vegetation issues in these chapters (a topic close to home for this reviewer), which is balanced if rather selective of examples.

The latter part of *Leaving Eden* tries to answer the question 'What should we do about global change?'. In these chapters the author departs from straight science into socio-economics, the politics of development, international trade and similar issues which shape the late twentieth-century. He capably reveals the many injustices and imbalances between North and South, and indeed suggests that the political consequences of failing to tackle global environmental change will be mass transfer of peoples away from many tropical countries.

Nisbet describes population growth as the disease causing our planet's problems, which rather runs counter to his quote from Amos 5:11 at the head of his chapter on the subject, and which rightly points out the evils of oppression of people, corruption and so on. Indeed the whole chapter deals rather clinically and dispassionately with human issues, rather forgetting that each human being is a person.

Leaving Eden is by no means all doom and gloom. Nisbet cites good as well as bad examples of environmentally sensitive developments and believes that the recent accords to reduce ozone-damaging chemicals is a pointer for the future. But Nisbet leaves the reader in no doubt about the seriousness of his subject. On page 298, in his last chapter, he emphasises 'Whatever the shape of the future, it is important that the industrial economy should make no net emissions of CO₂, CH₄ or other pollutants and that this state should be brought about soon. (author's italics)

Dr. Nisbet's own stance is only betrayed in the closing two paragraphs of the book where he defends the Judeo-Christian faith pointing out our stewardship role over creation and highlighting the covenant with Noah which explicitly includes all living things, a point Schaeffer made much of 20 years ago in his marvellous book on the first 11 chapters of Genesis. The

book ends on the optimistic note that we are strong, capable and wealthy and surely able to meet the environmental challenge of global change as less of a task than the last threat to human hope which we confronted in 1940 and overcame. The title 'Leaving Eden' perhaps also betrays the author's views, but is surely just a little too oblique for today's godless generation and thus does a disservice by failing to indicate what this valuable work is about.

Julian Evans

Dr. Julian Evans is Chief Research Officer (S) of the Forestry Commission and Consultant to Tear Fund.

Vincent Brümmer (ed.)

Interpreting the Universe as Creation: A Dialogue of Science and Religion

Kok Pharos, Kampen, The Netherlands, 1991, vii + 148 pp.

As the title suggests, this volume of essays is the outcome of an international consultation on science and religion. No less than four of the papers are from the pens of British authors already well-known for their contributions to aspects of the dialogue.

The structure of the collection is quite simple. After two introductory chapters of a theological nature, subsequent chapters are paired so that we are given a scientific and a theological contribution in the areas of cosmology, evolutionary biology, and human nature. The one departure from this pattern is the concluding chapter which explores the theological implications of the ecological crisis.

The theological introduction is provided by Vincent Brümmer who defends Wittgenstein's concept of religion as a language-game against the charge of fideism. This is developed in the following chapter by Luco van den Brom. He relates it to George Lindbeck's cultural-linguistic view of doctrine. This suggests that the doctrine of

creation is part of religious map for the journey of life. Van den Brom maintains the possibility that it makes claims about the nature of reality. However, he effectively marginalizes the doctrine by treating it as a 'footnote' to salvation history which is retained primarily because we have no way of deriving ethical norms from scientific facts.

Personally I found the two chapters on cosmology the most interesting in the book. The first, by Chris Isham, discusses recent quantum creation theories. It stresses the highly speculative nature of these attempts to explain the origin of the universe. In its companion paper, Willem Drees explores some of the potential tensions between cosmology and theology. In particular, he focuses on cosmology's spatialization of time and its platonizing tendencies. However, while recognizing that these are hard to reconcile with traditional Protestant theologies, he suggests that theology need not be unduly worried—that we can evade such tensions by reverting to some form of Christian Platonism in which eternity is interpreted as timelessness and the universe is a mere reflection of mathematical entities existing in the mind of God.

By contrast, I found the chapters on biological themes rather disappointing. Taken as a whole they provide a useful introduction to the dialogue between science and religion in the areas of evolution, human nature and ecology. However, they simply go over ground that is already extremely well trod: we cannot answer the question 'What is life?'; evolution is not incompatible with creation and this has implications for our understanding of God (predictably, little attention is given to whether the view of God revealed in the Judaeo-Christian scriptures has implications for our understanding of evolution); human beings cannot be distinguished from animals by any biological or psychological criteria but only on theological grounds; and, finally, we

are told that this distinction is one of the roots of our ecological crisis.

No attempt has been made to integrate these papers into a consistent overview of the subject. The result is a degree of disjointedness which may irritate some readers. However, it does serve to highlight the degree of theological divergence within the debate.

Lawrence Osborn

Dr. Osborn is a space physicist and co-ordinator of 'The Gospel and our culture' programme.

John Harris

Wonderwoman and Superman

Oxford University Press, 1992, 271 pp.
hb. £17.95

Here is a good read for those who enjoy reasoned argument with a philosophical approach, and who are prepared to set aside their prejudices and 'gut reactions'. The author tackles some of the issues that will arise, and indeed are already arising, from our increasing knowledge of the human genome. As we discover more about the molecular basis of disease and malformation it may well become possible to improve our health and that of our children. All advances have costs as well as benefits and here is a timely attempt to predict possible avenues for 'progress' and their associated drawbacks. Unfortunately we know from experience that it is impossible to foresee the long term consequences of any new development but the author discusses this problem and the extreme caution it tends to engender.

The first chapter outlines some of the relevant technologies and the second discusses the embryo and why the author believes it to be immoral not to undertake research on it. Two densely argued chapters follow, the focus remaining on the embryo and its status. We consider the difference between harming and wronging and whether it is better to be born or never

to have existed. These chapters are heavy going for those of a pragmatic turn of mind and need close concentration.

After this the path broadens and we have two interesting chapters on the way we should use our human resources. They consider the ethics of buying and selling organs, of the commercial exploitation of knowledge gained from the Human Genome Project and the risks and benefits of the free market. These chapters are not related directly to the main thrust of the book but set the scene for the more interesting later chapters. Now we are brought face to face with the possibilities of genetic improvement and with manipulation not only of the genes of the somatic cells but also those of the germ cells so that a 'new breed' of humans could be produced. These favoured individuals might be genetically altered so that they are less likely to succumb to infection or malignant disease. The proposal is discussed in a matter-of-fact way and the ramifications for both those who are favoured and those who are not is pursued in detail. Even wilder scenarios are considered including the creation of ape/human hybrids. This is discouraged as it seems likely that these poor creatures would be unhappy!

Finally we return to today's world and the important problems arising from genetic screening. These not only involve couples at risk of having affected offspring, but also individuals whose genetic background makes them insurance risks or undesirable employees. These issues are already starting to have an impact and these chapters tease out the implications for individuals and for employers and society itself.

The author is a consequentialist and for him immorality consists of causing avoidable suffering to any person. Christians will share his deep concern for the individual and in particular the weak and vulnerable. The author's

moral guideline is effectively the Second Great Commandment 'Love your neighbour (in the widest sense of the word) as yourself'.

Going through the various chapters with the First Great Commandment, to love God with all our power, as a yardstick, should give rise to interesting and profitable discussion. Some will believe that any genetic manipulation of humans is taking too much upon ourselves and that the possibility of disaster signals plainly that we should desist. Others will follow the author's leading with interest and see at least some of what he puts forward as entirely compatible with our God-given mandate to be good stewards of the earth and its resources.

The book is well indexed and referenced and includes eight pages of suggestions for further reading.

Caroline Berry

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Jennifer Trusted
Physics and Metaphysics: Theories of Space and Time

Routledge, 1991, xii + 210 pp. hb. £30.00

There is a lot in this book! In just over 200 pages it takes you from primitive science right through to Stephen Hawking, including on the way scholasticism, medieval physics, Roger Bacon, Erasmus, Copernicus, Bruno, Kepler, Galileo, Descartes, Bacon, Leibnitz, Newton, Spinoza, Kant, Hume, Whewell, Mill, positivism, spiritualism, and Albert Einstein to name but a few. Theories of heat, light, electromagnetism, relativity and quantum gravity are described and the role of metaphysics is stressed.

This comprehensive coverage is both the book's strength and its weakness. Trusted attempts to show that 'insofar as belief in order in nature and in the human capacity to have know-

ledge of the world is linked to religion, religion may be said to have played an important part in our search for understanding and the possibility that it is necessary to scientific inquiry cannot be dismissed out of hand' (p. 190). Such a claim is backed by a broad review of science through the ages, with attention to the views of individual scientists. This is impressive, but to the non-specialist can at times be somewhat tedious.

The thesis that metaphysics is not irrelevant to science is not new. Trusted goes down a path well worn by Jaki, Hooykaas and Russell, broadening the scope but perhaps in doing so losing some of the focus. At times the distinction between physics and metaphysics is blurred, for example when the constancy of the velocity of light is referred to as a metaphysical principle.

For philosophers and historians of science this book is well worth a read. However, for others both the price and the breadth of the book may prove difficult.

D. A. Wilkinson

David A. Wilkinson, formerly an astrophysicist is now a Methodist Minister and Chaplain at Liverpool University.

P. B. Medawar

The Threat and the Glory

O.U.P. 1991, 291 pp. pb. £6.99

Few scientists can write as well as Peter Medawar, and for style, only Stephen Gould is a competitor. *The Threat and the Glory* is a selection of his writings including his Reith Lectures edited by one of his acolytes. I say acolyte deliberately, as the introduction reeks of

fawning, concluding that after his stroke in 1969 his I.Q. was reduced to three figures. Or perhaps, the editor is reminding readers that Medawar was not exactly gifted in the grace of humility, and had little time for the IQ nonsense! (p. 66). Fortunately his choice of essays is excellent.

The essay which gives the title of the book 'The Threat and the Glory' is an article on genetic engineering, written in 1977, which then was beginning to take over from nuclear research as the ultimate scientific threat.

Essay 19 on Animal Experimentation is an excellent and compassionate justification of animal experimentation, which will not be acceptable to all! I found it a totally convincing argument. Other essays cover topics such as scientific fraud, 'Florey Story' which is a review of MacFarlane's superb biography of Florey which correctly argues that too much of the glory over the discovery of Penicillin went to Fleming, and the Cost-benefit analysis of pure research, which no member of the Government can have read!

I don't want to say more. This is a good read for scientist and non-scientist, with more than enough to make one think and forget his four-figure I.Q. Medawar's attitude to science may be summed up as 'The Threat and the Glory' in which he sees both the wonder and glory of scientific advances and the need to be aware of the threat of misuse of science. Despite his hardheadedness, he probably underplays the threat.

M. B. Roberts

The Revd. Dr. Roberts is vicar of Chirk, Clwyd and a former geologist.