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THE VICTORIA INSTITUTE
OR
THE PHILOSOPHICAL SOCIETY OF GREAT BRITAIN

FOUNDED 1865

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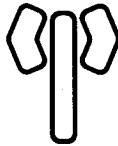
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GENERAL EDITOR: Dr. A. B. Robins



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Editorial

It was a great shock to many of us when we learned of the death, in November, of Dr. Robert E. D. Clark, the previous editor of this journal. I had only known Robert since assuming responsibility for the editorship in the summer of 1983, and paid him several visits in Cambridge. These meetings were a tremendous encouragement to me, and I was delighted when Robert agreed to carry on with 'News and Views' which, over the years, he had made his own. I formed a very high regard for Robert, and would like to echo every expression made in the obituary below. Many, many people will have lost a great friend, and a unique champion of truth. The obituary has been written by the Reverend James Newcombe of Bar Hill church, who also took Robert's funeral service. In the course of time, we hope to collect together memories, anecdotes and contributions from those who knew Robert over the years. It would be wonderful if at some future date we could make a 'Memorial Issue'; may I ask anyone who cares to do so to get in touch with me about this?

Another change! This issue is the first to be printed and published by Paternoster Press, to whom I would like to express my thanks for their help over the arrangements. Alongside *Faith and Thought* we hope to issue from time to time a News-sheet with details of meetings and items of interest, correspondence, etc. The first issue will contain some of Robert Clark's last contributions to 'News and Views' which haven't been previously published.

This issue of *Faith and Thought* contains the papers which were presented at the Annual Conference in May, 1984, on the subject 'Man—manager or manipulator?' December 31, 1984 marked the six-hundredth anniversary of the death of John Wycliffe, the 'morning star of the Reformation'. It seemed appropriate to include a contribution from the organisation which bears his name—the Wycliffe Bible Translators. There are still many tribes in the world who do not have the scriptures in their language, and the very lengthy process of translation has been much shortened by the advent of computer technology. The other articles in this issue bear on the matter of 'meaning' and the understanding of the relationship between God and man. Though brief, these contributions provide a

salutary check upon our too-glib use of words and ideas at times.

Finally, the editor owes apologies to a number of contributors. The names of both Sir Robert Boyd and Dr Robert Clark were omitted from the list of Vice-Presidents in the last issue. Very sincere apologies are due, again to Sir Robert Boyd, for omitting from the cumulative index 106-110 two of his contributions to volume 109. They have, in fact, been attributed to R. Boyle in error (Volume 109, pages 19 and 111). My attention has been drawn to the omission of at least one name from the cumulative index (also an article from volume 109, part 1). There may be other such omissions regarding this particular issue, and if so I apologise to all concerned. When the editorship was transferred 18 months ago, so also was the index material for volumes 106 to 109, and it may be that this was incomplete. As a result of Robert Clark's untimely death, there is no way of finding out at this stage. However, I can only say that as he was so thorough, the fault is almost certainly mine.

The present issue contains a notice of the Annual Conference in May; more details of this are available elsewhere. Please note the venue, which we hope will be more convenient.

Dr. Robert E. D. Clark: An Appreciation

Robert Clark died on Sunday, 18 November at Addenbrooke's Hospital, Cambridge. He was 77 years old, and his funeral took place in Bar Hill, Cambridge, at the Ecumenical Church, of which he had been a member for several years. He leaves a son, Stephen, who lives in Glasgow, and a great many friends the world over.

Robert will be remembered in the first instance as an outstandingly gifted scholar, whose interest and knowledge spanned an unusually wide range of subjects. He was equally at home in the worlds of chemistry (which he taught) and theology. His insatiable curiosity led him deep into the study of history, biology, physics, and linguistics. The scope of his reading was quite remarkable, and he made, and kept, careful notes on every one of the thousands of books he read in the course of his life. The fruit of his scholarship was readily apparent both to his pupils at a number of schools and colleges, and to the readers of the many articles and books that he wrote. His overriding concern was always the link between science and religion—a field in which he was able to make a particular and distinctive

contribution as editor of this journal. A rigorous approach and lucid presentation were characteristic of all his written work, as were also the stimulating insights and profound convictions for which so many have cause to be grateful.

However, as well as being a great scholar, Robert Clark was also a fine person, whose deep Christian faith was evident in all that he did. However firm his views, he was always ready to listen; however great his achievements, he was invariably humble; however busy his schedule, he would always find time for other people. He was a truly gentle man, who will be greatly missed by all who knew him. He died shortly before completing what was to have been one of his major works—a commentary on 'Revelation'. Perhaps, one day, that will be completed and published as a tribute to the memory of an unusual character whose wisdom, courtesy and enthusiasm were a source of inspiration to us all.

The Rev. James Newcombe
Bar Hill, Cambridge.

Annual General Meeting, 1984

The Annual General Meeting of the Institute for 1984 was held in the Hudson Lecture Theatre, Chelsea College, 552 King's Road, London SW10, on Saturday 19th May at 10am. In the absence of the President, the Chairman of Council presided.

Apologies for absence were received from the President, Sir Robert and Lady Boyd, and Mr. P. Keymer.

The Minutes of the AGM held on the 21st May 1983, which had been published in the Journal, were taken as read and adopted.

On the nomination of Council, the President, the Vice-Presidents, and the Honorary Treasurer were re-elected for further terms of office.

Dr. R. E. D. Clark, nominated by Council, was elected as an additional Vice-President.

The appointment of Dr. A. B. Robins, previously co-opted by Council to fill a vacancy, was formally ratified.

Mr. P. E. Cousins, Mr. D. Mitcheson, and Prof. C. A. Russell, who formally retired from the Council, were re-elected for a further period of service.

The Treasurer presented the Annual Accounts and the Auditors' Report for the year ended 30th September, 1983, and these were adopted *nem. con.*

Messrs. Benson, Catt & Co. were re-appointed as Auditors. The Chairman of Council gave a brief informal report.

Chairman's Report

The Chairman reported that the membership of the Institute was steadily increasing; about seventy members had joined in the last twelve months; but five resignations and two deaths had occurred, and six members had moved without informing the office of their new addresses. It was regretted also that nineteen members were more than one year in arrears with their subscriptions, and, under the Council's rule, their names would be removed from the membership roll on the 30th September, 1984, unless their subscriptions were received beforehand. Many of the new members were the result of the recent publicity campaign, which was proving successful.

The Council had decided that those of its members who had been elected Vice-Presidents should cease to be listed as Council Members, as Vice-Presidents were eligible to attend Council meetings and were expected to share fully in the government of the Society. Sir Robert Boyd and Dr. R. E. D. Clark were affected by the decision; so there were now two extra vacancies on the Council in addition to existing vacancies. Fellows of the Institute were reminded that under the terms of the Constitution they had the right to make nominations for election to Council; and the Chairman encouraged them to give serious thought to this responsibility. For many years the Council had been a self-perpetuating body, and this was not necessarily in the best interests of the Society.

Although the objects of the Institute were laid down in its Constitution, the best ways of achieving them were open to debate, and the Council had given renewed thought to the matter. One possibility would be to publish in the Journal articles of a more popular style than those at present included—which might give the Journal a wider appeal—while another possibility would be to present papers of a more academic nature—which might in time have greater influence because of their impact on scholarship. The Council had not been able to reach a clear decision on the matter. It was therefore planning to hold in the Autumn a special meeting devoted to further consideration of the future work of the Institute. The Council would welcome comments from the membership.

The Council was very concerned about the steeply increasing

costs of printing and distributing *Faith and Thought*, and ways were being sought of minimising these costs without reducing the quality or quantity of the material published. It appeared that one way of doing this was to issue the Journal in two parts each year, instead of three, each part containing an increased number of pages; and to relegate short notes, news items, notices of meetings, etc., of interest only to members (as distinct from libraries) to a separate occasional News-sheet, which would not be sent to libraries. Negotiations were proceeding with a Christian publishing company, who already publish journals on behalf of other organisations, with a view to their undertaking the printing and distribution on the Institute's behalf, at costs more economic than the Institute itself can achieve.

The Chairman reiterated that the Council always welcomed constructive criticism, helpful comments, and suggestions on such matters as topics of papers and conferences.

Finally, he announced that the Symposium on the occasion of the AGM in 1985 would be a joint meeting with the Link Study Group (of the Shaftesbury Project in Scotland) on the subject of *Natural Theology and the Theology of Nature*. This was being planned for Saturday, 18th May.

Our Contributors

David Lyon (Senior Lecturer in Social Analysis, Bradford and Ilkley Community College)

From 'Pacman' to 'Homelink'—Information Technology and Social Ethics

Rowland Moss (Professor of Human Ecology, and Pro-Vice Chancellor of Salford University, and ordained)

The Ethical Underpinnings of Man's Management of Nature

Duncan Vere (Professor of Clinical Pharmacology and Therapeutics, London Hospital Medical College)

Does Man's Dominion over Nature include the Natural World within Himself?

Theodore Goller (Missionary working with Wycliffe Bible Translators)

The Use of Computers in Bible Translation

Richard Skinner (Family Therapist)

The Creation of Meaning

David Pusey (Principal Lecturer in the Department of Physical Science and Technology at the Polytechnic of South Bank, London)

Creation as Frame-by-Frame Projection from the Mind of God

David Lyon

From 'Pacman' to 'Homelink': information technology and social ethics

The information-handling revolution is with us. The silicon chip, by vastly reducing the size and price of microelectronic components, opens the door to developing 'information technology', which is the *marriage* of computing with telecommunications. The applications of the microchip are global, and have potentially profound consequences for society, politics, economics and culture.

Games like 'Pacman' form the bait which has put more computers per person in British homes than anywhere else in the world. 'Homelink', advertised as the 'world's first homebanking service', shows how these computers may 'talk' with others. People can make cash transfers from their living rooms, by connecting computer, television screen, and telephone line (Prestel). This is just a step away from the 'wired society', where *interactive* cabling enables a whole new range of communications including, they say, computer democracy and computer education.

But few of the feverish workaholics in the 'sunrise' hi-tech zones have time to reflect on the ethical dimensions of computer and cable, and few of those concerned with ethical demand and ethical direction feel they have sufficient grasp of computer-aided design, co-axial cabling or direct broadcasting by satellite to be able to comment intelligently.

Hence we have an enterprise of immense importance and widespread impact which is growing at astronomic speed, but without the benefit of ethical wisdom as to the *direction* in which it should grow. Governments are locked into beggar-my-neighbour competition for microelectronic markets, hi-technologists are hooked on the quest for intelligent machines and computer-integrated manufacture. Even should they want an 'expert' ethical opinion, there is none. Not the goal of the race, but fear of the anticipated consequences of failing to join it, seems to be the key motivator.

In this paper I wish firstly to make a case that this centrally significant issue of the late twentieth century should be subject to ethical inquiry and guidance, secondly, to review some of the ethical options open, in the search for an adequate base, and thirdly, to show how this presents a serious challenge to Christian ethics, a challenge to make biblical insight relevant for today. In fairness, I must admit that I am neither an ethicist nor an electronic engineer by training. My interest in the question arises from the *social* analysis of information technology.

An information technology ethic?

As in any new field, problems of definition arise. Information technology (IT) is concerned with the processing, storing, retrieving, transmitting and receiving of information. 'Data' are basic facts, the items which are combined into what we call 'information', such that our 'knowledge' may be increased. Can there be an ethics specifically related to such a technology as deals with 'information'? (Some do not even seem to have considered this. When I asked a member of parliament about the ethical aspects of IT the only relevant questions he could conceive had to do with pornography on cable TV channels.) Or, if there is no *specific* ethic, are we seeking the extension of existing ethics in order to struggle with ongoing concerns which are *amplified* by the emergence of IT?

Clearly, the topic is enormous and unwieldy, especially as it refers to the convergence of hitherto largely distinct technologies. Yet some overview is essential. At present, the two partners in the marriage tend to talk past each other. One thinks of IT mainly in terms of computer-aided design and manufacture, robotics and automation, and the electronic office. The other has in mind new communications technologies such as cable television and satellite broadcasting. So ethical conversation could be similarly limited. Work-place issues, of job-contraction, deskilling, and dehumanizing, may be the only ones considered by one partner, whereas the other may think only about questions of content and control of communications channels, or of data protection.

Much hangs on a deceptively simple question: is technology neutral? Many assume it to be so. Let us remember that we are not discussing hardware, like microchips or machines, *per se*. Technology is merely a way of doing things. Only in its application do questions of value and ethics arise. So it is said. In fact, it

proves impossible clinically to isolate technology from the context of social relations, especially those of power. Using a mainframe computer in a bank, for instance, immediately channels human choices. The technology has certain purposes built into it. The human intentions embodied in it have to do with lower labour costs, efficiency, reliability, and so on. The bank may now only be used *in certain ways* by its clients, who have to get used to computerised accounts and, likely, less personal contact with bank workers, so we ought at least to be careful when using a notion like 'neutral technology'.

Again, take the case of cable television. Here is a technology, a way of providing a network of two-way communication channels. Because the British government believes that the 'future' lies with cable, franchises have been granted to several companies to set up cable systems, initially luring customers with the promise of a wider range of entertainment channels. But is it 'neutral'? These cable companies are not setting up a public service (like the BBC), but a private, commercial system. So they target large cities, thus immediately risking discrimination against other, especially rural areas. And despite the utopian promises of computer democracy, using broadband cable, the vertical hierarchies of control within these companies speak more of profit-making than of establishing democratic communication networks.

The point is that technology is shaped by social factors and human choices. Interests and purposes of governments and firms are built into information technology. It would seem that in *this* sense the notion of 'neutral technology' deserves to be jettisoned. Questions of power, at least, are always involved. Sometimes, as heard in this statement by Franco Benedetti Olivetti, this is painfully clear: 'Information technology is basically a technology of control and co-ordination of the labour force. A factor of fundamental importance in mechanising structured work is the capacity for control that the manager thus acquires'.¹ Whose interests does this technology serve? Who may use it, and who is excluded? Such questions point to a distinctly ethical dimension to IT.

A range of recognisable ethical issues is thrown up by IT. Questions of truth and falsity of information arise both with computer-use, and with the growth of teletext services. Who says what is to count as 'information', and who is to guarantee its

1. Quoted in Brian Jenner (ed.) 1983, *Future Conditional*, London: Home Division of Methodist Church, p.59.

accuracy and veracity? (The French are developing a system of 'signing' computerised information.) Questions of liberty arise from the mushrooming personal databases which are another face of IT growth. Police computers now have the ability to hold extensive files on all British citizens. Other government departments and business organizations also hold much personal information. Without adequate protection, the threat of Big Brother is perfectly serious and real. Lastly (though there are no doubt others), questions of equity are raised by the development of IT. Are we heading, as seems not unlikely, for an 'information rich/information-poor' division both within Western societies and between North and South? Every time 'information' has a price put upon it, and is thus turned into a commodity, access to it is restricted to those who can pay.

Clearly, then, the benefits of IT for agriculture, industry, energy-conservation, medicine and education must be seen in the light of the potential problems also raised by it. I suspect that there are few, if any, ethical issues which are unique to IT. But the old issues which reappear in new, hi-tech guise are numerous. Because of the rapidity of change, the strength of the forces (big government, business, and military) impelling us into an 'information age', and the long-term consequences of decisions reached now, these issues are urgent, and should be high on the ethical agenda.

The ethical options

How should the ethical agenda be formed? What is an appropriate response to IT? Various options are on offer today, four of which may seem appropriate in some way to IT. I shall use the categories of ethics, and suggest how each be assessed.

Utilitarianism proposes that we engage in a quest for hard facts which will provide a firm foundation for ethical choice. If only we have the facts, we may know whether this or that aspect of technology is good or bad. Now, although it is highly desirable to have accurate knowledge of a particular technology's effects—any *mindless* Luddism or *ignorant* technophilia is obviously out of court—'facts' are actually hard to come by. In any case, they are seen quite differently by different persons. Herbert Schiller, for example, sees IT serving the cause of world-dominating cultural imperialism,² while Ithiel de

2. Herbert Schiller, 1982, *Who Knows: Information in the age of the Fortune 500*, New Jersey: Ablex.

Sola Pool sees only beneficent 'new technologies of freedom'³ Prediction, which this utilitarian approach really advocates, is inappropriate in a uniquely new situation. We simply cannot generalise from past experience. We have none. What is more, even if the utilitarians could tell us the consequences of certain actions, they must still offer criteria for assessing those consequences.

Existentialism gives us another option. As reason cannot arbitrate on the basis of facts, then individual choice becomes paramount. Certainly, we may discuss the various alternatives, but then we must jump one way or the other. There is no rational solution to whether IT ought to be developed for remote computer diagnosis or remote electronic warfare: we simply have to choose and live with the choice.

Unfortunately, much is already left to individual choice (due to reliance on market forces), and it is precisely this fact which is causing public concern. The information-rich/information-poor gap widens exactly because individual persons and firms are left so much to their own devices. Also, we would expect some 'outside' evaluation of some choices. No doubt there would be general agreement, for instance, that within a democracy, giving the police unlimited powers of surveillance is very dangerous.

Naturalism tries to base ethics in what is 'natural'. So where the scientist might call milk 'dairy produce', the 'naturalist' would call it 'food'. This is its natural purpose, to nourish. As food, it *ought* not to be wasted. Now, Protestants have objected to this doctrine on the grounds that it can become rather rigid and arbitrary, and scientists have at times rejected it because, they have said, the notion of 'purpose' has no place in scientific description. There may be ways around the former difficulty,⁴ but as to the latter it is plain, as we shall see, that teleological explanation is still involved in science today. The fact/value distinction embodied in the 'scientific' objection is hard to sustain.

The natural ethic could possibly be of some use for our IT purposes, but only as it relates to some humanly desirable state. One could argue, say, that it is natural to protect people from the unwanted intrusions of powerful social agencies because of

3. Ithiel de Sola Pool, 1983, *Technologies of Freedom*, Cambridge: MIT Press.

4. Oliver O'Donovan, 1980, The natural ethic, in David Wright (ed.), *Essays in evangelical social ethics*, Exeter: Paternoster Press.

their God-given human dignity. As far as the specifics of IT are concerned, the idea of finding a 'natural' use for a computer is clearly absurd.

Historicism, lastly, probably qualifies as the most important actual basis for choice in the hi-tech world, though it is seldom formally thought of as a basis of IT ethics. In this case, development is justified as part of the upward march of progress. Much of today's science and technology is done, it seems to me, within the implicit framework of an evolutionary world-view (this is the teleology referred to above). One hardly has to read between the lines in order to hear the evolutionary overtones in phrases like 'the information era', 'adapting to the next stage', and so on.

A curious paradox is that the same people who justify the headlong rush into artificial intelligence or interactive cabling on the basis of progress will often turn round and describe their technology as 'neutral' when questioned about its applications. In fact, the evolution-progress doctrine simply will not do. In what sense can it honestly be said that remote electronic warfare (to which development most of the big electronics transnationals contribute massively) is 'better' than other forms of warfare? They say that the computer will be to the information era what the car was to the industrial era. Enough said.

While Christians may well find agreement with one or other of the above options at specific points, it seems to me that the only realistic response to them is to forge a distinct alternative. One issue which crops up above is the distinction between fact and value. Naturalism tries to relate them explicitly, historicism does so covertly. But the theist declares that we *must* relate them for, as Arthur Holmes says, 'no facts are meaningless and nothing in creation is wholly value-free'.⁵ The natural order is not a mechanism devoid of meaning, but a process in which God makes actual the good.

The world of 'facts' (and technology) is the world of creation, fall, redemption and the new age. This 'biblical drama' is, I am convinced, the best basis for Christian ethics.⁶ The creation does tell us about the basic meaning of the world and persons, with God as meaning-giver. The Fall reminds us of distortions of

5. Arthur Holmes, 1971, *Faith seeks understanding*, Grand Rapids: Eerdmans, p.110.

6. See David Lyon, 1980, The challenge of marxism, in David Wright, *op. cit.* The phrase 'biblical drama' comes from Richard Mouw, 1976, *Politics and the biblical drama*, Grand Rapids: Eerdmans. Christopher Wright makes a similar case in 1984, *Living as the people of God*, Leicester: Inter-Varsity Press.

meaning and relationship which affect analysis, emotion, and choice. The coming of Christ tells of opportunity for persons to relate once more to God, and for the curse's effects to be reversed. The new age draws us, with Christ's promise of the restoration of all things, challenging us to join God's project in present ethical action.

Let us tentatively place IT in this context. IT may be viewed as part of human stewardship in opening up the creation, easing the human lot and resisting the curse by eliminating drudgery and boredom, and fostering neighbour-love through the opening of new communication channels.⁷ The Fall is implicated in it as well, though, as it was in the technolatriy of Babel. Putting all one's faith in new technology, as happened at Babel, could again lead to the disintegration of human communication.

Redemption reminds us that technology may carefully be developed under God, with stringent concern to safeguard human interests. After the Old Testament redemption, God gave many directives to his people, relating to how life ought to be lived for the best. Their technology did not extend much beyond farming and house-building, but in each case regulation was required. Animals were to be restrained from damaging people and things, and houses had to be built with parapets around their flat roofs to protect life. Such things require more time and expense, but are indispensable to this ethic. Christian standards, in fact, should be set by the new age of justice and *shalom*, which means that strategies will often appear critical of today's social/technological arrangements. They cannot but be. The challenge is to find concrete ways of influencing change in the right direction.

There are, then, both good reasons for questioning the adequacy of several ethical options, and demonstrable relevance in an ethic based in biblical revelation. As far as IT is concerned, I believe this perspective pushes us towards a third way between, on the one hand, hi-technophilia and the 'silicon idol', and on the other hi-technophobia and neo-Luddism.⁸ Creative and responsible development of IT seems appropriate,

7. See Michael Parsons, 1983, *Theology and the information society, Media Development*, pp.32-35.

8. Michael Shallis, 1984, *The silicon idol*, Oxford: Oxford University Press. Not all 'Luddism' is 'mindless'; see David Lyon (forthcoming) 'Marxist misgivings about information technology: help or hindrance in facing the future?' in Ajit Jian and Alexandra Matejko (eds.) *A critique of Marxist and non-Marxist thought*, New York; Praeger.

but only in the context of acute awareness and rejection of the patterns of exploitation, lack of care, and de-humanisation which already characterise present arrangements.⁹

The ethical challenge of IT

It is all very well to agree (if you do) that a biblical basis for IT ethics is superior to other proposed bases, but this simply puts the ball firmly in the Christian court. I doubt whether Christians are ready for the ball. A division has grown up in the Christian mind between 'personal' and 'social' ethics. Extensive attention is paid to the former, lamentably little to the latter (although at least more recognise this as a problem now). But all the while the world changes. Above all, our social systems are continually stretching, in time and space. This does not mean that ethic of immediate inter-personal relationships and local community is irrelevant. Rather, it must be supplemented with the ethic of the long-term and the global. This is the 'stretching' over time and space to which I refer.

Hans Jonas alludes to this contemporary challenge to ethics, arguing, somewhat as I have done, that science itself cannot answer today's problems. There is no technological 'fix'. His wistful question is 'whether without restoring the category of the sacred, the category most thoroughly destroyed by the scientific enlightenment, we can have an ethics able to cope with the extreme powers which we possess today and constantly increase and are almost compelled to use'?¹⁰ My answer, of course, is that we cannot. But at the same time, I believe there are ways of demonstrating to those who do not share a biblical world-view the relevance of its ethical demands.

Key areas, where Jonas believes there is an 'ethical vacuum', are the *long-term* and the *global* aspects of new technology. Nature itself is now vulnerable to human activity (including its very destruction), in an unprecedented way. In relation to IT, it is clear for example that the establishing of a cabling infrastructure has long-term consequences—just as did the roads and railways of previous times. This means that there

9. See Howard Davis, 1983, *The ethical challenge of new technology, Shaft*, pp.1-4.

10. Hans Jonas, 1973, *Technology and responsibility: reflections on the new task of ethics, Social Research*, p.52. See further, 1984, *The imperative of responsibility*, Oxford: Oxford University Press.

has to be greater serious attention paid to the *future* in political thinking. It will not do for governments to think only in terms of the length of their office. The issues are too important.

Likewise the global aspect. This presents a massive ethical challenge. Direct satellite broadcasting raises dangers of international propaganda campaigns by those with transmission-power. Capital is now electronically shifted round the globe at an incredible rate. Transnational corporations operate without reference to national economies. They also set up plant in different parts of the world without actually transferring any technology or skills for self-reliance to those places. This means that the North/South divide grows ever more rapidly. One could go on.

Even at a local level, the difficulties are tremendous. Government policy is dedicated to IT as the post-recession economic saviour. But what are the assumptions built into government reports and initiatives? Are they for a more humane, democratic, and peaceful world? And what are the reasons for firms, schools, and organizations adopting IT? The scramble to 'keep up', the desire to control workers, and the obsessive fascination with novelty do not seem far from the surface. All this calls for Christian involvement and comment, at precisely a time when no one seems willing to stop and reflect on where exactly IT is taking us.

Rowland Moss

The Ethical Underpinnings of Man's Management of Nature

Introduction

Environmental problems have become a major pre-occupation of the second half of the twentieth century. The activities of pressure groups and the growth of political parties overtly concerned with such issues, and their success in rallying popular support and gaining media coverage, have made it impossible even for Right-Wing Governments to ignore such questions, as they would no doubt wish to in their pursuit of free competition and the unrestricted operation of market forces as the basic elements in their management of society.¹ Both parties tend to leave the ethical underpinnings of their positions unexamined, even though there is a recognition of the moral dilemmas posed by the management of nature by man for his own needs and ends.² The purpose of this paper is to attempt to

1. The emergence of the Ecology Party in Britain, and its counterparts in Europe, which have, perhaps as a result of a more representative electoral system, enjoyed considerable success, is a significant fact in this connection. The publicity achieved by Greenpeace, and by Friends of the earth, in particular campaigns and activities, is also important. See F. Sandbach, *Environment, Ideology and Policy*. (Blackwell: Oxford), 1980; and M. Redclift, *Development and the Environmental Crisis: Red or Green Alternatives?* (Methuen: London), 1984; *inter alia*.

2. The naïve assumptions of most work on environmental policy (indeed, one might say of every political alternative in the more general sense), relating to ethical issues is apparent. The virtually unexamined presupposition that the 'Judaeo-Christian' ethic is in some way to blame for all our ecological problems is part of environmental folklore. Drawn from Lynn White's well-known article (L. White, The historical roots of our ecological crisis. *Science*, 155(37), 1967, pp.1203-1207), the humanist environmental lobby has made this the basis for the search for a 'new' ecological morality. But a careful reading of White's article and a thoughtful consideration of its implications reveals that the common interpretation is not justified. Furthermore, if the Judaeo-Christian ethic is to be identified with the Biblical ethic, then it can be argued that it is essentially conservation-oriented (see R. P. Moss, *The Earth in our Hands*. (IVP: Leicester), 1982). For fairer examinations of the issues involved, see J. Black, *The Dominion of Man* (Edinburgh University Press: Edinburgh), 1970; J. Passmore, *Man's Responsibility for Nature* (Duckworth: London), 1974; E. Ashby, *Reconciling Man*

articulate and structure a number of alternative underpinnings by which management decisions are influenced ideologically, whether or not such decisions are overtly recognised as moral choices. Three preliminary observations are pertinent.

First, it is necessary to emphasise that man cannot avoid accepting the role of manager in relation to nature. The provision for his basic needs of food, water, and natural resources for his technology, however unsophisticated, must come ultimately from the natural world in which he is set. Even the choice to preserve natural species or ecosystems for their own sake, rather than for man, is a management decision in a fundamental sense. Furthermore, when such a decision becomes necessary it will almost always be a decision which is made at a cost to man in terms of his denying himself a 'good' (in the economic sense) in order to allow nature its own niche in his scheme of management. In fact it is precisely this choice which faces man in relation to tropical closed forests at the present time.³ The arguments for clearance are economic and social; those for preservation are for retention at the expense of the economic benefit which would accrue immediately from using the land in a different way.⁴ A similar argument could be developed in relation to other pressing environmental

with the Environment (O.U.P.: London), 1978, *inter alia*. An excellent recent review of the whole nexus of ethical questions is to be found in R. Attfield, *The Ethics of Environmental Concern* (Blackwell: Oxford), 1983. This also contains a very full bibliography relating to the whole area of concern.

3. The CO₂ question is a matter of considerable debate at both the scientific and the political level. Closer to home we have the current wrangles over acid rain in Europe, and in North America, which have yet to be resolved. The technical literature is considerable. But for recent readily available considerations of the importance of tropical forests and their ecology see, F. B. Golley (Ed.), *Tropical Rain Forest Ecosystems: Structure and Function*. (Ecosystems of the World, Vo.14A). (Elsevier: Amsterdam), 1983; and S. L. Sutton, T. C. Whitmore and A. C. Chadwick (Eds.), *Tropical Rain Forest: Ecology and Management*. (Special Publication No.2, British Ecological Society). (Blackwell: Oxford), 1983.

4. The point in the case of tropical forests is that an immediate profit can be obtained by radical clearance, for example by turning the land released into rangeland for the production of beef for export (e.g. in South America for the U.S.A. market), or for other quick returns on capital investment. Other, more conservative uses are less profitable in the short run, and may, as in the case of management for selective timber extraction, promise profit only in the long term. With quick return on capital the primary aim of the financial investment, the more conservative use stands no chance in economic terms, simply because ecological costs cannot (and also are not considered by those making the investment to be important anyway) be readily taken into account in the

questions.⁵ Then also 'preservation' is impossible in relation to untrammelled nature, since 'nature' is in a constant state of flux, involving both the dynamics of ecosystem function, and of adaptation and secular change. If man wishes to try to keep an area occupied by a contemporary ecosystem as it is now, then he will need to manage it in order to pre-empt the secular change at the very least.⁶

Second, the management choices inevitably made by man in his relation to nature have a moral dimension within them; there is always an implicit 'ought', which may or may not be recognised. In the example of tropical rain forest already cited, there is at the very least the implicit assumption that man 'ought' to be prepared to sacrifice his immediate economic gain for the sake

economic equation. Population pressure is also a factor in Asia and Africa, where growing populations demand increased food production, so that the conservative systems of natural fallowing, involving the development of forest regrowth when land is abandoned after cultivation, break down as the fallow period is shortened. Furthermore, the demands of modern agricultural machinery, the use of which some see as a way of increasing production, require more thorough and more extensive clearance, and the consequent breakdown of the ability of the forest to regenerate.

5. Acid rain presents a similar conflict between cost minimisation and the need to consider ecological consequences. Reduction of SO₂ and other releases into the atmosphere, involves the installation of expensive equipment into the exhaust systems of plants producing the pollutants. To do this for purely ecological reasons is not the way most financial investors would wish to see their money used. This presents another paradox in the case of coal-fired power stations. SO₂ emissions can be reduced by using coal with a low sulphur content; the coalfields in Britain which produce low-sulphur coal are mainly in South Wales and in Scotland. It is in these areas that the pits are, in the short-term analysis at least, uneconomic in terms of the cost of production in relation to the market price. The introduction of legal requirements restricting SO₂ emissions could significantly increase the market price of low sulphur coal, which would modify the whole question of economic balance; whether significantly enough to make unprofitable pits profitable is matter of doubt. But this does emphasize the somewhat complex inter-relations involved in introducing ecological costs into industrial and commercial economics. For a review of methods and concepts, with case studies, in reaching decisions of this kind see, Y. J. Ahmad, P. Dasgupta, K-G Maler (Eds.), *Environmental Decision-making, Vols.1 & 2*. (Hodder & Stoughton/U.N.E.P.: London), 1984.

6. Preservation can mean two things; first, simply allowing nature to go its own way, in which case change is inevitable, both through internal dynamics, and through the influx of new plants and animals in the normal processes of dispersal and migration (in this the actual area of the ecosystem may be crucial; see pp.377-386, pp.465-476 in Sutton, Whitmore and Chadwick (1983)); and second, the attempt to inhibit natural change by the processes indicated; this inevitably involves management. See also J. Miles, *Vegetation Dynamics*. (Chapman & Hall: London), 1979.

of the welfare of future generations, even if it is not implied that man 'ought' to be prepared to preserve complex ecosystems for their own sake.⁷ The rationality of such 'oughts' depends not upon scientific argument, however persuasive and well-founded, but upon ethical discourse; this in turn depends upon a set of ontological propositions concerning the relations of man to nature, and of both to God, which may or may not be articulated. It is to these that the present paper directs its attention.

Third, despite the radical disparity between the various frameworks of ontological propositions held by individuals and groups in society today, this does not imply that agreement at a purely pragmatic level, concerning what needs to be done, between differing groups is therefore impossible to achieve. Indeed, practice proves that this is not so, and the British response to the World Conservation Strategy in which it was possible for a very disparate group to assent to the response of the Working Party on *Ethics: Environmental Ethics and Conservation Action*, is a clear and convincing example.⁸ This study is not concerned with pragmatic issues, such as those covered by agreed 'codes of practice', which are common in applied science, and industrial and social groups and institutions; it is concerned with ethical justification rather than political or pragmatic necessity; more particularly it is concerned to expose the *weltanschauung* which underlies each different form of ethical justification in its assumptions concerning God-man-nature relationships.

These mind-sets will be dealt with in turn. At least eight may be clearly distinguished, conveniently grouped into three categories on the basis of their view of God:

- I. Frameworks based on a materialist metaphysics:
 - (i) evolutionary humanist;
 - (ii) technological pragmatist;
 - (iii) Marxist.

- II. Pantheistic or polytheistic metaphysics:
 - (i) mystical holistic and ecological mystical;
 - (ii) magical.

7. The problems of this view are thoroughly argued through by Passmore (1974), pp.173-195.

8. In *The Conservation & Development Programme for the U.K.; a Response to the World Conservation Strategy*. (Kogan Page: London), 1983. Part 6, pp.407-438.

- III. Theistic metaphysics:
- (i) orthodox Roman;
 - (ii) liberal Protestant (often implying deistic rather than theistic views);
 - (iii) orthodox Protestant.

Each will be considered separately, then the final one (III.iii) will be examined in more detail in order to show the broad themes of biblical thought on the relations of man to nature, of man to God, and of nature to God, under the headings of creation, redemption, and consummation. Finally, the discussion will be widened considerably to outline the broad elements in the management decisions which man of necessity makes in his life as an individual and in society, in order to show that though man cannot avoid the manipulation of nature he does have a satisfactory ethical base upon which to build responsible management. The ethical foundation is vital, since manipulation can have many effects over and above those desired from the course of action chosen; and responsible use depends not only upon developing understanding of the processes involved, but also upon the ethical framework which contributes the 'ought' to the act of decision.

The presuppositions underlying ethical frameworks

I. Materialist presuppositions

These sets deny either the existence or the relevance of any notion of God to a world-view which is of any practical use as a basis for moral action. They are therefore bi-polar in that they consider only the relationship of man to nature and of nature to man. Nevertheless each has to introduce a third pole in order to supply the 'ought', the prescription as well as the description. They are illustrated in *Figures 1a, 1b, and 1c*. Each effectively introduces an assumed doctrine relating to the development of man-in-society in relation to nature, and each doctrine is no less, and probably much more, open to objection than a thorough-going theism which makes a personal and active God the essential—indeed the only essential—third pole in the system of relationships. On the theistic view without the third pole—the persons of God—neither of the other two can even exist; man and nature are both contingent, only God is necessary.

Figure 1a: The conceptual structure of evolutionary humanism.

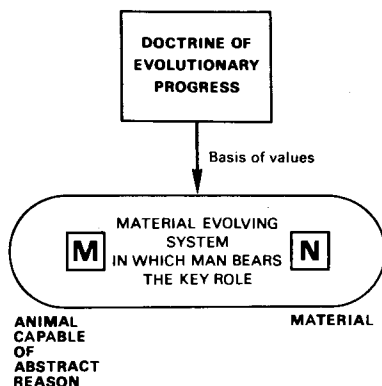


Figure 1b: The conceptual structure of technological pragmatism.

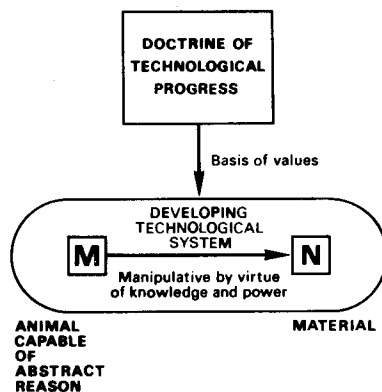
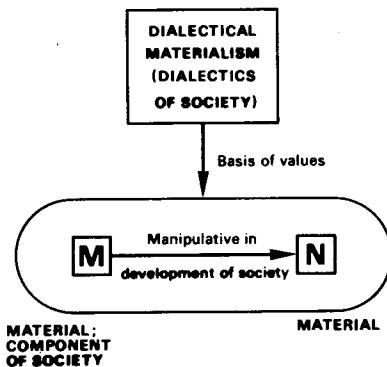


Figure 1c: The conceptual structure of Marxism.



I.i. Evolutionary humanism

On this view man is a part of nature, and is different from it only with respect to the capacity and development of his brain as compared to other vertebrates, and, by virtue of that material fact, therefore has powers of abstract thought, creativity and control denied to other organisms solely by their less developed or non-existent cerebral capacity. Thus man now has powers of choice and decision conferred on him, and he has a set of options open to him which will determine the future course of his own development, and also, inevitably, the fate of non-human nature as well. Furthermore, the use man has made of his much greater cerebral capability, particularly in the acquisition of 'scientific' knowledge, provides the sole secure basis for a rational choice between competing options.

It is recognised that in order to make such a choice man needs criteria of 'value', since knowledge, even 'scientific' knowledge, can provide only a forecast of the possible outcome of each course of action which is available at any one time; it provides no basis for choosing between outcomes. The necessary criteria are then sought through arguments developed from ontological premises concerning evolution. Not only are the necessary value judgments seen as the production of evolution, but their inherent validity is judged by reference to criteria derived from evolutionary concepts. For example, the notion of 'survival' is commonly used. It is argued that the important basic need of any species is that it should survive—that is not only exist, but reproduce itself. To this end it adapts to the constraints and possibilities of the environment in which it finds itself. In non-human nature this is a purely fortuitous process, since such species adapt non-teleologically through random genetic and behavioural changes, which may or may not contribute to survival in that environment; the survival value of such changes must always be a *post hoc* judgment. But man, with his greater knowledge and his capacity to forecast outcomes (which is purely the outcome of greater brain power) has the power for conscious adaptation, and can therefore adopt those courses of action which he considers will best contribute to his survival and indeed 'improvement' as a species. For example in relation to environmental problems it might be argued that other species should be preserved because they have genetic potential which might conceivably be important to the survival of man at some time in the future. Such arguments can become very

sophisticated.⁹ They do not, however, in themselves provide an unassailable ethical basis for choice and decision.¹⁰

There are at least two underlying assumptions which may be questioned in the context of the present discussion. First, there is the presupposition that accurate forecasting into the distant future is possible with the necessary precision and confidence to make choice possible, and that, even if such accurate and reliable information were available, that 'man' would act rationally and choose the 'right' course of action according to those predictions. The first element in this assumption is clearly not yet true, even in the physical and biological realms, let alone in the economic and social, both of which must be vital components of any realistic attempt by man to 'determine the course of his own evolution'. Furthermore, the longer the timescale the more components of change have to be taken into account, particularly those over which man can scarcely have any influence at all, like climatic change, and the course of human discovery and the growth of ideas. The second element in the assumption cannot with any confidence be assumed from the history of the human race hitherto. We may legitimately ask how many human decisions at any level—personal, family, national or international—which have resulted in disastrous consequences, have done so simply because the tools for prediction have produced wrong forecasts, or because those making decisions have rationalised in favour of the decision they favour for quite other reasons, or simply because of human arrogance and obstinacy. Unless we can settle securely for the first of these three as of over-riding importance in the past history of man, there is no reason why we should suppose that greater knowledge and improved forecasting techniques should make a very great difference to the success rate.

Second, and more fundamentally, there is the unarticulated, perhaps unconscious, assumption that evolutionary development is to be equated with progress in a sense deeper than increasing complexity of organisation, that the direction and pattern in time of evolutionary change is in some real, non-

9. See e.g. Royal Institute of Philosophy (Ed.), *Nature & Conduct* (Macmillan: London and Basingstoke), 1975; H. Skolimowski, *Eco-Philosophy* (Marion Boyars: London & Boston), 1981; D. C. Pirages, P. R. Ehrlich, *Ark II: Social Response to Environmental Imperatives* (Freeman: San Francisco), 1974; for a critique of evolutionary ethics see A. G. N. Flew, *Evolutionary Ethics* (St. Martin's Press: New York), 1968, *inter alia*.

10. See Passmore, 1974, *loc. cit.*, in Note 7.

emotional sense 'good'.¹¹ The rationale for this presupposition, however, does not rest on scientific inquiry or explanation. The 'naturalistic fallacy' is not in any way resolved.¹² Man, it must be admitted, is indeed the most complex organism yet to appear on the earth, both as an organism, and in his social organisation. But that does not make him, *ipso facto*, of more or less value than any other species. Throughout natural history species have appeared and become extinct; there is no reason to rate the survival of *Homo sapiens* as in some sense morally good, or indeed the survival of any species as morally good. Nor is there any reason to rate the survival of man as better, or even more desirable, than that of any other species, unless we are prepared to equate complexity with goodness. It is thus not surprising that evolutionary moralists and advocates rarely avoid invoking implicitly utilitarian arguments, such as self-evident principles, or even natural law, in their attempts to arrive at an ethical justification for what they consider to be acceptable moral principles in relation to environmental problems and the use and abuse of nature.¹³

It seems clear that there is a need for the third pole in order to build an adequate ethical framework; whether, in the event, its provision in the casuistry of evolutionary ethics is in any sense satisfactory is beyond the scope of this discussion. It is, however, perhaps not surprising that some evolutionary apologists find it difficult to avoid assigning ontological status to what is after all only a description of what is thought to have happened over a long period of time on this planet. This is

11. Waddington tried to argue this. See C. H. Waddington, *Science & Ethics* (Allen & Unwin: London), 1942. He followed Herbert Spencer, one of whose papers is included in the excellent collection of papers edited by A. C. Kaplan, *The Sociobiology Debate: Readings on the Ethical & Scientific Issues Concerning Sociobiology*. (Harper & Row: New York and London), 1978. There is a wide range of opinion represented, and there are contributions from both biologists and philosophers.

12. See part III of Kaplan, 1978. Also K. R. Popper, *The Poverty of Historicism* (Routledge & Kegan Paul: London), 1961; chapter 27, Is there a Law of Evolution Laws and Trends?, and especially n.1, p.108, n.2, p.119, and n.1, p.127. Not only does the problem of deriving an 'ought' from an 'is' (a prescription from a description) not squarely faced by most evolutionary biologists writing on ethics (let alone resolved satisfactorily), but also they generally fail to appreciate or counter the distinction so clearly and significantly made by Popper between producing a plausible explanation for the *origin* of morality in naturalistic terms (e.g. by suggesting an evolutionary origin for altruism), and providing criteria by which the validity of the moral value, once developed, may be judged.

13. See the papers by numerous biologists in Kaplan, 1978.

implied by the teleological language used to describe the activity of the process, and of its non-human participants; evolution—with a capital 'E'—is attributed the willed actions of a person.¹⁴

I.ii Technological pragmatism

This is, in essence, the conventional view of most Western countries. It is rarely, if ever, argued through to any profound level; if it were its patent inadequacy would be obvious. Human development is seen as being primarily a technological process, of man manipulating his environment for his own use, and of his solving the problems that arise, as and when they do, by devising techniques which eliminate the adverse consequences. It has been included as a materialist view, even though it is not infrequently masked by a thin garment of Christianity; we must, however, see through the *négligé* to the true form beneath, which is in fact thoroughly materialist and man-centred. Even the Christianity is thoroughly man-centred and technological as we shall see later in the consideration of the Orthodox Protestant view, which will be distinguished from it.

The central proposition of this view is that human history is to be seen, in relation to man and nature, as a developing technological system, in which man's facility in manipulating his environment becomes more sophisticated, and therefore more productive; thereby 'progress' in every area of life is achieved. Though the developing system poses problems, as side effects of the main development, they too are susceptible to technological solution. Thus environmental and ecological problems are seen as side effects of the main development, and will be solved by the devising of the appropriate techniques by man's ingenuity. The basic responsibility of man is seen as using

14. See Popper, 1961, n.2, p.119; or watch any programme on television which deals with natural history, where evolution as a possibly plausible explanation of development all too frequently becomes an active agent with foreknowledge, teleological content, and the capacity to plan and initiate purposive actions extending over long periods of time. How often do we hear, 'Evolution does (or has done) this or that'? David Attenborough's, *Life on Earth* was particularly full of such Freudian slips! And reputable biologists as scientists recognize this; in a valuable book on the ecology of tropical plants the author finds it necessary to emphasize what the use of his 'evolutionary shorthand' is intended to convey, and to exclude the teleological implications and the misconceptions which might arise from his use of anthropomorphic terms; see D. H. Janzen, *The Ecology of Plants in the Tropics*. Studies in Biology no.58. (Arnold/Institute of Biology: London), 1975. Introduction, p.v, last sentence in the final paragraph.

nature for his own material betterment; and the consequent improvement of his standard of living or quality of life in purely material terms. Not infrequently this view is seen as the natural outcome of the 'Protestant work ethic';¹⁵ whether or not that is so is outside the scope of the discussion in this paper. It is certainly not a biblical ethic, as will be seen later in the discussion. It is in fact this view of the relations between man and nature which may be accused of being, historically, the cause of the environmental deterioration which was so publicised in the 1960s and 1970s;¹⁶ it was not, as was so often asserted, with little justification, the Judaeo-Christian ethic which was to blame.¹⁷

Technology, in this context, is not narrowly defined. In its broad sense it connotes simply the devising and understanding of techniques of all kinds; they may be social, economic, medical, psychological, even aesthetic, as well as natural scientific. The inherent dangers of this faith in technological solutions was trenchantly criticised by Jacques Ellul over two decades

15. The so-called Weber-Tawney thesis concerning the industrial revolution and the rise of the capitalist system; see R. H. Tawney, *Religion and the Rise of Capitalism* (Penguin: London). Essentially, the thesis is that the work ethic supposedly advocated by the Calvinist doctrine of vocation encouraged the development of industrial activity and the accumulation of capital. Some environmentalists take this thesis and argue that it is the same attitude of mind which led to the rape of nature. Modern industry has, it is asserted, brought this about by the accumulation of wealth by turning the resources of the earth into money. The link is, I suggest, very tenuous, even if the Weber-Tawney thesis is accepted, which it need not be (see H. F. R. Catherwood, *the Christian in Industrial Society* (I. V. P.: London), 1972).

16. The argument I would wish to develop in another context would be that the Calvinist doctrine of vocation bears within it inherent moral constraints which allow the use and development of nature only in direct moral responsibility to a real personal God, who requires both a responsible and compassionate relationship between employer and employee, and also an equal responsibility and compassion towards the nature which he created and pronounced 'very good', and which itself is actively praising him (cf. Psalm 19). It is the loss of the dimension of real responsibility to a personal God, as a result of the deism of the 18th century, and the man-elevating individualism of the philosophy of the Enlightenment, which opened the way to the rape of the earth. Technological pragmatism in its fullest development is the result of these, and perhaps other, converging streams of thought which have little to do with Christian theism in its full and defensible form.

17. One wonders how often this completely untenable view has to be refuted by both Christian and non-Christian writers before it disappears from the thinking and writing of environmentalists. It persists even in the most recent textbooks. One can only speculate that the pretence is kept up because the alternative views are recognised as being deficient and inapplicable, but the consequences of accepting the biblical view involves too great a sacrifice of other sacred cows to be contemplated.

ago,¹⁸ but the viewpoint has increasingly insinuated itself into the thinking of most politicians in the Western bloc, and permeates most political platforms.¹⁹ The basic premis is that progress consists in technological advance, upon which human betterment depends, and that for every problem which arises there is a programme which will solve it, if only man can exercise his technological ingenuity successfully. Thus the solution to environmental problems is seen in purely technical terms, of legal and social manipulation as well as scientific understanding; any ethical input of an explicit kind is rejected as quite subsidiary, if not completely irrelevant.²⁰

The implicit assumption in the whole scheme is obvious—that technological solutions will always be possible, and, more important, that man will always be ingenious enough to devise them. This is a major leap of faith in man, and man alone. Furthermore it is a complete implicit rejection of what most men for most of history have recognised, and which even atheist and agnostic humanists overtly share, namely that there are moral principles upon which human conduct should be based, and to which individual and group interest must be sacrificed if the good of the greater whole demands it. Thus the implicit assumption in this view is a naive doctrine of technological progress. The key word in this discussion is of course *implicit*; it is not explicitly argued through, indeed it is difficult to see how it could be, since it is *amoral* rather than *immoral*. This is not to say that individuals espousing this view are necessarily *amoral*, indeed they are often in their attitudes to personal morality both dogmatic and outspoken. It is the system of thought that is amoral, and social morality is at a discount. Its weakness is obvious. The fact that man has managed generally to contain the problems created by

18. J. Ellul, *The Technological Society* (Knopf: New York), 1964.

19. The belief in inevitable technological progress and of the human condition by manipulation of the structures of society lies at the root of all major political programmes (even the Ecology Party, in the sense that it would wish to manipulate structures in order to produce a 'better quality of life'; it is different in the way it would wish to define and measure 'quality'). The evidence is the pre-eminence of the party manifesto—which is simply the prescription of a technique by which the party would achieve its aim (usually of a more materially comfortable and monetarily richer state for its supporters).—Technological pragmatism is the root philosophy of each major party in most countries of the Western world.

20. See e.g. the case studies in J. M. Edington and M. A. Edington, *Ecology & Environmental Planning* (Chapman & Hall: London & New York), 1977; or Ahmad, Dasgupta and Maler, *op. cit.*, 1984. (Note 5 above).

his technological advances in the pursuit of wealth in the past in no sense demonstrates his inevitable capacity to do so in the future. Indeed there are indications that with the rapidly increasing rate of technological mastery, it is becoming increasingly difficult so to do, not least in the area of nuclear energy.²¹

Ethically the implication is that, if man can develop and use a technology, then there is no reason why he should not do so, or why restrictions should be placed upon its use, either in mode or extent.²² In practice there are constraints reached by political agreement, that is by developments of codes of practice, international treaties, or business agreements. These are, however, not based on ethical judgments but on expediency and mutual advantage.²² Those espousing such a view of human development often pride themselves in being 'realists', which they contrast unfavourably with the 'starry-eyed idealists' who suggest that there may be over-riding reasons why the short-term gain may contribute to a long-term loss, not least in relation to ecological questions. Those who suggest that there may be over-riding or absolute moral principles which might conceivably relate to technological or economic development are generally seen to be even more out of touch with the 'real world'. There is thus, not infrequently, a tendency to be antagonistic to the introduction of ethical discourse into the consideration of technology, not simply a reluctance to examine ethical questions.

I.iii. Marxism

Any analysis of ecological problems in relation to human society

21. As in the disposal of nuclear waste. All the methods are essentially storage methods which attempt to contain the radiation safely until it is reduced to 'acceptable' levels by natural processes of degradation. The risks of the failure of storage systems, whether by breakdown of fail-safe mechanisms or by human error, in other fields have recently been epitomised in the Bhopal disaster, and earlier at Seveso and Flixborough.

22. In most fields it is possible to arrive at a code of practice which most practitioners are prepared to accept, even though their ethical positions may be very different in quite fundamental ways. These can if necessary be by legal or other sanctions. But this is an arrangement quite independent of an ethical base; it contains no *ought* which is binding. In practice, as in the case of the recent Warnock Report, it is an uneasy compromise between those who would see man as unique in that he has a direct moral responsibility to God, and those who see him as no more than a very highly developed product of evolution, an animal with superior powers which, in the interests of preserving the species he needs to be careful in the ways he uses them.

reveals their multi-faceted character.²³ It is therefore clear that solutions, if they exist, must themselves also be correspondingly multi-dimensional. This is the attraction of perspectives which purport to be holistic, or 'wholistic', to use the contemporary solecism. The attraction of Marxism as an all-embracing world-view is thus strong. Whether or not the emphasis on inter-relationships which some consider the essence of ecological thought, was in fact anticipated by Marx and Engels, as some argue,²³ it is clear that the view of societal structures and their ramifications which forms the basis of Marxist analyses has a conceptual affinity with much broad modern ecological 'wholism'. The distinction is, however, that while Marxist intellectuals have worked out their concepts with considerable rigour and thoroughness, ecological 'wholists' have been considerably less successful without recourse to mysticism (see II.i below). Marxism provides a fully materialist perspective, despite the not insignificant internal controversies and the multiplication of sects. Its strength in relation to the analysis of environmental problems is that it presents them as problems of the structure of society, rather than as scientific or technological dilemmas. In the Soviet Union, debates not unlike those characteristic of the West between conservationists, and technologists and industrialists in Western societies, do go on.²⁴ The social context is nevertheless different, in that a fully materialist evaluation of all costs and benefits, both short-term and long-term, is possible and in fact demanded by the need to further the underlying and inevitable social process towards the full communist ideal. Marxism is a world-view of future material hope; the needs and welfare of those not yet born must therefore be a significant element in decision-making, and the sacrifice of short-term gain to long-term benefits is frequently necessary. This is an argument ably deployed by Soviet conservationists.²⁵

That is not to say that the Soviet Union is without such environmental problems; the evidence is that acute problems exist in many places. This is in part due to the ignorance of ecological and environmental processes which is shared with the West,

23. See Passmore, *op. cit.*, 1974, pp.43-59.

24. H. L. Parsons, *Marx & Engels on Ecology* (Greenwood: Westport & London), 1977; see also F. Engels, *The Dialectics of Nature* (Progress: Moscow), 1934 (original papers and tracts written between 1873 and 1886).

25. See P. R. Pryde, *Conservation in the Soviet Union* (C.U.P.: Cambridge), 1972; this contains an excellent survey of the Soviet position.

and partly to the fact that there is no less a debate there than in the West, and that the immediate has often won in the influencing of decisions and actions. Nevertheless the basic world-view postulates an underlying process which can provide a basis and a sanction which is absent in the prevalent technological pragmatism of the West, and which is less easily developed from a biological evolutionary basis.

There is, however, an absence of an 'ought' at the personal level, and the notion of responsibility to an on-going socio-historical process is, to say the least, not easy to conceive, even to translate into practical action. The inevitability of state bureaucratic coercion is thus no less an essential part of the moral framework than it is in any of the systems already examined; and such coercion is founded on the insecure concept of ethical responsibility to an impersonal and ultimately inevitable process. It is also based upon the undemonstrable assumption that the process is in a quite fundamental sense a 'progressive' one. The notion of progress and its nature depends upon the criteria used to define it, and changing ideas, aspirations, and beliefs on the matter are a characteristic of Christendom in particular, and possibly human society in general.²⁶ Likewise, ideas on the possibility and mode of the improvement of man in a moral sense show striking contrasts throughout the history of western thought.²⁷

In practice therefore it would seem that Marxist states are faced with problems not dissimilar from the ecological and environmental deterioration typical of capitalist societies.²⁸ These are seen as part of the dialectical process of history, and it would be argued that a socialist state would necessarily adopt the wisest use of its resource base, once the real issues were appreciated. But the Marxist view, at least in relation to the present, shares with its capitalist counterparts an unquestioning acceptance of the necessity and desirability of economic growth as the primary, even unqualified, aim of society. This implies that ecological pressure groups have as vital a role in Marxist states as in capitalist ones.²⁹ The lack of an explicit ethical authority over and above the pragmatic concerns of

26. *ibid.*, chapter 9.

27. See J. M. Baillie, *The Belief in Progress* (O.U.P.: London), 1950, and M. Ginsberg, *The Idea of Progress: a Revaluation* (Greenwood: Westport & London), 1953; also R. Nisbet, *History of the Idea of Progress* (Heinemann: London), 1980.

28. See J. Passmore, *The Perfectibility of Man* (Duckworth: London), 1970.

29. Pryde, *op. cit.*, 1972.

economics and technology is therefore no less apparent and urgent than in the milieu of western technological pragmatism or evolutionary humanism.

II. Pantheistic or polytheistic presuppositions

The mind-sets included under this grouping see nature as more than a mechanism to be manipulated to meet man's needs, however circumspectly and prudently. Nature is accorded a value in and of itself, apart from any value it may have for man, and irrespective of any consequences that may result from man's deliberate or inadvertent interference with the complexities of natural systems, whether the results be beneficial or harmful to man. In materialist systems, if they are rigidly followed (which they rarely are by their practitioners), the ethical argument for criteria for human action must always ultimately return to the specification of a value for man, however tenuous the casuistic link; such arguments must ultimately be utilitarian in form and character. Notions such as 'complexity' or 'wonder' which are sometimes construed as instilling inherent value to nature are in the ultimate analysis no more than ascriptions of functional relation or psychological response. They provide no reason for the allocation of value, though of course they may well prompt the further psychological response in those so affected of a reluctance to damage or destroy that which has impressed or moved the individual in that particular way. It does not, however, provide any basis for moral prescription, other than that which can be argued through on utilitarian premises.³⁰

It is therefore not surprising that modern man has sought ways of implanting such value in nature itself; nor that man from the beginning has apparently divinised nature. This is illustrated in Figures 2a, and 2b, where the modern development in which ecology is invested with 'mysticism' is structured according to the three poles used in the present analysis, and the underlying attitude of mankind in many places and at many times is also set out. These two views embrace many particular variants, and are generally not available in a formally structured presentation.

II.i. Mystical holism

Reference has already been made to the fact that the actual or

30. *ibid.*

Figure 2a: The conceptual structure of mystical holism.

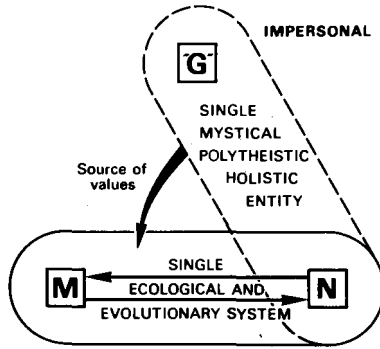
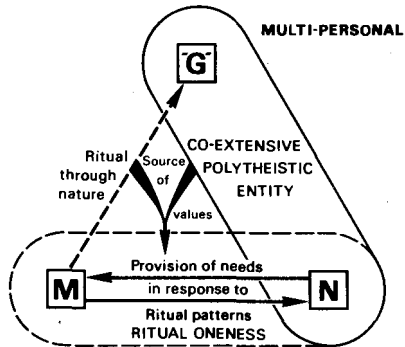


Figure 2b: The conceptual structure of magical animism.



implicit personification of 'evolution' is a characteristic of much popular, and even some quite rigorous, writing by evolutionary humanists. Some carry this much further and look to eastern mysticism quite openly and explicitly in order to provide the ethical underpinning for the respect for nature in itself which they wish to inculcate into the attitudes of contemporary society.³¹ In fact there was no need to look to the East, for some philosophical writing of the German idealists would have

31. See e.g. F. Fraser Darling, *Man's responsibility for the environment*. In F. J. Ebling (Ed.), *Biology & Ethics* (Symposium of the Institute of Biology No. 18), (Taylor & Francis: London), 1969. Many other examples can be cited. The notion is implicit in M. Nicholson, *The Environmental Revolution: a Guide for the New Masters of the World* (Penguin: London), 1972. This rather curious book seems to appeal to the same underlying principle, even though it is concerned to maintain mores instead of morals, perhaps simply social conventions rather than morally responsible behaviour; see B. Allsopp, *Ecological Morality* (Müller: London), 1972.

served just as well,³² but the ecological movement cannot be readily divorced from the counter-culture of the 1960s, and the gurus and ashrams of the orient were an essential component of that general movement; the gaze towards the rising sun was thus perhaps quite understandable. The essence of this viewpoint is to see man and the natural world as a single ecological and evolutionary mechanistic system, and to invest it with inherent value by emphasising the holistic, complex inter-related character of the whole and imparting to its holism a numinous sanctity and mystery which demands its preservation by virtue of its essential inscrutability. It is asserted that, even if analysis should produce a comprehensive understanding of the working and inter-relation of its parts, then the sum of the parts would not be validly equated with the whole. It is thus 'holistic' in the pure philosophical sense. Such thinking usually goes beyond that point, however, and the 'over-and-above' element is the mystery which gives the numinous aura, and instils the inherent value which is intended to produce the necessary reverence for nature which the ecological idealist seeks. It is a kind of crypto-panteism. Thus the attraction of eastern mysticism, divorced of its cruder contaminations, is quite understandable, because it does provide a value for nature which gives it intrinsic criteria for respect.

Thus what has been termed mystical holism embraces a wide variety of viewpoints, ranging from an almost unconscious change of evolution (a solely scientific, and therefore limited and closely defined, concept) into *Evolution* as some kind of inherent controlling and teleological principle built into nature, to the overt espousal of at least the philosophical elements of eastern mysticism from a variety of quite distinct religious sources.³³ It is, of course, at this point that ecology, as a rigorous scientific pursuit, almost imperceptibly passes into a significant cultural movement with quite clear political overtones. Political movements, such as the Green Party, or the Ecology Party, of course include others whose base for ethical discourse and political action is quite different, and in their very existence as political parties are concerned with much wider issues than those concerned with the use and abuse of nature. But their inner inspiration is often some form of mystical holism, and they

32. So Passmore, *op. cit.*, 1974, p.173.

33. Thus Fraser Darling, who was a first-rank natural historian/ecologist, in the article referred to in Note 31.

clearly spring from the ecological movements of the 1960s which were closely related to the other cultural convulsions of that time.

While such a viewpoint might arguably provide mankind with reasons for respecting nature, it is by no means clear how an argument can be developed regarding the actual use of nature, without which man cannot exist. Furthermore, the problem of responsibility also arises. Who holds me responsible for the respect or reverence which I ought to have for nature? What sanctions govern my behaviour in this respect? Eastern philosophy concerning nature selectively received to engender appropriate reverence for nature, can only answer these questions by being set in its full religious context, for the responsibility and the sanction is obtained in effect by setting the ethical argument in the context of a soteriological one. The behaviour is required of me in order that I might attain that bliss for which I yearn and work—and different religions offer the prospect of different 'heavens'. So that ultimately, if the argument is to be followed through, it must lead to specific ontological questions, relating to soteriology.

II.ii. Magical animism

In most places at most times there has been an underlying consciousness on the part of man of an inherent relation between himself and nature which is beyond his understanding or control. Sometimes this has expressed itself in a fear of the capriciousness of the natural world, even its malice; at others it has simply been an admission that nature is not to be trifled with; at others it has simply been a recognition of the fact that, when man has done all he can to manage nature for his use, there is still an indefinable dimension which needs to be taken into account, if not actually placated. In many societies it attains overt religious expression, as in the *baalim* and *asherim* of Old Testament times; many religions which are today grouped as 'animistic' fall into this category, but this is both to cloak their diversity and simplify their complexity, especially when they are also categorised as 'primitive'. Furthermore, very many, if not all, which have been subjected to detailed scrutiny reveal an underlying monotheism in which the root of all belief is in an unapproachable, and therefore in practice irrelevant being, on whom those polytheistic entities which are served and placated are ultimately dependent. Practical religion is thus concerned

with the contingent rather than the ultimate.³⁴ It must be emphasised that the naive evolutionary view of the development of religion, depicted in *The Golden Bough* of Sir James Frazer for example, is scarcely tenable in the light of contemporary anthropological research. If it is to be held at all it clearly needs such drastic modification as to make it almost unrecognisable.³⁵

The viewpoint is not, however, confined to overt religious expression. It underlies much magical practice, which has been a constant undercurrent in rural communities even in Christendom from time immemorial. Furthermore, just as the Jewish people took pagan festivals and transformed them into celebrations of the glory of Yahweh, so the Christian Church has done the same with the pagan festivals which it has encountered in the societies to which it has come.³⁶ The resurgence of overt magical or proto-magical practice in the broad ecological movement of the second half of the 20th century is an indication that even the techno-scientific assault of the past 200 years has not extinguished its power.³⁷

The distinguishing character of this group of mind-sets is that their approach to nature incorporates as an essential feature the use of ritual. Sometimes this is overtly religious or cultic, in other cases it is shown by the performance of acts which have no

34. See e.g. the set of case studies in D. Forde, *African Worlds: Studies in the Cosmological Ideas and Social Values of African Peoples* (International African Institute/O.U.P.: London), 1964.

35. This, like the notion of the ecologically disastrous Judaeo-Christian ethics, is another untenable idea which persists despite continual accumulation of evidence to the contrary. If the naive evolutionary view is false, as the evidence suggests that it is, in that at root animistic religions are in fact theoretically but not practically monotheistic, then the evolutionary basis of the Graf-Wellhausen hypothesis in Old Testament studies collapses, and the position is considerably weakened. See also, on African religion, E. B. Idowu, *Olodumare: God in Yoruba Belief* (Longmans: London), 1962; and also E. B. Idowu, *African Traditional Religion: a Definition* (S.C.M.: London), 1973.

36. So with Christmas and Easter, etc. C. S. Lewis has suggested that in the actual events of the Christ, Jesus of Nazareth, the myths of other religions—of dying gods, and gods becoming men, of death and rebirth, find the substance of which they are but the imperfect and dimly perceived and inaccurately delineated dreams. See chapter 3—'Myth Become Fact'—in C. S. Lewis, *God in the Dock: Essays in Theology* (Collins: London), 1979. (First published in 1971 in *Undeceptions* (Bles: London)).

37. This is to be seen, not only in the resurgence of interest and participation in the occult, but also in such groups as the Findhorn Community on the Moray Firth in Scotland, and perhaps even in the idea that by talking to plants their health and growth is enhanced.

known scientific consequence, but which are pure ritual. Nature is in effect treated as personal or multi-personal, and as the provider of needs, nature and natural objects are treated as having personality of their own in that their inner essence is to be penetrated and communicated with. Even in the 20th century in sophisticated, urbanised, materialist, mammon-worshipping, modern western society the notion that man is 'nearer God's heart in a garden'—or in the country, or in the hills, or in the wilderness—'than anywhere else on earth' is still pervasively powerful. This surely betokens the fact that deep in the folk memory of modern man there is still the relic of the fact that he is closely bound to nature—a fact which Genesis 1, 2 and 3 make abundantly clear.

It is easy to dismiss such viewpoints on both scientific and theological grounds. To do so is rather facile, for the very fact of their persistence and resilience, and even their resurgence in western society today, despite the attacks to which they have been subjected, is itself a fact of some significance. While rationally indefensible within the framework of assumptions of modern western man, they reveal a deep psychological and emotional need which cannot be discounted. Such a need can however be brought into a rational framework if theistic assumptions form the basis of the world view within which they are to fit. If we assume that man was created a part of nature, yet a part of nature which forms the articulate and self-conscious focus of nature in relation to a personal God, the deep affinities which the magical-animist mind-set represents is a full part of actually being human as created by God. Relations with nature are not to be seen merely as scientifically specifiable ecological functions, but as deep ontological ties which are part of the created order as intended by God. In a non-fallen world they would lead beyond themselves to the Creator; in a fallen world man focusses on the ties themselves, and treats them ritually and magically. Such practices are in effect man recognising his responsibility to God in relation to nature.

III. Theistic pre-suppositions

Thus we are led to consider theistic frameworks. They start from the assumption of a real, personal God, who is creator, sustainer and purposeful worker, in relation to man, nature, and all that is. Full-blooded orthodoxy, whether Protestant, Roman or Orthodox, is prepared to accept such a proposition without

qualification, on the basis of revelation, apart from any human philosophical arguments which might be advanced for such a position. Nevertheless there are Christians who would with some justification claim to be theists, who would be disposed to lay greater weight on the philosophical dimension, and argue that the intellectual insights of modern evolutionary thought—in the '*Evolutionist*' rather than the 'evolution' sense—is a profound advance in human perception, and can be integrated into a single mind-set in relation to Christian thinking. Teilhard de Chardin was of course the prime example of such thinking, and his influence on much thought within the broad spectrum of professedly Christian philosophy can hardly be overestimated.³⁸

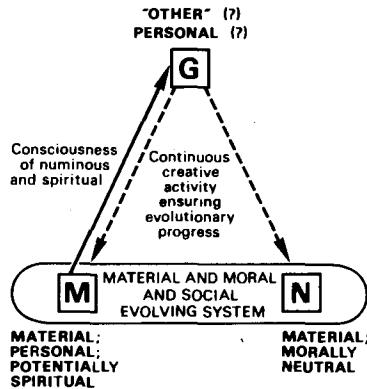
In this group therefore there are three main systems to be included—the liberal Christian, the orthodox Roman, and the framework of biblical orthodoxy, which will, in the context of this paper, be set out in fuller detail than the other views which have been considered.

III.i. Christian Evolutionism

It is important to emphasise that this viewpoint is predicated upon the assigning of equal—or almost so—authority to the broad Christian theological tradition and modern evolutionary philosophy. We are not concerned with what has been termed, perhaps mis-termed, theistic evolution. This is essentially an attempt to bring fully within the ambience of biblical theistic assumptions the essentially empirical and scientific elements of evolutionary thinking. Christian Evolutionism aims to reconcile two separate systems of philosophical thought. Man and nature are seen as a single evolving system, in the physical, biological, moral and social realms (*Figure 3a*). Mankind is evolving towards an increasingly developed spirituality by a process which is an expression of the continuous creative activity of God, which, despite all the apparent set-backs, will eventually produce that being for which the whole process, beginning with the initial emergence of matter from energy was designed. Jesus, if he is accorded importance or uniqueness at all, is seen as that being appearing before his evolutionary time. In its extreme form this mind-set is a kind of evolutionary

38. See, of course, P. Teilhard de Chardin, *The Phenomenon of Man* (Collins: London), 1959. See also the devastating review of the work, by an eminent biologist, in P. B. Medawar, *The Art of the Soluble* (Methuen: London), 1967, pp.71-81.

Figure 3a: The conceptual structure of Christian evolutionism.



eschatology. It embraces many disparate sub-systems, too numerous to be detailed here, from a pseudo-orthodox group of ideas rooted in the idea of evolutionary progress, which in other respects may approach beliefs recognisable as distinctively and uniquely Christian, to an heterodoxy scarcely distinguishable from a somewhat mystical evolutionary humanism. The complexities of Teilhardism, clothed as they are in obscure literary convolution, in fact represent the most consistent attempt to develop the essential linking theme of all these views, which is simply to accord philosophical Evolutionism the same normative status as that given to the revelation of God in Jesus of Nazareth, and to seek a unified system embracing both. Since this is, almost by definition, impossible, it is the latter set of norms which tends to suffer severe attenuation in the process.³⁹

The essential question is, however, whether such a viewpoint can provide a more satisfactory basis for ethical discourse than can a non-theistic evolutionary humanism. It is difficult to see how it does, for the moral imperative ultimately reduces to the same essentials, namely responsibility to a process, not a person; to a principle of development rather than to a God who requires a certain kind of behaviour.

III.ii. Orthodox Romanism

It is necessary to emphasise that the differences between the

39. So Sir Julian Huxley was prepared to write a sympathetic Foreword to *The Phenomenon of Man*, when it was translated into English (see Note 38). Medawar makes some perceptive comments on this fact (*loc. cit.*, p.81).

two fully theistic views now to be considered are much less than the gulf between them and every view hitherto considered. They both start from the assumption that a personal God is the source and sustainer of all that is, that He has revealed Himself by His acts in history, and supremely in the incarnation, life, death, resurrection and ascension of Jesus of Nazareth as Son of God, which are real events in history, not psychological responses of other human beings to a rather impressive, even unique, human person. This God is not only the final reason for all material existence, of which man is part, but also the ultimate source of all moral authority. The universe belongs to God as creator, not to man; as creator of man, God gives him unique power which carries with it direct responsibility for its exercise to the personal God who gave it. The locus of human responsibility for nature lies not in some inherent property or process of nature itself, but in God who created mankind and the nature over which he has been given power. The difference between the Roman and the biblical view is that in the latter case the responsibility to God by the individual and the group is exercised directly, whereas in the former its requirements and obligations are exercised through the mediation of an authoritative Church which itself has a divinely appointed function in the chain of responsibility, ultimately final and absolute, should it choose so to exercise it. The exercise of this authority in relation to an issue which has clear and direct ecological and environmental implications was of course the Papal Encyclical on birth control, the content of which has recently been given reiterated support by the present occupant of the Holy See. It would be wrong, however, to allow this element to loom too large in the evaluation, and *Figures 3b.* and *3c.* are clearly closely analogous in their structure, and thus in the relations of the mind-sets they represent. Thus the Roman position in effect includes an additional element incorporated into the system, and must be taken to embrace the major elements of biblical orthodoxy set out in the next section.

III.iii. Biblical orthodoxy

Figure 3c. sets out this viewpoint in the same framework as the other perspectives already considered. In relation to the main thrust of this paper, however, it is necessary to develop it more fully, and therefore it is also set out in a developing sequence in *Figures 4a.* to *4e.* Christian orthodoxy, unlike every other view

Figure 3b: The conceptual structure of Roman orthodoxy.

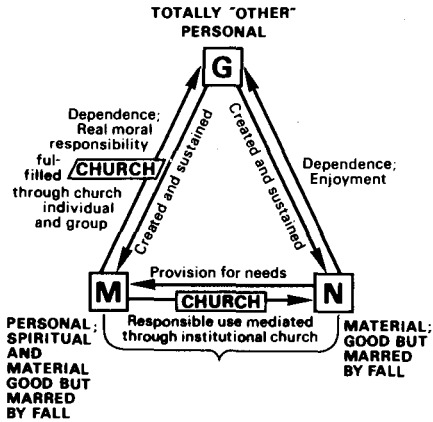
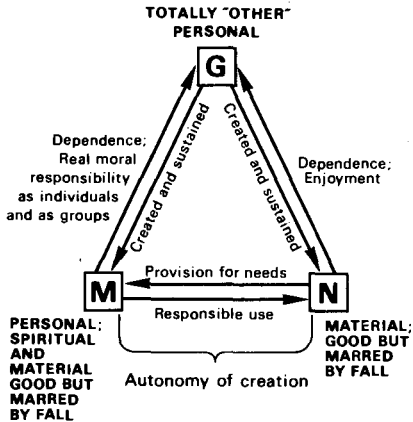


Figure 3c: The conceptual structure of Biblical orthodoxy.



so far examined (i.e. in Groups I and II, and certainly some examples of those Christian views embraced in III.i) takes an uncompromising theistic stance which asserts that God is the only ultimate reality; all other realities are contingent, depending upon him for their reality. These contingent realities, whether known to, or knowable by, man or not, including the reality within which man exists, of which he is a part, and which he seeks to understand and use, are absolutely dependent upon the will and word of God; they have no existence separate from his decision. God does not think and then speak and then do; his thought is his word is his act, for there is no sequence in God,

since sequence depends upon a concept of time, and that dimension itself is a part of the contingent, not the ultimate reality—as indeed are all dimensions perceived or inferred by man. In simple biblical language God speaks and it is, as in Genesis chapter 1. As a corollary when God ceases to speak, it is not. The world of human experience, however unimaginably vast, however inconceivably complex, however intricate in the inter-relations which are its essence, is there and continues to be there only because moment by moment in all its parts, aspects and dimensions, God wills it to be so. To use another anthropomorphic metaphor, the universe, which is the reality we know, seek to understand and use, is but one thought in the mind of God. As such, God is not only unknown, but unknowable, at least in the terms which men usually categorise 'knowing'. The 'existence' of such a God may be a reasonable inference from what we observe and understand of our world of experience, but even the use of the word 'existence' itself begs questions.⁴⁰

The assertion of the Christian faith is that this God has revealed himself, both generally in the reality we know, as a whole, and particularly in specified events and words to men living within that reality, and pre-eminently by becoming part of that reality in the person of the man Jesus of Nazareth. This revelation is normative in him, and proceeds from him to the normative interpretation of the other aspects of revelation. From the perspective of a thorough-going Christian theism to proceed in any other way is to commit a methodological mistake of very serious dimensions. The contrast with the other approaches so far considered is thus complete. Again it seems necessary to point out that there are only secondary differences between the Roman view (III.ii) and that of biblical orthodoxy on this fundamental issue, but the contrast with other views is sharp and stark.

From this basis then it is possible to build a biblical theology of man and nature. The scheme is illustrated in *Figures 4a. to 4e.* God 'speaks' (4a), that is, all that is depends on him absolutely for its existence, including the dimensional framework within which it exists, which for the universe we know is a space-time

40. Existence in itself, in any sense which man can comprehend, is contingent, dependent upon God. The danger is that we reduce God to part of our experienced environment by speaking of his 'existence'; the trouble is we have no other word which serves any better.

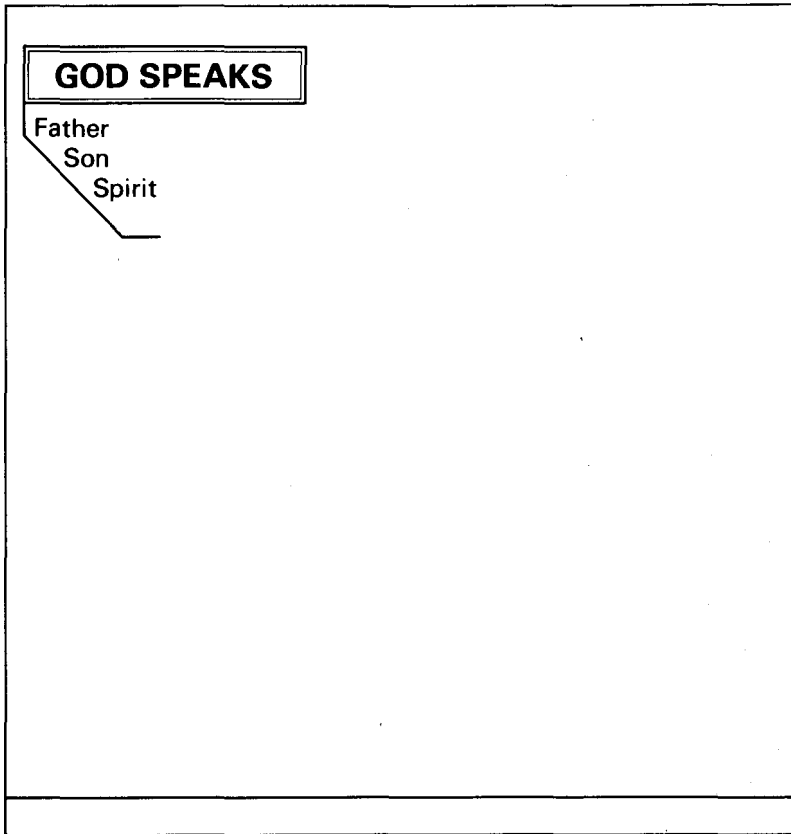


Figure 4a: The absolute foundation—the creative, sustaining Word of God.

continuum, though should other dimensions be discovered they would not be outwith the creative act and process which depends upon God alone. Our universe in general, our planetary system more particularly, and pre-eminently the earth on which we live, thus exists, and, as part of it, man is given by God a special responsibility with respect to it (4b). Thus in creation man's moral responsibility is both implicit in the nature of things, and explicit in the direct command of God. The implicit relation is the recognition of his creaturehood and dependence; the explicit is the one direct restriction on man's actual use of nature imposed quite specifically by God—of *that* tree you shall not eat. Man's disobedience is thus not simply the breaking of a

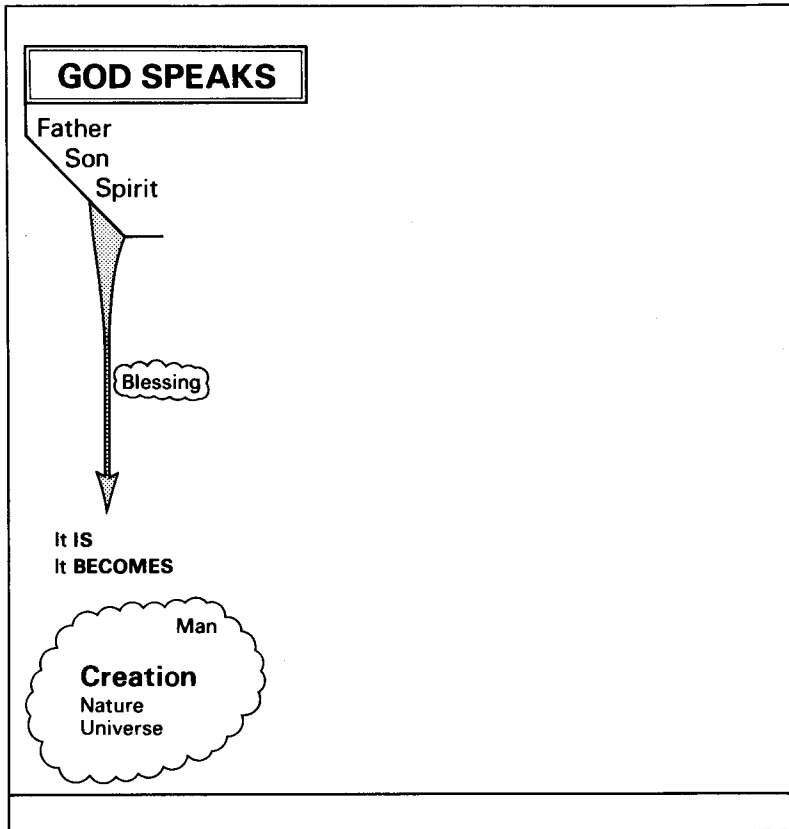


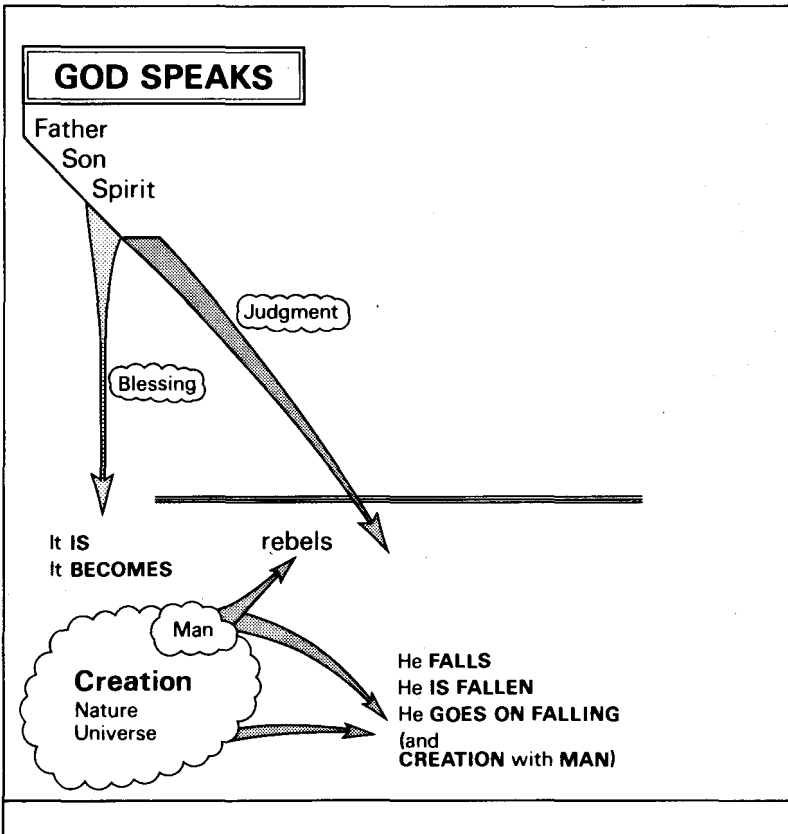
Figure 4b: The Word of blessing and responsibility in creation.

divinely-given rule—a forensic act—but even more fundamentally a denial of his true creaturely nature, a contradiction of the very essence of the created order. It is disobedience, it is rebellion, but it is also a refusal to accept the true constituted nature of the universe of which man is a part. Judgment is therefore inevitably also threefold: legal retribution, spiritual alienation, and insoluble disruption of the natural order (4c.). Man's sin thus not only affects him; it also irrevocably disturbs that natural system of which he is a part. Environmental and ecological problems can therefore only be ameliorated, never eliminated, because there is an alienation *within* the natural system itself, as well as an alienation *between* man and nature, consequent upon

his alienation from God and God's alienation from him. Nature fell, is fallen, and continues to fall, with man.

God, however, does not leave man and nature to move towards inevitable disaster. He begins a work of redemption within man and nature, which centres on the incarnation of God himself as a man. He chooses a people and on the basis of that free choice seeks a response from them in terms of a code of social, technological and ritual behaviour. Their enjoyment of his favour and blessing is conditional upon their taking this total demand seriously, and nowhere is that more apparent than in their use of nature in order to provide for their needs, and in their public recognition of their complete dependence upon

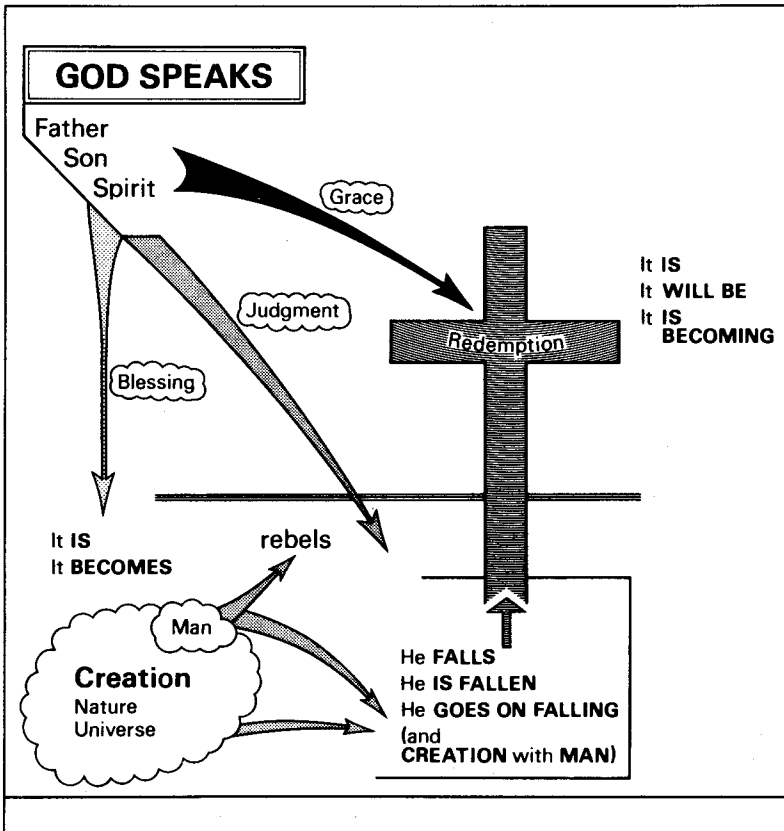
Figure 4c: The Word of judgment on man's rebellion against God, and his declaration of his independence, his denial of his contingent status by virtue of creation.



him for all that nature provides. This is part of the full meaning of the sabbath laws, and pre-eminently of the year of Jubilee (Leviticus 25 and 26). The intimate connection between the fruitfulness of the land and the social and personal morality of the people is a recurring theme in the prophets, especially those of the eighth century B.C. As the Messianic hope grew, and in the inter-Testamental period became increasingly a political vision, it was not dissociated from the hope of the restoration of nature which was a dimension of the original prophetic vision (see Isaiah 11 and 65).

The coming of the Messiah produced no instant solutions. His humiliation and execution, also part of the prophetic vision,

Figure 4d: The Word of redemption in God's covenant love, focussed and concentrated in the cross of Christ and its total achievement.



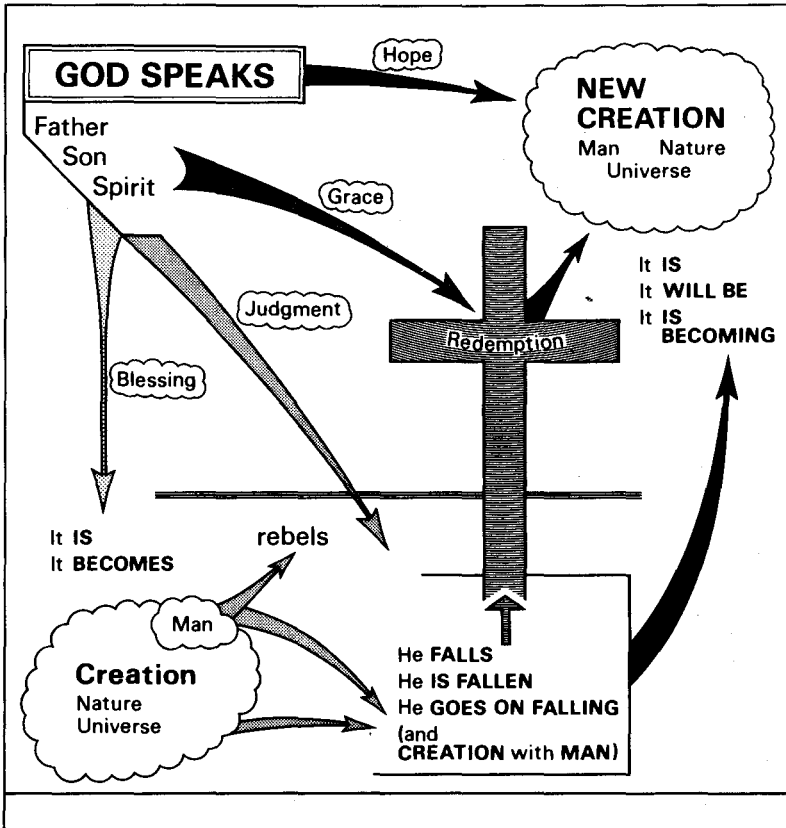


Figure 4e: The Word of sure hope as the redemption achieved by Christ works towards and is consummated in the new creation.

were not defeats, but redemptive acts towards which the prior events were pointing and working, and from which all subsequent redemptive events follow and derive. The resurrection and ascension were God's public vindication of those acts of redemption, not in any sense a rectification of unfortunate and sad mistakes. The redemption of man and nature thus centres on the Cross and what was accomplished there by God in Christ—reconciling the *world* (*kosmos*, of which the *ktisis*, of Romans 8:22-23 is a part). It, like creation and the fall, is a past fact, a present process, and a future succession of that process (*4d.*). But it also contains a future hope, that of new creation, of which the resurrected, re-created body of Christ Jesus is the firstfruit.

The new creation of the sons of God is the precursor of the total new creation of them and the whole universe—new men on a new earth in a new universe—at the second coming of Christ at the consummation of all things (4e.). Such a new creation is not an intangible 'spiritual' entity, nebulous and ghostly. It is more real than that which it replaces, in the same way as the resurrected body of Christ Jesus was more real than the one from which it came—the one which was laid in the tomb, but which on Sunday morning had been transmuted into its new reality. So with the sons of God for whose full redemption the whole creation groans and waits so that its redemption may be complete in new creation. Furthermore, just as it was necessary for God in Christ to pass through this present fallen creation in order to effect the new creation, and it is necessary for the redeemed of the Lord to pass through sinful flesh in order to attain their new creation, so also it is necessary for the whole of the natural creation to pass through its state of frustration and futility in order to become the new heavens and the new earth.

This theistic perspective rooted in historic Christian faith provides a number of vital underpinnings for the Christian in his approach to environmental and ecological problems. In the first place he will see his efforts to improve situations and to change attitudes, not simply as attempts to solve problems or to meet needs, but as a positive contribution to one dimension of God's ongoing purpose of cosmic redemption, and as an outworking of the special redemptive grace of God to him. Then, as a corollary, he will see the work of non-Christians in the same area of concern as an operation of the common grace of God working to a related end, in preventing the downward trend inevitably consequent upon the threefold alienation outlined earlier in this paper. Furthermore, he will not be a man without hope, for he looks for a new heaven and a new earth as well as a new humanity, towards which he is working, even though he knows that the final consummation of the purpose is to be sought only in the second coming of his Lord. Third, he will see all nature as created by God for *his* praise and pleasure and not for man's use or exploitation; he will be caring for *God's* earth. And the Christian will see his environmental responsibility in personal terms, for man is accountable to a real personal God (who has revealed himself as a true man in Jesus Christ) for his behaviour in relation to the earth and to nature, for on this view acts towards nature have a real moral content no less than that of acts towards other men. Finally, the Christian environmentalist or ecologist

will have no illusions about the limits of what can be achieved in a fallen world, and in a society of fallen men who by and large refuse to recognise their fallen-ness and moral and spiritual deprivation and therefore do not look to the only true source of redemption, not only for man, but for nature as well. But he will not be discouraged, for he will not judge his own decisions and actions in terms of their intrinsic effectiveness, or their actual consequences for environmental improvement or degradation. He will believe that, insofar as the decisions are taken and the actions performed in responsibility to God in the light of the principles he has revealed, and the facts of situation as far as he can ascertain them, God will ultimately make himself responsible for the consequences as he works out his own full purpose. Thus the full Christian theistic underpinnings have a profound and extensive implication for environmental action, as well as providing a set of ethical principles for human use of the earth and its resources.⁴¹

Conclusion

A number of sets of underpinnings for the examination and attempted solution of environmental problems have been briefly examined. Particular attention has been paid to the orthodox framework provided by biblical theism, principally because it is the one most usually treated with insufficient understanding and sympathy. Its implications are not only directly ethical, but provide a world view which impinges on a whole range of subconscious attitudes and approaches which relate to decisions and actions on environmental problems at both the individual and the corporate level. At the corporate level man

41. See for orthodox biblical treatments of the domain of discussion: Moss, *op. cit.*, 1982; also R. Elsdon, *Bent World: Science, the Bible & the Environment* (I.V.P.: Leicester), 1981. For a more liberal viewpoint see H. Montefiore (Ed.), *Man & Nature* (Collins: London), 1975. For a Roman Catholic view see C. Derrick, *The Delicate Creation* (Stacey: London), 1972. And, also from the Roman perspective, a delightful book by a Jesuit Father, R. Faricy, *Wind & Sea Obey Him: Approaches to a Theology of Nature* (S.C.M.: London), 1982. Other relevant studies are: I. G. Barbour, *Earth Might be Fair* (Prentice-Hall: Englewood Cliffs, N.J.), 1972; A. R. Peacocke, *Creation & the World of Science* (O.U.P.: Oxford), 1979, (especially chapters VII and VIII).

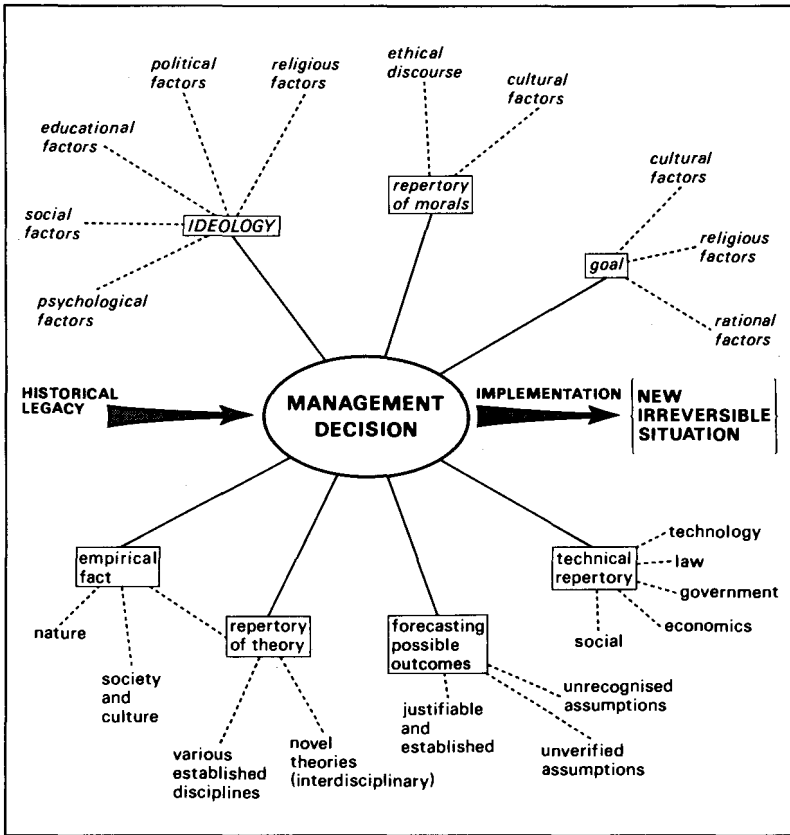


Figure 5: The elements in an environmental management decision.

cannot avoid management decisions, and *Figure 5* illustrates the ramifications of such decisions. The disparate elements in the Figure are nowhere completely independent of the mind-set of the decision-makers. The decision made is always irreversible. It is therefore perhaps not only appropriate, but also of some importance, that such an examination of underpinnings as has been briefly attempted in this paper should be undertaken and made a matter of open discussion. In the past too-facile conclusions have been reached, and then assimilated into the environmental folk memory without adequate critical examination. If this paper has succeeded in making a contribution towards a more balanced and critical evaluation, then it will have achieved something worthwhile.

Duncan Vere

Does Man's 'dominion' over nature include the Natural World within himself?

'Man is the link which unites the natural and spiritual worlds.'
James Orr.¹

Despite the balanced statements of Genesis ch: 1 vs. 26 and 28, and ch: 2 vs. 15, the record of Christendom seems to have been one of acceptance of dominion over the natural world rather than of stewardship of it on God's behalf (Gen. 2:15). This seems the more surprising in view of Jesus' consistent references to man's role as being one of a steward, or faithful servant, over God's possessions (Matt. 18:21-35, 20:1-16, 21:23f, 33f; Lk: 19:11-27, 20:9-19). Perhaps the parables have been interpreted in so spiritual a framework that even the clear relevance of the spiritual for the earthly here-and-now has been passed by.

For many cultures, Christian tradition seems also to have feared incursion into the natural world within man. At times this represented no more than a superstition born of ignorance, as the difficulties faced by the early anatomists show. At other times there was an awareness of man's exalted spiritual status, which was seen to forbid in some way tampering with the 'temple of the Holy Spirit'. This did not prevent innumerable weapon wounds, however, nor the dissection of criminals and other classes deemed (quite wrongly) to have forgone human privilege. In scripture, from the start, the text is preoccupied with violent incursions, and the significance of blood in terms of life. Whether impressed by his brother's occupation, or by his father's duty of stewardship, Cain asked, 'Am I my brother's keeper' (or steward, or shepherd)? The answer was that this was indeed the case, at least by implication, and the matters of blood and responsibility for bloodshed, were raised immediately.

Whether some at times have regarded man's body as not part

1. Orr, James (1904), *The Christian View of God and the World*. The First Series of Kerr Lectures, Lecture IV, Andrew Elliot, Edinburgh, seventh edition.

of the natural world, or at others (like the Greeks), taken it to be so entirely part of nature as to be evil or contemptible,^{2,3} scripture clearly states that man's body and mind are within nature (Gen. 2:7, 3:19, Psalm 103:14), but worthy of a respect totally different from that given to other animate creatures because man alone is made 'in the image of God', and man was not 'given' for any purpose to other men (Gen. 1:29, 9:3).

The last century has seen a quiet but deeply significant revolution in man's handling of the natural world within himself. The elements of this revolution are the explosive growth of scientific understanding, so that we now know that most of the illnesses which afflict us have direct parallels throughout the animal kingdom, the growth of effective therapies, which work by chemical or physical invasion of our internal world (e.g. surgery, anaesthesia, antibiotics), and the growth of wealth in the developed world which allows these costly manipulations. But the new therapies are no longer confined to their largely traditional roles. Noting that man can use methods hitherto confined to the conquest of illness to alter bodily shape, to vary the normal state of mind, to change patterns of reproduction, we now find these methods devoted increasingly to non-therapeutic goals. There is no need to attempt a comprehensive list; it suffices to consider the use of drugs in psychopathic offenders, non-therapeutic abortion, breast enlargement by silicone prosthesis, and *in vitro* fertilisation to understand the range of options now open to change *normal* life processes. Respect for the body has again faded, unless an individual chooses to press the matter in court. To mention a rather extreme example, the recent death of a London policewoman by machine gun fire from an Embassy window was described as 'regrettable', but not as grounds for further action by those responsible. The general effect on ethics seems to have been a shift right across from deontology to consequentialism, so that the end justifies the means and no principles are sought.

So, man now regularly invades man in ways which were unforeseen in scripture, apart from a few prophecies whose interpretation is unclear at present. Evangelical Christians thus find themselves faced with an acute problem of Bible interpretation (a hermeneutic problem). In an age where hardly a week

2. Greek Philosophy, man's body in: see *Illustrated Bible Dictionary*, Inter-Varsity Press (1980), Part I pp.202-203, Part II p.941.

3. Plato, *The Republic* translated by H. D. P. Lee, Penguin Books (1955), p.389. Book X, §608-611.

passes without some novel ethical problem, Christians are in a world where direct commandments are no longer to be found to apply. This situation demands inference of indirect commandments from scripture but begs the question of the *level* at which such inferences should be drawn. So, at the very moment when all look to the church for confident ethical pronouncements, evangelicals find themselves at variance over the simplest problems. This difficulty does not, of course, affect those who take their stand on church tradition, or on a liberal view, for there is no dearth of man-made theory. But how can one rightly divide the word of truth on such matters? Consider for example, only the abortion problem. Some base their view squarely upon the 'life' passages of scripture, and upon human 'personhood' as a *theological* concept, that a man becomes such because he is 'known' as such by God. At the other extreme, others place weight upon God's delegation of decisions to man, and upon the overriding duty of love to a neighbour. They would assert that abortion may well be the lesser evil, a necessary step to resolve a dangerous difficulty which opposes life in its deepest sense. Clearly, the view taken, be it either of these extremes or any between them will rest upon the various weights applied to many passages of scripture. So there are, not surprisingly, many hermeneutic systems, and over them all the need to respond to the inner light of the Spirit. Remarkably, there is in general more agreement on what to do than there is upon why it should be done.

We need therefore to ask two questions, 'what is the basic nature of man's incursion into man', and, 'what can we learn from scripture about *how* to approach such problems in general, rather than seeking solutions to the particular?'

Man's incursion into man has three important aspects—the scope of incursion, man's status as an explorer, and the question of what is 'natural'. The scope of the incursions is surely far broader than it appears at most. It is easy to be shocked and bewildered by a new technique like abortion, *in vitro* fertilisation or brain surgery, without noticing the serious and far-reaching incursions imposed by education, home training, social conditioning, advertising and indoctrination, all of which have been traditional elements of human culture from the start (see e.g. Deut. 6:7, 7:20-25) but have only recently become more flexible, and manipulable through the development of 'mass media'. We believe that 'good homes', schools, universities, foster freedom and cultural advance. So they do, by imposing

restrictions upon liberty. Modern political systems, like the organised worldly church at all times, seek to cultivate beliefs by selective fact-withholding, or discrimination. Selective fact-control is the stuff of war; it provokes and sustains conflict. Perhaps we should concentrate less upon what can now be done to bodies when there is so much wrong that is done to minds. It seems strange to 'third world' people to learn of our preoccupations; a distinguished Nigerian doctor commenting on our children's ward, said, 'in our country, they die in the street'. The problem is that practical procedures, like abortion or brain surgery, reify a problem, focussing attention upon some of its least relevant aspects, just as a broken window can divert attention from the state of heart of a thief. They demand attention because they are very concrete parts of a local situation, which must be dealt with for that reason.

Man is, and always has been an *explorer*; his 'dominion' and survival demand it. But exploration necessitates 'adaptation'. The more rapid the exploratory moves, the more difficult and hazardous adaptation becomes. Sudden exploration may lead to extinction, as may the failure to move as the environment changes. So we now have very clear evidences of this as the diseases of maladaptation. Consider some examples; rapid world travel has altered parasite migrations. Whether one considers influenza epidemics or the spread of schistosome worms in the West Indies, diseases are on the march. Much of the infection now occurring in hospitals stems from the use of antibiotics against other infections. Much of the malaria in South-East Asia is now chloroquine-resistant, and such parasites have now appeared and are appearing in South America and in Central Africa. (In a frivolous moment, one might consider modern medicines as an adaptation on the part of doctors to survive in business!) The 'improved farm' sprayed with insecticide and hedgeless, lacks butterflies and birds. Medical and industrial radiation, and exposure to mutagens have produced enhanced cancer incidence in some places. The three main fatal diseases of men in Britain today are attributable to smoking. Promiscuous homosexuals develop suppressed immunity and then cancers of a peculiarly fatal kind. (The A.I.D.S. syndrome). All have occurred within the last 50 years, a very brief time in planetary history. Thus, the quickening pace of exploration is itself proving to be an incursion, often of a very damaging kind, particularly if one considers wars as an effect of the stresses associated with movement and adaptation.

If there is a 'natural' world, how may it be defined? Is the 'natural' part 'something which hasn't changed recently'? The question matters because 'natural law' has been a mainstay of church tradition in some quarters, having an honourable, if restricted, place in scripture in Paul's theology, especially in passages like Romans ch. 1 and 2 and in 1 Cor. 11:14. It seems to me that natural law has a very restricted value, particularly where one is considering the goodness of unnatural procedures. Consider just one example: circumcision cannot by the wildest stretch be 'natural', but it was ordained of God for ceremonial purposes which included the use of the intact human structure as a symbol of the 'flesh', the natural man who is offensive to God (Jer. 4:4, Col. 2:11). What is more, circumcision has now been shown to be beneficial in preventing cancers in both sexes, a seemingly unlikely conclusion to an 'unnatural' practice.

First let it be said that scripture knows nothing of responsibility for human life being delegated *wholly* to man. The principle that all men, even kings, are to be stewards, or helpers of their brethren under God's command, is clear not only from Genesis 4:9-11 and Genesis 9:1-7, but in numerous other places such as Jeremiah 19:5, 22:3-5, 13-17 and so on. Man is clearly intended to walk in partnership with, and under the express guidance of God in these matters. That God *has* a will for man's conduct is very clear from Jeremiah 18:10 and 19:5. In Genesis, the thought of dominion is always linked with that of responsibility (Gen. 1:3, 6, 26, 27). The thought of relationship is clear in Matt. 4:4, 1:27-28, 2:18, as well as in Gen. 3:9. The 'I'-'thou' aspect of this relationship seems very clear, perhaps beginning with the 'word' of God which called man from the dust in the first place.

If we are to look to scripture for light on a proper approach by man to the human body, where should we look? Let us start with a problem which arose in Corinth, where abuse of the body may well have stemmed from Greek ideas of contempt for the body.⁴ The remarkable fact is that Paul, in his extended teaching about the body of man in the Corinthian letters uses no less than thirteen pictures or analogies, and adds a fourteenth in his letter to the Romans. They are as follows, with notes on the Greek words used based upon Vine.⁵

4. Coneybeare, W. J., and Houson J. S. (1898), *The Life and Epistles of St. Paul*, Longmans, London (new editors).

5. Vine, E. W. *An Expository Dictionary of New Testament Words*, Oliphants, London and Edinburgh, 1940.

	A mould, the form of character to which the body can conform	Romans 8:29 Romans 12:2, Philippians 3:21	
συσχηματίζεσθε συμμορφος	(outward transformation), (inward conformation) The impress of a mould, likeness	1 Cor. 15:49	
εικόνας	The image of Christ, or likeness to Him	1 Cor. 15:49	the word involves the two ideas of representation and manifestation
ναός	A temple	1 Cor 3:16, 6:19	a shrine or sanctuary
σκηνοῦς	A tent	2 Cor. 5:1	a booth, tabernacle or habitation
οικητηριον ενδυσασθαι	Clothing, clothed upon	1 Cor. 15:53-54 2 Cor. 5:3	}
ενοικησω	Indwelling	2 Cor. 6:16	
κατοπτριζομενοι	Reflecting, as a mirror	2 Cor. 3:18	an abode (i.e. not just a building)
σπερματων	A seed, falling to the ground	1 Cor. 15: 37, 42-47	
σκευεσιν	Earthen vessels	2 Cor. 4:7-12, 15	a household chattel used for storage
σωμα	A body	1 Cor. 12:1-31	'the instrument of life'
ετίσκηνηση	A 'thorn', damaging the body and enabling God's glory to shine out from it	2 Cor. 12:7-10	lit. 'may dwell upon me'
οσμην	A censer, an odour	2 Cor. 2:14-17	'that which arises from what is instinct with life'
πλαξιν	Stone Tablets	2 Cor. 3:3	'anything flat or broad' to receive a message in writing

Now, why so many pictures; what do they teach? It seems to me that they teach us two fundamental lessons:

(1) We like to study *man* to discover what he is. We use scientific method, we use reason, we use philosophy. There is nothing wrong with that, to give a *human* description of man. But why keep with that alone, where scripture teaches us the *creator's* description of man? This is a transcendent view of man, one which man could never reach without aid or revelation from without himself. Man's highest nature is to be found in God, in what God makes of man as he relates to him. What matters about the tent or temple is who lives within, what matters about the jar or censer is what it contains; what matters about a mirror is the light or image which it reflects, and so on. So, although man's body is indeed of lesser import than man-in-relation-to-God, nevertheless it acquires the highest dignity and value in being that which God can and does indwell, or inhabit.

(2) Every one of the pictures used by Paul is that of a receiver, a receptacle, a carrier of something glorious. They might be termed 'cavitory' models. Just as one can discern the shape and nature of a motor car, even if it has never been seen, by studying the empty, hollow jigs in a motor factory, just as one can discern the character of a fossil from the hollow impress left by it in some shale, so one can discern the true being of man's body from the 'God shaped hole' within it. Man can be filled, and reaches his full entity only when filled by a good or by an evil spirit. Man's body is an agent, a vessel shaped for a master's use. These ideas were not used by Paul alone. The Old Testament view of man as 'the candle of the Lord' (Psalm 18:28, Prov. 20:27, Jer. 25:10) is carried through in Luke 8:16, 11:33-36 and Rev. 2:5.

Now the idea of a 'cavitory' model can be taken further, most clearly seen in 2 Cor. 3:18. Consider a hologram. It is a most remarkable image, for it bears a three-fold relationship to light; it is formed, indeed *informed*, by light; it reflects in unique ways the form of light which gave it birth; and in so reflecting it reveals the character of that light in a play of colours and shapes which identify that light uniquely. Now, is that not what man is seen to be in relation to God in scripture? The very words used are the same; read about holography and you will see how it depends on *information*, *conformation*, *transformation* and *reformation* by, or of, light. A poor hologram will even result in *deformation*. In scripture man is seen as transformed by God's light, informed by God's word, reflecting God's light to others, whilst displaying its nature without the deformation which results from unfor-

given sin. We are back to the 'image of God' in Genesis, defaced but not effaced in the fall, renewed in Christ. This is 'indwelling' by the Holy Spirit, this is 'receiving the kingdom like a little child'. So man's true and highest nature is to be a container, and diffuser of the divine, originated and remoulded by the divine. Hence we have all the 'pots and purpose' scriptures from Jeremiah 17, Isaiah 14, 19 and 23 to Romans 8 and 9, and the thought of 'holy' or 'hallowed', as a vessel set apart for holy use, for a master's use, in Romans 12:1, Ephesians 1:4 and many another scriptures. Note also the 'Christ-in-you' passages (1 Cor. 15:20-23, 45-49; Col. 1:27, 3:16; Gal. 4:19) and the pregnant phrase 'should be' or 'destined for' as used of man (e.g. 1 Pet. 1:15, 16; 2:5-9; 2 Pet. 3:11-12).

How then does all this help us in decisions about how to treat other people? The best that the world can offer, its highest ideal, is the 'Golden Rule'; we should treat others as we do ourselves. There is nothing wrong with that, it is a key scriptural principle; it is central to the ethics of the Old Testament, of Jesus, of the apostles. Anything *less* than that must be wrong! But, I would argue, man has an even higher destiny, a greater personal dignity than even the *comparative* Golden rule would suggest; for if someone despises his own body, as did the Greeks, he is unlikely to respect others more than himself. No, it seems from scripture that our duty is to treat every man, whether old or young, male or female, intelligent and athletic, or mindless and disabled, as a 'candle of the Lord', a potential hologram of Christ. Hence interventions made upon man, whether therapeutic or not, should only be such as are aimed to facilitate and conserve their highest function as a receptacle, or perhaps if you will forgive a word from botany, a conceptacle, of the divine. If further evidence is needed, consider only how Jesus saw in the most degraded, ignorant or misled people, that which they could be by Grace and treated them with an appropriate dignity. This has always been the stamp of Christian mission and action in the world; it is an essential part of love to others.

Theodore R. Goller, Jr.

The Use of Computers in Bible Translation

Computers continue to be more apparent than ever before. They can be seen in shop windows in the High Street and *The Times* contains listings of computer-shows being held in various cities in the U.K. The putative audience ranges from parents of pre-teen children to corporation presidents. Claims seem to indicate that purchasing the right computer will solve many, many problems forever. To some degree, that is true and has been true for over twenty years. During this twenty-year period, computers have been introduced as labour-saving devices in Wycliffe Bible Translators and the Summer Institute of Linguistics.

In general, translation consists of several steps. These include: (1) understanding the source information; (2) analysing and learning the receptor language; (3) putting the source information into the receptor language (first draft); (4) polishing the new document (revising); then (5) publishing it. Computer technology has been applied to Bible translation in reverse order: step five was addressed first, then four, then three. Steps one and two are now under consideration and implementation.

In the late 1940s, Kenneth and Evelyn Pike completed translating the New Testament into a Mixteco language spoken in Mexico. They took their manuscript to a typesetting and printing firm. Because the language was foreign to the person typesetting the text, typographical errors were made. The Pikes proofread and marked the appropriate corrections. However, when the lines containing the errors were re-set, new errors were sometimes made. When the process was finally completed and the book printed, a new prayer request was also discovered for people who were working with newly-written languages: typesetting should not depend on the reading and typing skills of any human.

In the mid 1960s, digital computers were being used in business and scientific applications. By the end of the decade even Wycliffe Bible Translators were using them to process receipts, write cheques, print mailing labels, and prepare finan-

cial reports. Missionaries who had technical skills began to investigate ways to handle huge texts, like New Testaments, using computers, so that the problems that the Pikes and others had encountered might not recur. They also reasoned that the text could be stored by a computer and then recalled as often as necessary, relieving the tedious and time-consuming business of typing and retyping.

By the early 1970s, a computer-assisted text-editing and typesetting system, named IOTA, was in operation for translators in Mexico. When the text was typed, it was being recorded on paper tape (as an interim medium) rather than going directly on to sheets of paper. Then the text that had been recorded on the tape would be printed out using a line printer and the printout given to the translator. Often, he received it in duplicate. He could proof, mark corrections, and return it to the people who operated the large main-frame computer. Someone would make the required corrections without changing the parts of the tape that were correct and the translator would receive a new printout to proof. After the text was deemed correct, a tape of the most recent text would be read by the phototypesetting machine to obtain photo-ready copy which would be used in the printing process. Now, the final book would contain the same text that the translator had approved.

In the mid 1970s, smaller computers came on the market. Translators wanted to use this new technology, but they did not want to be tied to a non-portable, main-frame computer. Walter Agee was asked to find or develop a computerised text-editing and typesetting system using one of these smaller computers. He finally found a company, NewCaxton in Pennsylvania, using Datapoint 2200 computers to typeset something: horse racing forms! After negotiating with this company, Wycliffe Bible Translators were given permission to use the text editor and two printing programs, and NewCaxton would typeset the material on their VIP phototypesetter. People in 'Wycliffe' named this the SPEED system. It permitted capturing the text on magnetic tapes (cassette), correcting it, and typesetting it. By 1976, a simple, consistent, changes program was added and by 1977, a program that read through the text, verifying that all the chapters and verses were present (or where there were problems) was developed. A short time later the consistent-change program's power was increased to allow massive re-spelling to be done quickly and easily. By 1979, a program which listed all the words with their references and two more

text editors had been added; the original editor, verse checker, and consistent-change programs improved, and the printout programs speeded up.

At last, a computer could be used from the rough draft stage to typesetting. The task of typing the original draft and making corrections to that text could be done by people of average typing skill after a short training period. However, specially trained people were needed to devise the complex change tables used (a) to change the shorthand marker for each different element of text into the appropriate typesetting commands and (b) to change the spelling of words and wording of phrases. For example, the translator of the Igede New Testament (Nigeria) made a list of 209 different words and phrases that needed to be changed. When that list was 'read' by the consistent change program, it took less than four hours to apply them to the entire New Testament! It would have taken months just to find them all if the changing had been tried manually. It took another three and a half hours to make a printout of the entire New Testament for another proofing round! Note that the work was still divided between the translator, who was responsible for the text, and a typesetting expert, who was responsible for manipulating that text once it was ready for typesetting. Also, programs for language analysis had not yet been developed for general use.

In the late 1970s, several translators wanted to do linguistic analysis using a small computer, but the Datapoint 2200, with its 16k memory, mains power requirement, and cassette tapes was not deemed practical. At the same time, more companies were marketing small, more powerful, and almost portable computers. After deciding that no company was making a truly portable computer that could operate from a direct current source (a battery recharged by solar cells) *and* fit in a suitcase, 'Wycliffe' developed and field-tested a 'computer in a suitcase'. The computer grew, as more options were requested by translators, but the project was finally terminated for two reasons. 'Wycliffe' decided not to become a manufacturer, *and* the suitcase could no longer hold the computer!

However, that strong desire to change to a more powerful computer for text-processing continued to grow. The new one must allow the individual translator to obtain printouts without needing the services of a typesetting expert. It must also run the kinds of programs that non-specialists could use and understand. After much discussion, the Digital Equipment Corpora-

tion, VT103, was chosen. DEC's RT11 operating system was to be used and new special programs would be written for translators. Immediate reaction was favourable even though the VT103 was not really portable, required mains power, and used a very expensive storage medium. Soon it became apparent that the VT103 was not the final answer: portability was still an important issue, as were programs that were easy for non-computer people to use.

In 1983, Radio Shack marketed the TRS80-100, a truly portable computer. Previous small computers were being renamed 'transportable' in comparison. Then came the Sharp 5000, delighting the eyes of people in 'Wycliffe'. This new computer would fit in a briefcase and run on batteries! People within 'Wycliffe' began re-writing existing programs for it and writing new ones to solve problems faced by people doing linguistic analysis *and* translation work.

Simultaneously, people involved with preparing texts for typesetting had developed a typesetting system around the DEC 11/73. Previous programs developed for the Datapoint 2200 were rewritten for the DEC. New programs were developed to solve problems discovered over the years; problems that often caused lots of retypesetting. (Some of these were due to the different appearance of the text once it was set in type rather than output by a line printer.) This latest computer and these programs could reduce the processing time by fifty per cent.

Also by this time, Computer-Assisted Dialect Adaptation (CADA) had become a reality. CADA is not machine translation. It is a program which accepts as the input a text from a source language and generates that same text in a closely-related target language according to the linguistic rules supplied by someone who is familiar with both languages. It was not designed for translating German into Mandarin: it assumes the two languages are very closely related and have the same world view like Central Cakchiquel and Eastern Cakchiquel. For example, the Central Cakchiquel word *yech'obon* becomes *nqulnucun*. It does so because the following are defined:

- y*, the continuative, becomes *n*;
- e*, third person plural agent, becomes *qul*
- ch'ob*, THINK, becomes *nuc*
- on*, actor emphasised, becomes *un*.

Note that CADA does not provide a finished, polished translation; but it does supply a very good rough draft!

In 1985, computers are being used in 'Wycliffe' for business purposes, for text processing and typesetting, and dialect adaptation.

Linguistic analysis programs for field use are still being developed. This seems to be the next frontier. The translator (linguist) needs to be able to analyse the various non-scripture texts prior to beginning translation work. His goal is that the scriptures make sense in the culture for which he is translating.

Richard Skinner

The Creation of Meaning

Two years ago a couple of friends became parents for only five minutes: their baby died virtually at birth. It is the sort of occurrence which evokes the response, amongst many others, 'What is the point? Just what *is* the point of that?' It appears to be utterly meaningless. It is when something apparently so meaningless occurs that we are made aware just how important meaning and purpose are to us. Mankind is a meaning-seeking species. I wish to look at the search for meaning in the light of a particular view of mankind, the view which regards man as co-creator with God. To call man co-creator with God is not to suggest that he has the ability literally to create, say, matter or energy from nothing; that indeed appears to be God's prerogative. But man does have to respond to creativity, and in responding he actually participates in that creativity and completes it. The fullness of God's creativity remains unrealised until acknowledgement and response come from man.

This response can often be below the threshold of awareness. In fact, simply perceiving something requires a form of creativity, in that the brain has to take all the information from the senses and construct a coherent image for our subjective inner world which, we assume, corresponds to the objective outer world. The brain is not merely a passive recipient but an active organiser of sense data, and this ceaseless activity occurs automatically without our being conscious of it except in special circumstances such as being faced with an optical illusion. Then we become more aware of trying to create a coherent, stable image out of the visual information we are receiving. But normally the creativity of ordinary perception takes place unconsciously. And this is one level of responsive creativity which helps complete the original creativity of God.

But there is another, higher level of responsive creativity. This is the willed, conscious response to what is perceived or experienced, and it is vital for the completion of God's original and originating activity. The absence of a conscious response from man leaves God's creativity in a state of limbo, somehow more than merely latent, but not fully actualised. To try to make this obscurity marginally less obscure, an analogy is in order. Con-

sider the activity of a human-being who is generally regarded as creative—a poet. It is clear that his creativity is inseparably linked with communication. In the first instance, communication takes place between the poet and himself. This is inevitable, for as the act of writing proceeds (and in this I include all the pre-writing struggle and deliberation), understanding will develop in the poet of matters he did not previously realise he knew. This slowly developing understanding is integral to the act of creativity; what the poem does to the poet himself and how he responds, and how the response influences and shapes the still inchoate poem, constitute the creative act. The poet's response to his own creativity is part of that creativity. And what happens when someone else reads this poem, becoming involved in the communication? Further creativity results, since the reader cannot help but respond; even indifference is a response. And response implies creativity, since the reader must acknowledge the words, take them, and make sense from them. He cannot know whether the sense he makes is what the poet intended; in fact, he cannot even be sure that the poet intended there to be any sense at all. But whether he finds sense or no sense, the reader creates a response to the poem which is not mere passivity.

So what do we have? We have a sequence of poet-poem-reader-response. It is this sequence which must be considered the true unit of creativity, and the poet's original act of creativity remains incomplete in the absence of reader and response. Or, rather, once there is a reader and therefore a response, the unit of creativity can no longer be confined to poet-poem. Now that's all very well, but how does it apply to God and man as co-creators? What I am suggesting is that in the same way that poem-poet-reader-response should be considered the true unit of creativity with regard to a poem, so God-creation-man-response should be considered the true unit with regard to creation as a whole. Once there is a part of creation capable of conscious response, namely man (and, for all we know, other elements of creation too), then that conscious part of creation and its response enter into the creative unit. This does not take away the primacy of God's creativity, but it acknowledges that man creates anew in his response, and his re-creation is an integral part of God's creativity. Without man's response, creation is only latent; it is there, but not fully realised.

What consequences follow from the notion that man is co-creator with God? I think the most important is the realisation

that we are responsible for attributing meaning to what we see about us and what happens to us. That is to say, it is inappropriate to assume that meaning is inherent in some thing or some occurrence, and all we have to do is dig deep enough to find it. On the contrary, the only meaning we can ever know arises solely in our response to what is or what occurs. Our response is the meaning. It might be objected that God has invested meaning in things and events, and it *is* up to us to discover what that meaning is. It certainly may be that God intends to communicate some meaning in a given thing or event, but that does not remove from man the responsibility for creating the meaning himself. Like the reader of the poem who can never be sure that the meaning he attributes to it is that intended by the poet, man can never be sure that the meaning he attributes to a thing or event is that intended by God. He *has* to create his own meaning. Belief that that meaning corresponds to the meaning God intended is an act of faith, as indeed is the underlying presupposition that God intended there to be meaning in the first place.

So in summary, I am suggesting that to ask, 'What is the point; what is the meaning?' is to ask the wrong question. The secret of understanding is not to seek right answers, but seek right questions. And the right question is not, 'What is the point?' but, 'What point, what meaning, do I create and attribute to this thing or event?' Do not seek meaning in the thing or the event itself, but respond, and let the response be the meaning. Mankind is the creator of the meaning he seeks.

But that's not quite satisfactory, and the unsatisfactory nature of it lies not in the somewhat tortuous logic, but in the fact that emotionally or spiritually or existentially it doesn't quite ring true; almost, but not quite. For a start, I am uncomfortable with the notion that I create the meaning of things and events which I experience. However much I may argue along those lines, I nevertheless go around with the feeling that there is a meaning, however dimly I might apprehend it, which is God-given and independent of me. And if there weren't that meaning, or if that meaning were unattainable, then no matter how hard I might work at creating my own meaning, it would be tainted with futility, a nasty suspicion of living in an illusion. Perhaps I'm saying that I don't really fancy taking the risk of accepting full responsibility for my life and the meaning it may or may not possess, and would prefer to have it all sorted out for me.

The other unsatisfactory aspect of the ideas expressed above is this: it's all very well claiming that meaning is what you attri-

bute to events, but what happens in the actual, concrete situation of being faced with someone in grave distress? To someone going through an experience of gratuitous nastiness, do you say, 'Never mind, old son. There is no meaning to what is happening until you yourself create that meaning.'? Were someone to try that on me, my response would be a very blunt one. No, obviously one wouldn't be so crass—I trust. But should one, dare one, even *think* that that person has to create his own meaning to account for or somehow redeem the nastiness happening to him? Of course, when we come across someone who says of a nasty occurrence, 'well, I reckon it wasn't all bad, because such-and-such came out of it,' then we can rightly respond, 'Good for you, glad to hear that something constructive emerged.' But that 'something constructive' cannot be the ultimate meaning of the event; a spin-off, a bonus maybe, but not the meaning. The technology which led to space probes had, as a spin-off, non-stick frying pans, but one would have to be an idiot to claim that non-stick frying-pans were the true meaning of space probes. So I can accept that meaning attributed to a nasty event by the person involved is indeed a bonus, but I cannot bring myself to impose on other people's experiences the view that meaning is ultimately determined by their response. It denies the reality of the suffering and it denies the *experienced* fact of meaninglessness as something destructive. From the Christian viewpoint, it looks suspiciously as though it denies the possibility of God breaking through into the individual's personal history—the possibility of the source of meaning confronting the individual in the midst of meaninglessness.

In conclusion, then, a part of me argues that meaning is not inherent in a thing or event, but is bestowed by the individual, whilst another part of me says, 'Yes, well, but that's not quite how I experience it, at least, not all the time.' There is a perpetual tension between the role of God and the role of man in the working-out of existence.

David Pusey

Creation as frame-by-frame projection from the mind of God

The theme of this essay is the activity of God—or more accurately part of the activity of God. Although creation is the *first* reported activity of God, it is possible to claim that it is both the continuous and the essential activity of God.

Were we to be asked, 'In what activity is God reported to engage more often than any other?', most of us would guess at speech. 'And God said' or 'Thus says the Lord' or some equivalent words are surely the most repeated phrases in the Bible. Texts could be taken from thousands of places: Young's *Analytical Concordance* lists over 7,000 references to one phrase alone—'The Lord God said'. Those with the necessary combination of Hebrew and patience can search in this context for subtleties among the several words translated as 'God' or 'Lord God', but here it is assumed that the only God, our Saviour through Jesus Christ our Lord, is referred to by all the separate designations. It becomes clear then that the Lord our God is supremely a Being who communicates—One Who Speaks—and often it is through His speech that God acts.

The words from Genesis 1:3: 'And God said . . . and there was' emphasise this. We will consider then *not* the speech of God, but the creative activity of God. 'In the beginning God created the heaven and the earth' and creation is the continuous and essential activity of God.

Behind all the pictures we may have of God as Lawgiver or God as Saviour—and Israel knew God as Saviour before the Law was given at Sinai—behind all these pictures and supreme above them is God as Creator.

Our understanding of the relationship of God to His creation has implications for our faith. The right understanding here will help us to appropriate in faith, rather than waver in doubt or wallow in incredulity! For the scheme of things to exist as we know it, IT IS ESSENTIAL THAT GOD BE CREATOR CONTINUOUSLY. He is active so that the world and everything in it can endure. Our universe is held in being by God, sustained not so much by the odd bit of tinkering here and there, as by moment

by moment creation. We are, *in general*, totally unaware of any discontinuity because, *in general*, the new creation is so contiguous with the old that no gap is perceived and an apparent consistency is revealed to us. We live at such a pace that the frame jump from one picture to the next is not noticeable—in general. The analogy of the cine film is a useful one, and to exploit it further we can conceive of the universe as projected from the mind of God frame by frame: not a pushing along of something set in motion at the beginning, so much as a continual making new of the scene in each frame.

The rational universe in which the scientists presume that we live is so, only for as long as God continues to act rationally, maintaining the apparently unbroken sequence of events.

This view of the connection between Creator and creation derives in part from reflection on the divine name. Certainly as disclosed to Moses the 'I am who I am' has about it an aura of independency. God's continued existence does not depend on our thinking about Him, but our continued existence does depend on His thinking about us. It is in this sense that sparrows, sold two for a penny and five for tuppence, do not fall to the ground without the Father's will, nor is one of them forgotten before God.

As the Psalmist reminds us, 'It is He that hath made us and not we ourselves'. In this connection the prayer of Sir Jacob Astley before the battle of Edgehill in 1642 becomes pregnant with new meaning: 'O Lord, Thou knowest how busy I must be this day; if I forget Thee, do not Thou forget me'.

Now the suggestion that the mind of God was active in creation is not new. The 'Logos' of John's Prologue has long been interpreted by some as the mind of God. But the idea of a moment by moment recreative projection is somewhat novel. It has obvious affinities with the illustration of the television screen under the control of an electronic wizard whose skill and artistry allow him to present a series of pictures of anything he chooses—of, for example, a cricket match. Prof. Donald MacKay, who originated the illustration, reminds us in *The Clockwork Image* that those who watch the sequence of pictures will be able to deduce the laws of cricket, and perhaps even the laws of mechanics in so far as analysis of the ball's flight pattern allows it, BUT ONLY SO LONG AS THE CREATOR OF THE SCENES MAINTAINS THE ORDERLY PATTERN.¹

1. D. M. MacKay, *The Clockwork Image*, IVP, 1974.

Two things follow: the analysis will not reveal the electronic artist, only the rational nature of the world he creates. Also the scientific analysis of the scenario, whether on Prof. MacKay's TV or my projected film, does not lose its value when it is recognised that it is held in being by an external agent. We should note that there is no need for gaps in the scientific account (as a place where the artist has his role); however complete the scientific understanding of the sequence of pictures it is their very existence which demands an explanation. And that explanation is beyond the power of science to give, for science has its self-imposed limitations, as its analysis of art or music or drama reveals.

We move on now to begin an exploration of the consequences of God's continuously creating the world as we know it—although this really reflects another of the approach roads to this thesis.

Insistence on continuity has been carefully qualified by the use of 'generally'. For in this model of the relationship of God and His creation—and it is no more than a very useful model—there is obviously scope for Miracle and, along with miracle, for Prayer. Much of our intercessory praying is a demand for the miraculous or at the very least for the extraordinary: although, as Fosdick points out, our Heavenly Father exploits the laws the scientist finds in nature more often than He transcends them.²

Let us consider first miracles in persons: Paul says, 'If any man be in Christ, he is a new creation'. Many will testify to this transforming experience. By way of example, a one-time practising homosexual said, 'When I admitted to my companions that I had received Christ into my life I was filled with a sudden, surprising awareness that He was real, and was in me, and that I was now a completely new person.' Only those who have struggled to 'heal themselves' can really know the release which recreation by God can bring. We turned to Him, and He said, 'let there be a new creation' and there was!

But miracles are not only in persons. Most of us are familiar with the tricks of photography, and even when we know how it is done we still enjoy the illusion. The heavenly Producer/Director is able, between the creation in one frame and the recreation in the next, to change water into wine at a wedding or water into blood in a river. He can also add to the matter in the universe from one frame to the next to provide manna in the

2. H. E. Fosdick, *The Meaning of Prayer*, Fontana, 1960, p.127.

wilderness or to multiply loaves and fishes. We may not add one cubit to our stature by taking thought, but God can add to His creation merely by thinking about it.

For some, the ascension with its de-materialisation of the body of Jesus poses problems. But the disappearance between one frame and the next of the body of the ascended Lord need not require the release of energy equivalent to 70 or 80 kg of matter. With God continuously creating, the option lies with Him to add to or subtract from the matter He is mentally handling, and our laws of conservation are principles for human guidance not for divine obedience.

Having said this, we should remember, as C. S. Lewis has pointed out, that nature is extremely adept at accommodating miracles. Miraculous food is digested in the usual way and sustains the body as effectively as ordinary food. A miraculous conception leads to a usual nine-months pregnancy, and the Holy Child is born in the usual way to grow from the vulnerability of babyhood to be a man among men, tempted in all points like we are, at every stage of the way. The marvel is not that God is born of a virgin, but that God is born at all!³

It is said that Alfred Hitchcock appeared in every film he made—coming from behind the projector as it were to be on the screen. God is no less able. There is immense intellectual satisfaction in God's chosen way to combine in one person the fully divine and fully human natures, conceived of the Holy Ghost and born of the virgin Mary—the fusion of human and divine.

Mention of C. S. Lewis reminds me that this filmstrip model may owe something to one of his *Letters to Malcolm*. There he describes the assault with a chisel on a house that is part of a stage set. The attacker discovers it is not a real house, but it remains a real stage set. No chips of stone, but holed canvas and windy darkness. To learn that our universe is made up of fundamental particles described by mathematical equations is analogous. We find reality to be other than we had supposed. Our shock can be no less if our environment and indeed ourselves are in reality the equivalent of projections on a screen.⁴

But what is real? Ultimately only God is real. And God said, 'Let there be . . . and there was'. And God continues to say, 'Let there be', and there is! Moreover the instant He no longer says, 'Let there be a consciousness called by our name', we shall

3. C. S. Lewis, *Miracles*, Fontana, 1960, p.63

4. C. S. Lewis, *Letters to Malcolm*, Fontana, 1966, p.82f.

cease to exist. Such a time may never come; the love He has shown to individuals supremely in Jesus, suggests that, for reasons not easy to understand, individuals matter to Him. He has made us for Himself, and our hearts can find no rest until they rest in Him.

For others who deny that He is real, He may one day out of kindness, no longer say, 'Let them be,' and they will then cease to exist.

This model has to overcome two problems. The first and more serious is a sharpened version of the traditional paradox of God's omniscience and our free will. If God's thoughts determine the content of the next frame, how can the individual exert any influence over it? The Christian claims that the Creator has allowed free will and that our choices are genuine, albeit conditioned in part by previous experiences and our own or other people's choices. Once we have made a choice the consequences work out in accordance with the divine logic. In the normal way of things, they follow scientific laws by which God orders His creation. But how can a choice be made in the first place?

The outworkings possible from a given set of circumstances may appear to be many, but analysis can break down the complexity into a branching and interlocking sequence which involves a series of selections between two options (the initial choice limiting or making possible subsequent ones). At some levels we are conscious of this: e.g. if I choose not to submit this manuscript, the editor cannot choose whether to publish it or not.

In that the Christian conceives of God as active in His creation, especially in Man through His Holy Spirit, there is feedback from the first frame which can influence the content of the second. Also the actual choice may be made over a series of frames, and the incipient and growing decision is all that need be built in. What does seem clear is that we cannot unmake a choice and its consequences.

The second problem is the enigma of innocent suffering and the mystery of evil. It may be asked why, in the process of creating a new frame, the Creator cannot omit these. In a sense He could, but were He to do so it would involve the end of the scheme of things as we know it. The end of the age would arrive. For the Creator has committed Himself to a programme which in many ways limits the options open to Him. He may not, without frustrating His own objectives, override the freedom—the true

freedom—to be independent that He has given man. We can deny Him, but though we deny Him, He will not deny us (for the moment). So He has held the travailing creation in being until now, and will do so until He ceases to say, 'let there be'.

Meanwhile for those of us who know Him: It is the God who says, 'Let light shine out of darkness', Who has shone in our hearts to give the light of the knowledge of the glory of God in the face of Christ (2 Cor. 4:6). In knowing Christ we know God the Creator. For creation is His continuing and, for us, necessary activity. God said, 'Let there be . . . and there was'; He yet says, 'Let there be' . . . and there is!

Proposal—that the earth was created much more than 6000 years ago

This was the title of a debate sponsored by the Creation Science Movement which took place in Westminster Chapel, London, on November 24, 1984. The motion was proposed by Dr Alan Hayward, a Research Physicist, and opposed by Malcolm Bowden, a Chartered Consulting Engineer. Both protagonists have written books concerning the relation between science and religion, and both oppose the evolutionary hypothesis of the origin of life. They differ, however, on the age of the universe. The meeting was chaired by Dr. David Rosevear.

The programme of this particular debate was very carefully circumscribed, each speaker being allowed 40 minutes to state his case, and then after a refreshment break, each was allowed 20 minutes to reply to the other, 10 minutes of questions from the 'floor' and a 10 minute summary from each. These times were adhered to, which was of benefit to the audience, the size of which indicated the interest in the topic. On a show of hands, 'old-earthers' outnumbered the 'young-earthers' by two to one. The chairman briefly outlined the history of the Creation Science Movement, which started life as the Evolution Protest Society in 1940, but adopted the present title in 1960 to be more in line with American movements.

This report of the debate is set out in note form for brevity and, it is hoped, clarity, and the author has taken no view of his own, but merely acted as reporter.

Alan Hayward offered evidence for an old earth, viz:—

- 1 the light by which we see distant stars was emitted many years ago, since it has been travelling distances of light-years to reach us.
- 2 all short-lived radioactive isotopes have decayed over the years, and we are left with long-lived (natural) isotopes.
- 3 sandstone, shale and limestone formations are more than one mile thick, suggesting very long deposition times.
- 4 deposits carried down by rivers near the ocean, and forming the continental shelf, are very thick near the interface between river and ocean, and fall off in thickness farther out. This suggests a long period of deposition; deposition from a *flood* would give greater depth under the ocean than near the coast.

- 5 certain strata found in the U.S.A. show 30,000 alternating layers of clay and sand, which would require alternating periods of quiet and turbulence, and would not be so organised as a result of flood deposition.
- 6 similarly, the formation of varves is the result of alternation of summer and winter, and as many as 100,000 can be observed.
- 7 the very large fossil deposition on the earth which, spread out, would be a matter of feet in thickness, could not have resulted from a short flood.
- 8 the formation of coral reefs suggests a period of hundreds of thousands of years, since each diatom contains only a minute amount of chalk.
- 9 the arrangement of fossils within the strata is invariably in the order below, the youngest being at the top. Rarely is this order upset.

Quaternary	— man
Tertiary	— large mammals
Cretaceous	— end of dinosaurs
Jurassic	— diatoms
Triassic	— dinosaurs—shark's teeth
Carboniferous	— insects
Devonian	— amphibians
Silurian	— land animals
Ordovician	— land plants
Cambrian	— invertebrates
- 10 the igneous intrusions, found in sedimentary rocks, take a long time to cool
- 11 forests, e.g. in Yellowstone, can be seen to have resulted from 44 superimposed forests. This indicates a very long time, and could not be the result of alternating flood and volcano (as suggested by Morris and Whitcomb).

Malcolm Bowden asked the question—'how do we approach the evidence?' We must not start with pre-conceptions. He offered the following evidence for a young earth.

- 1 from the known break-up rate of comets, these should have disappeared from the solar system in 10,000 years, whereas they are still evident.
- 2 Saturn's rings are still young, because their orbit is elliptical, not circular.
- 3 our sun is shrinking in size at a rate of 0.1% per century. Even

- 6,000 years ago it would have been the size of the earth's orbit round it.
- 4 from the rate of deposition of meteoric dust, this should be many feet thick, e.g. on the moon, whereas it is only a few inches in depth, suggesting thousands, rather than millions, of years.
 - 5 the earth's rotation is slowing down, due to tidal drag. Extrapolating back a few million years would lead to an impossibly-rapid rate of rotation.
 - 6 a similar extrapolation of the decay-rate of the earth's magnetic field would also lead to an impossibly-large value.
 - 7 the tilt of the earth's axis has been known and used for a very long time for time-keeping. There is a periodicity about this tilt which is cyclic, but upon extrapolating backwards, a sudden decrease is observed, asymptotic at about 2,300 B.C. This could have been the time of the flood, and have resulted from the impact of a meteorite in, say, the Pacific Ocean.
 - 8 the speed of light is decreasing. Again, back extrapolation from the data of the last few hundred years, and following a $(\text{cosec})^2$ curve, results in an asymptote. At about 4000 B.C., the value of the velocity is very large—of the order of 10^{10} times the present value, and this would imply that all radioactive decay calculations would be suspect. (Decay would be *much* faster then, than now).
 - 9 with regard to the fossil data, a proposed hydrothermal model involving 'super-critical' water, would lead to solution and deposition of minerals different from presently-measured rates. The earth may have started cool, and whirl-pool effects could have given rise to many observed phenomena.
 - 10 fossil shells are very often found closed. The process of opening the shell and the decay of the contents is a lengthy one. Closed shells are evidence for inundation (i.e. flood).
 - 11 the deposition in coral reefs can be explained by tidal oscillation.

Alan Hayward's reply:—

Countless scientists have produced the evidence which geology, astronomy, physics, etc., bear witness to. The 'short-earth' scientists pick out special cases, and are often amateurs. The extrapolations described above are very hazardous, from scant data obtained in the last few years. The years around 2,300

B.C. are unlikely to have produced a catastrophic event, since none of the old records (e.g. Egyptian) mention it. Cosmic dust deposition data are now much more accurate than they once were (about 1 cm in 1 billion years). 'Super-critical' water is in no way extraordinary with regard to dissolution of minerals.

Malcolm Bowden's reply:—

Fossils are in fact found out of order, and man can be shown to have lived in the cretaceous age. Evidence to this effect cannot be disseminated because libraries and the media will not give it a hearing. More evidence about 'miocene man' has yet to be revealed. There are more data to be published on the velocity of light proposition, and the evidence from the cosmic dust is firm. It is by hind-sight that the 'old-earthers' now claim a lower rate than once they did!

With regard to the coral reef build-up, this is mostly limestone. Is there enough evidence that diatoms are responsible? We cannot simply divide the height of the reef by the rate of deposition.

Mr. Bowden concluded by re-iterating his opening remarks, that most scientists eliminate the facts that do not fit within the usual geological framework. The 'young-earth' researchers, on the contrary, approach data with an open mind, and look for facts that don't 'fit'.

The questions from the floor, and the answers, confirmed the views of the two protagonists, and there was no evidence that anyone present had changed their views as a result of the debate. In concluding remarks, Dr. Hayward regretted that Christians were divided on this issue. They should be uniting to attack evolutionists. Mr Bowden claimed that the age of the earth was an important issue, because a 'young earth' would not give evolutionists the periods of time they required for developments to occur.

A. B. ROBINS

NOTE: A similar discussion to the above was reported in *Nature* 1984, 311, 703, this being a review of a meeting between the Association for the Protection of Evolution, and the Biblical Creation Society, held from 23-26 July, 1984.

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G. Lloyd Carr, *The Song of Solomon*, 1984, Tyndale Commentary, IVP. 175pp. £4.75 hardback. £3.95 paperback

Dr. Carr, who is Professor of Biblical and Theological Studies at Gordon College, Massachusetts, is exceptionally well-equipped to handle this biblical book, with its rich vocabulary and its subtle relationship with the love-poetry of Israel's neighbours. His introduction gives a useful survey of the chief varieties of the Song's interpretation, discussing very fairly the pro's and con's of allegory, typology, drama, cult, and, in his words, 'the natural or literal interpretation'. The last of these is his choice. He sees the book as a celebration of sexual love, pure and unalloyed, as the Creator's gift to us, needing no makeweight of hidden meanings to justify the presence of such poetry in the Canon.

The pivotal passage, he argues, is the consummation of the marriage, described allusively in the two verses 4:16-5:1, to which the courtship of the early chapters has led up, and from which the relationship develops with emotional ups and downs and growing intimacy. This analysis yields a coherent and, to me, convincing overall pattern, which the commentator maps out with evocative headings to his five sections and to the smaller units within them.

Less happy, in my view, is his relentless search for erotic *double-entendres*, for which he draws freely on pagan literature and sometimes on the subtleties of etymology [see, for example, the series of steps through etymology and Akkadian usage by which the line 'his banner over me was love' (2:4) becomes 'his wish regarding me was love-making' (p.91)]. Scarcely a flower or a place or an act is seen as simply its apparent self, and the exquisite nature-poetry tends to be reduced to an elaborate cryptogram for sexual anatomy and love-play. Again, the argument against a typological interpretation descends at one important point to special pleading, where it plays down the relevance of Psalm 45 to the Song by detaching the messianic motif of that psalm from its royal marriage motif (p.29). This is done by insisting that the 'queen' in Ps. 45:9 is a mere paramour (despite the Hebrew of Neh. 2:6), and that the king's 'desire' for her beauty (11) is merely lust (despite the innocent use of this word as 'longing' in, e.g., Deut. 12:20; 2 Sam. 23:15). On this basis the psalm is allowed no vision of the church as the bride of Christ, and therefore no significance for the interpretation of the Song of Solomon.

A curious lapse, for correction at reprinting, is the persistent mis-spelling of the Hebrew root for 'to love', throughout the special study of it on pp.61-63. Did Homer nod, or only his proof-reader?

Despite these few criticisms (and on no book of the Bible is there less unanimity than on this one!) it must be said emphatically that this commentary is a mine of information and of penetrating discussion, not only of virtually every word and construction in the book, but, most helpfully, of the progress of its theme from start to finish. I salute the author's scholarship from far below, and think it no exaggeration to regard his commentary as indispensable to any serious study of this unique part of Scripture.

DEREK KIDNER

D. Guthrie, *Exploring God's Word*, Hodder and Stoughton, 1984. 222pp. Paperback. £1.95

The author of this Bible guide has packed comments on Ephesians, Philippians, and Colossians into one volume, and does not intend that these notes be a comprehensive exposition of Paul's letters. Rather, the aim has been to provide a collection of brief outlines. Sometimes only a few verses are grouped, at other times, as many as ten. For example, Ephesians 2:11-12 forms one unit, 'Reconciliation by means of a Cross'. This is broken into three, the problem of separation, the astonishing bridge, and the remarkable results. Each of these is further subdivided, in the first case into six, with a sentence or two of comment on each. The main sub-divisions are indexed for easy reference, and thus the volume can be used very effectively for individual Bible study, or group study. It would also provide an excellent framework for preachers. Each epistle has a brief introduction setting forth the background of the time and circumstances when it was written.

A. B. ROBINS

P. C. Craigie, *The Twelve Prophets, Volume 1*, St. Andrew Press, 1984. 237pp. Paperback. £2.95

This volume, and the three following, continue the series of com-

mentaries under the title 'The Daily Study Bible', to which reference has already been made (*Faith and Thought*, 1983, 110, pp.223, 254). The first volume of the minor prophets contains Hosea, Joel, Amos, Obadiah and Jonah. The text, given in full, is that of the Revised Standard Version. The commentary underlines the often-forgotten fact that the prophets were a disparate group of men who came from different backgrounds, whose ministry was different, but who shared one characteristic—obedience to the divine call, whatever the cost in popularity or misunderstanding. The author reminds modern readers that we should not too readily read passages such as Joel 2 with Christian eyes, but try and grasp the contemporary meaning first; we might then also take the warnings to heart. This is particularly true of the book of Amos, which has many modern parallels, e.g. social injustice. The book of Jonah provides some difficulty in interpretation, and this author regards the story as a parable, although he acknowledges that an historical interpretation is possible. He regards Jonah, in fact, as an allegory of Israel, and maybe of each modern Christian.

Whether or not one accepts the 'liberal' interpretation, typified by the comments on Jonah, the commentaries in this series are eminently readable for the ordinary Christian. The bibliography with this volume covers a wide field of interpretation (from IVP to SCM).

A. B. ROBINS

J. F. A. Sawyer, *Isaiah Volume 1*, St. Andrew Press, 1984. 267pp. Paperback. £3.50

This commentary covers the first 28 chapters of the book of Isaiah. It is made plain from the start that the author considers Isaiah to be multi-authored, some of it written before the Exile, some a century later. 'I have been concerned . . . not so much with whether Isaiah is historically accurate, as with what he is getting at.' The text is well cross-referenced throughout, without losing readability. References are made to most of the biblical books, and the Qumran texts are also referred to. The historical setting in which Isaiah spoke features largely, but such is the literary style, one does not feel submerged under historical facts. With regard to interpretation, the passage in Isaiah 7:10-17, regarding Immanuel, is a useful reference point. The 'child prophecy' is variously interpreted as Hezekiah, Isaiah's

own son, and as Christ himself. Although the 'young woman' is not necessarily a virgin, this translation is not excluded. Later Greek translators used the word for virgin, and the gospel followed this tradition. Although the original passage may have been a 'doom' prophecy, '... it would be a retrograde step to cut through all the many splendours of later tradition ... a betrayal of the spirit of the texts as we now have them'. The bibliography is selective, but very up-to-date.

A. B. ROBINS

J. G. McConville *Chronicles*, St. Andrew Press, 1984. 270pp. Paperback. £3.50

The book of *Chronicles* is often under-rated in O.T. study. This reviewer remembers a lay-training course on the O.T. in which the books of *Chronicles* were completely passed over due to pressure of time. The author of this commentary has done a service by writing a very readable commentary, which admirably fulfills the aim of the Daily Bible Study series, i.e., to make the O.T. relevant today. The author dates *Chronicles* as post-exilic, and stresses that it is not to be seen primarily as an historic book, but more an interpretation of history. For this reason, Solomon's and David's reigns occupy a disproportionate amount of space in the *Chronicles*—these men are examples for successors to imitate.

This commentary will give readers an urge to re-read these 'less interesting' books of the O.T. The author picks out 2 *Chronicles* 7:14 as issuing an urgent message for all God's people at all times. The work is very extensively cross-referenced to other texts of scripture.

A. B. ROBINS

A. G. Auld, *Joshua, Judges and Ruth*, St. Andrew Press, 1984. 280pp. Paperback. £3.50

The author considers that a knowledge of the difference between Hebrew and Christian Bibles is necessary to an understanding of the meaning of these three books. *Joshua* and *Judges* are included in Hebrew tradition as 'prophecy', i.e. not so much about events past as applications of the Torah to everyday life. *Ruth*, on the other hand, is a synagogue reading suitable for

harvest. The author takes the view of Noth, that later writers (Deuteronomists) unified all the books from Deuteronomy to Kings, and that there was no earlier draft of these books. Thus, although Joshua and Judges are about past events, it is a distant past by the time of writing. 'Memory of the past they may be—but historical record, hardly'. This interpretation is exemplified in the incident of the battle of Jericho. '—it is highly improbable that Jericho was an inhabited city when Israel entered the land. Chapter 6 tells us more about what later generations believed, than about what in fact happened'.

Ruth is a short story, told concisely and delightfully, revealing much about local custom. The author suggests that 'Ruth' argues for a more open policy towards mixed marriages than do some of the prophets. It is important to reflect that Ruth was a close ancestor of David, and thus also of Jesus.

A. B. ROBINS

Richard J. Mouw, *When The Kings Come Marching In*, Eerdmans/Paternoster, 1983. 77pp. Paperback. £3.95

Evangelical Christians have consistently been embarrassed by the arts and culture generally, and have found difficulty in incorporating human artistic and political achievements into their theology. In this fascinating study, centred on an exposition of the vision of the New Jerusalem in Isaiah 60, Professor Mouw seeks to contribute to the ongoing discussion of the relationship between Christianity and culture.

Taking culture to include the broad pattern of social life (political, economic, educational and artistic) he argues that God is the Lord of culture, and will incorporate man's cultural achievements in the future heavenly city. He stands firmly in the evangelical tradition in taking the teaching about heaven seriously and literally. Four main features of the Holy City are singled out—'the Ships of Tarshish', 'the Kings of the earth' who march in, the people of many nations who are drawn to it, and the light that pervades it.

There is an apparent discrepancy between God's destruction of pagan artifacts in Isaiah 2 and their use as instruments in God's service in chapter 60. Mouw sees the latter as God's transformation of man's cultural achievements to serve his end. Man was placed on earth to introduce a cultural 'filling' and the Holy City comprises Eden and the 'filling'. What God is against

is the 'proud and lofty', that is racist pride, nationalism and the misuse of culture.

The Kings who come into the city are not just the 'saved' Kings but also corrupt Kings who must stand trial. He has a vision of political dictators being led into God's presence by the persecuted, not simply as an example of revenge but as an example of God's glory and justice. 'Cruel tyrants will hear the testimonies of those whom they have martyred. White racist politicians will wither under the gazes of black children'.

Drawing on his encounters with Christian leaders who support apartheid he seeks to show how both Isaiah and John in the Revelation see God's ultimate breaking down of barriers dividing nations. The book ends with the vision of Jesus as the light of the City drawing the redeemed to Himself. It is a book full of interesting insights into the implications of God's redemption and our responsibility as Christians towards the world that both God and man have created.

R. S. LUHMAN

Ronald H. Nash, *The Concept of God*, Zondervan/Paternoster, 1983. 127pp. Paperback. £5.95

A couple of years ago the reviewer argued that in Christian theism the concept of God involved three issues—characterisation, consistency and identification, and sought to demonstrate the coherence of theism by investigating concepts like omnipotence, omniscience, timelessness, immutability and their relationship to human freedom.¹ Professor Nash has adopted a similar approach in this book and has sought to redefine traditional Thomistic theism, which he espouses, in the light of the challenge of Process Theology.

He summarises the various views that have been held historically and in recent years concerning the various attributes, and critically evaluates them. For instance, he shows that the medieval writers were correct in asserting that omnipotence was limited by logical restraints, in contrast to Descartes who maintained that it meant God could do literally everything. This, the author points out, would involve God being able consistently to promise one thing and do another. In assessing the various issues raised by divine omniscience Nash comes to the conclu-

1. R. S. Luhman, *The Evangelical Quarterly* 14 (1982) 88-104.

sion that the majority of the difficulties rest on a confusion. He writes, 'Without an argument to show that God's foreknowledge makes all future human acts necessary, there is no need to resort to any of the theories studied in this chapter'.

One of the most difficult chapters relates to omniscience and immutability, but here again the author finds no incompatibility because what the objections amount to is that God cannot describe states of affairs in 'first-person' terms when they refer to other persons, but can nevertheless still know them. While God is immutable in his real being the author follows Norris Clark in asserting that God can act and interact with his creation by being an active agent and not a passive recipient, thereby entailing no change in his intrinsic inner being.

Nash acknowledges that the concepts of timelessness and simplicity are more difficult. He dispenses with the latter by insisting that simplicity is not unique to God and adds nothing to our understanding of Him. He believes God's eternal existence is coherent even though he is not sure whether it should be classified as timeless or just of unending duration.

The attraction of this book is its brevity and comprehensiveness. It is written in a style that is understandable to the layman, unlike more philosophical treatises. I would wholeheartedly recommend it and only hope that more volumes could be produced like this on other aspects of the philosophy of religion.

R. S. LUHMAN

Sir Norman Anderson, *Christianity and World Religions*, IVP, 1984. 216pp. Paperback, £3.95.

The subtitle, *The Challenge of Pluralism*, is a reminder that pluralism is a challenge to all religions and none. Does the universal religious sense point to a living God? Do the many religions indicate differing ways to differently-conceived gods, or one God? Or, if one religion is truly revealed by God, what can we say of the others? This is honestly and well discussed by Sir Norman Anderson in this expanded version of his earlier *Christianity and Comparative Religion*.

A lengthy introduction outlines modern theological assessments of religious beliefs and experiences, and leads to a chapter on mythological, historical, and mystical approaches, over and against the original proclamation of the Christian faith. Next comes a chapter of theories of salvation, as against the

unique salvation through the Cross. Finally, the first part of the book ends with a chapter on God's disclosure of Himself in the Incarnation, as opposed to interpretations of God and His ways in world religions and philosophies. These four chapters are backed by excellent references to ancient and modern theologians.

Now the author comes to what thinking Christians are concerned about in a day when devout members of other religions are all around us, representing those to whom once we went around the world with a message to the lost. If Christianity is the one way to God, what of all the others? Is there any alternative way of salvation for some, or all, of them? Sir Norman refuses to narrow the issue, but equally does not find room in the Bible for universalism. It is true that Jesus said, 'No one comes to the Father but by me', and how few non-Christians believe that they have found Abba, Father?

The book points out that Israel experienced God and salvation without knowing Jesus Christ, even though not all Israelites were saved. Their sincere God-given ceremonies were a substitute. And what about babies who die as babies? How far can one take the concept of unconscious salvation through Christ? Anderson tentatively leans on the thought of mankind in God's image as a tree from which the lost have been broken off, rather than as a set of leaves who must be brought together to form a tree (pp. 166-7). Most religions may still hold some memories of God's original revelation (which has been kept pure in the Bible), although they also contain error. But also in these religions 'there is much that could best be described as human aspirations after the truth, rather than either divine revelation or Satanic deception.' (p.172).

The closing chapter sums up its content by the title, *Proclamation, Dialogue, or Both?* Both approaches are in Scripture, and Christians should use both today. Dialogue does not mean that we are searching for some fuller truth than the Bible contains, but we try to understand how and why the other believes as he does, so that we in turn may show what Jesus Christ means to us.

The reader knows that the book does not solve all his problems, but it gives thoughtful answers to them. In the end we may conclude that all who are saved will admit at the Judgment that, whether or not they knew it on earth, it is the Lord Jesus Christ who has saved them, since there is no salvation outside of Him.

J. STAFFORD WRIGHT

Nilo Geagea, *Mary of the Koran: a meeting point between Christianity and Islam*. Philosophical Library Inc. New York, 1984. 278pp. \$17.50

Dialogue is not always two-way. Today Christians involved in attempting to communicate in perceptive depth with people of other religious beliefs need to be aware of the multi-faceted nature of the task; that whilst at the one-to-one personal communication level this for a time might be relating primarily only two main systems of religious thought, in the background of both sides there are major differences which in turn in their own right need to be noticed and reckoned with. Christians working with Muslims therefore ought to be aware that since Vatican II some Roman Catholic theologians have been developing approaches and perspectives on other religions, Rahner's 'anonymous christian' being probably best-known in this regard.¹ This book continues in that tradition, and a case is made for the teachings of Roman Catholicism and Islam about Mary being an area where both can find mutual agreement.

The book itself is translated from the French and reads well despite numerous quotations, especially in the extensive footnotes which are usually left untranslated. This problem also afflicts the text in places, and no attempt has been made to revise the bibliography for English readers. The text is presented in three parts. (1) Detailed exegesis of the Koranic text. (2) A discussion of the content and a comparison with standard Roman Catholic dogma. (3) Conclusions.

The analysis begins with a brief discussion of the hermeneutic to be followed, a key word exposition of the Koranic text in its deduced Koranic settings. The traditions are, for the most part ignored, purposely. This however evades a major problem, namely, that Islam is not just the Koran but also includes the traditions up to the fourth century after Mohammed as *authoritative*. While there is some movement within Islam to return to and re-interpret the Koran most Muslims would regard this as forbidden. This then serves to highlight the problem within Roman Catholicism which influences the dialogue, namely that church traditions and dogmas are also in practice regarded as equally authoritative with the Bible. Thus there is no discussion within the book as to why the Koran is compared more with the Christian traditions and Apocrypha than with the Gospel narratives.

1. For a summary of Rahner's ideas see chapter one of Peter Cotterell's, *The Eleventh Commandment, church and mission today*, IVP, 1981.

Strict comparisons should be either between the Gospels and the Koran, or Gospels plus traditions with Koran plus traditions.

The second section discusses the content of the Maryan material in the Koran and is probably the best section of the book. A powerful case is put forward for seeing Mary as the model woman, as an example to be followed and a classical model of faith like Abraham. In a small divergence into popular Islam where some form of mediation between God and man by angels, martyrs, prophets and saints is believed, the author presents a strong argument for placing Mary in this list, arguments that could be taken up and used by Roman Catholics in their contact with Muslims. But while acknowledging that Protestants have not often given due weight to Mary's importance, the reviewer can see no scriptural evidence for worshipping her, and any attempt no matter how skilful to get Muslims to venerate her we must regard as a hindrance to effective dialogue that only serves to reinforce Muslim objections to Christianity. For instance Geagea writes, 'Why can't one cultivate a tender veneration toward her or nurture ostensibly some adequate form of homage or worship towards her?' (p. 163). Both Muslims and true Christians could unite in effective reply.

In the third section there is some discussion of the sources of Mohammed's ideas about Mary. Rightly in discussing these he points out divergences as well as agreements, and stresses that the links are not necessarily a 'script-from-script' dependence, but that oral sources possibly circulating at the time must be regarded as primary. But Geagea also puts up a straw-man idea and spends much time demolishing it, namely that the Koran was written by a Jew and contains nothing that is not exclusively and typically Jewish. Scholars in fact recognise at least four possible sources for Mohammed's ideas, Christian, Jewish, Zoroastrian and Arabian. There is also confused argument. Rightly Geagea points out that 'the outspoken antagonism by the Koran to Christianity did not aim at the Christian religion in its genuine and orthodox expressions because they were unknown as such to the Koran.' (p.233). Helpful, as a starting point for considering for instance the divinity of Christ.

But Geagea wants it both ways, for twenty pages later he asserts that the 'historic' elements relating to Mary in the Koran reflect sixth century Christian beliefs in the Arabian peninsula. 'They were Christian or Judeo-Christian items of faith, not always clear in technical formulas but *always orthodox*' (p.253, italics mine). Such a view would not be widely held outside

Roman Catholicism, and is actually a hindrance to effective dialogue for it is such a lack of orthodoxy that could have contributed to beliefs that the Trinity is God-Mary-Jesus, a belief widely held by Muslims even today. Given Geagea's opinion of the orthodoxy of beliefs at the time, despite evidence being to the contrary, it follows that Geagea can go on to deny, again as assertion without evidence, that the God-Mary-Jesus trinity came from a corrupt Christianity, and he sees it merely as an invention of Mohammed illustrating his high regard for her. There is very little discussion of this very important area. Instead Geagea is more interested in arguing for the veneration of Mary. And, though the book in general maintains an admirably gentle tone, he insults Muslims by referring to Islam as 'Mohammedanism' and the expression, 'all the divine religions' can only be inoffensive to the indifferent or to the pluralists. In the end the book fails in its apparent aim, to see in Roman Catholic dogmas points of mutual agreement, except insofar as veneration of Mary would be possibly acceptable to Islam at a popular level, which is as far from true Islam as veneration of Mary dogmas are from true biblical Christianity. And in failing, all Geagea is left with is wishful thinking, that the 'average Muslim nurtured for Mary a deep and honest cult of veneration'. (p.262). Such is not adequately argued, let alone proven, even given Roman Catholic premises.

R. LOERY

Kevin J. Sharpe, *From Science to an Adequate Mythology*, Interface Press, 1984. x + 145pp. Paperback. £6.45

Everyone with a Christian conscience must feel the need expressed by the author of this short work for a unified view that does justice both to scientific and religious truth without driving a wedge or a watertight compartment between the two. For some of us, the traditional biblical concept of a personal Creator who maintains in the pattern of natural events the coherence we discover and exploit in science and technology, serves more than adequately to unify our science with our religion under the category of obedient stewardship. Others, of whom Teilhard de Chardin was perhaps the chief exemplar in recent years, would like to present their religious view of the world as some kind of extrapolation of the world picture they derive from science. Dr. Sharpe, who is Chaplain of Auckland University, and 'active in

radical church politics', places himself explicitly in the tradition of Teilhard. He argues that what mankind needs is an 'adequate mythology', in a technical sense which he tries, not too successfully, to purge of pejorative associations. Neither science nor conservative Christianity, he maintains, can meet this need, though he would describe both as 'mythological'. Liberal Christianity he considers equally unsatisfactory. 'Liberal churches see the gospel as relevant in its correspondence with and answers to our questions, needs, and in some way, ideals. In its extreme this attitude makes the gospel a product only of ourselves, a way of reinforcing what we want to see as true, and the behaviour we feel is right. To avoid relativism, a compromise is needed between the gospel as traditionally understood, and modern secular understandings and ways of behaviour' (p.79). Dr. Sharpe's own contribution might fairly be described as eclectic rather than original. He objects to speaking of scientific and religious truths as 'complementary' on the grounds that in the case of *Genesis* the authors probably intended to answer 'how' questions as well as 'why' questions; but he accepts as one of the two main supports of his position the doctrine (which is surely part of conservative Christian doctrine if anything is) that 'God [is] that which causes all events, not only the initial creation of all things, but that which "makes" . . . each event to happen' (p.97).

His other main tenet, that 'the important things for life are not to be found in another world, and that claims for truth are to be assessed in what they say about this world' (p.97) is ambiguous. If meant epistemologically it is valid enough but hardly exciting. But if it is meant ontologically, it appears (as seems possible by his own acknowledgement) to owe more to the prejudices of Don Cupitt than to anything that rational argument can substantiate.

The book includes no fewer than 10 pages of bibliography, which might make it useful to students specialising in this rather turgid field. One can find valid and thought-provoking points even in its more speculative constructions; but for the anxious enquirer who is not enamoured of the passing fashion for 'mythology', I fear it has little of substance to offer.

D. M. MACKAY

Keith E. Yandell, *Christianity and Philosophy*, IVP, 1984. 289pp. Paperback. £7.50

I was pleased to be asked to review a book which seemed, at least by its title and the notes on the back sleeve, to be a serious examination of the link between Christianity and philosophy. Christian theology looks to philosophy for concepts which express truth, as much today as it did when the Early Fathers of the Catholic church used Platonic and Neo-Platonic concepts, to articulate the doctrines central to the Christian Revelation of God. After reading the book I felt somewhat cheated. In the final analysis I wondered if the title 'Christianity and Philosophy', was an accurate description of the content of the work. Certainly Yandell's work is a comprehensive study of the Philosophy underlying 'Theism'. He examines the great theistic themes and their accompanying moral systems. He considers the arch-enemy of Theism, 'the problem of evil'. However, he says nothing about the specific philosophical problems facing the Christian thinker today. These matters, i.e. the Trinity and the Two Natures of Christ, are the very heart of Christian thinking. They were forged using the tools of Platonic Philosophy and they are under attack from various aspects of current Philosophy. It could be argued that Christ's Divinity or non-Divinity is not the concern of a Theistic Philosopher. I would agree. However, if one is going to include 'Christianity' in the title of a Philosophical study, then these matters are of central concern. Arguments against Christ's Divinity are put forward in philosophical terminology. It follows that any defence offered must be forwarded in the same terminology. The Christian philosopher is not only concerned with whether or not Theism makes logical sense, but also with whether or not the idea of God as Trinity, One person of which takes on a human nature, can also be logically stated in the 20th century, as it was in the 4th century.

Giving credit where credit is due, one must say that Yandell's book is extremely comprehensive in the areas he did choose to examine. This made his work a stimulating companion to the other books I have read in the area of 'Philosophy of Religion'. I did however feel, that the clarity of his argument was often impeded by his sentence construction. I found myself reading some sentences over and over again to try to follow his thought. This is not good communication.

In short, I found the book difficult to read, mainly because of

the somewhat tortuous use of the English Language. It was also disappointing, in so far as it failed to help me in those areas of Philosophical Theology which I feel, as a thinking Christian, most need clarification.

MICHAEL W. ELFRED

Steve Bruce, *Firm in the Faith*, Gower Publishing Co. Ltd., Aldershot, 1984. 207pp. £14.50

If we Evangelicals, like Robbie Burns, have ever felt a hankering to 'see oorsels as ithers see us', then the requisite 'giftie' is presented to us in this book. Steve Bruce, by his own account an atheist whose sociological training has made him a 'fan' rather than a 'player' of the conservative Protestant game, has produced perhaps the most sure-footed and (according to his lights) fair-minded account of the evangelical scene to have appeared in print for a long time. He has had the humility to seek key facts from representative leaders of each group he examines, either in person or through their writings, and has made a valiant and largely successful effort to imagine how things looked from the inside of each position.

His main aim as a sociologist is to identify observable factors that might explain why some Protestant movements have survived and grown, when others have decayed. Although he has been based mainly in Northern Ireland, and gives what some might think undue attention to the motions of minnows in a small pool, his research also covers the Big Business of American TV religion, the evangelical religion of American Big Business, the phenomenal success of mass Crusades, and (of special interest to British academics) the differing fortunes of the SCM and IVF (now UCCF) in the world of student religion over the past half-century.

What is especially refreshing about Bruce's approach is his insistence on the explanatory value of people's *reasons* for doing what they did. 'If objective circumstances are going to be used to explain why people behaved as they did, then they must be viewed as circumstances which create problems for actors, which create new opportunities, and which perhaps set limits on what actors can and cannot achieve. That is, the role of the human consciousness must be preserved. It cannot be neglected in favour of a mechanical causal story' (p.18). Although he allows himself the half-truth that 'reality is socially constructed' (p.19) as a (surely unnecessary?) support for the claim that 'new

movements can acquire *legitimacy* simply by virtue of their popularity', the value of his work lies in its patient efforts to establish objectively what people actually thought and wanted at the key points in his stories.

Despite (or is it because of?) his professed detachment, Protestant liberalism does not emerge very creditably from Bruce's analysis. 'For a faith that was designed to appeal to modern man, liberalism is surprisingly bad at being intelligible without being vacuous' (p.81). 'The main plank of the liberal platform is relevance: translating the faith into terms appropriate to modern Western man in a rational and secular world. To have modern secular man display utter indifference to one's efforts undermines the certainty that one has got it right. Whereas either popularity or unpopularity can be seen as confirmation for the conservative, only popularity can do that for the liberal. The conservative is like the camel; ideologically equipped for extended periods of drought and able to sustain himself on his "old paths in perilous times" until he comes across the next oasis of revival' (p.92).

This concern for (short-term) 'relevance' Bruce diagnoses as a main factor in the notorious decline of the Student Christian Movement. 'One of the themes that run through all the policy discussions of the post-War SCM is "building bridges". If the students were not interested in Christianity but were into Marxism, then the SCM had to build a bridge to the Marxists by showing what a lot they really had in common. If Freudianism was this year's flavour, then the SCM had a conference on Christ and Freud. When many young people became attracted by the idea of communal living, lo and behold, the SCM discovered that there was really a strong communal streak in Christianity too and built their own commune . . . Whether this was ideologically sound is not my concern, but it can now be seen to have been organisational suicide. The bridges that were built to the secular world did not serve to bring new blood into SCM or the Christian Church. Instead, these bridges served as paths of defection for SCM members. Rather than Marxists becoming Christian, the Christians became Marxists. One year the whole Edinburgh branch left the SCM to become a cell of a Trotskyite party. One leading staff member left the SCM during its commune period to join a "real" commune. In competition with other groups and organisations built around a more specific set of beliefs, an organisation built upon a diffuse and general belief system must lose' (p.91).

Equally perceptive (and merciless) is Bruce's critique of the psychologistic debunking of Christian conversion, as exemplified by William Sargant's *Battle for the Mind*. 'Sargant's accounts of behaviour and responses at crusades have little in common with my observations of similar events in the period between 1978 and 1981 . . . What emotion there is, is not the result of preaching on the subject of hell; far from it, it is produced by the combined satisfaction of 7,000 people who all believe that they have some treasured prize that the rest of us lack. That is, the emotion is the result of a certain set of beliefs, and not the cause of them (although obviously such services, if constantly enjoyed by the participant, will act to *confirm* the beliefs that inform them). Further to confound the Sargant argument, one might point out that all this hopping and skipping occurs at the *start* of the service and is not preceded by any preaching. The sermon comes after the singing, and the atmosphere during this is invariably quiet, with the audience relaxed but attentive . . . [Sargant's] use of the revivals of Wesley and Edwards as examples of how high emotional tension could be created, is suspect. He gives little thought to the reliability of the reports of the work of these men, and rather too readily attributes motives to them when there is considerable disagreement about their motivation. Wesley is accused of having deliberately created tension in his audience by preaching on hell and damnation. This is a gross exaggeration; Wesley did not preach a great deal on hell. Edwards was short-sighted and he read his sermons in something approaching a monotone, pausing whenever a member of his audience interjected' (p.107). Sargant's methodological failure to *talk* to converts is traced to 'an *a priori* theoretical assumption that the explanation of conversion must involve causes that are unknown to the actor'. If he had himself attended crusades, 'his own observations and experiences would have given him an insight into the processes he infers from a superficial acquaintance with journalistic accounts and possibly unreliable historical accounts' (p.109). He would have found that people change their beliefs *for reasons*. 'It seems to me improper procedure to employ different types of explanation (I learnt what I know; you were brainwashed) for why people hold certain beliefs, without first providing good evidence for the initial dichotomy. Are there any grounds for saying that people who commit themselves to Christ at crusades are changing beliefs in a manner different in form from that followed by others in more "normal" circumstances?' (p.111).

Bruce's own view is that crusades 'offer an important "rite de passage" for young evangelicals which has a social role identical to that of confirmation and first communion in other religious traditions. Crusades do not *cause* conversions; they provide opportunities for people to claim conversion experience, to commit themselves to a set of beliefs and practices that they think and feel might be better than the lot they have at the moment' (p.112). 'Conversion [is] something that the actor accomplishes rather than something that is done to him' (p.120).

It would be surprising if, at times, Bruce's agnostic understanding of biblical doctrine did not seem inadequate to a Christian reader, and he is occasionally careless or ill-informed. On p.99 for example he attributes the injunction to 'cast your bread upon the waters' to Jesus; and on p.86 he 'writes down' the conservative evangelical attitude to music and other 'secular' culture as if Francis Schaeffer (whose name does not appear in the bibliography) had never lived.

His understanding of evangelical social thinking is similarly patchy. Sir Fred Catherwood's *Case for a Christian Social Order* is said to contain 'little that is particularly "Christian" '; and we are told without evidence that 'a majority of evangelicals would probably support the idea that unemployment is caused by the sinfulness of those who are without work' (p.175). But such instances of over-generalisation are relatively rare. On the whole this readable spectator's analysis can be recommended as a thought-provoking antidote to complacency for Christians of any stripe, provided that—as with the *Screwtape Letters*—we bear in mind the avowed standpoint of its author. Try it on your local evangelist, or your local ex-SCM bishop, as a 'hair shirt' for Lent.

D. M. MACKAY

Steven T. Katz (Ed.) *Mysticism and Religious Traditions*, Oxford University Press, New York, 1984. 278pp. Paperback. \$9.95

It has often been argued, and is more frequently assumed, that the mystical lies at the heart of all religion. Further, it is suggested, the fact of the mystical provides a common core to all religions and therefore constantly questions the various interpretations in the light of the pure consciousness of those fortunate enough to experience the divine or the One directly. Much research has been directed to the collection of examples

of mystical experience, and by comparison of them identifying what that common core could be. The thesis is attractive because it appears eirenic in an age of controversy, and is protected by the mystics' claim that the experience is in principle ineffable. The chief demerit of the theory appears to be that it is untrue. For example, as Katz claims in this stimulating and important collection of essays, there is no such thing as 'pure consciousness', uninterpreted or unmediated by language, institutions, social structures or conceptual schemes. Mystical experience should therefore be seen as congruent upon and determined by, even supportive of, the linguistic, doctrinal, social and theological traditions of a given religion. Far from being the common undifferentiated heart of all religions, mystical experience is particular to each tradition and dictated by it. The mystic does not so much question the institutional religion in the light of personal experience, as confirm the public faith of a religious tradition in personal experience. This thesis is examined in Jewish, Islamic, Buddhist, Hindu and Christian contexts in a series of essays which are illuminating both for their range and their clarity. The references appended to each essay constitute in themselves a valuable bibliography of current scholarship, but the lack of an index is a disadvantage.

It is important to note that such a view enhances and does not diminish the importance of the mystical, for it makes it all of a piece with the tradition it expresses. Whereas one might have argued that mysticism, however basic to religion *per se*, was peripheral to an understanding of a given tradition, it is now clear that it is integral. Moreover, to claim that mysticism is dependent upon the doctrines and social structures of a given tradition is not to question its reality; it is simply to place it in a context where it can be discussed and perhaps understood. It is not, therefore, that mystical experience is ineffable because it is related to the ineffability, the experience of God, but because it is specifically a non-linguistic way of expressing or experiencing the truth about a relationship with God or the ultimate, as expressed in a given tradition of religion. To see what such an 'uneffable experience' means or says we must look at the theology of the traditions.

Lastly, and perhaps more importantly, the essays in this volume illustrate the fact that no social or political progress will be made unless serious consideration is given to the religious nature of social structures. Thus, for example, the caste system is not simply a socio-economic matter, it is a way of expressing

the relation of pure and impure which is the crucial matter for Hindu religion. To recognise the mystical in written religious traditions, rather than as something beyond and above them, is evidence that religion is a category of human experience which cannot be subsumed under other categories with remainder. It appears that religious reflection may stimulate religious experience; we should not be surprised if this is so.

K. B. WILSON

A. E. Lewis (Ed.), *The Motherhood of God*, St. Andrew Press, 1984. 71pp. Paperback £1.00. A report of the Woman's Guild and Panel on Doctrine Study Group.

This is a brilliant report, compiled by the study group which consisted of ten people; seven women and three men (four of the members being ordained). The purpose, as the report says, is not to change or replace the traditional understanding of God as Father into a Goddess or female deity, but to understand the theological implications of the concept of the Motherhood of God and the role of men and women in the Church.

The first chapter deals with the history and background from whence the traditional male image of God has arisen in the Scriptures, especially Christ's address of the one who sent him as the Father.

The following chapters expand on the dominance of the male address of God in the Church's prayers and hymns, which has helped to alienate some women. The erroneous view that God has a gender has led to confusion. A considerable proportion of the study has been devoted to understanding God as Father with motherly qualities.

The conclusions of the group were that all human language is inadequate for the task of expressing and addressing God. Some members of the Group thought that although God has motherly qualities, to call God 'Mother' would cause hurt, if one took into account the dominant testimony of the New Testament. The remainder of the group felt that the Church should seriously consider the feelings of those who believe that God is the Maker of us all and he transcends everything that is best in the female way of being human and the human way of being motherly.

N. LOPES

John Wenham, *Easter Enigma: Do the Resurrection Stories contradict one another?* Paternoster Press, 1984. 162pp. Paperback. £2.95

It is often said by non-Christians that the beginnings of the Christian story lie so far back in the mists of history that we should not feel overconcerned with them today. This is a strange and illogical view. As time goes it is not so very long—only about thirty human life-times, and perhaps less than the life-time of a long-living tree—since the New Testament was written. In many disciplines outside theology we think in terms of quantities which, relative to the human scale, are vastly greater. Looked at in this light even the very beginnings of history did not start so very long ago. It is so easy to roll the word 'thousands' off the tip of the tongue that it conveys the impression that what we mean is thousands of millions. The first task of the biblical scholar and apologist should be, then, to make the time between what he describes and the present seem no longer than it is. With superb skill this is just what John Wenham in the present book succeeds so well in doing. This is a beautiful book, well written, well researched, well produced and inspiring. It is illustrated with maps of the ancient city of Jerusalem showing the whereabouts, in so far as they can be ascertained, of the buildings and places mentioned in the NT. The final result is a pleasure to read: the book deserves to become a classic.

It is commonly taken for granted that the stories connected with the resurrection of our Lord are inconsistent with one another. In starting work on the present project, Wenham tells us that at first he did not feel at all committed to the view that inconsistencies are completely absent. On the face of it, were this to be so it would not even help the Christian cause for critics would say at once that, of course, the accounts were copied from one another. How much better then that they should be apparently inconsistent, yet so recorded that detailed research would show that this is not really so. And this, in fact, is the impression with which this book leaves us. In the course of his studies Wenham himself lived in Jerusalem for a time and as far as is humanly possible he seems to have collected together all the facts and all the reasonable suggestions that have been known to scholars in the past. The conclusion he reaches is that without using implausible suggestions, there is no single instance in which the claim of inconsistency can be substantiated.

Apart from the general theme the discussion on the various

personalities encountered in the NT story is full of interest, though it needs to be stressed that if some of Wenham's detective work is faulty, his thesis is not imperilled. Many of the difficulties which an English reader encounters are due, says Wenham, to the widespread use of identical names for different people. The difficulties are the same as we might encounter were we to set to work to identify a man called Smith in a chronicle of an English village. Perhaps the commonest girl's name in NT times was Mary, or Miriam, and no fewer than seven women with this name are mentioned in the N.T. Wenham considers them all in turn and he makes the interesting suggestion that Mary who lived in the respectable village of Bethany left home to live as a prostitute in Magdala where she was converted when she met Jesus. Another interesting suggestion is that John the Apostle was a first cousin of our Lord, being the son of the sister of Mary, mother of our Lord. The treatment of the interrelations of the personalities concerned is excellent and although, inevitably, some guesswork is required, the result is always plausible.

R. E. D. CLARK

David B. Wilson (Ed.), *Did the Devil Make Darwin Do It?* Iowa State University Press, 1983. 241pp. Paperback. \$12.95

Books on the creation-evolution controversy continue to proliferate. Few of them say anything new, although there is a continuing attempt to refine the issues involved. This book follows a ground-plan rather similar to that of *Darwinism Defended* (Michael Ruse, Addison-Wesley, 1982). Like Ruse, the sixteen contributors are pro-evolution.

The first section of the book outlines the nature of the controversy, with chapters on science and religion in the age of Darwin, scientific creationism as presented in the US, together with philosophical aspects of the creation-evolution debate.

Section two summarises some relevant scientific orthodoxy in astronomy, earth history, the origin and evolution of life, and thermodynamics as applied to stellar and biological evolution. The chapter on prebiotic chemistry is unsatisfactory. The primitive atmosphere of the earth is assumed to be reducing and the experiments of Miller (1953) on the synthesis of some amino acids by sparking mixtures of ammonia, methane, hydrogen and water are quoted. No hint is given that later

models of the early atmosphere show it to have been oxidised and that free oxygen was present very early on. (See *Faith and Thought*, 104, p.23; 105, p.155; 108, p.21). Some of the difficulties of the prebiotic 'chemical soup' theory have been indicated by J. H. J. Peet (*Faith and Thought*, 109, pp.127f.); by A. J. Cairns Smith, *Genetic Takeover and the Mineral Origins of Life* (1982) and by F. Hoyle and C. Wickramasinghe, *Evolution from Space* (1983). In addition, R. E. D. Clark has pointed out that the absence of Prussian Blue deposits also tells against the occurrence of hydrogen cyanide in the primitive atmosphere (*Faith and Thought*, 104, p.188).

Discussions about 'evolution' are not helped when the term is applied to *change* as such. On p.100 the label is given to the universe, where 'matter has gradually changed from a high-temperature high-density state . . . to its present low-temperature, low-density state.' Also in this section we are told that the argument about increasing entropy pointing backwards to a creation, contains the 'weakness' that the supposed act of creation defies the very laws of thermodynamics on which it is based! (p.128). In fact, it follows quite clearly from Clausius' formulation of the second law of thermo-dynamics that the universe cannot be infinitely old. Such a view was held by Kelvin, Tait, Maxwell and Jeans (among others).

Section three contains chapters on various creation beliefs; Christianity and evolution, and a liberal (Christian) manifesto. Here it is maintained that the early chapters of Genesis, as interpreted by American creationists, flatly contradict modern cosmological theories. Moreover, Genesis, chapters 1-3, contains two mutually-exclusive stories of creation (surely the compiler(s) of Genesis would have been aware of this?). The conclusion is that the creation account may only be accepted for 'religious' reasons, to convey religious truth, not facts. Contrast the demonstration of the unity of the creation account by the Jewish commentator Cassuto (*Faith and Thought*, 108, p.5).

The final section of the book is about creationism in public education: it is concerned exclusively with the situation in the U.S.

In general, the book is written in an interesting and informative manner. There is an index and references to a considerable bibliography. Pains have been taken to present the views of American creationists in a fair and representative manner. No misprints were found.

Henri Blocher, *In the Beginning*, Inter-Varsity Press, 1984. 240pp. Paperback. £5.95

This book, a translation of *Révélation des Origines*, by a baptist lecturer in Systematic Theology and Philosophy at the Faculté Libre de Théologie Evangélique, Vaux-sur-Seine, is an exposition of the early chapters of *Genesis*. Although it covers the whole of the primaeval history, it concentrates on the first three chapters: It is not a verse-by-verse commentary but a detailed exploration of a few major themes: the week of creation; being, order, and life; the image of God; man and woman; the Edenic covenant; the breaking of the covenant; the consequence of sin; and the promise of redemption.

The first chapter is devoted to the author's approach to *Genesis*. He is not particularly interested in how the book came to be written or compiled; there is no discussion of the documentary hypothesis, although he does accept P. J. Wiseman's suggestion that the repeated *tôl'qôl'* formula indicates a succession of tablets. He differs from Wiseman, however, in understanding the formula as a title to what follows, rather than as a colophon to what goes before.

He sees the creation narratives as both word of man and word of God. As word of man, they require every available line of philological investigation for their elucidation: as word of God they have to be seen as part of the total, consistent, revelation in the Bible. Thus the author is careful to test his interpretation of the documents for consistency with other parts of Scripture. He wisely eschews all scientific (e.g., geological, biological) considerations in his exegesis, and allows Scripture alone to speak. The book is thus pre-eminently theological.

There is much of interest in Blocher's exposition, but the conclusion that is of greatest relevance to the concerns of the VI is that Genesis I is to be understood symbolically: the 'week' is a literary device deliberately and carefully designed by its author in a highly artificial and numerical form to present important theological truths, including particularly the significance of the sabbath: it has no chronological implications. This conclusion is reached by a number of different arguments, and not without a careful and fair discussion of the arguments of those who think otherwise.

It is only after the author has completed his exposition of Genesis 1-11 on linguistic and theological principles that he finally turns in an appendix to scientific theories. He quickly dis-

claims any competence in this area, and then goes on to demonstrate the falsity of the disclaimer. For in eighteen pages he provides a masterly summary of the main arguments and counter-arguments of the two main schools of thought amongst Christians—theistic evolutionists and creationists. The treatment is succinct, well-informed, balanced, and fair. Would that the active contestants in the debate were all as well-informed! Blocher does not presume to cast his vote, for he recognises that much more research is needed before a definitive conclusion can be reached.

The book is lucid and well-documented.

GORDON E. BARNES

Sir Fred Hoyle, *The Intelligent Universe*, Michael Joseph, London, 1983. 255pp. £12.95

In 1981 Hoyle and Wickramasinghe produced their book, *Evolution from Space* (reviewed in *Faith and Thought*, 109, 3, 220-227), in which they presented their case for believing that life originated, not on earth, but in space, and that the evolution of complex forms of life on earth had been achieved by the continuous invasion into the earth's biosphere of new genes in the form of viruses and bacteria. Although this postulate greatly enhances the theoretical probability of a materialistic origin of life, they argued that the chances of such an event actually happening were still so infinitesimally small as to render it incredible. They suggested that some source of information, some form of intelligence, was in fact responsible for controlling the origin and evolution of life.

This new book by Hoyle is a fascinating and stimulating development of these ideas, and attempts to get to grips with the intelligence in the universe. It starts by arguing the improbability of any normal mechanistic explanation of evolution; and employs arguments similar to those of the earlier book.

Hoyle accepts the Darwinian idea of natural selection, and believes that on many planets throughout the universe very different forms of life may exist as a result of selection of genes for the local environmental conditions. His problem is to account for the development of those genes; and it is for this purpose that he invokes the concept of the intelligence, or source of information. The normally-recognised direction of information flow is in a positive time direction, i.e., from past to future; this usually is

accompanied by increasing disorder. Evolution, however, involves increasing order or complexity, and to explain this Hoyle postulates that information may also flow in a negative time direction, i.e., from the future to the past. (He does not explain how this might happen, but he does point out that Maxwell's equations for electromagnetic radiation operate equally in both directions). So perhaps the control of evolution is located in the infinitely remote future, and the whole process is thus directive or teleological.

Hoyle considers the possibility that, over vast aeons of cosmic time, the fundamental properties of matter might change, so presenting problems for the maintenance of carbon-based life. But, as he points out, the information controlling life could be encoded in other material languages, and he has little doubt that the intelligence of the time, or the ultimate intelligence, would cope with the problem. (This idea of the information's being coded in language other than the chemical language of DNA could be used by the Christian to explain a future resurrection life where continuity of personality occurs in a new, spiritual, body [1 Cor. 15, 44]).

This book represents (a stage in?) the search by a brilliant mind for answers to fundamental questions raised by contemporary science. Following the methodology of science, Hoyle is looking for those answers within the universe. Whether such a search will prove successful remains to be seen. At present he cannot get very far: even some of his starting points are controversial (e.g., that cosmic dust consists of micro-organisms is not accepted by many astronomers), and his ideas of information flow from the ultimate intelligence are purely speculative. He eschews philosophical and theological notions, although at times he comes very close to them. He recognises that some of his ideas bear marked resemblances to the insights of some religions, e.g., his ultimate intelligence approaches the God of Christian theism, and his infinitely remote future resembles eternity. Despite this, he repudiates the Christian faith, although he admits to being 'deeply impressed by many of the sayings of Christ'. He nowhere tells us plainly why he cannot accept Christian answers to his problems, but from occasional hints one can guess that he is reacting against, not Biblical Christianity, but a naive, popular, misrepresentation of it. He thinks, for example, that to identify the creative intelligence with God is to inhibit the asking of any further questions about cosmology. He obviously has not read *Faith and Thought*. He imagines that God

can influence the universe only through miracles, which have decreased in numbers from Moses onwards, until they are now non-existent. I doubt if he has read Eph. 1:11, Col. 1:17, or Heb. 1:3. He thinks there is only one-way communication between God and the universe. So what about the biblical insistence on the value of prayer?

If I understand Hoyle aright, he sees the origin and development of life as the achievement of intelligence struggling within the constraints imposed by a rather inhospitable environment dominated by the principles of quantum physics. Biblical faith, on the other hand, sees both life and its cosmic environment as the unified product of an intelligent Creator, who is concerned, not only with the mechanics of the universe, but also with moral principles of righteousness and love. I suspect that Hoyle's intelligent universe, complex though it is, is far too simple to explain all there is to explain.

Although some of its concepts may not be easy to comprehend by a non-physicist, the book is very clearly written in non-technical language and beautifully illustrated by many diagrams and photographs. It is well worth reading for anyone interested in current scientific debates.

G. E. BARNES

D. Gareth Jones, *Brave New People*, IVP, 1984. 221pp. Paperback. £3.95

Genetic Engineering and Test-Tube Babies (*in vitro* fertilization) have been much in the news and were touched upon in a recent VI Symposium entitled, '1984—Man, Manipulator or Manager?' In this book Gareth Jones, who is Professor of Anatomy at Otago University, New Zealand, describes the recent advances in biomedical technology and assesses their ethical implications. He himself describes it as 'a journey of personal discovery by a medical biologist with a keen interest in ethics'.

He argues that the biomedical revolution has a price not only materially but in terms of human values, e.g. the status of marriage and the extent to which human life can and should be altered. The danger in science is for materialistic values to become ultimate and for humans to be seen as only physical machines, where either health is made an ultimate value, or everything—pregnancy, frustration and death—is seen as amenable to treatment.

Professor Jones describes in detail the various genetic diseases and how they can be either controlled by careful genetic counselling, or diagnosed by amniocentesis or screening, and then either operated on or, where this is impractical, the foetus can be aborted. The ethical issues raised by abortion are tackled towards the end of the book.

The largest section of the work is concerned with the application of biomedicine at the beginning of life and deals with *in vitro* fertilization (IVF), artificial insemination (AID), and cloning. He believes IVF should be limited to married couples. Although AID is not necessarily adultery, he asks whether a desire for a child is a sufficient reason to have one. Cloning of humans is futuristic but feasible and as well as making exact duplicates of famous people could provide interchangeable parts for transplants. However, cloning would not necessarily solve the problems of genetic disease and would undermine the dignity of the human being by making him merely the replica of another, designed to serve the interests of others.

With the subject of therapeutic abortion we come more down-to-earth. The author tackles the thorny problem of when a foetus becomes a person and comes down on the side that sees the foetus as a potential person who becomes more of a person as the pregnancy develops. Restricting himself primarily to genetic deformities, Jones would allow abortion for severe cases where personhood is in doubt, such as Lesch-Nyhan syndrome and anencephaly, but not for Down's syndrome. In general he believes that helping the handicapped is the best way, with abortion as a last resort and an admission of failure on the part of society to cope with handicap.

As with his previous book, *Our Fragile Brains*, the author shows his skill at presenting technical issues to the lay public in a readable way. As Christians we ought to be thinking about the issues raised in this study and Professor Jones is as good a guide as one could hope to find.

R. S. LUHMAN

S. Rose, L. J. Kamin and R. C. Lewontin, *Not in Our Genes*, Pelican Books, 1984. 322pp. £3.95

'Over the past decade and a half we have watched with concern the rising tide of biological determinist writing, with its increasingly grandiose claims to be able to locate the causes of the

inequalities of status, wealth, and power between classes, genders, and races in Western society in a reductionist theory of human nature.' This is the motivation behind a well-written and incisive book by three distinguished scientists, respectively a neurobiologist, a psychologist and an evolutionary geneticist. The biological determinism which they oppose is defined as the view that 'human lives and actions are inevitable consequences of the biochemical properties of the cells that make up the individual; and these characteristics are in turn uniquely determined by the constituents of the genes possessed by each individual.' *Not in Our Genes* has a two-fold task: first to provide an explanation of the origins and social functions of biological determinism, and second to expose the emptiness of its claims which stems from inadequacy in both the data and the reasoning of its proponents.

In the opening chapters of the book, the authors trace the historical development of modern science and its associated mechanistic and deterministic world view. They show how—through the industrial revolution—this is intimately related to the emergence of a capitalist system from a previously feudal society. It is biological determinism which provides one of the arguments used to justify the hierarchical class structure which capitalism has produced: inequalities in society are due to differences in inherent merit, these differences are due mainly to genetic differences, hence a hierarchical class structure in society is justified. This argument has its origins in Victorian views that a man's character is always true to his breeding, while recent understanding of the mechanism of heredity has simply added superficial scientific respectability to these political claims.

Rose, Kamin and Lewontin dispute the assertion that differences in social success are due mainly to genetic differences; indeed they regard any attempt to describe the genetic and environmental factors determining human attributes such as intelligence, in terms of a single percentage value, as just too simplistic. They also reject the idea that moral justification for a political system can be obtained from human genetics. 'Ought' cannot be derived from 'is'. However, while affirming the moral neutrality of scientific facts, they also recognise that those same facts may well have moral *implications* for political systems justified in other ways.

In chapters five to nine, the scientific data which supposedly support the claims of biological determinism are examined.

The inheritance of IQ and of mental disorder, and genetic differences (relating to social success) between races and between the sexes are scrutinised in turn—the evidence in each case is found wanting. This is mainly due to inadequately constructed experiments which do not allow clear discrimination between possible genetic and environmental causes of a particular human character. Sometimes even deliberate scientific fraud has been perpetrated, as the scandal of Sir Cyril Burt and his IQ studies illustrates. The authors also go on to attack the writings of sociobiologists and the attempts by some to seek adaptive explanations of human behaviour in terms of natural selection operating in man's recent past.

In the final chapter, an alternative view of human nature is put forward. The authors reject biological determinism (our behaviour is the product of our genes) and also cultural determinism (our behaviour is the product of social conditioning). In their own words: 'We must insist that a full understanding of the human condition demands an integration of the biological and the social in which neither is given primacy or ontological priority over the other but in which they are seen as being related in a dialectical manner, a manner that distinguishes epistemologically between levels of explanation relating to the individual and levels relating to the social without collapsing one into the other or denying the existence of either.' This dialectical approach involves not only the interaction of genes and environment in the development of behaviour, but also the interaction of the individual and the environment—organisms are not simply passive objects on which an independently-varying environment operates, but rather they themselves actively determine their own environment. A concept with obvious attractions for three authors with a conspicuous commitment to human social change.

On the whole I found this book to be both a clear and objective critique of biological determinism. The 'dialectical' conclusion has the advantage that it is fully compatible with a rigorous mechanistic and deterministic world view, while recognising the complexity of inter-related causes and the different levels of explanation in the development of human behaviour. Only occasionally do the authors let their political beliefs get the better of them, painting the supposed 'opposition' as blacker than black. For example, they fail to realise that the stress laid by many sociobiologists (e.g. Wilson, Dawkins and Trivers) on genes and behaviour, is not because of some evil bondage to right-wing

ideology, but rather because evolution by natural selection involves the differential survival of genes in succeeding generations; only through genes can animal behaviour have any adaptive evolutionary significance. The reason that evolutionary theory does not therefore by necessity substantiate genetic control of human behaviour is that mankind is qualitatively different from other animals in his cognitive powers. We are learning, thinking, beings and it is our basic capacity to learn and think, not our thinking and learning, which is inherited in the genetic code and shaped by natural selection. Indeed it is our ability to think in abstract terms which confers on us free-will and moral responsibility (despite the mechanistic operation of our bodies and brains), not the 'multiplicity of intersecting causal pathways' underlying our behaviour as the authors suggest.

In conclusion, despite my own differences of opinion on one or two points, I must say that *Not in Our Genes* is a quite excellent book. The contribution of more than one author is not obvious and their methodical demolition of biological determinism is a pleasure to read. They make their political motivation plain: 'We share a commitment to the prospect of the creation of a more socially just—a socialist—society.' However their arguments do not presuppose left-wing ideology and I would unhesitatingly recommend this book to anyone wishing to think through the issue of biological determinism.

BARRIE BRITTON

V. Reynolds and R. E. S. Tanner, *The Biology of Religion*, Longman, 1983. 332pp. Hardback. £14.95

This book is concerned with the interaction between human and cultural processes. In particular, questions are raised as to whether, and how, religions of all kinds can be seen as human efforts to deal with long-term survival prospects in a Darwinian sense.

The authors deal with their sociobiological theme by a consideration of the human life cycle, from conception to death, and the manner in which religious taboos and practices may be supposed to have biological significance for the survival and reproductive success of their devotees.

The book makes fascinating reading as one learns of the beliefs and practices in a wide diversity of societies. Numerous

tables of data appear in the text. Their somewhat forbidding aspect is more than compensated for by the delightful sketches of Penelope Dell.

The writers appear to deal sympathetically with the religious beliefs they discuss, from those of the Amish in the U.S. to those of the Zigua of Tanzania. Nevertheless, one is left with a somewhat bemused feeling at the end of it all. Do religions really operate at a biological level? Are their manifold practices really designed to contribute to the preservation of the race, or some part of it? The thesis seems a bit like looking in a dark cellar for a black cat which isn't there!

The book has an index and 24 pages of references. It is well bound and is a useful source of information for those interested in anthropology and comparative religions.

D. A. BURGESS

Michael Shallis, *The Silicon Idol: the micro revolution and its social implications*, Oxford University Press, 1984. 188pp. £8.95

Michael Shallis declares that Western societies are rapidly creating and worshipping a silicon idol. The computer craze is more serious than mere faddishness; we are unwittingly committing ourselves to a kind of society which is far from obviously desirable. We have allowed ourselves to believe that new technology is good for us, that it carries its own imperatives within it, and that if we fail to obey those imperatives we will simply cease to progress.

As with several other recent critiques of the so-called micro revolution and the computer culture, this one is written by a long-term computer-user and teacher of computing. Shallis is a tutor in the department of external studies at Oxford University, and he speaks with some authority born of experience, and also from fairly extensive reading in the history of technology and in contemporary studies such as that of Joseph Weizenbaum (*Computer power and human reason*, Penguin 1984).

The discussion ranges from 'artificial intelligence', to present and projected computer applications, and the implications for employment, work, and culture. Woven into this are the themes of what it means to be human, 'sacred and secular' technology, and the incidence and consequences of 'silicon idolatry'. The book is simply and straightforwardly written, and provides a

good introduction to some of the key issues surrounding computing (and some relating to its marriage with new communications technology). It is couched in the cautious language of someone who does not pretend to know the future, but also contains a streak of iconoclasm stemming from profound doubt that computers will turn out to be the saviour of humankind.

Shallis makes his case that technology cannot be neutral—that it is always shaped by human interests—more by illustration than by extensive argument. In particular, he repeatedly reminds us of the connection between microelectronic developments and the military. The parents of computing are a reductionistic view of the world and of humans, its midwife is the military, and its nurse, capital-based industry, he says. Such social shaping is in fact leading us into the arms of danger. Not only are the hopes unfounded of those who see some return to full employment resulting from the growth of hi-tech industries, but we are making a society which is also fragile and vulnerable in other ways as well. Social disruption, computer crime, and takeover by a technocratic elite are all-too-real risks in a computer-based society. Inequalities within and between nations are also likely to increase in the wake of the 'explosion of information'.

But Shallis' main focus is on the cultural, religious level. He argues that fatal confusions have crept into our computer culture. Human beings, unique because of their capacity for self-transcendence, are conceptually reduced to mere 'information processors', while machines are being credited with 'intelligence', and thus their potential contribution to human welfare is over-rated. The problem is 'teknois' (obsession with technology). Seeing ourselves reflected in our technology, like Narcissus we are infatuated with the reflection, and forget who we really are. This is part of the idolatry pervading our modern world.

Another aspect of silicon idolatry is this. Today's technology is 'secular' by virtue of being geared to the 'gods of efficiency, power, profit, and progress'. Older, prosthetic (i.e. human extension) craft technology was 'sacred', symbolic, and often geared to God's glory. While Shallis clearly has an important point here, the sacred/secular technology idea makes a dubious distinction. True, one can discern within computer culture a lust for quantity at the expense of quality, but to align new technology entirely with what amounts in Shallis' view to 'ungodly' principles is as mistaken as nostalgically assuming

that the technology of previous eras was suffused with some worthwhile religiosity.

This is a thoughtful and thought-provoking book, written with considerably more integrity than many current 'computer society' type of books. But I am left with a sense of unease. Why is Shallis still in computing if, as he says, computers simply weave around us 'an electronic web of artificiality', and if 'we should become ashamed to use' machines that 'think'. He toys with the term 'Luddite' to describe his stance, and rightly tries to rescue such resistance to technology from the status of a silicon idolater's swearword. (A closer examination than Shallis makes of Luddism would actually be instructive for us.) Is it not conceivable that, with eyes open to the dangers, and a demand for democratic participation in the process of technology innovation, computers could have a role in a humane society, and even be harnessed to glorify God?

DAVID LYON

O. R. Barclay (Ed.), *Pacifism and War*, I.V.P., 1984. 256pp. Paperback. £5.75

This symposium, in a series entitled 'When Christians Disagree', presents the views of eight Christians on what must surely be regarded as the supreme moral and political issue of the day: the Christian's duty with regard to peace and war. The aim of the series is to help individual believers to clarify their own thinking and relate it to the Bible.

The authors were paired off, and each pair was invited to reply to the essays written by the others. Clearly the application of biblical teaching to the practical affairs of the world is no easy matter. Some of the contributors to this volume call in the biblical evidence more than others. Sir Frederick Catherwood, for example, who argues against nuclear pacifism makes only scant reference to the Bible.

In a preliminary chapter, the editor presents some opening theses. These reveal the tension between the Sermon on the Mount and other New Testament passages which stress the duty to resist evil, and the function of the State in doing so. He then sets out the questions that must be faced, beginning with: 'are we agreed that evil should be resisted, if necessary by force. Or is force (violence) always wrong?'

The various positions adopted by Christians are set out, and

the 'just war' concept examined in some detail. The concluding chapter attempts a summary of the arguments used. One basic divergence of attitude is noted. Pacifists, it is said, tend to have a negative view of the State but a more optimistic view of the individual. 'Just war' advocates see things the other way round. The key issue is whether the Christian should be active in helping the State to do its God-given job, including acting as a 'minister of wrath'.

This book contains a great deal of useful material, but it would have been of greater value if more had been said about how the Bible is to be used in the formulation of moral judgements. What is the nature of the authority of the Bible? Many of the differences between Christians on vital issues arise because there is no clear understanding of and agreement upon that fundamental question.

K. G. GREET

W. A. Heth and G. J. Wenham, *Jesus and Divorce*, Hodder and Stoughton, 1984. 287pp. Paperback. £5.95

Nearly one-third of this book is taken up with textual notes, bibliography and index, which is some indication of the careful research which has gone into its preparation.

If one considers the brevity of the dominical references to divorce, it is astonishing how much interpretative literature they have generated. A summary of the New Testament teaching will both indicate its brevity, and also give some idea of the problem of harmonising the several references.

(1) God intends marriage to be an indissoluble union. 'What God has joined together, let no man separate' (Mark 10:2-9 and Matt. 19:3-8).

(2) Divorce, followed by re-marriage constitutes adultery. (Matt 5:32b, Mark 10:11-12, and Luke 16:18)

(3) Married couples should not separate or divorce (1 Cor. 7:10)

(4) In cases of separation or divorce, those involved must remain single, or be reconciled (1 Cor. 7:11)

(5) Divorce is a kind of adultery, and leads the woman to commit adultery, except in the case of unchastity (Matt. 5:32a)

(6) 'Whoever divorces his wife, except for immorality, and marries another commits adultery' (Matt. 19:9).

Surveying this outline, it is little wonder that different interpre-

tations have been advanced by those who have undertaken to set forth the 'scriptural view' of the matter. A widely-held view today is that re-marriage after divorce is allowable on the grounds of immorality. The historical survey in this book reveals, however, that a variety of other views have been held by those who have studied the sacred texts with great care, and have arrived at different judgements about the meaning of some of the words used, e.g., immorality. According to Heth and Wenham, the view which has most to recommend it is that of the early Church, which allowed divorce, but denied the right to re-marry. In the final chapter, the authors endeavour to offer pastoral guidance to Christians who have already entered into a second marriage, following divorce. Whilst the ideal of indissolubility is always to be upheld, those who have failed should make the very best of their second marriage, even if, accepting the interpretation offered in this book, they must conclude they are 'living in sin'.

It seems a rather harsh way of putting the matter. One is bound to ask whether those who concentrate exclusively on the divorce texts in the Bible have given sufficient attention to what the spirit of Jesus requires. This is not to suggest that the texts are unimportant, but to recognise that, in the face of divergent interpretations, the Christian must seek to know 'the mind of Christ' by an understanding of His whole teaching and ministry. What other recourse have we when the immediate texts are inadequate, and apparently ambivalent?

K. G. GREET

Donald Coggan, *Paul—Portrait of a Revolutionary*, Hodder and Stoughton, 1984. 256pp. Paperback. £7.95

Archbishop Temple said that, to him, 'St. Paul is the exciting, and also rather bewildering adventure: with St. John, I am at home'. Donald Coggan takes a rather different view. A writer of long experience, with over a dozen major works to his name, together with scores of lesser pieces, he has chosen to write on Paul to mark the 50th anniversary of his ministry. Moreover, it is a work of love, written 'to repay the author's debt to a man whose life and letters have been a constant challenge and a never-ending source of inspiration . . . for preaching and lecturing'.

The book is not a commentary, but rather 'a portrait of a revolutionary, a man in Christ, a pilgrim, apostle, man on the road—

not only on the road which led from Jerusalem to Rome, but also the road which led from earth to heaven'. As such, there is no pretence at new scholarship. The aim is to shed new light on Paul's character and convictions. A good deal of Pauline reading has obviously preceded the writing, for instance, Bornkamm, Deissmann, Grollenberg (not Grollenburg, as in the Index) and Beker are used with discernment. There is no attempt, however, to use a comprehensive bibliography. Käse-mann, Theissen and the Jewish scholar Sandmel, to name a few, receive no mention.

The writing is flowing, the reading intentionally uncomplicated. One does not need to retire to the study to embark on one of the twelve chapters, which include Youth, New Creation (the Damascus road conversion), Thinker and Writer, Man of prayer, Freedom-fighter, Churchman and Man of vision. This is not a book which debates the authenticity of particular Pauline epistles, or which wrestles with some of his more obscure passages. It is a book which shows Archbishop Coggan's detailed knowledge of the Scriptures, and which incorporates many of his own theological, moral, and social views. Each chapter is used as a vehicle for some penetrating thoughts, which are drawn out from Paul's beliefs or actions, and shown to be applicable to Christians today. For example, there is a probing analysis of the heart of Paul's character—he was 'a man *in Christ*' (pp.74-81). Again, Coggan uses Paul's sufferings to draw out some fine thoughts of his own on that subject (pp.87-95). In the chapter on Paul as 'Thinker and Writer', one is struck by the statement that 'we shall only understand Paul when we regard him as the apostle, indeed the champion, of the dedicated mind' (p.103). One could go on. There are interesting 'Cogganine' thoughts on the Trinity (p.122), on freedom-fighting (his definition of the phrase is quite different from the conventional), and on Paul's churchmanship. 'It seems likely that Paul's radical rethinking of the imagery of the Bride began at the point when he met the Lord on the Damascus road. For the question addressed to him, which must have smitten him with immense force, was not 'Saul, Saul, why do you persecute my Church?', but 'Saul, Saul, why do you persecute *me*?'. Christ and his Christians were *one*. Touch them, and you touch him. Injure them and you injure him. Persecute them, and you persecute him. They are his Body'.

Occasionally, it is arguable whether the Archbishop makes good his case, as when he states that the 'seeds of Liberation

Theology at its best are within Paul's letters' (p. 160), or when he agrees with E. F. Scott that 'Paul was one of the great pioneers in the emancipation of women' (p. 164). On the other hand, there is a fine chapter on 'Paul and Jesus', where a convincing case is put for the view that Paul's teaching was authentic in its exposition of the basic truths of the Master, both doctrinally and ethically.

To sum up, this is a book of stature, well worth reading, both to discover more about the motivation behind Paul's great ministry, and also to fuel one's own discipleship along the pilgrim road. At the end, one is left to answer the question: is this the portrait of a revolutionary? Donald Coggan does not fully spell out in what ways Paul was revolutionary—the reader must do that for himself.

W. A. HAYWOOD

Donald Reeves (Ed.), *The Church and the State*, Hodder and Stoughton, 1984. 121pp. Paperback. £3.95

This fascinating and eminently readable book contains the substance of eight lectures given by the Rt. Hon. Mrs. Shirley Williams; The Rev. Professor Owen Chadwick; The Very Rev. Victor de Waal, Dean of Canterbury; The Rt. Hon. Tony Benn M.P.; Mr. Teddy Taylor M.P.; Canon Eric James; The Rt. Hon. David Steele M.P.; and the Rt. Rev. Mark Santer, Bishop of Kensington. The introduction, by the Rev. Donald Reeves, the Rector of St. James', Piccadilly, could also be regarded as a ninth lecture.

The substance of the lectures is the relationship between the Church of England and the state, and the involvement, or non-involvement, of the Christian ethic in politics. Each participant gives reasons for the advantages, or disadvantages, of disestablishment and all advocate in their own way that the Church has a duty to concern itself with social, economic and political issues. They sometimes differ as to how the Church should make its impact and voice felt in these matters.

Each age regards its problems as of paramount importance with respect to its own security. However, it is obvious to reasonable, thinking people that the really big issues of today, such as pollution, over-population, famines on a vast scale and the nuclear arms-race, which threatens a nuclear holocaust, can only be dealt with by way of political solutions. Can the Church

give valid, spiritual direction to the solution of such problems? The role of the Church in the affairs of men, whether established or not, is discussed in this book by the eminent contributors. I found the result extremely stimulating and thought-provoking.

B. W. COOK

E. S. Lennox and S. Brenner (Eds.), *Molecular Biology and Medicine*, (Academic Press)

This journal was first published in July 1983, and was intended to be issued five times a year. The library charge is £50 and the private subscription charge £25 per annum (U.K.). The editorial board of 14 members covers a wide spectrum though figures predominantly U.K. and U.S.A. scientists. There is in addition a very comprehensive advisory board.

The publishers express as their aim 'the provision of a meeting ground between the basic scientist and the clinician, and to build up connections between molecular biology and clinical medicine'. Papers in molecular and cell biology, biochemistry and biophysics are acceptable, and preference is given to articles on human material. A particular feature of the journal is the inclusion of brief topical reviews by acknowledged experts—there are 4 in the issue (and 10 'conventional' papers).

The editors aim for rapid publication, but this is hard to assess in a first issue. All the papers in the July copy were accepted in March, which is a measure of speed of publication when no back-log is involved.

The new journal is appealing in its layout, with glossy paper, and clear print and diagrams. It is well-bound, and the July issue has 180 pages. Each article is headed by a summary in *larger* type than the article itself. This is a very helpful innovation, and makes 'scanning' much easier for the hard-pressed scientist. The contents (back cover) are also easily readable—another helpful feature. We should like to wish this new journal all the success that the first issue indicates that it deserves.

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Dr. R. J. Thompson, Tutor in Biblical and Historical
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Gordon Barnes, MA, Chairman of Council of the
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- 12.45 pm **Lunch**
- 2.00 pm **NATURAL THEOLOGY: IS IT SCRIPTURAL?**
Rev. Richard Russell, BA, MA, MEd, Anglican Curate
- 3.00 pm **Tea**
- 3.15 pm **NATURAL THEOLOGY: ARE THE PHILOSOPHICAL
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Rev. Malcolm MacRae, MA, Associate Minister at
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