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THE PHILOSOPHICAL SOCIETY OF GREAT BRITAIN

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FAITH AND THOUGHT

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GENERAL EDITOR: Dr. A. B. Robins



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Editorial

The present issue is mainly given over to memories and appreciation of the life and work of our late Editor, Robert E. D. Clark. The extended length of this issue has been made possible by numerous monetary contributions from those who knew Robert. We are very grateful for such help, and donors are listed in this volume. Several contributors have mentioned particular aspects of Robert's work they would like to see reprinted, so we have done that in this issue. It is hoped that Volume 112, (2) will be a fitting tribute, though only an inadequate one, to a great personality and a great Christian.

Also in this issue is a brief report of the 1986 Annual Conference, the papers from which will appear in a future issue.

The Gunning Prize Essay is printed here, and we congratulate Reg Luhman for his success in our most recent essay competition, and for his contribution on a very topical issue.

There is no Newsletter to accompany the journal; please do not forget to write in with suggestions and contributions. We cannot have a Newsletter without news.

Annual General Meeting, 1986

The Annual General Meeting of the Institute was held at the London Institute for Contemporary Christianity, St. Paul's Church, Vere Street, London, W.1. at 10 a.m. on Saturday, 17th May, 1986, with the President in the chair.

Apologies for absence were received from the Rev A. E. Backhouse, Sir Robert Boyd, Prof. M. A. Jeeves, P. T. Keymer, D. Mitcheson, Prof. C. A. Russell, R. Wilkins, Prof. D. J. Wiseman.

The Minutes of the AGM held on the 18th May, 1985, which had been published in *Faith and Thought*, 111, 2, were taken as read, and adopted.

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

Sir Norman Anderson, O.B.E., Q.C., M.A., LL.D., DD., F.B.A., nominated by Council, was elected an additional Vice-President, in recognition of his many years' support of the Institute.

Mr. T. J. Chappell, F.C.A.A., having indicated his intention of not standing for re-election as Hon. Treasurer, the Council nominated Mr. David S. Williams, B.D., M.Th., A.I.B., as his successor. Mr. Williams was duly elected as Hon. Treasurer.

Dr. Brian Robins, Mr. David Burgess, and Mr. Gordon Barnes, who formally retired from the Council, were re-elected for a further period of service.

The retiring Hon. Treasurer presented the Annual Accounts and the Auditor's Report for the year ended 30th September, 1985; and these were adopted *nem. con.*

Messrs. Benson Catt & Co. were re-appointed as Auditors.

The Chairman of Council gave a brief informal report, summarized below.

Chairman's Report

The Chairman of Council welcomed Dr. David Ingram, the new President, and expressed the Institute's gratitude for his willingness to accept the appointment.

Although during the year under review the quality of the Institute's work had been maintained, in that it had attracted valuable contributions to its annual symposium and to the Journal, the Chairman reported that the financial affairs of the Institute were far from satisfactory. Although the Accounts had shown a smaller deficit than in the preceding year it was still far too large: in fact, any deficit was undesirable. The problem that the Institute had been facing for some years was that of a too low membership. To solve the financial problem the membership needed to be at least doubled. During the year it had actually decreased: there had been fifteen enrolments and twenty three resignations. He was, however, pleased to note that none of the resignations was due to dissatisfaction with the work of the Institute. This level of resignation probably had to be regarded as the level of natural wastage. The only solution to our problems was therefore to increase dramatically the level of enrolment. This was proving difficult, and that suggested that either our wares had limited appeal or our advertising was missing the mark. The evidence available favoured the latter explanation: few Christians seemed to be aware of the Institute and its work. He therefore invited members to meet for an informal discussion of the problem before the afternoon session of the symposium.

The Chairman pointed out that, but for the hard work of the retiring Treasurer, who had relieved the Auditors of much of the work involved in preparing the Accounts, the deficit would have been significantly greater. He therefore thanked Mr. Tom Chappell for his services to the Institute.

He was glad to report that it had been possible to find an eminently suitable successor in good time to ensure a smooth hand-over of the

financial responsibilities, and he thanked Mr. David Williams, who had a higher degree in theology as well as banking qualifications, for his willingness to serve the Institute.

The Chairman reported that the arrangements with the Paternoster Press for producing *Faith and Thought* were working smoothly, and he expressed the Institute's appreciation to both the Editor and the Press for the high quality of the Journal. There were, however, certain minor financial aspects of the arrangement that needed further consideration. He announced that the next issue of the Journal would be a memorial to Dr. Robert Clark, its former Editor and a man who had given so much valuable thought to the relations of science and faith.

Finally, he announced that the next AGM and Annual Conference was being planned for Saturday, 16th May, 1987.

Report on the Annual Conference, 1986

The annual conference of the Victoria Institute took place once again this year at The London Institute for Contemporary Christianity, on 17 May. The meeting took the form of a symposium entitled *The Nature and Nurture of Man*.

Dr. Caroline Berry, a consultant clinical geneticist to the SE Thames Regional Health Authority, gave the first paper, Genes and the Nature of Man. Dr. Berry first outlined the structure and function of DNA in its role as blueprint for the person. Man, however, is much more than the sum of his genes, because he is created in the image of God (who is *not* a sequence of DNA!). DNA is the vehicle for the implantation of his spiritual image. This image is shown by relational aspects of man's behaviour. His uniqueness lies not in physical nor even in psychical characteristics but in his relationship to God, as shown by his participation with God in the seventh day of the creation account in Genesis. A serious problem is that our understanding of God's intent for man is obscured by the Fall: the only way to restore a proper understanding is by looking to the person of Jesus.

What then of the 'sanctity of life' in terms of the foetus? Where and when does life begin? Respect should certainly be shown for the total person and at birth there is no doubt about the full humanity of the neonate. Difficulty arises at the earlier stages.

Although a number of people in scripture were said to be called from the womb, there is no indication that zygotes which do not implant are important to God. Their use in research could bring real gains in our understanding of infertility, contraception and genetic

disorders. Possible misuse should not mean no use, provided there are adequate controls through legislation.

Dr. Berry emphasised that there are no easy answers to questions raised by the possibility of research using *in vitro* fertilisation: for the Christian such ideas need to be thrashed out in the light of our stewardship under God.

The second paper was given by Dr. David Livingstone of the Geography Department, The Queen's University of Belfast. He dealt with *Science and Society: Reflections on the Radical Critique of Science*. The speaker outlined the views of Marxists and sociologists, who point up the social and ideological constraints which mould the pattern of scientific development. Scientific knowledge is seen to be the expression of social factors alone—the felt need to preserve the *status quo* of society and to promote the interests of middle-class practitioners of science, especially in the 19th century.

In contrast, Kuhn sees science changing *via* a dramatic change of paradigm, with no rational means of deciding between alternatives. Science is no more than jargon to help us predict behaviour.

How do we address these issues? There *are* social pressures, of course, but social inputs need not lead to universal scepticism, particularly in view of the cumulative success of science. It may be that Kuhn makes too much of discontinuities: there can be good reasons for a paradigm shift.

Moreover, a good scientific analogy (for example, *plate* tectonics) can give 'signals' of truth by offering testable suggestions, even if pragmatic success is no guarantee of truth. Certain theories (for example 'evolution') have a historical resilience—an ability to overcome anomaly. They tell us something about the 'real' world, however the social origins were involved.

Social and ideological roots need to be uncovered, but not simply to dismiss the science, only the scientism.

The final paper—*Psychological Research and Christian Belief*—was given by Professor David Myers of Hope College, Michigan, USA. His theme was the development in psychological research of apparent paradoxes (Yin and Yang) which are paralleled in Christian belief. For example, the paradox of Brain and Mind arises from the fact that mind emerges from brain and yet appears to control brain. In Christian belief there is the paradox of Body and Spirit: we are now, and in eternity, bodies alive and yet are created for spiritual relationship. Dr. Myers developed five parallel relationships of this kind in a fascinating manner. Complementary propositions of a rather paradoxical nature seem to be needed in psychology and in Christian theology.

The meeting was chaired by Gordon Barnes, Chairman of Council of the VI.

D. A. BURGESS

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R. S. Luhman

Ethics of Scientific Research: Can Embryo Experiments be Justified?

The jubilation that accompanied the birth of Louise Brown, the first 'test-tube' baby, was not shared by a large number of Christians who saw it as the first step towards the fulfilment of Aldous Huxley's vision of the Brave New World. The virulence of feeling is seen not only in their opposition to the Warnock Committee but in the treatment accorded to a fellow Christian, Professor Gareth Jones, whose book, *Brave New People* sought to evaluate the issues surrounding in vitro fertilisation (IVF). He was subjected to personal abuse, his views were misrepresented and he was compared to a purveyor of books promoting incest, rape, pornography and child abuse. The campaign against him eventually led to the withdrawal of the book from the American market.¹ This attitude is not only non-christian but it also trivialises an important issue . . .

Embryo Experiments

One of the by-products of IVF is the existence of superfluous ova extracted from the mother, which can be fertilised and inserted into the uterus if the first attempt fails or can be frozen for future use. If they are not required they can either be discarded or possibly used for scientific research under licence with the donor's consent.

The pioneer researcher, Dr. R. G. Edwards, argued, 'We would have to take several eggs from the mother, and transfer only one or two back into her. The remainder would be thrown away. Is it acceptable to discard the excess embryos?'² If they are not discarded he suggests that research could be done to develop knowledge of human reproduction, embryology and contraception and to alleviate the effects of genetic diseases and deformities. He rejects research on cloning, because, once produced, clones would be the continual subject of research and they would be deprived of the right to be different.³

1. D. G. Jones, 'The View from the Censored Corner' *Journal of the American Scientific Affiliation* (1985) 37 169-177.

2. R. G. Edwards in D. Paterson (ed.), *Genetic Engineering* 28 (1969).

The Warnock Committee accepted experimentation on 'spare embryos' up to fourteen days, which included trans-species fertilisation under licence but not beyond the two-cell stage. They were less happy about using embryos for the testing of drugs because this would encourage the production of embryos for this purpose. Three members of the committee rejected research altogether, fearing that once allowed, embryos would be routinely used and the word 'spare' would be a euphemism.⁴ Other groups made similar recommendations, including the Medical Research Council and the Royal College of Obstetricians and Gynaecologists. The latter wanted to include research on the early development of the nervous system as well as the effects of drugs and desired to extend the research period to seventeen days. The time limit was dictated, according to Warnock, on broadly utilitarian grounds; the balance of benefit over harm. The beginning of the central nervous system occurs on about the twenty second day and one can be reasonably sure that before that time the embryo does not feel pain. Also implantation is not usually completed before this time.

Other experiments have been suggested such as the production of human-animal hybrids which 'would be able to carry out unpleasant jobs and mundane tasks in the community',⁵ and the development of immunologically identical organs for transplantation. Both possibilities are discounted by Warnock as futuristic and, in any case, excluded on the fourteen day rule.

A Christian Critique

The Christian case against experimentation is based on the supposition that from the moment of fertilisation the organism—zygote, embryo, foetus—is a human being made in the image of God. O. R. Johnston actually argues that, 'When little Louise Brown was in the embryonic stage *it was Louise Brown* who was transferred to her mother's womb where she belonged, not a "thing", not a featureless generalised human being nor a piece of human tissue.'⁶ Destruction of the embryo or foetus is regarded as murder of an innocent being because it is impossible to separate stages in embryonic development which would justify a division into viable and non-viable.

3. R. G. Edwards and D. J. Sharpe, 'Social Values and Research in Human Embryology' *Nature* (1971) 231 88.

4. M. Warnock, *A Question of Life* ch.12. pp.70-74; 90-93 (1985).

5. W. Walters and P. Singer, *Test-Tube Babies: A Guide to Moral Questions, Present Techniques and Future Possibilities* (1982).

6. O. R. Johnston, *Warnock-weighed and found wanting* (n.d.) 10.

Biblical support for this view is found in God's knowledge and care for His people before birth and that if the incarnation occurred it must have occurred at conception.

The Biblical Evidence

Professor J. W. Rogerson correctly points out⁷ that the Bible cannot be directly used to decide issues concerning the status of the foetus if only because the Biblical writers knew very little about the process of fertilisation.

The only passage that may have any direct bearing on the subject of the status of the foetus is Exodus 21:22-24, but even here the meaning is disputed. The Hebrew literally reads, 'And when two men fight and they strike a pregnant woman and her child goes forth and there is no injury; surely he shall be fined as the woman's husband may put upon him . . . But if injury occurs you shall give life for life, eye for eye . . .' Many translators and commentators think that the first reference is to miscarriage, but this is rejected by W. C. Kaiser,⁸ who points out that the verb means 'to go/come out' and is used of normal births except for Numbers 12:12. There is a Hebrew verb for miscarriage (cf. Ex. 23:26; Hos. 9:14) which could have been used if this is what was meant.

The Greek translation (LXX.) is literally, 'If two men strive and smite a woman with child, and her child be born imperfectly formed, he shall pay a penalty.' The addition of the word *ἐχεικονισμένον* (*exeikonismenon* = not fully formed) is not justified by the Hebrew and may have been inserted under the influence of current medical theory. Augustine accepted this as the basis for his distinction between the formed and the unformed foetus, which created problems for him in connection with the possible resurrection of the unborn who die in the womb.⁹ This distinction, '... between *foetus animatus* and *foetus inanimatus* or *informis* persisted unbroken in Roman Catholic tradition until the decrees of 1884 to 1902.'¹⁰

The Bible states that God created man in His image and likeness, but what does this mean? Commentators are agreed that it does not indicate physical likeness but are not agreed on what it does mean. Is it rationality (S. R. Driver) moral capacity (Laidlaw) knowledge of God in righteousness (Calvin) or dominion over the lower creation

7. J. W. Rogerson, 'Using the Bible in the Debate about Abortion' in J. H. Channer (ed.) *Abortion and the Sanctity of Human Life* 77-92 (1985).

8. W. C. Kaiser, Jr., *Toward Old Testament Ethics* 170-171 (1983).

9. Augustine, *The City of God*, 22.13.

10. G. R. Dunstan, *The Artifice of Ethics*, 82-83 (1974).

(Thieliecke)? Perhaps with F. Kidner, it should be taken as a transcription or distillation of the incorporeal in terms of the temporal. The concept of the image of God in man cannot help us in the question of IVF unless we can define what is meant by the term and when it is that the embryo takes on such an image.¹¹

If we study the words used to describe the nature of man in the Bible we are nearer a solution. The Hebrew word 'nephesh', often translated as 'soul', is used of both animals and man (Gen. 1:20, 21; Gen. 6:17) and the seat of the mind/spirit and often indicates the total person.¹² The New Testament uses πνεῦμα (pneuma) more often than ψυχή (psyche) to indicate the divine image in man. Paul regards man's spirit as inactive until revived and activated at regeneration. (1 Cor. 2:11; 15:45)¹³ What he does not tell us is whether the spirit is present from conception onwards.

Apologists point to passages like Psalm 139:15–16 and Job 8:10–12, which indicate that God knows a person in the womb and is involved in the process of embryonic development to show that God's Spirit is present in the embryo from the beginning. More specifically passages like Jer. 1:5, Gal. 1:15, Luke 1:15, 41, are cited to prove not only that God is present within the womb, but that He chooses people before birth for His work. John Wenham writes, 'John's jumping (in the womb) is not to be equated with quickening . . . Luke is describing a special movement inspired by the Spirit.' About Luke 1:41 he writes, 'Who is it that prompts John's joy, the two-week-old embryo of Jesus, or Mary? I incline to the former.'¹⁴ I find this unconvincing. It is sufficient to explain it in terms of Divine choice and care from birth so that, ' . . . even before he was born, the hand of God was on him preparing him for his work.'¹⁵

Such passages show that God is not only the creator but also the sustainer of the universe and that He has foreknowledge. This is not enough to establish the thesis. As Rogerson points out, if we insist that an embryo is a person because God is involved, what do we say about spontaneous abortions? If they had been named by God, why didn't they live? Surely we only know that an embryo is a person in

11. F. D. Kidner, *Genesis* 51 (1967); cf. J. I. Packer in B. N. Kaye and G. J. Wenham, *Law, Morality and the Bible* 169–171 (1978).

12. Cf. E. Jacob and F. Baumgartel in G. Kittel and G. Friedrich, *Theological Dictionary of the New Testament*, 9. 608–631; 6.359–368. (E.T. 1964–1974)

13. Cf. D. Guthrie, *New Testament Theology*, 165 (1981).

14. G. Wenham in *Abortion: The Biblical and Medical Challenges* 5. (1983).

15. I. H. Marshall, *The Gospel of Luke*, 58 (1978).

16. Cf. R. F. R. Gardner, *Abortion: The Personal Dilemma*, 126 (1972).

retrospect. A live-born child can sue for damages suffered in utero, but a still-born child cannot sue simply because it is not a person.

It is true that the Bible prohibits killing (Ex. 20:13) because man is made in the image of God (Gen. 9:6.) But this too must be balanced by the fact that on occasions, God also commanded that whole groups of people, children included, should be exterminated. (Josh. 10:40; 1 Sam. 15:2.) Even if it is possible to justify such destruction,¹⁷ it nevertheless proves that the sixth commandment is not absolute. The Royal College of Gynaecologists' Report asks, 'Knowing as we do that in the natural process large numbers of fertilised ova are lost before implantation, it is morally unconvincing to claim absolute inviolability for an organism with which nature itself is so prodigal.' It will not do to reply, with Dr. Iglesias, that, 'We are moral beings. Physical nature is not'¹⁸ if we believe that God is in control of nature. If God can dispose of embryos and cause handicaps (Ex. 4:11) and is wholly good, why should we not be permitted to dispose of them?¹⁹

Philosophical Arguments

1. *Persons*

It is generally assumed that embryos are either persons or potential persons and that we all know what a person is, but this is far from certain. The philosophical literature on the subject is considerable and I am indebted to Michael Tooley's monumental survey²⁰ for what follows:

In what sense could we claim that embryos are persons? Is membership of the species 'Homo sapiens' sufficient? If a baby is born without a brain (anencephaly) would we want to say that it is a person? Doesn't an individual need to possess some attribute, like awareness, desires, memories or even self-consciousness or rationality? Even if we limit the list to awareness, memory and the ability to discriminate are these not also possessed by robots and artificial intelligences? Would we want to call these persons? If we include a sense of pain and limited visual discrimination then these are possessed by all vertebrates, but yet cannot be found in an embryo. One thing that distinguishes mankind from other animals is the capacity for imitative learning yet this does not come much

17. Cf. J. W. Wenham, *The Goodness of God*, 123-127 (1974).

18. T. Iglesias 'Social and Ethical Aspects of IVF' in *Test-Tube Babies: A Christian View*, 92 (1984).

19. Cf. R. S. Luhman, 'Belief in God and the Problem of Suffering' *Evangelical Quarterly* (1985) 57. 330.

20. M. Tooley, *Abortion and Infanticide* (1983).

before the second year of life. On purely scientific grounds there seems little support for the idea that the embryo is a person.

Professor O'Donovan in his article²¹ stresses that there are no 'criteria of personhood' independent of personal engagement. A person is known only in relationships. How can one have a relationship with an embryo? For Tooley, a person must be an agent and possess the concept of himself as having a variety of inter-related desires at different times.

Could not an embryo be a person because it has a mind/soul and is created in the image of God? Besides the problem of what constitutes the mind or soul and whether it can be separated from the brain,²² there is the question of when the soul/mind begins. From fertilisation until implantation the fertilised egg (zygote) is totipotent, that is each cell in the morula could become an embryo if implanted in the uterine wall. Indeed identical twins can develop during this time. If this occurred would we want to say that the soul of the fertilised ovum had split into two? We know that many embryos do not grow to maturity but are spontaneously aborted. If all these aborted embryos are persons with souls then, as Gardner observes, the majority of human beings in heaven will not have reached recognised human form.

Even if it were possible to maintain from fertilisation all humans have souls this of itself would not imply that we should not allow them to die, because as Tooley shows, if post-mortem life is superior to that on earth we would be doing them a favour. The same would not apply to mature human beings who already have established relationships on earth. The only objection would be if we adopted the view that unbaptised or unsaved infants or unborn children are consigned to hell or limbo. It is interesting to note that David, whose psalm of contrition has been thought to give credence to this view, expressed the hope that he would one day see Bathsheba's dead child in a future life.

1. *Potential Persons and Possible Persons*

It is often argued that because it is not possible to make any clear divisions between the fertilisation of the egg and the birth of a child there can be no distinctions drawn. Thus it is maintained that the zygote, although perhaps not a person in its own right, is nevertheless

21. O. O'Donovan 'Again: Who is a Person?' in Channer (ref. 7).

22. Cf. H. D. Lewis, *The Elusive Mind* (1969) R. S. Luhman, 'Belief in God and Life after Death' *Faith and Thought* (1983) 110 156-185.

a potential person and should not be tampered with. But why stop at fertilisation? Gardner quotes Means, who says that at fertilisation all that happens is that, '... two squads of 23 chromosomes each perform a nimble quadrille on the genetic drill-field ... There is no more human life present after this rearrangement than there was before.' More questionably Glover claims that if it is a cake that we are after it doesn't matter whether the ingredients are thrown away before or after mixing.²³ In fact, of course, the genetic constitution of the zygote is different from that of the ovum and sperm and the zygote will develop into an adult unless prevented. However neither an embryo nor a foetus can survive on its own. In fact infancy needs to be fairly advanced in humans before we can say they are truly visible.

Professor Hare once suggested that if it is better to be alive than not have the opportunity to live then there is an obligation upon people to procreate as many children as possible. But is it possible to deny rights to a possible person if we fail to procreate him? Derek Parfit puts forward another case. A woman could conceive now with the knowledge that her baby may be deformed, but could wait three months and conceive a normal child. Would we want to say that by failing to give birth to the first child that she has deprived him of life when she could have a different child who would have a better life? Although the outcome of destroying a potential child and having another is the same as not destroying the first child, we intuitively know that a potential person is different from a possible one. It is never right to treat even potential persons as means only but always as ends.

Possible Responses

1. *Banning Experiments*

The Care Trust in their submission to Warnock stated, 'We believe that the vision of a society from which disease and disability has been banished is a noble one. But no advance towards this end should ever be undertaken if it demands the discarding or destruction of human individuals en route ...'²⁴ They were sympathetic to the relief of infertility but not at the price of embryo research.

If we adopt the view that it is never right to kill an embryo, then we not only ban experiments but also abortion and the use of the I.U.D. contraceptive. At most we would allow an abortion if the life of the

23. J. Glover, *Causing Death and Saving Life*, 122 (1977).

24. *Human Fertilisation and Embryology* 32 (1983).

mother was in danger on the principle of double effect, that is that we intend to save the life of the mother but, as a consequence, the life of the foetus is unintentionally destroyed. The danger of this approach is that it elevates the embryo and gives it precedence over existing persons.²⁵

A moderate position is adopted by the Norfolk Clinic, Virginia, U.S.A. whose practice is only to reinsert all fertilised eggs. A practical difficulty could arise if an ovum was found on fertilisation to have a genetic abnormality. Although it could possibly be justified to advise a pregnant woman whose child might be born with a genetic abnormality to go on with the pregnancy, it cannot ever be morally right knowingly to reinsert a genetically abnormal embryo into a woman's body. In such a case it would be more advantageous to allow research on the embryo in the hope that any knowledge gained would prevent similar abnormalities recurring in the future.

2. *Limited Experimentation*

Gareth Jones said of his critics' position, 'To adopt a position that deviates from the view that the embryo is anything less than a person demanding complete protection under every conceivable circumstance is to exclude one automatically from the domain of evangelicalism.' He then asks what meaning this has '... in the midst of some of the horrendous dilemmas which doctors and families have to face.'²⁶

The moderate view adopted by the Warnock Committee is to limit research to a fourteen day period and severely restrict the type of research undertaken. Many see this as unworkable and see doctors Frankenstein, Moreau and Mengele waiting in the wings ready to do unmentionable things. Reference is often made back to the Nazi era where it is said that it all started with doctors claiming that there was such a thing as a life not worth living. This led on to the taking of life of the chronically sick followed by those not wanted for racial or ideological reasons. Professor Dawidowicz believes a fear of returning to such a situation is groundless and is based on a misunderstanding of Nazism. The so-called euthanasia only had meaning in terms of 'the purity of the nation (Volk)' interpreted in ideological, not real terms.²⁷

Man is made in the image of God but that image is tarnished and doctors and scientists have not always acted in a responsible manner; the abuses of animal experimentation and the workings of the Abortion Act are ample testimony to this. Part of the reason no doubt

25. M. Kohl, *The Morality of Killing* 40 (1974).

26. D. G. Jones (ref. 1) 174-175.

27. See H. Kuhse and P. Singer, *Should the Baby Live?* 93-95 (1985).

is the bad wording of the laws and the lack of adequate supervision. There is always a danger that men will seek to 'play God' but as David Hume long ago pointed out, '... If it is for God alone to decide when we shall live and when we shall die then we 'play God' just as much when we cure people as when we kill them.' Man was also given dominion over nature, including his own, and the responsibility of using God given knowledge for the benefit of all of God's creatures. Sometimes this will mean making decisions as to who should die and who should live and perhaps whether to do research on embryos. If we are to play God let us do so in the spirit of Newton, who sought to think God's thoughts after Him.



Robert and Margaret Clark

Robert E. D. Clark

Robert Clark had a distinguished ancestry. His grandfather, also Robert, was a pioneer Church Missionary Society worker in the Panjab,^{1,2} and his father, Hamlet E. Clark, though originally trained as a barrister, became ordained later, and also served in India. Hamlet Clark was a colleague of Theodore Pennell, who founded the Bannu and Peshawar hospitals.³ Robert's mother was Edith Panton, the sister of the minister of Frinton Congregationalist Church. Both her sons, Robert and Roger were educated at St. Lawrence's College, Ramsgate. Roger went on to qualify in medicine from the London Hospital, whereas Robert's gifts were inclined more to science, and he studied chemistry at Cambridge.

It is at this point that most of our contributors take up the story. It appears that a Fellowship at Cambridge University was denied Robert, and he subsequently became a lecturer in the Cambridge Polytechnic. It is evident that his influence in matters both scientific and spiritual was considerable, as judged by the memories that follow. The anecdotes come from associates, colleagues, and fellow members of the Cambridge Inter-Collegiate Christian Union (CICCU), and together these build up a picture of a personality who was unique, Christ-centred, and outward-looking: truly a champion for truth.

1. H. M. Clark *Robert Clark of the Panjab*, A. Melrose, London (1907).

2. A. M. Pennell *Pennell of the Afghan Frontier*, Seeley, Service and Co., London, p.49 (1914).

3. J. Murray *Proclaiming the Good News*, Hodder and Stoughton pp.104-105 (1985).

Memories and Appreciations

At school I was some two years junior to Robert Clark (always known at school as Neddy Clark). He was a most sincere and conscientious Christian, but somewhat unconventional and even 'odd'. He used, for example, to hold doors open for small fags rather than expect them to hold doors open for him; and he circulated a paper on Sunday afternoons round Big School (when all those below a certain seniority were supposed to be quiet, writing letters home or reading), stating that there would be a talk by him on the Second Advent 'in classroom X, at 5.30 (*D.V.*)'—which struck boys as a little odd when the proposed talk was to be only about an hour later!

We used sometimes to have a stroll together just before going to bed, and I well remember one evening, when I was trying to do some prep, that he came and asked me if I would go for a short walk. He seemed rather insistent, so I said 'yes'; and he led me to a little copse where we sat down to talk. He then informed me that he had got mumps (which caused me to jump a yard or two away!) but that he had received a letter from his mother in India telling him about some wonderfully miraculous healings. So he wanted me to lay hands on him with that end in view. I felt unable to do this, but said that I would pray with him that God's will would be done—and I remember being somewhat intrigued about what would be the situation next morning (I was very young!). What in fact happened was that I received a note from him to say that, to his great surprise, he woke up still having mumps. He felt it must be due to his lack of faith, and he was off to the sanatorium. On the supposition that there was any lack of faith, however, it was certainly mine not his!

When I went up to Cambridge he was already a scholar at St John's College reading science, but with a lively interest in magic, demon possession and haunted houses—on the subject of which he had read pretty well every book in the University Library. There was a famous story that he took a fellow-student to a CICCUM mission run by Willy Nicholson, and then to have coffee after the meeting. When Robert asked him what he thought of the meeting, he said he was very impressed. 'Well, what are you going to do about it?' asked Robert. When his friend replied 'I must give it some serious thought', Robert said 'Yes, quite right; how long will it take you? Forty-five minutes? I'll wait'. He did wait. His friend came to the Lord, was subsequently ordained, and lived a very fruitful life. In later testimonials, the student concerned claimed that he had been distinctly 'wild' before.

Robert always did just a *little* science work on Sunday, in order to demonstrate that he was not under the Law, or a strict Sabbatarian. There was a rumour (possibly apocryphal) that one weekday he had to read the lesson in Chapel. No-one was present, except the Dean and Neddy. The story goes that the Dean said 'Dearly-beloved Robert Clark, the scripture moveth you and me in sundry places . . .', with the jibe that the scripture would be much more likely to move Neddy than the Dean.

NORMAN ANDERSON

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I was closer to Robert than many, because he had some individual traits, and undergraduates tended to find him a little 'odd'. He was generally known as 'Neddie', though I always called him 'RED'. Whenever he had written a paper, a book, and so on, I immediately, and usually justifiably, wrote him an encouraging and flattering note. To the end, I called his attention to things to deal with in the Victoria Institute, etc. I sometimes corrected him in scientific and apologetic matters.

Both Roger and Robert were high in form-lists at school, in all aspects of science, and both won prizes. In their vacations, they experimented and collected natural history specimens. They would lay on a tea, with iced-buns etc. as a bribe to get boys to come and hear the lectures. For example, on several evenings in the hostel a meal would be laid on, some 12 medicos would turn up and sleep through a lecture on beetles. The lectures went over the audience's heads—but they enjoyed the buns.

Mother indulged these initiatives and 'RED' had a corrugated iron hut in the garden for his 'Laboratory'. Mother was one day preparing lunch when there was an almighty explosion. She looked out. The hut was down, with thick black smoke rising from it. She rushed down the garden, fearing the worst, when RED crawled out, covered in grime. 'Sorry, Mother. I had forgotten that effect, when X meets Y'. Roger also had several hair-raising escapes when pursuing natural history.

Robert, there is no doubt, was a genius, and moreover had the capacity to make complicated things clear, and to illustrate well. In that respect, he was the right lecturer and supervisor for the Polytechnic centre of teachers, and must have helped many ordinary students to understand the more intricate parts of organic and bio-chemistry.

The first of RED's books, *Conscious and Unconscious Sin* was a realistic approach to the problem of sanctification, a subject too

lightly treated by some evangelicals. The CICCUC gently laughed 'Neddie's new book is all about unconscious sin—as if there is such a thing.' The reviewers in the more serious theological journals thought differently, though sales were not large. Both Dr. T. R. Glover, the Public Orator at Cambridge, and Dr. Martin Lloyd-Jones thought it was an important insight, and a critique of some current errors. RED's attempt to introduce his uncle's ideas about eternal punishment, and certain prophecy matters led to his views being considered bizarre. It was here that I started writing encouraging notes. One book which did receive attention from CICCUC and some students was *The Universe and God*, 1939. This was replaced by *The Universe—Plan or Accident?*, in 1949 which ran to three editions. Other writings such as *'Darwin, before and after'* we tried to circulate around, but it was not easy, and the titles were not always the best. The Darwinism controversy and the 'spirit' of the scientific world have taken a different view from our student days. But—RED did a good job; almost a solo war of apologetics. RED battled on all his life against the tide, which is now turning, and there is no doubt he strengthened, and saved, the faith of many young Christians. I am sure that Glover was right; we failed sufficiently to back a genius, and undervalued him.

Once, when I called on him not long after World War II, he had begun a collection of everything bearing upon science and religion. He had cuttings and photocopies (early ones) and the beginning of a large system of classification. Then he said 'Doug, I've stopped buying all but a few books. As soon as they come out, I copy them here.' He was building a new library round the walls of his room (*pace* copyright). He developed the cuttings and recording system to considerable proportions.

Several times, when for IVF, medical or apologetic reasons I wanted to discuss with a chemist certain new problems, I got some help from Oliver Barclay's research scientists. If I really hadn't got it clear, I'd ask RED. He came back in a flash, and made it quite clear. From 1935 onwards we should have used RED as a 'super-clarifier' of science and religion.

DOUGLAS JOHNSON

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Although I went to school with Robert at St Lawrence's, and we were in the same dormitory for about five years, I have only had spasmodic touches with him since then. He was in the congregation of St Paul's, Cambridge at the time when I was vicar for 10 years, and we saw a great deal of him, his wife Margaret, and son Stephen. However, it was

not until he moved to Bar Hill that once again we caught up with him.

At school he was always known as the greatest authority on everything to do with the Bible, and his quiet witness was always greatly respected. At Cambridge his scientific work commanded respect from those in his college and the University, and his books have been a tremendous help to many Christians students over the years.

Robert had a difficult time in the later years of his wife's life when she had virtually a breakdown. Robert found it difficult to know how to look after her. After her death, we used to call on him as often as we could, give what assistance we could in sorting out his files, and helping him to keep the house in an ordered state. He had a small dachshund which he greatly loved, but which scared the life out of visitors. His study was full of every kind of electrical and technological gadget; he was a methodical person, storing away all the information he received. He never liked leaving home, so that he and his son, living in Scotland, did not see much of each other.

KENNETH HOOKER

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My memories of Robert Clark (we gave him a more familiar name in those days!) go back to 1927 when he was two years my senior in the CICCUC and I was somewhat out of my depth, not having a scientific mind, and finding him much more profound than I was. I seem to remember him writing a very original pamphlet on the difference between conscious and unconscious sin. I could not quite follow him.

But the chief story of those days was his mode of personal evangelism, unique to him, like so much else. The evangelist at the time was the fiery Irishman Willie Nicholson (he who offended the local R.C. priest by some remarks about the benefits that would accrue if the Pope got married). RED took along to one of the services an undergraduate of his acquaintance who had made a reputation for himself for living it up and as a result had been made an honorary member of several College drinking clubs besides his own. On returning from the powerful evangelistic sermon, delivered in Holy Trinity Church, RED took his companion back to his rooms ostensibly for coffee. Before serving it up, however, he sat him down by the fire and sat himself opposite him, took out his watch, put it on his knee, and said 'I'll give you five minutes, . . . to decide in.' A tense silence followed as the minutes passed, and then the break came. Both men ended up on their knees in prayer, and the wild young 'blood' went on to become an ordained minister of that Gospel which had been so

uniquely presented to him by a highly unorthodox preacher and a most unusual fellow-undergraduate.

A notable subject in which RED displayed his originality, though retaining his evangelical convictions, was in his defence of Christian pacifism. His booklet 'Does the Bible teach Pacifism' is, to the writer, as convincing an argument as could be wished for in its logical treatment of the subject. The Old Testament toleration of warfare is shown to be 'for the hardness of men's hearts', and Dr. Clark, like many others, could find no support for war and violence in the New Testament. It is surprising that few evangelicals seem to have followed him, at least publicly.

H. E. HOPKINS

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I first met Robert in 1924 at Cambridge, where he (successfully) and I (unsuccessfully) were trying for entrance scholarships at St. John's College. I did however manage to get admission as a commoner—it was a lot easier then than now—so we met again when we went up in 1925. During the next three years I got to know Robert well, because for most of the time we were reading similar courses, and also because of our common interest in the Christian Faith. In his case it was more than an interest; it was a whole-hearted dedication. In that respect, as well as in academic ability and physical stature, Robert stood head and shoulders above most of his contemporaries. He was not only a very good scientist but also a very good evangelist.

As such an evangelist, he sought, as opportunity offered, to convert to Christianity those with whom he came in contact, an activity which must have been very costly to him because of his shy and retiring disposition. However, he was fortified not only by his own faith, but also by others of like mind in the CICCUC, of which he was soon a prominent member. Even the Archangel Gabriel himself would have had difficulties in producing conversions on a large scale, so it is not surprising that the activities of CICCUC were unfruitful except in a few cases. Robert, however, was never discouraged. If he was rebuffed, as he often was in a polite way, he always answered with exquisite courtesy and beatific smile. As far as I know he was never actually reviled, but if he had been, he would certainly not have reviled again. However, what might have appeared a lack of success was not necessarily so; I can testify from my own experience, although I never joined CICCUC, that Robert and his friends did valuable work in 'seed-sowing'.

During the May Term of 1926, the General Strike took place. Robert did not volunteer to drive buses or railway engines, as some

undergraduates did. But one evening he decided to visit, with a few of us in support, the 'working-class' district of Cambridge, to see what, if anything, was going on. We came across a group of men on a street-corner who seemed to be either strikers or sympathizers. In no time at all Robert was addressing them in forthright terms. Whether it occurred to him that in doing so he was courting the fate of Paul at Ephesus, I do not know, but if so, it did not deter him.

Yes, he knew the coal-miners had a genuine grievance, and that there was much poverty and hardship in those communities; something ought to be done about it, but that did not justify the use of violence, still less the attempt, by those on strike, to disrupt public life and undermine the lawful government of the country. Those who took such action did so at their peril because they were answerable to God, etc. etc. Whether Robert actually quoted Romans chapter 13 to his awe-struck audience I cannot remember, but that was the gist of his discourse. Even we who knew him were astonished at his courage and his audience was so taken aback by the complete unexpectedness of it all—this young man of commanding height and glinting spectacles lecturing them in this way—that they listened with open mouths and an almost complete absence of heckling. We all parted good friends.

In 1928 most of us went down with our second-class degrees, while



Graduation, June 1928

Robert, with his double-first (sic) stayed on to do a Ph.D. in Chemistry, successfully completed in 1931. The fact that he was not elected to a Fellowship was a disappointment to him, and to his friends also, naturally, but he accepted it with equanimity. If that was the Lord's will, then so be it. It is unlikely that his failure to acquire a fellowship was due to lack of academic excellence. There may have been keen competition, or perhaps his rather idiosyncratic personality told against him; he was not a typical 'high table' man.

I kept in touch with Robert intermittently, and was pleased to receive from him in 1934 a complimentary copy of *Conscious and Unconscious Sin*, his first publication. It is perhaps no mere coincidence that Robert's 'Opus 1' should have been a treatise on sin, because this was one of the chief pre-occupations of CICCUC at that time, which tended to be over-concerned with what was 'lawful' and what was not, enjoining its conclusions on all who would listen. In a delightful review of the history of CICCUC, Robert poked gentle fun at the quirks of his youth, recalling that smoking was 'semi-sinful'. (The review is published in this issue. (Ed))

I found the book, although lucid and well-organised, heavy-going, and in conversation with Robert many years later, a reference to it produced from Robert a deprecatory smile. He did not disown his youthful work, but regarded it as immature, and perhaps scarcely worth the trouble. Like most intelligent Christians, he acquired new insights with the passage of time, and like a good scientist, did not hesitate to modify his theological position accordingly. In particular, he discarded the doctrine of endless punishment, zealously propounded by CICCUC and other evangelicals of that era, and came to agree with his life-long friend Dr Basil Atkinson and many other intellectuals, that the doctrine of Conditional Immortality, though not without its difficulties, corresponded more closely to the teaching of Scripture than did the alternatives. He even had some sympathy with Universalism, properly understood, but regarded it as non-proven.

Although he did not work within the confines of the University after completion of his Ph.D., Robert spent most of his life in Cambridge. Until he retired, he was a lecturer at the College of Arts and Technology. In the CICCUC, he enrolled Donald Coggan when the latter arrived as a freshman in 1929. He also came to know John Hapgood, taking him as a lodger when a Ph.D. student; Robert by now was married. He found his fellow-scientist and fellow-Christian congenial company. He became sufficiently friendly with him, such that when Dr Hapgood was consecrated bishop, he wrote a letter of congratulation, but at the same time chiding him gently for taking the oath in the Consecration Service, contrary to Matthew, 5:34-37.

I understood from Robert that the reproof was accepted with grace and humility, with a defence along the lines of Naaman bowing himself in the house of Rimmon.

Those who knew Robert often wondered at the vast amount of work that he must have got through, reading and writing. It is not generally known that for many years this was carried out under a handicap. Not only was his own health not robust, but his wife became restless. This necessitated frequent moves of house, but Robert, with great patience, sought only his wife's contentment. This explains why he rarely attended Victoria Institute meetings, which was a deprivation for him. Robert never spoke much of this, but knowing of it, one marvels at his output of work, always of the highest quality.

After his wife's death, I visited him again, and was amazed to see so many books and files, all deployed in so small a space. He had a marvellous filing system, and could put his hand on anything he wanted, very quickly. In recent times I saw Robert more often than I once did, because we both used to attend an afternoon reception given annually by the Master of our College. I usually arrived first and used to wait for him to appear. Last year he did not appear, and I felt a pang as I remembered the reason. He was a great man in his way, and will certainly figure in the Celestial Honours list.

A. HOWARD WEBB

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I was once Editor of the Victoria Institute Transactions for a few years when eye trouble forced REDC to give up his editorship. Happily, he latter recovered sufficiently to take the editorship over again. All God's children are unique, but some so-to-speak are more unique than others. RED was one of these. I had known him since 1932; he took his Ph.D at Cambridge when I was an undergraduate. With his great intellectual ability he combined a singularly Christian character. A holy and humble man of God, if ever there was one.

F. F. BRUCE

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My memories of Robert Clark are of a shy and scholarly young man, clad in a B.A. gown working, I suppose, for his Ph.D, when I came up to St. John's as a freshman in 1928. I viewed him with considerable awe, for he seemed to have knowledge about so many abstract matters of which I knew precisely nothing. But he was a staunch

supporter of the activities of CICCUC and obviously a man of deep Christian commitment.

DONALD COGGAN

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When I went up to University in 1938, Robert Clark was a demonstrator in chemistry, and one of the few graduates who would support the Christian Union in Cambridge. We regarded him with a certain amount of awe. He started a discussion group in his flat, attended by a small group of, mainly, scientists who wanted to debate apologetic and philosophical issues. This was an oasis in dry ground for many of us. The Christian Union was distinctly anti-intellectual by reaction against the Student Christian Movement, and although Robert's group was considered a little odd, it certainly helped me and others. In fact I suppose the inspiration for the Research Scientists Christian Fellowship arose, in part, from it. Robert was also a member of the first small RSCF conference which I called as secretary in 1943, and he was a very important member of the RSCF for many years, coming to the conferences regularly.

Robert's books at that stage were some of the few things on science and faith which were available to people in the Inter-Varsity Fellowship. They must have had a wide influence. When, later, the RSCF started 'Current notes and abstracts on science and religion', Robert edited it for a while. It was subsequently dropped and absorbed into Christian Graduate (now Christian Arena). When space was short, he started writing for other journals, ending up with *Faith and Thought*.

Robert was a real pioneer in the field of apologetics in relation to science. He was one of the small number of people who dared to tackle the overwhelmingly liberal establishment. It must be remembered that at that time the Christian Unions were small, or non-existent, and the SCM very large in every University, almost totally dominated by a fairly radical liberalism. Many evangelicals had an inferiority complex intellectually. RED was one of the bold spirits who stood out.

OLIVER BARCLAY

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Like others, I have benefited tremendously from reading Dr. Clark's books, but there was a lighter side to him. Of all the lectures given to the Cambridge University Chemical Society during the time that I

was an officer thereof, the one which I remember still was not one of the learned ones—whether from Dr Clark or from anyone else—but his extremely successful illustrated talk on 'Fireworks'. After an historical review of his subject, siege bombardment was assisted by 'an auxiliary cat' with fireworks tied to its unfortunate tail, sent into the town; we were treated to a demonstration. Not only was this on the grand scale, in spite of its being an indoor event, but everything worked, and worked well. No doubt this is a tribute to the skill of the departmental staff, who paid for the chemicals. I don't know—the C.U.C.S. didn't. I was treasurer and should know, but several pounds' worth of magnesium were oxidised in fifteen minutes. The dry humour of the reference to the 'auxiliary cat' was typical of Dr. Clark.

JOHN MANN

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Robert Clark was my friend and correspondent for 55 years—longer than anyone I have ever known outside my family. We first met when I went with a Science scholarship to St John's College, Cambridge, in 1929. I lived for three years at the top of E staircase in the Second Court and Robert lived at the bottom of the same staircase. It was my first experience of living away from home and his many kindnesses to me and the long conversations and country walks we had together did much to make my three years in residence happy.

He lectured on Chemistry for many years, a subject in which he had done important original research. He spent much of his time reading and amassing an enormous card index summarising the information he gleaned from books and original papers. Basically a devout Christian who had specialised in organic chemistry, he took a special interest in some surprising subjects such as the history of magic, fireworks, spontaneous combustion of the 'Bleak House' type and so on. It was a surprise to hear him talk convincingly about the strange belief held by some people most of us would call cranks who believed that the Earth was flat! He did this so well that one almost believed him to be a Flat Earthist himself! He had a profound knowledge of Scripture and especially the New Testament and, though he wasn't really a linguist, he knew enough of the Greek to be able to explain the obscurest passages. The CICCUC often held meetings in his rooms, the college representative in my first year being Donald Coggan, who later became Archbishop of Canterbury.

After I qualified as a surgeon I once went on a cycling tour with Robert and a mutual friend, crossing to Antwerp and going through Belgium and the Ardennes as far as Rheims and then returning via

Paris and the war cemeteries of Flanders. It was a warm summer and we economised some nights by sleeping on the dry hay stored in country barns. Wherever we went in France there seemed to be village fairs and I well remember Robert's almost childish delight in riding in the 'dodgem cars' at these. He was about 6'4" in height and he had some difficulty in squeezing himself into the little cars!

I did not share his strong views on Pacifism and spent four happy years in the British army during World War II, but he forgave me for this and our correspondence went on in the friendliest manner! Somehow I never expected him to marry, but he did and in later life he was much saddened by the prolonged illness and early death of his wife Margaret.

During my years in the British Colonial Medical Service my wife, little daughter and I had a nice house in Bournemouth where we spent several happy leaves. Once when Robert wrote and said he would be giving a lecture in Bournemouth we invited him to lunch. This was the only time he met my family, but with his old world courtesy he fitted in nicely and enjoyed being shown over our home and took a special interest in the absurdly tame robin that lived in our front garden. My wife went to make final preparations for lunch, leaving Robert, little Pamela and me in the dining room. As the maid was about to bring in the first course Robert thanked Mrs Laycock, gave her a charming bow and made for the door! We had to point out tactfully that he had been invited to share lunch with us and perhaps he would like to say grace. It seemed that he was under the impression that the meal was over! I mention this because in spite of his very active mind and wide interests he was at times very much the 'absent-minded professor'!

We met for the last time in 1965 when I was in Cambridge for a few days. He wrote me letters and kindly supplied me with copies of *Faith and Thought* until nearly the end of his life. He was a wonderful friend and I was saddened to hear of his passing, but I know he looked forward to Heaven, which was a very real place to him.

H. T. LAYCOCK

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I knew Dr Clark from the time when I was a student at Cambridge and he a young lecturer/research worker. For part of the time we shared a flat together in Sidney Street.

Robert was a lovable person with a keen scholastic mind. From the time I first met him he had committed himself wholeheartedly to serving the Lord, and with his increased learning, to using his

scientific training to the glory of God. He rejected superficial, traditional values, and adopted a humble, simple way of life, spending all the time he could spare writing in support of the Christian faith and pointing to the harmony between true science and religion.

He had a keen sense of honesty in thinking, and was worried by the tendency even among some Christians to rationalise. His first (and in some ways his best) book was *Conscious and Unconscious Sin*, and in it he examined carefully the function of conscience and the way we sometimes accept things that are wrong without realising they are in fact sinful. The dangers of hypocrisy are as real today as they ever were, and Christian witness depends on being constantly on guard against them.

He was above all a keen student of the Bible, which he loved deeply. His most careful study was that of the gospels, and especially important to him was the Sermon on the Mount. This led naturally to his commitment to Christian pacifism which remained a guiding principle through the whole of his life, and his book *Does the Bible Teach Pacifism?* has made a considerable impact and is still one of the best sellers on the subject. Among other wrongs he exposed was swearing on oath, with its implied double standards of truth; and he stressed repeatedly the absolute need for love in relationships, and the obligation to forgive those who offend us.

I gained so much of lasting value from Robert which I can scarcely put into words. He helped me, and his other friends, to build their lives on the sure foundations of the Christian faith, with its ideals that have stood the test of time, and he tried to take in deep seriousness the commands of Jesus to those who would follow him. I treasured his friendship greatly, and will always be thankful for his life so dedicated to the service and love of God.

FRANK T. FARMER

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I venture to mention some of the health problems Robert Clark had, together with an invalid wife, as early as 1975. He spoke frankly about them when editing my manuscripts. 'I am just going into hospital for my sixth eye operation'. (January 1977)

You may like this anecdote. He was giving me good book leads, and quotes on World War I combat gases. In mentioning ammonium perchlorate, a high explosive that may have given off a little chlorine gas, he wrote 'A few years ago, teaching some students from Hopkin and Williams near here, where perchloric acid is made, I learned that they were using a hammer and chisel. They had no idea it was an

explosive' (needing a detonator). He continues '... after consultation with their London chemists, the company started to take a good deal more care with the stuff—used to make very deep blue stars for rockets and Roman candles. After World War I, ten or twenty tons of it were exploded, and the result was the discovery of the temperature inflection in the high atmosphere, the silent zones with much more noise much further away, being investigated'.

The above is punctuated just as he had it. I can only imagine what the last line or two conveys, but the high, hollow, sound of fireworks comes to mind. He added that the scientific journals were full of the above experiment.

In keeping with this, he wrote to me in October 1977 (I was in deep anxiety, and trying my hand at lifesize medallic portrait art, which I do well, and for which there is zero market): 'I am afraid that I cannot help with regard to bas-relief sculptures; pyrotechny was more in my line. I have lectured on this quite often.'

In an early letter, during a year of heavy correspondence on technicalities concerning my essay on 'Auschwitz gas' he told me that his very first job, after college, was concerned with combat gas cylinders—phosgene I believe—under William Pope at Cambridge. Professor Pope developed the clever short-cut to circumvent dangers in the production of mustard-gas in 1918, the Germans having already a full year's lead in manufacture.

D. D. BRODEUR

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The first of Dr. Clark's books which I read was *Darwin, before and after*, and at that time I, as a student, was endeavouring to understand better the relationship of Christianity, the Bible, and science—which I was studying. The book made a great impact, and this remains today in the views I hold regarding the subject of creation. Others of his books which have touched me have been, *Christian Belief and Science*, *Science and Christianity—a partnership*, and *God beyond nature*. Personally, I have distributed dozens of copies of Dr. Clark's writings, particularly the latter two books. On the whole, his works have served to strengthen faith in the Creator, and to inspire respect for His creation. I personally am a better Christian and scientist because of reading his material.

WAYNE FRAIR

* * * * *

It came as a great shock when I learned of the death of my life-long friend, Dr. Clark. I first met him in 1942 when I was only 15 years old, in the fourth form at Bournemouth School for Boys. At that time Dr. Clark was a chemistry master who taught the first and second year sixth forms. My chemistry master, A. Spencer White, must have mentioned that I was very good at chemistry, for Dr. Clark invited me to carry out experiments along with the older boys in the sixth forms, which I considered a great honour. From that point onward we became firm friends, even though I was twenty years younger.

During the dark days of 1942-45, when the outcome of World War II was by no means certain, Dr. Clark encouraged a number of boys in the choice of a career in science, by forming a science society which met at his house once a week during term-time, between 7 and 9 p.m. The society was jokingly named 'quam minimum labor', or 'quam' for short, and was regularly attended by about 12-15 boys aged 16-19. Each of the attendees would read 'papers' of about 30 minutes' duration on any scientific subject in which they were personally interested. Dr. Clark would also present papers on a variety of subjects (e.g. fireworks, theology and science, evolution, alchemy, magic, witchcraft, etc.), all of which were interesting and educational. Sometimes there were slide-shows, using his magic lantern. Minutes of the meetings were kept, and I still have the minutes book.

After the meetings we would converse informally for an hour or so on scientific topics, and Dr. Clark would show us some of his books. These meetings greatly stimulated the scientifically serious students, most of whom went on to universities and later became academic or industrial scientists.

Although I have many happy memories of Dr. Clark, I shall relate only one or two by way of illustration of his great humanity and kindness.

In 1941 I set up a home-laboratory in our garden shed. Dr. Clark was interested in fireworks, and was instrumental in purchasing various chemicals for some of the boys, including me. One evening (when I was only 15) I had prepared a mixture of barium chlorate and magnesium powder, 2-3 ounces of which I placed in a small glass bottle fitted with a screw cap through which I threaded a 1 foot long piece of magnesium ribbon to act as the fuse. Having buried the bottle in the ground, several attempts to make the fuse burn failed. It would only sputter and then go out. It was getting dark and my Mother was calling me to supper. The fuse was down to about three inches, so I cautiously brought my little spirit lamp close to the end to re-light the fuse. There was a blinding flash and a deafening

explosion. As my face was only about two feet away I was temporarily blinded, as well as having my face scorched and hair burned off. The explosion left a crater over two feet wide and a foot deep in the earth! I was in no condition to go to school next day. Dr. Clark heard about the accident and immediately came to my house to see me. He pleaded with my parents to let me continue with chemistry, saying that 'every good chemist has a few explosions in his career.' He then gave me £2—a lot of money to a poorly paid teacher in those days—to set up a proper laboratory in my shed. This is just one example of his great humanity and kindness. I, in turn, pledged to Dr. Clark and my parents that I would not make any more explosives, but would pursue safer experiments. This event was, I believe, a turning point in my career, as it not only brought Dr. Clark and myself closer as friends, but confirmed my desire to become a scientist.

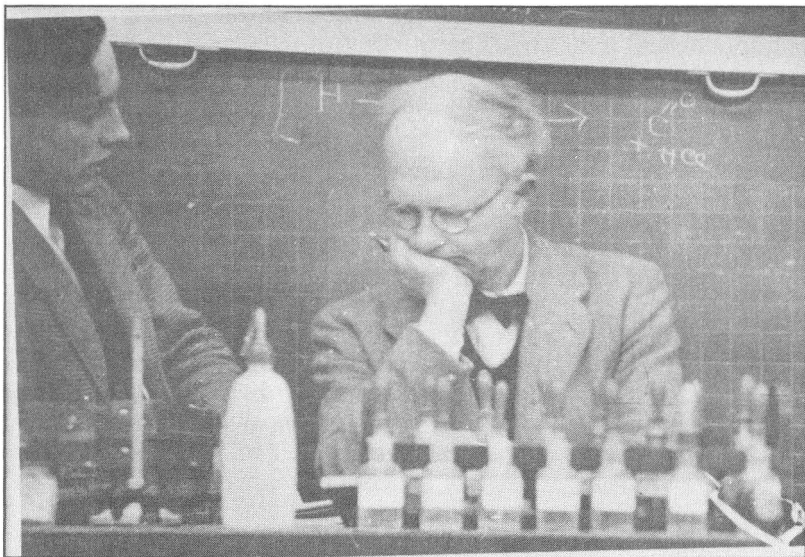
In the first and second year sixth forms, Dr. Clark taught chemistry and certain parts of the physics course (mainly magnetism, electrostatics, and electricity). He was an excellent teacher, extremely knowledgeable in his subjects and, like all good teachers, his lectures resulted in a good set of notes for the student. I still have my notes on chemistry and physics, as well as the laboratory notebooks. Even now, after all these years, I occasionally consult them.

After leaving Bournemouth School in 1945, just as the War ended, I lost contact with Dr. Clark, but in 1955, while carrying out a literature search, I came across his name in Chemical Abstracts. The address was given as Cambridge Technical College, so I immediately wrote to him there. Within a few days I received a very nice letter, and our friendship continued from that time until his death in November, 1984.

We published two papers jointly (in the *Journal of Chemical Education*, and in the *Journal of Organic Chemistry*) on a chemical reagent in which Robert had always been interested. I also arranged for the manufacture and sale of this analytical reagent in the United States and Canada by a chemical company in New Jersey, from which Robert derived a royalty on sales.

We corresponded regularly through the years, and Robert followed my career with interest. I last saw him, Mrs. Clark, and their only son, Stephen, when I visited Cambridge during a business trip in 1967. Robert had not changed that much, and was as friendly as ever.

There is no doubt that my long friendship with Robert Clark significantly influenced my choice of a career, as well as my outlook on life as a Christian. Robert was a deeply religious man, and we frequently discussed matters of a religious nature in our correspondence. I keep a photograph of Robert, myself and the other boys of the second year sixth form (taken in 1945) on my office wall. His



"Taken Unawares", Cambridge, February 1956

Photo: Copyright © The University of Newcastle upon Tyne

passing was a great loss, and I miss him very much. He was an excellent teacher, a devout and great man, and a very dear friend. He used to say that we shall all meet again in Heaven, and I look forward to it, when the time comes.

R. G. NEVILLE

* * * * *

I first met Robert Clark in the late 1940s when he was still a bachelor and lived in a minute flat in Sidney Sussex Street, Cambridge. His main living-room was full of electrical and chemical apparatus in weird profusion, and just below the ceiling was a large screen of wire netting which could be charged up to several tens of thousands of volts by means of a huge induction coil. This was Robert's device for removing the negative or positive ions (I forget which) from the atmosphere in order to relieve the feelings of oppressiveness before a thunderstorm. Unfortunately it also had the effect of interfering with all the radios in the neighbourhood, so it was not much used. This was perhaps just as well since the highly charged screen was within easy touching distance.

When, a year or so later, I went to lodge with Robert, now married,

similar scientific apparatus filled the whole of his front room and was only prevented from engulfing the rest of the house by Margaret's determination to preserve a semblance of order.

He was a marvellously stimulating person to live with. His wide reading in odd literature ensured that he was always bursting with out-of-the-way information. This, coupled with the essential simplicity of his belief, enabled him to indulge in a sort of running commentary on human absurdity. I disagreed with much of what he said, but nobody could have wished for a more stimulating education or for a clearer example of simple Christian sincerity.

I was living with the family when, on February 21st, 1950, he had his first detached retina, a shattering blow to someone whose whole life revolved around books and experiments. Characteristically, he accepted it with complete trust in God and as he slowly began to recover some vision he invented various devices for making reading easier. Margaret, I suspect, suffered more than he did, since her reaction to problems tended to be depressive whereas Robert seldom lost his basic cheerfulness.

We were a strange household—in many ways wildly eccentric. Yet looking back on it 35 years later I am conscious of a high degree of Christian integrity.

JOHN HAPGOOD

* * * * *

With the death of Robert Clark another of one of my best and oldest friends has passed away. We first came together in our days in Cambridge when he, like so many other sincere Christians, tried to enroll me in one or other of the various evangelical organizations which were common features of university life. He was not successful, and I fear he found me a very trying person. In many ways, however, we were rather similar. We both were very active people with immense curiosity and inquiring minds. Robert had solved many of his most acute problems since his faith in God and the Christian message had inspired his life and thought from the early days until the end. I had no such faith. Before I was twenty I had lost the little faith I had in the existence of God and the story of the incarnation. Not only did I doubt the *truth* of religious messages: it seemed to me there were too many religions and too many messages. For instance, the God of the Old Testament was hardly the kind of Person who could command respect, let alone love. Yet it was soon apparent to me that Robert held different views and he never showed how my teasing him about a talking donkey and the Lord's part in the massacre of the

Amalekites pained him as much as it amused me. He gradually realized, I think, that we had much more in common than we had thought. Moreover, Robert's knowledge and search for truth was infectious, and our passion for books, libraries and the construction of gadgets brought us closer together. I began to see that Robert was essentially a good man trying, and succeeding, to live the good life. What clearly supported him was his faith which, to his sorrow, I completely lacked. As was said of Henry Sidgwick, I had grave doubts about everything. It was a pleasure for Robert that I had doubts about certain evolutionary theories and similar doubts about the claims of spiritualists, believers in reincarnation and belief in the survival of personality after death. On the other hand, although an Honorary Associate of the Rationalist Press Association, I am not an atheist since such implies belief that there is no God and any 'belief' is as distasteful to me as it was essential to Robert.

As the years passed my old friend and I kept in touch and he used to send me some of his brilliant reviews in *Faith and Thought* to which I looked forward with pleasure as many of them dealt with problems of the paranormal which was one of my special studies. Our friendship increased and our letters indicated a warmth of feeling which came from the heart. He would begin by writing 'My very dear Ding' and I would end by sending my best wishes and tokens of affection and love.

E. J. DINGWALL

* * * * *

I had an immense admiration for Robert's power of reducing complex things to simple terms over a vast range of knowledge. He had an ability shared by few scientists and fewer theologians to write lucidly and profoundly in both their fields.

His modest five-page note in our first newsletter on 'Two Views of God and His World' struck me as a theological contribution of first-class importance. Critics of Clark were inclined to label him as a semi-deist, because he believed that God had given laws to his universe, with which he could be properly said at times to 'interfere'; whereas, they contended, God is at work all the time at every point in the natural order, working both in a usual way and occasionally in an unusual way. Clark's note outlines the reasons for believing in a God-given suspendable natural law and for disbelieving in God's immediate concern with every particle in the universe. He might (had he not had a deep aversion to unnecessary technical jargon!) have

characterised the view he opposed as semi-pentheism. Pure theism must steer its way between semi-deism and semi-pentheism.

May I suggest that this innocent-looking little note written at the very end of Robert Clark's life may be given the more permanent place that it deserves in the memorial volume (p. 189).

JOHN WENHAM

* * * * *

Faith and Thought published in 1971 (Volume 99, page 43) a paper by Professor Hirst as one contribution to a symposium on Education at the Victoria Institute's annual meeting. The venue of the gathering is given as University College, London. I cannot remember whether we went as far as Tavistock Square for lunch, but there is a clear picture in my mind that I walked with RED Clark, who was otherwise unaccompanied. I ventured, somewhat tentatively, to say 'I think Professor Hirst is throwing out the baby with the bath-water'. Robert immediately responded 'Why don't you write and say so?'. I simply read it through, line by line, and applied a plain man's critical razor to each point which seemed open to question. After some editorial revision by Robert, my paper finally emerged. (Page 55 of the same issue.) I was of course venturing into a field in which I had no experience. RED must have judged my effort worthy of the journal.

I mention one other encounter. The *Harvester*, official house-journal of the Brethren, accepted a suggestion of mine to run a series on Christian Destiny; I was given the task of collecting contributions. I asked Robert Clark to write about the physicist's view of the 'end', offering as a caption 'Heaven and Earth shall flee away'. In the event, the article appeared as 'A New Heaven and a New Earth'. I did not know Robert was pondering a full exposition of the book of Revelation. I was surprised to discover him to be a literalist in his understanding, to find him prepared to align his deeply fundamental understanding of physics with a literal view of the detail in Revelation.

It is, indeed, surprising to find one like Robert, with such a piercingly clear insight into the essentials of such a vast range of natural science issues, idiosyncratic on minor issues. He was a convinced pacifist (though I do not mean that 20th century war, and preparation for war is a minor issue; only that pure pacifism is a minority cause). Like Robert, I was a conscientious objector in the last war, but shifted towards its close to non-combatant khaki, because resistance to Hitler seemed right. But Robert argued from Scripture for polygamy, was disposed towards substance in para-psychology, and Uri Geller spoon-bending. He brought David Brodeur into *Faith*

and Thought with two major papers which traced the active influence of evangelical Second-Advent believers in producing the present State of Israel. This seemed to me to be like self-fulfillment of prophecy, but Robert countered, 'Did our Lord not act "so that scripture might be fulfilled"?'

G. W. ROBSON

* * * * *

I was a student at the Cambridge College of Arts and Technology from 1969 to 1972, and was fortunate to meet Robert during my time at college. Our Christian Union was large and active, and although he was President thereof, Robert wisely stood back and allowed us to handle the day-to-day problems of running the C.U. However, he was always available for counsel and advice. All of us who knew him loved his gentleness and humility, while remaining rather in awe of his formidable intellect.

On one occasion, in 1972, shortly before some of us left the college, he invited us to his house for a meal, even though he was having to nurse his wife. He treated us to a guided tour of his filing system with the enthusiasm of a small boy with his favourite toy. He also took the opportunity to indulge in a little proselytising for the Victoria Institute, for which I remain grateful.

We kept in touch after I left Cambridge, and in August 1983 I was able to visit him, with my wife, shortly before we departed for the U.S.A. It was a delight to find that, despite his increasing physical frailty, his mind was still sharp. It seems trite, but we cherish the memory of a brilliant yet humble saint, who was so devoted to the Lord.

R. C. WHITE

Streams of Renewal

PETER HOCKEN

Preface by Cecil Cousen

Introduction by R. J. Hollenweger

This study is based on extensive research and contains a great deal of information not available to the general public at present. It documents the process by which a number of sources came together during the 1950s, giving rise to the charismatic movement in Britain. Peter Hocken draws upon conversations and letters to tell this story in a way which will appeal both to the general reader and to the historian who wishes to place the movement within its international setting.

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David A. Burgess

Robert E. D. Clark—A Brief Anthology from his writings

Being like children

How foolish these children's games seem to us adults! And yet they condemn the self-satisfied way in which we defend ourselves. We like to pretend that the child is ignorant and that is why he is not so prejudiced as we are. But is the child ignorant? No, not a bit of it! He behaves in just the same way when he knows perfectly well what are the facts of the case. He knows as well as we do where his playmate is hiding and yet, when he comes to seek for him, he does so in a very 'unprejudiced' way. He pretends to himself that he has forgotten what he really knows. He absolutely refuses to allow his knowledge to spoil his discovery of truth. And for this very reason he finds a real freshness in the 'discovery' and the game continues to amuse him.

Grown up people can be divided up roughly into those who are child-like in the above respect and those who are not. When we talk to some people we find that they at once listen like new born babes, ever looking for something fresh. These are the people who make a habit of putting out of their minds all that they already know, the people who are determined that present knowledge shall not be allowed to prevent them learning anything new. On the other hand, there are the prejudiced people who are saying to themselves all the time: 'Does this fit in with my present view?' These are the people who nip every new idea in the bud, the people in whose minds the seeds of knowledge can never come to perfection.

This habit of dismissing from our minds as much knowledge as possible so that we may listen to anything new with freshness and vigour, is a habit that can be cultivated with a little effort . . . Much of the prejudice, the hatred, the willingness to go on tolerating manifest evils, the thoughtlessness and the stupidity of the world, can be traced down to this one thing—that men refuse to copy the child. It is for this very reason that men often make our beautiful earth little better than a hell.

Being Like Children (unpub. MS)

God of the gaps

It seems clear that we must reject, out of hand, the modern myth that investigation of the gaps of science leads only to a futile god-of-the-gaps kind of religion. As well might the opponents of the Curies and the Rutherfords have talked derisively of a 'radioactivity of the gaps'. The unprejudiced man will not limit his horizon before he starts his exploration. Since gaps in knowledge are the fountain of new knowledge, we must boldly explore the supposed gaps with all the care that we can muster. Nor need we apologize for doing so.

... It is a fascinating quest on which we are about to embark. Men are waiting—longing—for a philosophy that makes sense of the world in which we live; a philosophy which makes sense of the emotional side of man's nature as well as of the facts he knows about the material world. Can the scientific method help in this quest? Can it, if used fairly—not with the mere lip-service that has so often brought its application into disrepute—provide us with such a philosophy?

The Universe: Plan or Accident?

Faith, in science

Most writers declare that curiosity is the chief motive for scientific research. It would seem clear that this is not so. If I am curious, why do I not attempt to read and learn all the science that has already been discovered, at least in my own subject? Curiosity can be satiated much more rapidly this way than by exploring a new field where progress is bound to be slow. There would seem to be no answer to this question, if the curiosity theory is right. But in fact it is wrong. The motive for research lies in the fact that the research worker longs, above all else, to *realise* his own faith. It is this realisation that gives satisfaction and joy. It is the looking forward to the end of the journey which supplies the emotion which keeps the research worker at his bench. Faith is essential to the venture of research.

Christian Belief and Science

Hubris

Science has been a disaster for mankind. Intoxicated and deluded by his ever-extending control of nature, man has grown ever more confident that he is master of his fate and that the New Jerusalem can be built on earth here and now—or at least by the next generation but one. So he has ceased to live in the light of eternity. Modern men and

women no longer ask themselves whether the things they intend to do will bring them happiness or shame in the life to come. Imagine the change that would come over society if every statesman and every private citizen were to ask himself this simple question whenever he was about to make a decision! But infatuation with science has concentrated attention upon up-to-date social plumbing, while fanatical devotion to the creation of wealth, comfort and security have taken the place of heaven in the minds of men. And men, seeking first the things of this world instead of God's kingdom, have created unprecedented poverty and starvation together with fear unparalleled as to what the future may have in store.

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Unconscious sin

Perhaps no problem in the modern world is more important than that of unconscious sin. It concerns the Agnostic and Christian alike: it is the concern of world-wide movements, of reformers of every kind, of all who are unsatisfied with the behaviour of other people. But curiously enough it is a concern which is often hidden. People blame others for their faults as though all were conscious, but they like to think that most of their own sins are unconscious. They say contentedly that their duty is to deal with the sins they know and let the rest look after themselves. Discussion rarely goes farther than this. But everyone knows that more needs saying.

Free will

The fact of the matter is that determinism of the human mind is so far removed from common sense that there is probably no one who, after being wrongfully treated, will immediately and always regard the offender in the same way as he would regard his motor-car if the back axle broke. People are only tempted to believe in determinism when they do things which are morally doubtful and find their desires almost too strong for them to overcome; or again when they see a chance of winning a dialectical victory over their opponents. It is this which must constitute the moral test for determinism in every case.

Ethics

In the realm of ideas most people start off with the ready-made theories of other people, and details only crop up later. In the same way most people grow up with fairly definite ideas as to what is right and what is wrong. But in both cases much of the traditional heritage is wrong. If, at a later period, attempts are made to fit every detail into

a traditional heritage of ethics, the details will be of negligible importance compared with that scheme and scrupulous honesty 'in that which is least' will not be important. Details only become important when there is a willingness to see the possibility of error in conventional ideas of right and wrong. In the same manner details will never be of any great importance if they only exist to be fitted into a traditional heritage of knowledge. They can only be of importance if they open the way to radically new principles.

... Thus, by stressing attention to details, it is seen that Christ pointed to a method for fighting the evil that comes from rationalisation, and it is probable that no other method of attacking it is possible.

Conscious & Unconscious Sin

Explanation

Natural selection is a valid theory. It has been observed to operate in nature (e.g. in the dark colour which some moths take on in an industrial area) and also in the laboratory. So when we apply the principle to nature the picture we paint is plausible. Nevertheless it does not get us very far. After all, natural selection also determines which cars remain on the roads after a lapse of years and which disappear, but this does not tell us how the models are manufactured. No one has shown that chance changes in molecules followed by natural selection created the wonderful structures which we see in nature, and the idea is not very plausible. If, nevertheless, we insist that it is true, there is still nothing we can do to prove our case. It is an after-the-event guess. Apart from the fact that scientific jargon is used and that our prejudices favour this kind of guess, it has no better status than the equally untestable statement that God created things as they are.

The Christian Stake in Science

Christian origins of science

However we may interpret the fact, scientific development has only occurred in a Christian culture. The ancients had brains as good as ours. In all civilisations—ancient Babylonia, Egypt, Greece, India, Rome, Persia, China, the Abassid empire and so on—science developed to a certain point and then stopped. It is easy to argue speculatively that, perhaps, science *might* have been able to develop in the absence of Christianity, but in fact it never did. And no wonder. For the non-Christian world believed that there was something ethically wrong about science. In Greece this conviction was

enshrined in the legend of Prometheus, the fire-bearer and prototype scientist, who stole fire from heaven, thus incurring the wrath of the gods.

Historically it was Christianity and Christianity only which provided the firm bedrock of faith which made it possible for men to go exploring into the unknown, fearless of consequences. For the Christian knows, instinctively, that however world-shattering may be the conclusions he is forced to draw, they will never separate him from the love of God . . . In other cultures its religious and philosophical implications have soon made science appear foolish and dangerous and it has been destroyed.

Christian Belief and Science

Design

The fact is that we can approach science in one of two ways. If we believe in God it is not likely that we shall be too easily satisfied. If God made the world we may be sure that He put thought and loving care into all His works. Everywhere we shall expect to see beautiful mechanisms and the evidence that problems have been solved in all kinds of highly ingenious ways. Even when we think we understand some aspect of creation we shall never rest satisfied, for something far more wonderful may have eluded us. But suppose we do *not* believe in God. Then we shall naturally expect to find the exact opposite to all this. Since there is no mind behind nature, everything must have come into existence as a result of atoms hitting one another—chance and not mind must be the secret of the universe.

This second belief has led some scientists to spend whole lifetimes doing misguided experiments. They *want* to show that the apparently wonderful things which we see on every hand are only the kind of things which we should expect to emerge when atoms are shaken up together. Often such scientists have imagined that they have proved what they set out to prove, but, looking back, it appears that what they demonstrated most forcibly was that they themselves were simpletons. They were, indeed, simple enough to suppose that a few careless blitz-krieg experiments and a little slovenly thinking could solve all the mysteries of the universe.

Science & Religion

The discovery of design in nature must also be seen in historical perspective. In the nineteenth century it was often taken for granted that science had 'got to the bottom' of nature. It was tacitly assumed that future progress would consist, chiefly, in filling in details or

making measurements with increased accuracy. But the subsequent history of science has belied these expectations.

Modern discoveries have chiefly impressed upon us the limitations of our knowledge. The fundamental secrets concerning the nature of electricity and of matter, of the functioning of the cell and of the brain, of the origins of the universe and of life are all hidden from our view. New discoveries made in ever quickening tempo, undermine all the confidence that was expressed within living memory. The old belief that chance can explain the universe becomes more and more unlikely as the years pass—for the universe is bigger and the complexities of nature are altogether more surprising than anyone had anticipated. The trend of research is not towards explaining more and more of the fundamentals of nature in terms of chance and mechanism, but the exact reverse. It is the evidences of cosmic design, not of chance, that are accumulating. To say, therefore, that in postulating 'design' we put the clock of science back, is sadly to misjudge the developments of our day. It is science itself which is showing that the old materialistic notions, though they have their place when we are studying isolated parts of nature, can never give us a satisfactory picture of the whole.

The Universe: Plan or Accident?

Scientific rationalists

Rationalists have often claimed . . . that Christianity is one of those things which can easily be explained away in terms of our desires, our environment and the early influences brought to bear on our minds when we were children. Suppose that it be so. Can it be maintained that rationalism is immune from being explained away in like manner?

. . . It has been fashionable for whole books to be written about the psychology of Christians. The psychology of conversion, the psychology of religious mania (a rare disorder), the psychology of the Atonement, of the Sacraments and many like subjects have all been laboriously discussed by sceptics in learned volumes. St. Paul, St. Augustine, Spurgeon and George Muller, to say nothing of mediaeval saints, have suffered some hard knocks as a result of post-mortem psychoanalysis. In the society of cultured pagans it became quite fashionable between the two wars to explain away the lives of the best Christians who have ever lived. For the sceptic, in short, Christianity is not to be considered on its own merits, but only in connection with Christians whose shortcomings and virtues are easily explained away by means of an appropriate psychological technique.

All this is sufficiently familiar, but no one ever seems to think of psychoanalysing sceptics. It is certainly time for the omission to be rectified.

Scientific Rationalism and Christian Faith

The retarded child

The tragedy—if it be a tragedy—is that clever parents do not always give birth to clever children—very far from it. And when the parent with a middling or upper income level discovers that his child has a low I.Q. he finds the position difficult to accept . . . psychologists who have discussed the matter in America have come to the conclusion that such parents are often in greater need of psychiatric help than their retarded children.

Here we see a part of the price that the modern generation must pay for abandoning belief in God. In days gone by, parents seem to have felt little difficulty in believing that it was God's will that children should sometimes be rather below the normal level of intelligence. After all, it mattered more that they should love God than that they should turn out to be scholars, and the possibilities of saintliness were open alike to the rich and the poor, to the wise and to the foolish—indeed wisdom was often a barrier.

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Miracles

When a scientist today speaks of the uniformity of nature, he refers only to events which take place on a large scale—events which involve many millions of units, such as atoms, light quanta, or whatever it may be. The law of uniformity is no longer regarded as a fundamental principle of nature—it is a statement about *statistical* averages.

Nevertheless it is sometimes said that laws of statistical averages are certain, when very large numbers are involved, that it is unbelievable that they can ever fail. Our civilisation would be impossible, it is said, if miracles occurred. The safety of our buildings, our railways, our ships and our aircraft depends upon the law of the uniformity of nature. Nor could scientists discover nature's secrets if they believed that discarnate spirits might play monkey tricks with laboratory apparatus.

Remarks of this kind might have some force if miracles were as common as natural events: but if miracles were rare they would have no force at all. Does anyone suggest that Newton was any the worse as a scientist because he believed that God sometimes intervenes in

the affairs of the solar system? The existence of a haunted house or two would no more put science off the map than an occasional railway accident would make railway timetables impossible.

Miracles. A Study of the Miracles of the Old and New Testaments in the Light of Science (unpub. MS)

Halinitropyrobolia

Possibly you have discovered that halinitropyrobolia means fireworks!

Well perhaps I might start by telling you about the first firework I ever saw—at least I think it was the first. It thrilled my youthful mind and caused me to want to make more of them.

My brother and I had read in a playbook of science that if one placed a piece of phosphorus in a kettle and boiled the water, then in a darkened room the steam would be luminous. The phosphorus was promptly purchased. However the domestic kettle was not forthcoming and so it was necessary to adopt another plan. This I suggested myself. The kettle was boiling happily in the dining room when the trouble arose and I said to my brother, 'Why don't you hold the phosphorus in the steam, that ought to make it luminous just as well.' We put out the light and he took the phosphorus from the bottle, with the fingers of course, and held it in the steam. How well I remember those beautiful drops of burning phosphorus as they fell over the tablecloth, the hearth rug and carpet while the phosphorus was being taken back to its bottle. It was unfortunate that the last few drops could not well be seen for the dense cloud that had been formed in the room!

Unpub. MS. of an oft-given Lecture Demonstration

Christian pacifism

The lesson we may draw from history is that, having once made a compromise with war, Christians in every age have tried to set a limit to what a Christian may do. But to no avail. Each generation is horrified by new applications of science and technology applied to war, but takes for granted the things that horrified the generation before. Once the Golden Rule is abandoned there is no resting place and, in war time especially, the slide is very rapid. The methods of modern warfare would have horrified the Neros and Ivans of the past but in our day we—Christians with the rest—are only too apt to take them for granted.

Does the Bible Teach Pacifism?

Disposal of weapons (nuclear or otherwise) is not enough. It might even tempt a potential enemy to attack. National repentance—repentance of the terrible sin that we have harboured such weapons and even thought of using them—is called for. The government that destroys its weapons must repent, must seek the forgiveness of God . . . without repentance disarmament will avail little, perhaps nothing at all. Well swept and garnished, the heart of the unrepentant wicked man who ceases to do wickedly may prove a haven for devils worse than the first (cf. Matthew 12:43–45).

Pacifism & War (Ed. O. R. Barclay)

Revelation, chapter eight

The judgments which will now follow are quite out of the ordinary: they take place, too, just at the time when men are beginning to take heart again and hoping that life will settle down to normality once more.

We are told that three heavenly bodies will hit planet Earth in fairly rapid succession (8:8, 10; 9:1). Astronomically speaking, events of this kind are extremely rare—as far as we know, the last time one took place was about fifty thousand years ago, when the Arizona crater was formed. On average it is thought that fairly large asteroids hit the earth every 10 to 100 million years and that on land, over geological ages, the craters they produced are eroded away. The last really big hit may have taken place 65 million years ago: it has been credited with the death of the dinosaurs. The rare element iridium is far commoner in meteorites than in surface rocks and over wide areas, though not it seems over the entire earth, a thin layer 65 million years old containing iridium has been identified . . . The first heavenly body which John says will collide with the earth is described as 'something like a great mountain, burning with fire' (8:8); the second as like 'a great star blazing like a torch' (8:10); the appearance of the third is not described, save that it looks like a star (9:1).

If we understand the first two descriptions in their natural sense, the first is probably a fair sized asteroid, a mile or so in diameter. Since it falls intact it must be made of metal (iron-nickel alloy is usual) since stony asteroids readily break up when they enter the earth's atmosphere; the second is presumably the stony kind (it could be a comet with a stony head) and it breaks up on entering the earth's atmosphere tangentially. As it passes overhead it spreads dust over a great area of the earth's surface. Seen from the ground it has the appearance of a torch which leaves a fiery trail in its wake.

The largest asteroid is Ceres, about 480 miles across, with Vesta

still very large, but small by comparison. Ceres is so large that all the other asteroids put together only contain about twice as much matter as Ceres.

The shapes of the asteroids are extremely irregular—there is much too little gravity available to pull the materials of which they are made into ball-like structures.

... Whilst most asteroids maintain their orbits between that of Mars and Jupiter, some have very eccentric orbits and when they are closest to the sun (in perihelion) the orbits of some of them lie inside the earth's orbit—in one case even inside the orbit of Mercury.

These asteroids, known as earth grazers or Apollo asteroids, intersect the earth's orbit and sometimes they are near enough to be seen through the telescopes of amateur astronomers . . . The nearest encounter with an asteroid within modern times was with Hermes (1 mile diameter) in 1937, when it came to within half a million miles, which is a little farther than the moon.

... Until around 1800 all respectable scientists (Sir Isaac Newton included) thought that meteorites were figments of the imagination because (so it was argued) they never drop where trained scientists are stationed! In view of Newton's law of gravitation it seemed silly to think that stones could be poised in the sky ready to drop on our heads at any moment! Even Solinus (third century AD) did better than this with his theory that herons 'are wont to carry stones in their claws' which they drop on shipmen from the sky.

... It was Edward King FRS (1796) among others (especially Chladni) who helped to convince the scientific world that meteorites or stones from heaven are a reality. King was convinced by his study of the Bible, which tells of stones falling from heaven (Josh. 10:11; Ps. 18:13). Until his time the curators of museums where meteorites were kept had been urged by scientists to throw away these superstitious relics of a prescientific age. In interpreting the Revelation it is wise to keep the story of meteorites in mind because in the pre-1800 period a great many expositors of the book argued for symbolic interpretations of stars falling from heaven and thereafter these interpretations were repeated time and time again—indeed they still appear in modern books.

... How can (a non-nuclear) war be continued? The answer is now no secret. There is a relatively easy way by which you can destroy your enemy without spreading radioactive contamination, without enveloping the earth in a layer of soot, perhaps even without his knowing what you have done.

Many years ago, before the moon landings in fact, there appeared in the *London Times* for 20 January, 1962, an article headed 'US Told

of Method of Using Minor Planet as Weapon' . . . even at that time it was theoretically possible to divert a small planet out of its orbit and send it crashing into a predetermined target on earth. (He) described this latest horror as the 'asteroid bomb' and reckoned that, within a decade, both the United States and the Soviet Union could develop the necessary know-how. 'It was difficult to conceive of any military device more destructive or more decisive than the asteroid weapon. It would hit the earth with a violence of millions of hydrogen bombs . . . If aimed at the Atlantic, tidal waves would probably destroy the seaboard of the United States and a large part of Western Europe.'

A vast amount of attention is now being given to the asteroids by both sides and vast sums of money are being spent on their investigation . . . The bomb is never mentioned in the press but the value of the research is emphasised because it is claimed that were an asteroid to be about to hit us, its deflection just in the nick of time might be possible.

. . . Again we turn to the text. 'The second angel blew his trumpet and something like a great mountain, burning with fire, was thrown into the sea . . .'. The result? It lands in one of the oceans, perhaps the Pacific where to an outsider in space it looks as if this ocean covers about one third of the surface of our globe. Vast waves are produced, the tsunami of which lash the bordering low-lying lands with unparalleled fury. We remember that Jesus said that at the end time nations would be in perplexity 'at the roaring of the sea and the waves' (Lk. 21:25–26). The terrific heat liberated at the moment of impact, together with the shock wave, exert a devastating effect on one side of the planet. 'A third of the living creatures in the sea died and a third of the ships were destroyed.' (8:9).

Tomorrow's World: A Commentary on the Book of Revelation (unpub. MS).

Among Robert Clark's papers, many of them unpublished MSS, was found a striking paraphrase of 1 Corinthians, chapter 9. The following extract epitomises the dedicated life and labours of Robert himself.

So you see that the privilege of being able to serve you, my fellow disciples, without earthly reward, opens up the possibility of a heavenly reward which, if I can only win it, will be worth all that I do and suffer here on earth.

I hope that you too are seeking for that reward. The race is not easy. In games the athletes all run together but only one succeeds. Those who compete seriously have to discipline themselves—they have to be temperate in all things. They do not ask whether it is 'right'

or 'wrong' to have hot baths or eat heavy meals—they ask whether these things will help them in the forthcoming games. The race that God has set before us is no easier than theirs, but it is much more worthwhile, for they do it to obtain a corruptible crown: but we are incorruptible.

So, like the runners, I go straight ahead for the prize of God's high calling. And I have learned the lesson that vigorous activity for Christ is not enough. A runner who is running well might miss the mark if he was uncertain of the direction in which he ought to run. A boxer might devote all his energies to hitting the air, but that would not help him to overcome an opponent! It is the same in the race that God has set before us. I cannot hope to win unless I work deliberately and with foresight. But as you see, I have framed my plan as to how I may please the Lord and I have explained my plan to you.

How St Paul Planned His Life (1 Corinthians ix as it might have been written today) (unpub. MS)

Let Robert's words be the last we read. The following is taken from one of his inimitable contributions to 'News and Views', and sums up his attitude to the world and its standards.

'If we would be soldiers of the King of Kings, we must not allow ourselves to become slaves to the thoughts of those around us. There is only one question which really matters—what does God think about this? This does not mean that we shall always be different from other people, always the odd-one-out. Not at all. There are times when righteousness is expressed in the popular way of thinking. But it *does* mean that we must try to think independently of the world. Even if we are right, we must not just think that this or that is good or bad because other people say so. Not at all. We must look to God in prayer, and study his teaching given to us in the Bible, so that we may learn what He thinks about it. And when the great day of Judgement comes, we shall find that thoughts of this kind endure; we shall not be ashamed of them in that day. And even if we come to the wrong conclusions about what God thinks, even then we shall not be ashamed if we have really done our best to understand God's will for us.'

And from *Harvester*, November, 1978, page 314, the final paragraph from 'A new heaven and a new earth':-

To the Christian the ages to come will not be dull!

Imagine the thrill of helping in the work of rejuvenating and later governing the present world after the coming of Jesus. Imagine the experience of living with the Lord and with loved ones in the mighty

city of the future. No death, no pain, no saying goodbye! It will be no selfish existence. The nations around will need us (if we are privileged to have a home in the city) for outside the city there will certainly be accidents, perhaps disease and even death too. (The promise that these things are ended is perhaps for the saints only: it certainly does not apply to hell and may not apply to the new earth). The remedy for these things will be the leaves of the Tree of Life, a species which grows only along the sides of the river that flows in the city and as an avenue of trees down its main street. Checks will be made that only those who are pure in heart can enter the city and gain access to the leaves which are for the healing of the nations. There will be plenty to do! Perhaps, in time, there will be planning to do for the next 'big bang', and decisions on the form that new and intricate natural laws shall take next time!

Excerpt from a letter of R. E. D. Clark to one of his students

I've met sweet old parsons (and not only parsons) who will take no sides on the pacifist issue. Yet they personally wouldn't say boo! to a duck, and would be *most* gently disposed towards the worst criminal. Why is this? Surely because love is rooted in their minds through Christ, but has never grown beyond their little sphere.

They love the people they actually see in a very Christ-like way. But if only they would think: 'I must wish not only *these* people I know to be saved from suffering, but that the same shall be true of all men' then they would soon see that such could not be unless all men (and especially Christians to set an example) resolutely refused to hurt each other at the command of governments.

And so a principle is born.

Now surely all principles are born in this way—they are the building resting on the love which Christ has implanted in our hearts since we gave them to him. But, of course, we may look only at the building and forget its foundations—and that is even sadder than if we have a foundation and forget about the building! And myself I feel very guilty of having done the worse of these two.

Then how is it that people forget about the building? Surely it is because its so very hard to live in the world at all if we are consistent. A few days ago my boss suggested glues for propellors—some no doubt in time might reach the R.A.F. What ought I to do? Christ came not to destroy men's lives but to save them. And I—shall I, can I, as His disciple have any part or lot in destroying men's lives? And if yet I worry about so little (for I'm not making propellors) how shall I do anything?

And so we argue with ourselves. And in time, perhaps, we say: 'Oh hang it! What's the use of sighings within and fears without—and nothing getting done? I'm determined to ask no more questions for conscience sake!' And others do so likewise—yes all of us. And slowly all the enthusiasm for reform, all the ideals of childhood disappear as the morning mist. And—the world goes on as it did before.

I know of one way out and only one way. We are *all* so desperately compromised that we cannot change and do right of a sudden. So let's do right where and when we can! Let's say to God: 'I'm a sinner—and what's more it looks as if I'm going on sinning. Have mercy on me and help me to see everything that is wrong and to put little bits right now and again whenever I can. But above all please don't let me ever lose sight of my sins or the last straw of hope will go too.'

—written on the train to Cambridge, 4.3.1937
Sent by D. C. Mandeville

The following pages contain some of Robert Clark's writing for *Faith and Thought* over the years. The first paper is the contribution he made to the Victoria Institute conference in 1936. It is his first such contribution to the journal, and particularly fitting to be re-issued in this, the 50th anniversary of its appearance.

The Editor remembers a visit to Robert's home in the last year of his life, and being told, with evident delight, of the fact that 1986 would be the anniversary of his first paper. The fact was duly noted, to be referred to at the appropriate time. It is particularly gratifying to be asked to publish this paper in full, though sadly after its author's death.

The succeeding contributions are those which have been specifically asked for by friends of Robert. It would have been very difficult to select suitable parts of Robert's writings for an issue such as this, and the Editor is therefore very grateful for the suggestions which have been made.

The satire 'Three Blind Mice' is only one of innumerable unpublished writings, but gives an idea of another side to Robert.

We conclude with a list of contributions to *Faith and Thought* over the years, and a list of books published.

THE PRESENT POSITION WITH REGARD TO THE ORIGIN OF SPECIES

The advance of science in recent years affords indications that a theory of special creation of species may once again hold the field. But such a theory is not likely to become a part of science, for it is becoming universally recognised that science cannot make use of the idea of creation. The aim of science is to find relations between events, and this means that for every event science wants to discover a cause. But God and creation cannot be thought of as caused; if they are invoked the string of causes must cease. It is the same with the conceptions of purpose and mind in living creations. Most people agree that these exist and religion and philosophy must take them into account; but they must not enter scientific textbooks. It is not sufficient that a fact should be true in order that it may form a part of science.

A little consideration will show that this is no novel outlook. There are many cases in which perfectly true ideas must not be allowed to influence our method of living. The Bible recognises this. It tells us that no Christian is free from sin, but that we must live without allowing this belief to influence us: we must seek to be perfect as God is perfect. It would be wrong to say: 'Since I cannot be as perfect as God, I need not seek perfection.' Large numbers of other examples could be given. Thus there is a definite place for ideas which, though true, must never influence practice.

Science is akin to practice. It stands, not for a complete system of all knowledge, but for a method of attack—in short, for experiment. Thus it is natural that there should be certain ideas which it cannot use. It can use no ideas which do not suggest experiments.

It is for this reason that it cannot find a place for God, and so cannot interest itself in special creation. Science could almost be defined as the study of that part of nature which goes by itself and does not need God or even the minds of human beings. An example may make this clearer. An engineer builds a bridge and calculates that it will withstand such and such a stress. He finds that it collapses under a lesser stress—his science cannot explain why. If he is a Christian man he will not say 'Science cannot explain this, it must be the hand of God.' Instead, he will go through all his workings again in the hopes of finding a mistake. He may believe strongly in miracles, but that belief must never influence his actions in such a case as the above. No one could expect him to listen quietly to arguments proving the existence of miracles, as though this were relevant to such a situation. It would be absurd to tell him that he was fighting facts, or that it was his duty

to sit down quietly and accept the breakdown as a miracle. It is equally absurd to ask science to listen to the evidence of the working of God. Such ideas do not belong to science, though they may very well belong to the scientist in another capacity. It is this which Christians have so often failed to realise.

If, then, a belief in special creation is ever to become accepted again among biologists, it must be accepted by them as men, not as a part of their science. Their science will have to go on doggedly looking for causes, pushing things back farther and farther. When it reaches a stop it will not be interested any more. That is what has happened in physics and astronomy. We can push the universe back between a billion and ten billion years, but further than that it is not possible to go. What happened then was an event which looks very like creation by a mind, but science can only be interested in what happened after that event. Moreover, the scientist holds that the universe must be about the age mentioned, for it is only then that the idea of cause fails, and science must find causes as far back as possible. Yet common sense says that if there was a miracle a billion years ago, there is no improbability in the view that the miracle took place in much more recent times. It is only science as science which cannot allow such speculations.

Evolution has been studied a great deal in recent years, and evidence is slowly accumulating that if it is pushed back far enough it will reach a position very like that of astronomy. People used to point to the fossils and see in them a gradual evolution. The ancestor of the horse started off the size of a dog, and by and by it grew in size and its toes decreased in number. In the course of ages a creature of modern dimensions resulted. Several well-marked series of shell-fish showed a similar story. Sometimes these evolutions are gradual, each generation differing from the last in a hardly perceptible way, but often there are sudden jumps. The horse is gradual with regard to its size, sudden in the diminution of the size of its toes. This sudden type of change was not recognised at first. When it occurred it was easily explained away—the evolution might have been continuous in some other part of the earth. But now both types of evolution are recognised.

These records from the rocks suggested that all life must have sprung from the lowest forms. Aristotle's observation that the foetus in the egg goes through stages resembling lower forms of life seemed to favour such a view. Then widely different creatures were found to be built upon the same general plan, so much so that human anatomy could be taught from the bodies of animals. There were parts of the animal frame which seemed to serve no useful purpose, but

corresponding organs were useful in lower forms of life. These things also gave colour to the above theory. There seemed no alternative save evolution or the view that the devil hid the fossils to deceive, if it were possible, the very elect. Most people accepted evolution. Many Christians embraced the idea and sought to reconcile it with their faith. Generally they abandoned the first chapters of Genesis and decided that Christ was severely restricted by the errors of His age.

But in recent times science has only gone to confirm what common sense indicated all along, that evolution cannot explain the origin of species. Reproduction of living things, or rather of the *physical parts* of living things (for science has no knowledge of the soul), is a mechanical process. The mere fact that monstrosities result and can be produced experimentally long suggested that this was the case. The irradiation of the nuclei of cells by X-rays produces perfectly random changes, and investigation has gone to show that these changes are precisely the same in character as those which take place in nature. The fossil records confirm the same absence of design. Race after race changed in ways which resulted in their extinction. There was no evidence whatever that the hand of God was ruling these changes in 'evolution', as many of the theologians had supposed.

Experimental and mathematical work in genetics have gone to confirm the existence of the two types of evolution, the gradual and the sudden—both occurring without design, at random. The gradual is determined by survival of the fittest, as Darwin supposed, the sudden by changes in the cells similar to those produced by artificial means. Thus evolution on its *physical* side is not the result of miracle, but is subject to the laws of physics and chemistry like the inorganic world. That, at any rate, is the natural conclusion from these and many other facts, and it is the starting point of biological research. A few philosophically minded biologists have disagreed, as have the modernist theologians, yet their views command no respect among most scientists.

If this purely mechanical outlook is wrong, there is room for miracle—though some would like to hide it under the cloak of more difficult words. But if it is right, it is now becoming obvious that causes can only be pushed back a certain way. They cannot be pushed back to protoplasm or the primaevial slime which generated protoplasm as our fathers had supposed. It is only possible to push them back to some ready-made species, and there the cause becomes baffling. It is like the problem of astronomy repeated. At some point the uniformity of nature went wrong, and science can get no further. It must go on asking for causes in vain, for it cannot allow miracle. Yet,

just as in the case of astronomy, there are good grounds of analogy for supposing that creation of living creatures must have taken place. This idea is outside science in the sense that it must never influence science, yet it appears to be none the less true.

The evidence has come in the following way. *Cytology* (the study of cells) has shown that every cell contains a number of small particles called chromosomes. When the cell divides these particles reproduce themselves so that every cell in the body possesses identical particles. It has been found possible to connect various changes in the chromosomes with changes in the grown-up individual, so that as a result of direct experimental work it has become tolerably certain that the form, or at any rate the detailed structure, of an individual is determined by the structure of the chromosomes. These facts were first suggested by Mendel's observations on garden peas, where it seemed certain that there must be some structures in the cells which made plants tall or short. The chromosomes in some species are sufficiently different from one another to allow them to be distinguished easily. In such cases they can often be mapped out. This means that the structures in the chromosomes which are connected with the various characters, such as tallness, eye colour, hairs in different parts of the body, number of facets in the eye and so on, can be shown to exist in a definite order in the various chromosomes. The methods by which this can be done need not detain us here. The units in the chromosomes are known as *genes*. They must consist of complicated organic structures. The smallest of them appear to be at least a million times as heavy as a hydrogen atom.

It is now generally agreed that changes in the genes themselves, and in their positions with respect to one another, afford the raw material for evolution. The evidence for this is good. Examples of the main changes which have occurred in the rocks can be produced in the laboratory. Take the case of an animal the size of a dog becoming one the size of a horse. Exactly the same kind of result has been observed repeatedly in plants where it may take place in different ways. By purely artificial means the number of chromosomes in the cell may be doubled, and this results in a large and sudden increase in size. A similar result might easily take place during long periods if natural selection were picking out the fittest. The records of fossils do not show any phenomena which are inconsistent with the experimental science of genetics. A far greater period has elapsed in geological time and, as would be expected, there has been greater opportunity for profounder external changes to result; but there does not appear to be anything radically different in kind.

Suppose, then, that orthodox views—natural selection, the correct-

ness of the series of fossils, and so on—are accepted. Does that lead to abandonment of the special creation doctrine? In the past people have answered in the affirmative, but it is now becoming abundantly clear that that answer is incorrect. All that is observed in genetical experiments, and all that is observed in the rocks, appear to be nothing more than chance variations of already given structures. This can be called evolution if evolution merely stands for change, but it is not the kind of evolution which could make an animal out of dead matter. It is not constructive evolution. The variations are often large so far as the external form of an animal may go—but both in the rocks and in the laboratory they are more often destructive, and end in extinction, than constructive. How did the original chromosome structures arise? One authority calculates that the chances against any particular arrangement of the genes in the chromosomes must be 10^{1000} at the minimum,¹ and it is probably much higher. But that is only for the arrangements of the genes when formed. The actual building of a gene in a particular way must involve an enormous number of possibilities, probably at least as great as the above number. This means that the production of a chromosome by random movements of molecules involves that this occurrence will happen once in not less than $10^{10^{35}}$ times.

If the matter is not considered from the point of view of a chromosome being built up suddenly, but natural selection is allowed to work all the time, so that a given chromosome structure can become more and more complicated through the course of ages, the chances are of course greatly reduced; but the power to which 10^{10} must be raised is negligibly reduced. $10^{10^{35}}$ is enormously greater than $10^{10^{34}}$, but that makes no difference to the present argument.

It is impossible for natural selection to result in more and more complex structures unless the number of individuals is greater than the number of the chances against the constructive change, and on the most liberal basis it is impossible to get the chances low enough. The number of electrons in the entire universe is only about 10^{79} and the chances against the formation of these structures in the chromosomes are unimaginably greater.² Thus the whole situation suggests that differing kinds of species were created at remote epochs: first the simpler forms of life, later the more complex. That is what geology indicates, but with the evidence at present available it would look as if arguments that an evolutionary connection existed between them should be viewed with much suspicion. No doubt the number of

1. Sewell Wright, 'The Roles of Mutation, Inbreeding, Crossbreeding and Selection in Evolution' (International Congress of Genetics, Ithaca, 1932), vol. i, p.356.

2. A. S. Eddington, *The Expanding Universe* (1933), p.68.

species created was small, and each gave rise to many others in the course of time.

Lastly, it must be emphasised again that creation is not a scientific idea. Science can only go back to the moment of creation and reach an *impasse*. It has reached that *impasse* in the problem of the creation of the universe, and it appears to be in the same position in the case of biology. What happened before the point to which science can look back was in each case something suggesting mind and purpose—unscientific ideas, it is true, but none the less real. And philosophy and religion must be founded upon the whole of reality, not merely upon the parts with which science can deal.

Thus it looks as if the long controversy with regard to evolution and Christianity might soon close. The Christian has been perfectly right in demanding a special creation, and the scientist has been equally right in denying that such an idea ought to constitute a part of science. Evolution *may* be a perfectly necessary idea for science, but on viewing the world as a whole it must be seen to have the same kind of meaning as in such an expression as 'the evolution of the petrol engine.' The truth to which the evolution of science points may be an evolution of the ideas in the mind of God, rather than any direct physical connection. But since science cannot deal with God it must rightly ignore such possibilities.

MEN AS TREES WALKING¹

Until the present century it was commonly taken for granted that people born blind have the same ideas of space as those who can see. Philosophers, notably Locke, Descartes, and Leibnitz, in discussing the concept of space, assumed that both sight and touch give rise to the same basic ideas of space and distance. This assumption seemed to be confirmed by the fact that the congenitally blind do, in fact, speak of space just as we all do. Bishop Berkeley, however, in his *Essay Towards a Theory of Vision* (1709) put forward the suggestion that tactile sensation gives rise to a psychological world of space, and that only later do we learn to line this up with sight. But he gave no evidence for this view, and, in fact, as we shall see, the situation is the other way round.

The blindness of the congenitally blind, when due to cataract, can be remedied by surgery. But with very rare exceptions² this has only been possible in recent times. In the early days of the operation a

1. The author is indebted to Dr Leon Morris, and Mr Haddon Wilmer, for their helpful discussion in the preparation of this paper.

2. The first known case was in Arabia, in 1020.

number of people, including intelligent adults, received sight for the first time, most of them towards the end of the nineteenth century. If we include a few spontaneous cures, records of about eighty cases have now been published. Further cases are likely to be excessively rare, because in most Western countries congenital blindness must be reported, so that cures are now effected in early years before an infant is old enough to describe what it is like to be without sight.

It is a matter of great interest to psychologists to discover how a sightless person reacts to a newly acquired sense. In Germany M. von Senden devoted many years to the study of this subject. In 1932 he published a detailed survey of all known cases—a monograph of considerable length.

This book formed the basis of D. O. Hebb's epoch-making discussion of perceptual learning in infancy (*Organisation of Behaviour*, 1949), so that its importance eventually came to be realised. The book was exceedingly rare in Germany as sales had been small and all the remaining copies at the publisher's warehouse were destroyed in the Leipzig raid in 1943. All von Senden's original notes and case records were destroyed in another raid. Miss Sylvia Schweppe of the British Museum was able at last to discover a micro-film copy and laboured for ten years to get it published. Finally, in 1960, an English edition appeared.³

The picture which emerges is surprising. In none of the many cases studied did a sense of touch, in the absence of sight, give rise to a concept of a three-dimensional world. Or, if it did, as the philosopher G. J. Warnock thinks possible, it was of a kind very difficult to translate into that with which sighted people are familiar.

The blind-born, von Senden believes, have no sense of depth or space or even of distance. He cites many remarkable quotations illustrating the point. A boy knew that his room was part of a house but could not conceive that the house would look bigger than his room. A building a mile away was thought of as near at hand 'but requiring the taking of a lot of steps'. Up and down movement in elevators gave rise to no sense of height, or even of change in position. It was thought that the sun or a candle were touching a person who felt their warmth. The moon seemed a rather mythical object, but a blind person thought that it could be more easily investigated by means of elongated arms than by sight. The statement that it was a long way off conveyed nothing. A blind person had often been told that trees are taller than men, but the statement was not understood. After the

3. M. von Senden, 'Space and Sight', *The Perception of Space and Shape in the congenitally Blind before and after Operation*. English translation, Peter Heath. Methuen (1960), 42s.

operation, 'when she saw that a tree was ten times as tall as her father and mother she thought that her eyes were playing a trick on her'.

A more recent case, aged 52, in which the patient had been able to see for nearly a year in early childhood, follows the same pattern.⁴ Psychological tests were applied. On being presented with the Necker cube and the Staircase illusions, the man experienced no reversals. These illusions depend upon the fact that objects are seen in depth, but after recovery from blindness no sense of depth is present.

Again, touch alone gives no sense of shape or of how parts are joined together. There seems to be no general picture in the mind, of a cube, or even of flat shapes like circles, triangles or hexagons. The blind person is conscious of smooth surfaces (which he finds 'beautiful'), spikes or corners and edges but, owing to the fact that one can only feel a part at a time, objects larger than those which can be held in the hand are not sensed as a whole. There may be no idea, for instance, of how the parts of a frequently handled pet dog are related together.

After sight has been restored, those who were blind have great difficulty in recognising that what they see corresponds to the shapes they have previously handled. A week after a man's eyes had been opened he was shown an orange and asked its shape. His newly acquired sight gave him no clue—he could only discover that it was round by feeling. And later, on looking at a square and at a triangle he said that they were round. When corrected he said: 'Oh yes, now I understand. You can see how they feel'.

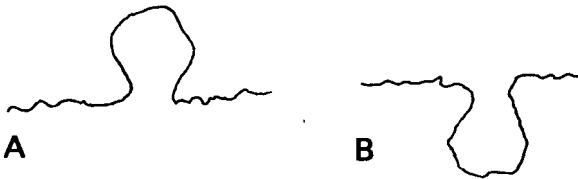
For many months such patients wonder why sight is supposed to be useful. They find it incredibly hard to discern shapes. The new sense brings uncertainty. There may even be a refusal to use it unless compelled. One blind man who knew his way about perfectly became lost and had to ask the way home when he was given his sight.

The blind soon learn to use the same language as other people. But often it is a form of words without awareness of the meaning. When they first realise that other people have a sense which they lack they attempt to understand it as a kind of touching. A number of these people thought that those who had sight were rather to be pitied than otherwise. Their curious faculty only worked at times which they called 'day', and failed altogether at times which they called 'night', but a blind man could go anywhere at night.

4. R. L. Gregory and J. G. Walker, *Recovery From Early Blindness*, E.P.S. Monograph, No. 2 (1963).

After sight has been restored it usually takes several months before its value is appreciated. During this learning period the eyes can be observed endlessly 'feeling' round the contours of objects.

The reason for this wandering of the eyes may be illustrated by reference to the writer's own experience. He has had four diathermy operations for detached retinas which have involved both eyes—two operations in 1950, one in 1952 and one in 1958. In three instances the area of detachment passed the macula. The interest of such operations is that they are equivalent to an experiment in which the retinas are removed and replaced in a new position. This means that previous to an operation the sight of, say, a straight line stimulated certain nerve endings and the messages transmitted to the brain were interpreted as 'straight line'. But after the operation the same straight line would stimulate different nerves and the corresponding message would normally have been interpreted in some other way. The result is that, after an operation, shapes as seen by the 'bad' eye, are distorted. After the 1952 operation this effect was strongly marked. A straight line, for instance, appeared as A below, the main loop being at the point at which I was looking directly.



This, of course, caused a good deal of strain. It was impossible at a glance to see the shape of an object through the eye. But by looking along the contours of objects, the main bend moved along and it became possible, very rapidly, to distinguish between the permanent and objective features of a shape and the subjective distortions. Over a good many months the distortion died down slowly. It is interesting to note that the other eye compensated for the distortion—a straight line appearing as in B. When both eyes were used together the shapes of large objects could be recognised easily enough, but when objects subtending a small angle at the eye were observed (e.g. a preacher's face in the pulpit) the eyes became dominant alternately with somewhat startling results!

In view of these experiences, we can understand something of the confusion that a person who sees for the first time must feel. He will see a welter of colour and shape. But the mind will not have learned how to interpret the messages passing through the optic nerves. By

moving the eyes rapidly from side to side and up and down some parts of the picture will retain permanence and some will move with the eyes. In this way it would be possible to make out large shapes, but for finer details to be perceived much time, patience and practice of eye movements would be necessary.

Now let us consider what von Senden has to say about how blind people group objects together.

Those of us whose dominant sense is sight group things together when they *look* alike—for instance, things of the same colour, or shape, or things which move in similar ways, etc.

Blind people do the same in principle, but they depend almost entirely upon a sense of feeling (taste and hearing only enter to a limited extent). The resulting classifications or *schema* differ greatly from those of sighted persons.

One such schema is that of the 'sequence-circle' with reference points—something which by continuous touching will bring you back to the part you first touched—one or more points in the schema must be distinctive so that you know when the 'circle' has been completed. (The 'circle' has, of course, no relation to a geometrical circle.) A wheel, with some point suitably marked, would fall into this schema; but so also would a living room—for a blind person would obtain his bearings by touching the sides of the room until he is back at the starting point again. Other schemata result from similar feelings—hard, soft, cold or warm things may each be classified together.

But structural plans are also represented. One of the commonest of these is that of a trunk or cylinder round which you can put your hands. But in this schema, if you lift your hands upwards, you find that they are suddenly stopped by branch-like objects which come out of the trunk. On the ends of these you can sometimes feel smaller movable objects.

In this schema the blind classify such objects as umbrella-stands, candelabras, men and trees. There is no confusion between them, of course, for polished wood, glass, skin and bark feel quite different. But they belong to the same structural pattern.

Thus men and trees are grouped together. Both have a central trunk and objects coming out of it (limbs or branches) with further smaller objects attached to these in turn (fingers, leaves and twigs). But they differ in their feel and in the fact that limbs move more than branches.

To people with sight men and trees bear no resemblance whatever. But of one congenitally blind girl we read that after she had received her sight 'one of the most important pieces of information that she imparted to a blind friend was the discovery that men do not

look like trees at all.' We have already noted that the factor of size does not enter the picture—of the same girl it is stated that if she had remained blind 'she would have gone through life with the vague impression that the tallest tree was about ten feet high.'

With this background of recently discovered knowledge it is instructive to turn to the New Testament. Many of our Lord's healing miracles were concerned with the restoring of sight to the blind (Matt. ix. 27; x. 46, 52; xi. 5; xii. 22; xv. 29–31; xxi. 14; Mark viii. 22–26; x. 46–52; Luke iv. 18; John ix. 1–7, and parallel passages). In only one instance (John ix) is a man specifically stated to have been born blind, and in a few others we are given very brief details of what happened. But apart from the simple statement 'now I see' in John ix there is only one first-hand description of his experience by a blind man who was cured (Mark viii. 22–26).

In this case the miracle is recorded as having taken place in two stages. Firstly, the man's sight was restored. When he opened his eyes he looked round half dazed and probably felt as bewildered as modern patients have done. Jesus said: 'Do you see anything?' He replied, 'I see men, but they look like trees, walking.'

The association of trees with men is quite unnatural except for the blind: a man with sight never confuses them. And it is obvious, too, that the man thought that men were about the same size as ordinary trees. The fact that this surprising confusion is mentioned in the gospel is a strong indication that the miracle happened as recorded.

But what did the man mean? His words *might* reasonably be taken in the sense, 'Now that I have it, sight is not much use to me after all. I cannot distinguish men from trees except that men walk and trees do not.' But with so little evidence available, we cannot be dogmatic.

Jesus laid His hands on him again. This time when he opened his eyes he looked intently or steadily (*dieblephen*) 'and was restored and saw everything clearly'. The implication seems to be that at the first stage, he did *not* look steadily—his eyes were wandering, seemingly aimlessly. This, as we have noted, is the natural reaction of those who first receive their sight. Nothing would be more natural than to say to such a man, 'Do you see anything?', meaning, 'Do you recognise anything?' Again, the story rings true.

In these few words, recorded only by St Mark, we seem to have as good evidence as we could desire that the miracle was genuine.⁵ Not

5. The word used, *apokatestathê*, translated 'restored', seems to be used in the same sense of 'cured', and should not necessarily be taken to imply that the man had previously seen. The sense could be 'restored to what it ought to be.' Thus, Mark iii. 5 uses the same word in connexion with the cure of the withered hand which was restored 'whole as the other', i.e. 'as it ought to have been' and not 'as it was before'.

a single ancient writer, so far as we know, had an inkling of understanding about the psychological world of men born blind—for no confusion would have arisen in one who had previously seen (at least beyond the time of infancy). Besides—the cure of a man born blind would have made a more startling story. But there is no mention of this. According to the gospels Jesus often cured blind people, so there would have been little point in finding out whether this man in particular had never seen before, or had been blind since infancy.⁶

Finally, it is worth comparing the case reported here with the much more detailed one in John, chapter ix. We note that in neither instance, so far as we are told, did the men ask to be cured. In other cases such requests were common, as in the story of blind Bartimaeus. This is natural, because a man born blind, or blind since infancy, might have little wish to see, and indeed, might have little or no conception of what seeing means.

Again, in neither case do we read that the men thanked Jesus for what He had done, or praised God for all around to hear—though again these features are common in the records of other miracles. As we have noted in the modern cases, men who have received their sight for the first time have no cause to feel thankful until much later on. In John ix it is noteworthy that Jesus waited for some time before finding the man again to tell him about the possibility of belief in the Son of Man. Immediately after he had been cured he would have been too dazed to appreciate what Jesus wished to tell him, so that the need for delay is easy to understand—we only read of delay in the case of one other miracle (John v. 14). Unfortunately, we have no record of what the man said when he first saw, but this is natural since neither Jesus nor his disciples were present at the time of the cure.

6. This conclusion may be compared with that of Professor R. H. Fuller (*Interpreting the Miracles*, 1963, p.34) who thinks that the miracle is one of the three least evidential in the Marcan record. It exhibits 'the pure form of a Hellenistic wonder-story, without any modification', and probably entered into the Christian tradition 'from a popular source outside Palestine in the Greek-speaking world'. The only evidence offered is that Form Criticism supposedly points to this conclusion (but why should not a *true* story be told in the form current at the time?) and that there is a story that the Emperor Vespasian cured a blind man by the same technique using spittle. But Vespasian did not come to the throne until around forty years after Christ's death; would there not, therefore, have been ample time for such stories of the Gospel to have reached Rome by this time, and for flatterers to have applied some of them to the Emperor?

A DOUBLE STANDARD?

In earlier times Christians often took delight in real or supposed scientific confirmations of their faith. This attitude is currently changing. In the contribution by Professor Van de Fliert, it has been identified with old-fashioned fundamentalism. Van de Fliert writes: '... It is a fundamental and extremely dangerous mistake to think that our belief in the reliable Word of God could ever be based on or strengthened by scientific reasoning'. To suppose otherwise, he continues, is to reveal a vast 'over-estimation of science'. If we hold the fundamentalist view, 'we lose the Bible as a reliable Word of God completely, because we make its teachings dependent on the poor state of our scientific knowledge today ... which will change tomorrow'.¹ For the fundamentalist the reliability of the Word of God is related to scientific reliability ... the question of the reliability of the Holy Scripture can thus be fought out on the scientific field.²

Three reasons in all are given for the repudiation of the older view. Firstly, it is claimed that attempts to support Christianity by appeal to science necessarily imply a double standard. The loyal Christian must decide whether to accept the final authority of the Word of God or of science; he cannot have it both ways. Secondly, it is claimed that science is ever on the move, a shifting sand on which no building can safely be constructed. Thirdly, it is stated to be a fact, familiar to every historian of science, that Christians who pin their faith on science always bring their religion into disrepute. To quote Van de Fliert again, they are in constant retreat, 'the theologians have had to surrender every position they had once taken in this struggle. That's what the history of the warfare between science and theology should have made conclusively clear'.

Let us examine these arguments. Firstly, there is the contention that if appeal is made to science in support of Christian belief, we shall find ourselves encumbered with a double standard of truth, the Word of God *and* science, instead of the Word of God alone.

This argument cannot be accepted as convincing until we have considered its validity in relation to Christian thought on a wider canvas. Supposed double standards of a similar kind are encountered in other connections. If there is a double standard between the Word of God and science, there is also a double standard between the Word of God and conscience. In the latter case, to force a man to declare which of the two is his ultimate standard would be extremely

1. Faith and Thought (1970) 98, 11.

2. *op. cit.*, p. 14.

foolish. If he opted for the Word of God he might (with witch-persecuting Christians in the past) interpret it in hideous ways; if he opted for conscience he might declare the inner light sufficient, and revelation redundant.

How, then, do Christians solve this dilemma? Most of us would claim that an appealing feature of the Christian message lies in the harmony which we find existing between Christian teaching on the one hand and the inner light of conscience which 'lightens every man coming into the world' (Jn. i. 9), on the other. This being so, can it ever be right to force a Christian to decide whether the Word of God or his conscience is his final authority? Conscience needs religion and religion needs conscience; we simply ought not to think in terms of setting the one up against the other.

Science affords another analogy. The scientist claims that he constructs his theories on the basis of ascertained fact, yet, in framing them, he has an eye to what seems reasonable and possible, perhaps also (as in mathematical physics) as to what is aesthetic. Which then is his real authority? Fact? Or his inner feeling of propriety? It would be unfair to persecute him with the dilemma. The two, he believes, work together.

The position between religion and science appears to be similar. The old adage that true religion and true science can never conflict is more than a cliché: it is the expression of a conviction of their interdependence. Like the Psalmist we may see the laws of nature and the laws of God in harmonious synchronism (Ps. xcii.).

The difficulty in the case of Christianity and science seems to arise from a confusion. If we say that the Bible *or* the Word of God is the sole authority for faith we do not mean precisely and literally what we say. The revelation of God does not exist in a vacuum: it stands in relation to man. It is we who are called upon to understand the revelation: it is the Spirit of God who enables us to do so.

In the last resort, then, the Spirit of God is our authority. He may make use of the revelation previously given by God, but also of conscience, a sense of propriety and of reason by which we gain understanding both of the Word and of science. It is semantically confusing to speak of two ultimate standards. In the last resort there is one standard and only one: the standard of God Himself who reveals Himself to man. If we do not usually speak in these terms it is because we cannot directly settle issues by appealing to the Holy Spirit, so that in practice, as in science,³ we must appeal to derivative standards. But we have no right to assume that there cannot be more than one

3. For example the atomic weight of an element was originally defined as the mass of an atom of the element relative to the mass of an atom of hydrogen. But this

derivative standard and in fact Protestants hold that there are at least two, the Bible and conscience, while Roman Catholics accept the Church and conscience.

In the Providence of God many factors may operate to persuade a man to become a Christian; it is wrong to limit God by claiming that agreement between the Bible and science may not be one of them. A man who is weighing up the pros and cons of a course of action may be tipped one way or the other even by an argument which in itself is not weighty. But science can offer more than this. Some men, at least, are so impressed by the coherence between incidental scientific teaching contained in the Bible on the one hand and scientific findings on the other, that for them this agreement constitutes one of the grounds of their belief in God. To minimize this fact on account of a preconceived notion that it *ought* not to be so, because science *might* change, or because it is illogical to prove the greater by the lesser, is to ignore known facts about the ways in which men do in fact change their minds.⁴ The stepping stones in a river bed may be slippery and unstably embedded, yet bring a man to firm ground on the other side. In the case of science, however, the Bible assures us that some at least of the stepping stones are unusually firm, the invisible things of God 'being clearly seen by the things that do appear' (Rom. i. 19-20).

We turn to the second argument, best known through its brilliant development by Karl Heim,⁵ the argument that science and religion must never be closely linked because science is a shifting sand.

To the writer, at least, it is difficult to understand how anyone can bring himself to make so sweeping an assertion, unless indeed, his knowledge of science is substantially confined to the border lands of science—in particular the atoms and the nebulae—or derived from sensationally minded journalists.

Inevitably, *at its boundaries*, science is ever in a state of flux. But its boundaries extend and, as fresh territory is conquered, areas of considerable stability are established. It is possible to say with some confidence that over a very large area of scientific knowledge neither we nor our progeny will witness great changes. Does anyone suppose that, in days to come, it will be discovered that the heart does not pump blood round the body, that the planets do not go round

presupposes an impossible experiment. Cannizzaro's derivative definition was therefore adopted—the atomic weight is the least weight in grams in one molecule of any of the volatile compounds of the element.

4. See, for example, Bernard Dixon (ed.), *Journeys in Belief* (1968). Also standard works on Christian conversions, e.g. R. O. Ferm, *The Psychology of Christian Conversion* (1962).

5. Karl Heim, *The Transformation of the Scientific World View* (1953).

the sun after all, that Avogadro's Law is false, that benzene does not consist of molecules containing six atoms of carbon apiece arranged in a ring, that chromosomes and genes are irrelevant to heredity, or viruses to disease?

Going back in history, it is often startling to note how much good science was known in the past. The fact that the earth is a sphere was common knowledge in the middle ages; ancient Greeks wrote of the running down of the universe in language which might be mistaken as belonging to the modern era,⁶ even if the ancient Hebrews did not know how to formulate the inverse square law, they *did* know that there were laws or ordinances that governed the movements of the planets;⁷ despite belief in magic the ancient Romans reckoned that it had its limitations for there were things which even magicians could not do (for example, make a river flow backwards⁸); the arguments used by the Stoics in support of natural theology show a good appreciation of the laws of probability and the illustrations used are not unlike those in use today. Added to a considerable volume of biological knowledge of a descriptive character, and much deep psychological insight, the sum total of ancient knowledge was not negligible.

It is evident that the notion that there is no stability in science is false and should be resisted. We should beware lest we attach our religion too firmly to the band wagon of the very latest scientific speculation, or to popular scientific philosophies which cannot be reconciled with established scientific principles, but this said, science may lend support to Christianity, and Christianity to science.

Thirdly, let us consider the statement that theologians have had to surrender every position taken in the warfare of religion and science.

This view, much favoured by modern atheists who will not allow Andrew White's *History of the Warfare of Science with Theology* to be forgotten, is open to attack on two fronts. Historically, as J. Y. Simpson showed many years ago,⁹ the extensive material collected by White does not warrant his conclusion. Such warfare as we find, was, in each generation, not primarily between theology and science but between older and younger scientists. Older scientists tended to uphold traditional views dogmatically; younger ones to question them and to achieve new insights. Young Rutherfords in every generation

6. See A. O. Lovejoy and G. Boas, *Primitivism and Related Ideas in Antiquity*, Baltimore (1935).

7. *Jer.* xxxi:35; xxxiii:25; *Job* xxxviii:33.

8. R. McQ. Grant, *Miracle and Natural Law in Graeco-Roman and Early Christian Thought*, Amsterdam, (1952), p.57.

9. J. Y. Simpson, *Landmarks in the Struggle between Science and Religion* (1925).

are told that they bring their universities into disrepute. Simpson provides many instances of the kind. Inevitably outsiders, *including theologians*, tend to adopt the views of older well-established investigators.

If, despite all, it is necessary to speak of a Victorian battle between science and Christianity, let us speak also of the battles between politics and science, philosophy and science, medicine and science, and law and science. Politicians, philosophers, doctors, lawyers, all, have often seized upon the latest findings of science and used them in support of views which they believed to be correct. If Christians sometimes misapplied science, as when (in 1834) Sir John Hershell set up a telescope at the Cape of Good Hope and 'showed a local resident a blood red star, only to hear in a sermon a little later that the Bible must be true because Sir John himself had seen the 'very place where wicked people go',¹⁰ it is also true that politicians have seized upon science in support of war, neglect of the poor and sick, and race extermination. A liaison of the latter kind is infinitely more harmful than an occasional unfortunate Christian speculation. But atheist influence is now so strong that these other issues are simply ignored. No one speaks of the warfare between other disciplines and science, or tells politicians, philosophers, doctors and lawyers that they ought not to have their conclusions on science for fear that today's science will change tomorrow.

In another form this third and last argument tells us that the history of science shows that when Christians link their faith with their science the result is a fiasco: they usually fail to back the winning horse and are left with a discredited theory.

The picture we are asked to visualize is that of the Christian a century or so ago appealing to the doctrine of the fixity of species in support of the biblical doctrine of creation, or to the older geological theories of catastrophism and Neptunism in support of the Genesis Flood. But science proved fickle and cruel: it left him stranded.

How representative is this picture? In answer it must be said that it is not at all representative. No one who has studied the relations of science and religion in the Victorian era can doubt that geology and biology account for only a relatively small part of the total picture. Yet when we turn to other fields, it is simply not true that theologians or theologically minded scientists were in the habit of backing the wrong horse. They often backed the right horse, but since no controversy was occasioned the fact is overlooked.

Joule, the physicist, was transported with delight as he reflected on the ways in which energy is apportioned in the universe and ascribed the arrangement to God; Faraday contrary to the usual view, linked his

religion with his science quite closely and found great scientific incentive in looking for evidences of God's care in nature; Prout, the chemist, saw signs of God's hand in many facts of chemistry; Lord Kelvin, Tait, Maxwell and other physicists of the time believed that the science of heat confirmed the truth of the biblical doctrine of creation; Babbage thought the computer he had invented might provide a model of the way God had ordained the occurrence of miracles; Boole the mathematician, was fascinated by the psychology of thinking and argued cogently that it made materialism untenable. Many nineteenth century excursions into theology were highly productive in the scientific field. Prout's *Bridgewater Treatise* written to draw attention to God's handiwork in nature is now a classic in the history of chemistry. To Faraday and more especially Maxwell, it seemed quite wrong to suppose that God would have created the universe for the most part out of nothing at all (mere empty space), a reflection that led to the study of the properties of space and so to the prediction of wireless waves. Much more might be said along the same lines.¹¹

Except in the case of geology, and evolutionary biology where clashes of personalities were involved, there is little in the nineteenth century science and religion relationship to suggest that the theologically minded people who took up definite views in science were later forced to retract. A case might, indeed, be made the other way. For example, Christians of a century ago often pointed to the remarkable property of water in expanding when it freezes as an example of Providence, while contemporary atheists retorted that as molten bismuth behaves likewise and yet occupies no obvious niche in nature, it was illogical to invoke God. Today all would agree that the properties of water are not less but a great deal more wonderful than earlier Christians had supposed.¹² Our wonder at the design to be found in nature has increased immeasurably with the passage of time. Christian anticipations of the way that science would go have proved on the whole more often right than wrong.¹³ Moreover, as we have noted, Christian involvement in science led in many instances to direct and wonderful advances in science itself.

Perhaps when the whole story has been told, it will transpire that

10. A. de Morgan, *A Budget of Paradoxes* (1872), p.179.

11. A documented manuscript on the subject is in preparation. See also *Faith and Thought* (1967), 96 (i), 3.

12. For discussions of teleology in chemistry see L. J. Henderson, *The Fitness of the Environment*, N.Y. (1931); R. E. D. Clark, *The Universe, Plan or Accident?* (1961); A. E. Needham, *The Uniqueness of Biological Materials* (1965); C. F. A. Pantin, *The Relations between the Sciences* (Tarnier Lectures, 1968).

13. R. E. D. Clark, *The Christian Stake in Science* (1967).

the struggle of Christianity with science will turn out in large measure to be the product of Andrew White's fertile imagination, and that positions taken up in science as a result of theological interest did not have to be abandoned unduly often.

Thus objections to a close liaison between theology and science prove unconvincing on examination. How then, we ask, should they co-operate?

In this connection the parallel with ethics is instructive. Humanists tell us that kindness, compassion and sympathy do not need external justification. In a sense they are right but there are times in the lives of all of us, and for some people these are not rare but common, when the intuition that we *ought* to recognize right and follow it proves woefully inadequate. The voice which says, "This is the way, walk ye in it" becomes a whisper; hope of immediate pleasure or worldly gain seems far more relevant than conscience. It is then that we desperately need a second standard: the love of God, the law of God, the hope of reward, even the threat of punishment (an unworthy motive to be sure, but vastly better than none at all). If we sin persistently, conscience becomes weak or distorted, or may disappear. On the other hand if, in moments of peril, the second standard keeps us on the narrow road, conscience will reassert itself in due course. Much of the tragedy of our world today lies in the failure to realize that two standards are necessary.

Perception (or awareness as Lord Brain prefers to call it¹⁴) affords another parallel. Many modern philosophers¹⁵ now recognize that when we see an object we may know in two distinct ways that it is there; by a direct intuitive awareness mediated through the senses and by a process of reasoning which enables us to interpret signals received through our sense organs. In the psychological field the difference between them has been focused by Michotte's experiments on the direct perception of causality in the outer world which is in contrast to the causality which we suppose to exist as a result of a reasoning process.¹⁶

These two kinds of perception are subject to alternation: normal perception is direct and intuitive, but when feelings of unreality are uppermost (culminating, perhaps, in an unreality or derealisation syndrome) we fall back on reason. We always use reason, in addition, to test the validity of direct perception which, like reason, may fail to

14. In J. R. Smythies (ed.) *Brain and Mind* (1965); *Science and Man* (1966).

15. See, for example, G. M. Wyburn, R. W. Pickford and R. J. Hirst, *Human Senses and Perception* (1964).

16. R. C. Oldfield, *The Perception of Causality*. For a translation of A. Michotte's paper see M. D. Vernon (ed.), *Experiments in Visual Perception* (1966), pp.235ff.

provide us with the right answer, the possibility of illusion being familiar to us all. Once again a two-fold standard is necessary: confidence is strong when intuition and reason work together.

These examples afford close parallels with science and religion. The Christian may know intuitively that he trusts the Word of God but his intuition falters at times. By reason the door is kept open for faith to return and when it does return, now supported by reason, it is stronger than before.¹⁷

The Bible abounds with instances of the way reason steps in when faith is dim. 'My God, my God, why hast thou forsaken me?' is followed by reasoned argument: 'In thee our fathers trusted . . . and thou didst deliver them . . . thou art he who took me from the womb . . . (Ps. xxii). When the Prodigal Son had lost all hope he reasoned to himself; 'How many of my father's servants have bread enough and to spare, but I perish here with hunger.'

What, then, is the upshot of this discussion? Surely it is this; that we should link our religion with our science as closely as we are able—just as we link other interests with science. Sometimes, no doubt, we shall make mistakes; our science or our biblical exegesis will be at fault. Sometimes the passage of time may show that arguments we have used in support of the Christian faith are wrong, yet if we have used them in all honesty may they not be profitable in their time? Does it matter if a generation yet unborn (or even those in ten years' time) will sometimes have cause to smile at what we said and wrote? Do we Christians of today feel that our side has been let down because Christians who lived centuries ago preached sermons about red stars, or mistook crystals formed from the ashes of plants for a resurrection of the plants and saw in such chemical experiments an enactment of the final resurrection? Of course mistakes will be made. But do those who take a different view of science and Christianity forget that mistakes are *equally* easily made in exegesis? Man can misunderstand the Bible as easily as he can misunderstand nature: he can link his faith to false interpretation as easily as to bad science. By parallel reasoning to that which is now being offered in many quarters it would be wrong to preach from the Bible because this might imply a double standard between the Word and our interpretation of the Word, or because we might interpret it wrongly and

17. *Jn. IV:46-54* affords an illustration. The official 'believed the word that Jesus had spoken to him.' Nevertheless, on returning home, he decided to apply a simple scientific test to his intuition that the healing of his son was our Lord's doing. He ascertained the time at which the boy began to recover, and learned that it was at the same time as Jesus had said to him, 'Your son will live'. This greatly confirmed his faith: 'he himself believed and all his household.'

interpretations are a shifting sand which may change tomorrow. Arguments against linking science with Christianity are arguments which may be turned against *all* preaching, all witnessing, all constructive thinking in the Christian field.

A HISTORY OF THE CICCU¹ AND SOME PERSONAL REMINISCENCES

Dr. O. R. Barclay has recently written a welcome history of the CICCU (Cambridge Intercollegiate Christian Union) which celebrates its centenary this year. The strange title (*What ever happened to the Jesus Lane Lot?*) is a reference to the group of students, known as the Jesus Lane Lot, who proved to be the embryonic CICCU of those days.

Dr. Barclay, a former CICCU President and now General Secretary of the Universities and Colleges Christian Fellowship (UCCF, formerly IVF) has kept in touch with the CICCU since his days at Cambridge and has obviously worked hard to compile this very readable and interesting story of the CICCU from its earliest days right up to 1977. In doing so, he has made good use of J. C. Pollock's *A Cambridge Movement* (1953).

In the present book there are nine chapters in all covering, usually, ten or twenty years apiece. The overall picture is most inspiring, for the CICCU in Cambridge has spread its influence during the century over the entire world. There were times when most CMS missionaries and a high proportion of ordinands in the C. of E. were CICCU men. The influence of the Christian Union at Oxford was less marked and, of course, until recent times Cambridge and Oxford, with London as a later addition, were the only English Universities. Today such institutions are numerous and the influence of any one of them, including Cambridge, is correspondingly less.

Many interesting themes and points of view find expression in this book which tells how successive generations of students faced new and ever-changing situations. Many of the difficulties encountered were caused by the rise of liberal theology which came to be accepted by nearly all scholars from the turn of the century onwards. Why? Charles Smyth, a historian, finds the chief cause to be the enormous missionary emphasis existing in the Christian student world of the time. Theological leadership and teaching at home was left to lesser minds, for the most part lacking strong Christian convictions: the ablest of committed Christians went abroad where missionary casualties were high, especially as malaria was still rampant in many

1. O. R. Barclay, *Whatever Happened to the Jesus Lane Lot?*, IVP (1977), 176pp.

countries. The average life of the Bishops of Sierra Leone, for instance, was at one stage little more than two years! On the other hand 'missionary blood-letting' was its glory and led under God to the foundation of evangelical churches all round the world.

Having once started to read this book I found it nearly impossible to stop! For me, the reviewer, it brought back legions of memories of Cambridge days, for I knew so many of those mentioned. One could only wish that the book had been three times the length! To have covered so much ground in 200 pages, and to have done it so interestingly is a credit to the author. Nevertheless the sheer brevity at times means that there is an occasional jump to another topic just as one is becoming fascinated by what one has already read. No doubt, however, a longer book would have proved less interesting to non-Cambridge men!

In the remainder of this essay I shall try to fill in the picture a little for the period when I was up (1925–39). Though the result is bound to be idiosyncratic, it will probably be of interest to many readers.

I think the first CICCUC man I got to know at all well was L. S. B. Leakey, apart, that is, from old school friends who came to Cambridge at the same time. Leakey had been at St. John's for a year and had come, with very little money, to train to be a missionary (see his autobiography). His boyhood, spent among the Kikuyu in Kenya, set him up in life with an unusual outlook. As a scholar of St. John's he was required to read *grace* (in Latin) at Hall and with others he set about creating a record by doing it in the shortest possible time—being hauled before the Dean for his efforts! A trifle irreverent, I felt, especially as he was CICCUC representative at the time. Looking back I think the explanation may be that he hardly understood a word of Latin and so did not realise what the prayer of thanksgiving was all about. Cleverly, he discovered that the University Statutes did not absolutely insist on Latin or Greek for Little-Go (the entrance examination): any non-European language would do instead. So he offered Kikuyu which he knew, perhaps, better than anyone else in England at the time. This put the University in a bit of a spot. They looked around for a suitable examiner and were advised that a certain Mr. L. S. B. Leakey should be approached! In the end I rather think he examined and passed himself, or at least helped his examiner to examine him! Later, while still an undergraduate, he was called upon to lecture to his own class.

Returning to the story, something suddenly happened. I never quite learned what, but the CICCUC Executive fired Leakey from his position as college representative of the Union (the late R. M. Scantlebury then became representative) and he was deeply hurt. The

trouble may have had something to do with his belief in man's evolution, but Leakey did not think his views were in any way in conflict with the Bible. Leakey was a passionately dedicated Christian. Every night before Hall he had a prayer meeting in his college rooms and after the row with the CICCUC Executive he poured out his soul to God, many a time, praying for his friends in College. I could not understand why this deeply devout, lovable if unorthodox fellow, who had come at great personal cost from far away Kenya and from missionary parents, with the intention of becoming a missionary himself, should have been rejected by the far less mature Christians of the Executive. Soon after this sad experience Leakey began to think that the missionary societies might reject him too. So he changed his line to anthropology and shocked the narrower Christian world by writing *Adam's Ancestors*. But he did not lose interest in mission work and for years after, when back in Cambridge, he would attend the CICCUC daily prayer meeting (DPM as it was called) and pray aloud.

No doubt it was right—and Barclay defends the position well—for the CICCUC to maintain a distinctive witness. But it was infinitely sad that in doing so it sometimes caused great pain to other Christians. One is reminded of the rejection of F. W. Newman (brother of the Cardinal) by J. N. Darby in the early days of the Brethren Movement. The tragic side of Christian orthodoxy and of distinctive witness deserves some comment in Barclay's book, I think. Unfortunately it receives none.

Leakey was fascinating to talk to. He gave me some insight into the silly mistakes Christians can make by failing to check easily ascertained facts. For instance in Kenya, a missionary had translated 'virgin' in the NT by a word which to the native means a girl who has regular sexual affairs with boys but is not married. Without knowing it, missionaries were teaching or implying that this was the right thing for young Christians to do, for they always said that Mary was such a good woman!

In the late 1920s and in the '30s the CICCUC was relatively small and much despised by academics. I remember (in 1929) reading Canon Raven's book, *A Wanderer's Way*, in which he lampoons CICCUC men as follows. 'Most of its members fall into one of two types' he says, 'they are either highly suggestible with that strange and almost unearthly look which is the seal of a child-like faith, or they are hard, thin-lipped, obviously repressing a mass of unexamined doubts, men of strong will and narrow bigotry'. Either way, says Raven, they only manage to maintain their faith 'by withdrawing from contact with their fellows, by living in a close community, and by rigid discipline of

prayer-meetings and Bible readings. The amount of harm they do to the religion of Jesus is simply incalculable'. And again, 'It seemed incredible that anyone with sufficient education to pass Little-go should still believe in the talking serpent, or Jonah's whale, or Balaam's ass, or Joshua's sun, or the cryptograms that foretold the second advent.'

Faced with that kind of criticism, it was too much to expect inexperienced undergraduates like me, straight from school, to have the wisdom of Solomon. Some of us reacted strongly—at least I did! Many a rare battle ensued with prominent theologians of the time—the College Chaplain, Bethune-Baker, J. M. Creed (the Dean) and others! An ignorant freshman one might well be, but it seemed wrong not to denounce the hypocrisy of reverend gentlemen who had affirmed belief in the Holy Scriptures and creeds to gain their positions, yet who openly tried to turn us undergrads into partners in their unbelief! ... And not theologians only ... In a chemistry Supervision in College my Supervisor used God's name in vain ... well ... a fellow student whom I had not seen or heard of for 50 years reminded me only the other day at a college reunion of what transpired! Probably I was rude and insolent but in the end God used my protest in a wonderful way.

The fact was that one had to fight to keep sane and true to God. Or so it seemed at the time. Many other CICCUs probably felt the same. And as a form of release they would sometimes do the strangest things. There was --- (I had better not print his name!) who armed himself with brushes and little tins of paint and went into the RC church where he proceeded to paint their images for them. Very naughty! One member of the CICCUs, who later became President, after indulging in the usual (for those days) riotous behaviour on the 5th of November dislodged a policeman's helmet (later the kind policeman gave it to him and the helmet is still a treasured possession!) and was taken with other undergraduates into custody for the night where he taught them all to sing hymns and choruses.

In some ways, however, the Cambridge so fiercely critical of our evangelical Christianity made us (me at least) sceptical of the sceptics. I owe much to W. H. Mills, FRS, my research supervisor, a world-renowned stereochemist. In his brilliant and inspiring lectures he cared for no man's reputation. Theories invented in Victorian times which had been repeated in text-books for half a century and more and regurgitated by generation after generation of students were quickly and unceremoniously dismissed as nonsense in the light of simple experimental evidence, and often with dry humour. In

chemistry you can frame experiments to test theories, in theology this is just what you cannot do. It hardly seemed plausible to suppose that Wellhausen and his ilk were right, dead right, while the great chemists of the past had so often been wrong, especially when they relied too much on their brains instead of experiment and observation.

I read physiology for Part 1 of the Natural Sciences Tripos and tried to broaden my interests by attending lectures at scientific societies where biologists often spoke. When evolution cropped up, famous men sometimes introduced the subject almost apologetically. That Darwin's doctrine of the selection of the fittest could account for more than a minute fraction of the wonders of biology always seemed to me highly improbable. One well known atheist, a man whose knowledge seemed astronomical, ridiculed the theory without mercy. In scientific circles it seemed to be accepted, not because of any plausibility it might possess, but for want of something better. Or else it was a faith held, passionately, by people who did not think carefully about what was involved. Here was a marvellous nineteenth century theory purporting to explain the whole realm of life. But would anyone take such a theory so seriously outside the field of biology? Chemistry was the most advanced of the sciences. In its early days the Newtonian chemists maintained that all particles were held together by gravity. In the nineteenth century progress was impeded by the doctrine that all atoms must possess positive or negative electric charges which serve to stick them together in compounds. These and other comprehensive theories, in their day, at least, must have seemed quite as plausible as Darwin's later theory, but they turned out to be wrong or (as with charged atoms) true only within a limited range. There seemed to be no grounds for taking Darwinism too seriously, though evolution was probably true within limited ranges.

I think most CICCUMEN men either rejected evolution or had serious doubts. But with liberal theologians, or 'modernists' as they were then called, it was otherwise. They talked about evolution as if there was no possibility of legitimate doubt. Charles Raven was one offender (though one was grateful to him later for his criticism of mechanistic evolution and in other ways too). For him evolution was the Holy Spirit. After reading his book (*The Creator Spirit*, 1927) one could only feel that this opinion was as silly as that of Robert Roberts, the Christadelphian (author of *Christendom Astray*, 1861) who identified the Holy Spirit with electricity. As time passed I felt increasingly that, even if CICCUMEN men were not all as thoughtful as one would have liked them to be, yet God kept them wonderfully free from the sophisticated nonsense prevalent in other religious circles. Sensible, earnest discussion and seeking for truth was possible with CICCUMEN friends:

those who thought we were lunatics had on the whole little useful to say. I realise looking back that I must often have seemed to outsiders, and some insiders too, self-opinionated, even arrogant. But was there not arrogance too in those who dismissed God's revelation as of no account, who denied even that we are sinners and need forgiveness, all on the flimsy basis of woolly-minded materialistic theorizing?

There were other ways, too, in which the theological faculty destroyed its own credibility. Chris Cook (C. L. Cook) of Pembroke College who read theology told me how on one occasion, as a raw undergraduate, he mentioned a flighty idea of his to one of his lecturers. Some time later the man reproduced the idea back to Chris, saying that he could not remember which professor had made the interesting suggestion, though he was sure that he had heard it quite recently! As Chris rightly said, one could hardly imagine this happening in any other Faculty! Or again, points which to a Bible reading student like me seemed very elementary indeed, seemed to lie at the fringe of knowledge among theologians. I remember saying at a meeting that, what ever His disciples might have thought, there was a good deal in the NT to show that Jesus Himself did not expect His second advent to be near at hand. And a theologian looked at me gravely and said in a condescending way that I had uncommon discernment! One evening, (this was a few years later) Joseph Needham gave a lecture on Theological Embryology to the St. John's Theological Society. The theological faculty was well represented. Needham told the story of how the RC theologians (they held a conference on the subject at the Sorbonne in 1733) reckoned that if there was any chance of a baby dying in its mother's womb before it was born, it was essential for the well being of its soul that it should be baptised. So a devout RC surgeon, F. E. Cangiamilla by name, invented a syringe for the purpose with a little cross at the end through which the baptismal water was poured. One child suffered five baptisms, in all, each 'under condition' just in case the one before was invalid! The theologians, who seemed never to have thought of this, were quite flummoxed! Soon they started to argue that in their opinion nothing magical happened to a child at baptism but that baptism was a convenient initiation into the church, where it would grow up in Christian surroundings. I asked them whether, seeing that this was so, they would find it needful to baptise a child that was at the point of death, who clearly had no prospect of growing up in the church.

Silence! Needham looked round saying that he thought this was a highly relevant question. There was a long silence in which you could have heard a pin drop. Finally someone said that one ought not to be

too logical! Again one felt that professional theologians apparently did not think their position out any more carefully than CICCU men and were hardly to be trusted when they maintained that belief in the Bible was unscholarly.

On the other hand even the liberal theology of those days was not all unprofitable. I regularly attended lectures, organised by the SCM, at which F. R. Tennant spoke. Though a bit pompous they were impressive and helpful. And to Dr. A. C. Bouquet, too, whose theological seminar I joined, I owe a deep sense of gratitude. But neither of these scholars were anti-evangelical. Later, I attended C. D. Broad's Lectures for Part 2 of the Moral Sciences Tripos. They were a trifle dull, but his writings influenced me greatly. Though an atheist he did as much as anyone to confirm my faith and I have learned since that I am not alone in this. Years later I wrote to tell him so and to thank him and had a kind letter in reply. All these experiences confirmed my loyalty to the CICCU. If its members (and me too) made mistakes, at least their hearts were in the right place.

Quite often older Christians circulated amongst us. There was one George ---, a retired missionary, who created much disunity in the CICCU with his teaching about a second blessing which he claimed to have received. He had achieved a state of sinlessness as a result and he told us that he had done nothing wrong for (I think) forty years. So an undergrad deliberately stamped on his toes and George said angrily, 'Why did you do that?' ...! Hampden-Cook, the Editor of Weymouth's translation of the NT retired in Cambridge and visited us (or me) often, seeking to put across his strange preterist idea of the second coming of Christ. And of course we all knew Basil Atkinson who figures much in Barclay's book. Tales of Basil and his doings were legion. When Buchman's teaching on guidance was doing the rounds, Basil published his little book *Is the Bible True?* A CICCU wit summed up the position:

Basil, Basil, tell me the answer do
 Tell me, tell me, is the Bible true?
 Veriker likes to shout it.
 Buchman has guidance to doubt it.
 But now we can get,
 For two and six net,
 An unbiased account by you.

(Veriker, if I remember correctly, was on the staff of the Crusader's Union).

I shall never forget how, in the days of the Open Air meetings run by the CICCUC, on one occasion the President of the SCM was asked to speak. Afterwards, when it was Basil's turn he referred to this 'determined attack by the Enemy'. Most of us were shocked especially as nothing, so far as we knew at all heretical, had been said. To his credit, be it said, Basil was much wiser in later days and was a pillar of strength and friendship to the CICCUC until the end of his life as Barclay rightly says.

Much as one agreed with what CICCUC preachers said, the standard they set was often very low—though there were a few notable exceptions (especially Rendle Short, Mowll the schoolmaster and brother of the bishop, and some missionary speakers). They came, often, for weekends from country parishes where the standards of preaching were not up to academic level! Sometimes astonishing things were said. I remember one preacher saying that he would never read a book in which 'He' referring to our Lord, was spelt with a small h—which, as an undergrad (later an eminent professor) pointed out, meant that he never read the NT!

Barclay mentions the ever-cheerful L. F. E. Wilkinson ('Wilkie') who at the time of the General Strike 'drove a tram with a zest and fervour that even Jehu might have admired.' I shall never forget seeing Wilkie dodging across the road just in front of a lorry as it turned into East Road. It was in the summer term when examinations were pending. Having escaped an accident so narrowly Wilkie twisted his head round and shouted out to the lorry driver, 'Nearly an aegrotat!'

The atmosphere at the time of the General Strike was quite fantastic. Students went off in gangs when they heard that various groups of workers had gone on strike. Chemical enthusiast that I was, I volunteered to work at the gas works—but the men there obligingly kept at work. Later I was just about to go to the London docks when, quite suddenly, the strike collapsed. At the time of the Strike all over Cambridge people were milling around with nothing to do, only too anxious to talk. Once I went down Mill Road. Soon I got talking with a man about Christianity. Within a minute or so an enormous crowd had collected. Then the police pushed their way in to say that I or we had completely blocked Mill Road to traffic, so would I please talk in a side road. It proved impossible to push one's way there so the police came again and this time they managed, somehow, to stop us talking. The crowd milled its way to Parker's Piece. Before long I found myself addressing, not all successfully, an audience of several hundred! Looking back I feel humbled for I never really knew how to rise to the opportunities offered.

The Willie Nicholson mission, described by Barclay, was a highlight for all who were up at the time. It was not possible for me at least, to go every night, for work pressure on us science students was intense and G. F. C. Searle could be quite fearsome towards students who had not written up their last experiment in physics. Searle, an antivivisectionist and Christian Scientist, was quite a character. Often he reduced women students in his class to tears and then invited them to breakfast for the following morning. Once a young lady was in despair because the needle of her magnetometer kept moving unaccountably and it proved impossible for her to take a reading. She appealed to Searle for help. He summed up the position with alacrity and shouted loudly for us all to hear—'Well! If you will wear steel corsets! I did not like following the voluminous directions he issued with each experiment too slavishly, and sometimes altered things to modify the experimental set-ups. At last Searle's wrath was kindled. 'Some men are fools!' he stated. I looked at him straight in the face and said 'Yes Sir, I quite agree with you. But are you implying that I am one of them?' 'Well' and he looked away, 'I wouldn't like to put it quite like that' he said. He walked off sheepishly and never spoke to me again throughout the course, for which I was deeply thankful. His young demonstrator was always more than helpful. In later years Searle always chatted in the friendliest of ways when we met in the street and once or twice I visited his home.

To continue, I managed to get along to the mission several nights and brought friends. In the pulpit Willie Nick was exuberant, shockingly crude, but in deadly earnest. At DPM we met him daily and there his character was quite changed. He was delightful, humble and saintly: it was impossible not to love him. Those who did not see this side of him were often offended, including a friend of mine who reckons that he was put back months in his search for God by Willie Nick. (But another friend, Ted Yorke of Caius, was wonderfully converted.) One memory is still vivid. Nicholson had been preaching solidly since 8.30 p.m. and now it was just before 10 o'clock by which time, at some colleges, students were expected to be in. A man right in the front of the church got up and walked quietly down the aisle to leave. It was not a gesture of defiance by the look of things: in any case a mocker would surely have made his protest much earlier in the evening! But Willie was roused to wrath! He shouted, he yelled, he thundered at that wicked sinner who was certainly choosing hell instead of Christ and whose conscience had so obviously been pricked. Why should he walk out just as the moment of decision had come? On and on he fulminated till the poor fellow had left by the door. How wrong this seemed at the time but it

brought home the lesson that one can love and admire fellow Christians even though they do things which, to us, may seem revoltingly wrong. God makes use of all kinds of quaint people and certainly He saw fit to make use of this fiery Irishman. Episodes like this also help us to feel sympathetically towards non-Christians when they criticise those who work for God.

Finally, I cannot thank God enough for the CICCUC. From the very start it provided warm friendship for an impecunious and otherwise lonely undergraduate. I shall never forget going, for the first time, to Dr. McCombie's chemical laboratory where there was no formal teaching and one was left a good deal on one's own though with some supervision. At once T. L. Livermore, then in his second year, who had seen me at DPM, recognised me and made me feel at home. Under H. R. Gough's Presidency a CICCUC Club was opened in the town and there was a CICCUC hockey club called the DODOS where men like me who did not shine at sport could enjoy themselves. (The College athletic clubs of those days at once dropped your name if your standard of play was below average.) For some reason I got in with the Sidney Sussex CICCUC (J. S. Wright and others) as much or more than with those of St. John's which was perhaps rather weak at the time. Soon I made many good friends outside the CICCUC too. How sad it is with friendships that though they are so many and so precious, it is impossible to keep up with more than a very very few. For fellow Christians at least we have the hope that 'with the morn/
Those angel faces shine/Which I have loved long since and lost awhile'.

REDC

A New Literary Discovery

in a poem entitled 'Three Blind Mice'

From bygone generations a story in verse has been handed down to us entitled 'Three blind mice'. No one ever accused it of literary merit, yet it has fascinated old and young alike, and its fame is such that there can be few in the British Isles who could not repeat it. It is the aim of this article to reveal some extraordinary arithmetical phenomena which have recently been discovered in the lines.

The habit of attaching numerical values to the letters of the alphabet is not new. The ancient Hebrew and Greek numerals were obtained in this way, and as a consequence every word, phrase or sentence had a numerical value obtained by adding the values of the constituent letters. It has furthermore been discovered by many scholars (e.g. The writers of the Jewish *Kabbala*. E. W. Bullinger, 'Number in Scripture', R. T. Naish, 'Spiritual Arithmetic' and especially Ivan Panin, 'Verbal Inspiration Demonstrated', and R. McCormack 'Heptadic Structure of Scripture', etc.) that the Bible is a network of mathematics, in which certain sacred numbers show themselves repeatedly. Outside ancient literature, however, it appears that no one has hitherto discovered this type of phenomenon.

In the lines of 'Three blind mice' the number three—which together with seven was the ancient number of perfection—is strongly emphasised, and if, conceivably, any mathematical design had been intended it is probable that three and seven, the two numbers of similar esoteric significance, would have been used. We must observe however that we are far more likely to be led astray by three than by seven, for the large proportion of one third of random (i.e. undesigned) numbers will be divisible by three, but only one seventh by seven.

Since English letters have never been employed as numerals, the only obvious numerical equivalents which can be assigned to them are those indicating their position in the alphabet. Thus $a = 1$, $b = 2$... $y = 25$; $z = 26$.

The verse we are considering contains $6 = 3 \times 2$ lines, $141 = 3 \times 47$ letters and $54 = 3 \times 3 \times 2$ vowels. The commonest letter 'e' occurs $21 = 7 \times 3$ times, and the longest word contains 7 letters. The numerical value of the whole passage is $1611 = 3 \times 3 \times 179$.

If these results are designed they will probably have been brought

into relation with the meaning of the words. Now the fourth line ('who cut off their tails with a carving knife') contains the description of the crime which would seem to mar the perfection. It is, therefore, very interesting to observe that on omitting this line the number seven becomes extremely evident.

The remainder contains $28 = 7 \times 4$ words and $105 = 7 \times 3 \times 5$ letters, having a total value of 1193 (sum of digits, $14 = 7 \times 2$). The lines previous to the fourth contain $14 = 7 \times 2$ words, the first seven (lines 1 & 2) giving 313, and the last seven (line 3) 322, (sum of digits 7 in each case). After the fourth line the phenomena cease as would be expected.

An extraordinary fact emerges when we study the title of the verse '*Three blind mice*'. A favourite ancient device consisted in adding up values of initial and final letters of words. In the present case the sum of the initial letters is $35 = 7 \times 5$ and of the final $14 = 7 \times 2$ giving a total of $49 = 7 \times 7$. Now the title stands for the whole verse, and the first letters of all the words in the verse $483 = 7 \times 3 \times 23$, or $364 = 7 \times 52$ on omitting line four. The last letters give 412, or 313 without line four, and though neither of these numbers is divisible by seven, yet it can hardly be coincidence that the sum of the digits is seven in each case.

We shall indulge in one further speculation. Could there be some esoteric meaning in the words, 'Cut off their tails'? Could they have possibly been meant to imply that if we remove something from the ends of the lines we shall obtain further light on the mathematical structure of the verse? There are several ways in which this could be done, but in each case results vindicate the theory.

The last 3 letters of each line give a total of $147 = 7 \times 7 \times 3$. The last 7 letters of each line give $462 = 7 \times 3 \times 22$. Every one of the third letters from the end of each line has a value of 3×3 or a multiple, and the total is $63 = 7 \times 3 \times 3$. The seventh letters from the end of each line give $72 = 3 \times 3 \times 8$. Needless to say when the first three or seven letters, or when the third or seventh letters from the beginning of each line are taken, no results are obtained, (except that one of the four numbers is divisible by 3, which is what would be expected by the laws of probability).

Strangely enough, if it should be stressed that the words 'cut off their tails' could only refer to three objects, the same results follow, for if we take the last three letters of the first two, the middle two, and the last two lines, we obtain the number $90 = 3 \times 3 \times 10$: while for the last seven letters the result is $234 = 3 \times 3 \times 26$.

The arm of coincidence may be long but no educated person is likely to invoke its aid to explain results such as these, and we must accept design as the cause.

Now the labour required to produce results like this would need to be prodigious, and it is clearly improbable that they could have been produced by human mind at all. Furthermore, if we are to suppose that they were written by a mere man, it is surely an extraordinary coincidence that the lines have been so faithfully handed down to us, in spite of the fact that until now no one ever suspected their true nature. Most of the rhymes our ancestors wrote have been lost—why should this rhyme, almost devoid of merit as it is to the casual observer, be among the few preserved? Surely there is only one rational explanation—namely that we are dealing with the miracle of inspiration. Many, of course, will scoff at this suggestion, but we have not met one such who has attempted to face the FACTS.

MATHEMATICS. Numerics

(Current Notes & Abstracts on Science & Theology. Oct. 1944)

The work of Ivan Panin (Verbal Inspiration Demonstrated: Thynne. A magazine called Numerics, etc. Cf. also McCormack, *The Heptadic Structure of Scripture*; E. W. Bullinger, *Number in Scripture*; R. T. Naish, *Spiritual Arithmetic*, etc.) has been much publicised in this country. Recently yet another booklet on the subject has appeared (W. M. Powell, *The Bible the Foundation Stone of Anglo-Saxon Civilisation shown by a Russian Scientist to be Verbally Inspired*, n.d. From 11, Rowney Bury, Harlow, Essex). (The title is objectionable; Panin is not a 'scientist'.) In this the old argument is reproduced. Thus, the author claims that in Matt. i, 1-11, 'the number of male ancestors of Christ, the number of those *not* male ancestors; the number of *proper* names and the *other* names; the *nouns* and words which are *not* nouns; the number of words in the *vocabulary*; of the *initial* vowels and consonants of the names, and the total number of *letters* are all multiples of *seven* and seven is the underlying numerical basis of the whole of the generations of God's chosen people, from Abraham to Christ (Matt. i, 17)'. The list sounds impressive and it is perfectly possible that the explanation suggested (verbal inspiration) is sound. But are the phenomena really significant? Why is seven rather than fourteen or even three taken as the key number (Matt. i, 17)? Why are only the nouns chosen instead of other parts of speech? Are all the above results really independent? Why choose initial vowels, and consonants instead of middle or final? Why not consider the value of only the first seven letters of the Greek alphabet? With so many possibilities from which to choose it is inevitable that a considerable

number of the results will be divisible by seven. Only by careful statistical treatment is it possible to discover whether or not the results are really significant. It is certainly time someone investigated the matter carefully, especially as Ivan Panin's 'results' are so widely used as a 'proof' of verbal inspiration in fundamentalist circles. Ivan Panin has actually gone to the length of revising the Bible—taking the readings as correct which fit into the number scheme—and this revised Bible was published by the Oxford University Press a few years before the war. Yet despite the vast amount of work which this entailed, I.P. never seems to have bothered to make sure that the basis is sound. When he discovers twelve features of seven in a passage he at once asserts that the chances are 7^{12} (always worked out in full!) to 1 against this being due to a coincidence—which is, of course, quite untrue. We are never told how frequently he looked for such features and failed to find them.

Using such methods it is easy enough to prove that *anything* is inspired. I once spent a railway journey from Scotland working out the numerics of Three Blind Mice. The results read as convincingly as anything Ivan Panin has published.

In G. Udney Yule's recent book (*The Statistical Study of Literary Vocabulary*, C.U.P. 1944) there are tables and curves illustrating the use of nouns by various authors. It is remarkable that in Part I of Bunyan's *Pilgrim's Progress* the words Blood, Holiness, Hope, Joy, Light and Salvation each occur seven times. (The word *Glory* occurs eleven times—otherwise no typical theological words of this character occur in the other frequency groups until very common words are encountered.) Bunyan can hardly have bothered himself to achieve this result deliberately. (The feature vanishes in Part II). Is it possible that when he had used the words a certain number of times, his unconscious mind created a feeling of satisfaction and prevented him using them again? The phenomenon of post-hypnotic suggestion certainly suggests that the unconscious mind would be capable of achieving a result of this kind.

According to I.P. and his followers the Bible is a network of mathematics. The numerical value of every sentence (Hebrew and Greek letters of the alphabet also stood for numbers and by adding these numbers a numerical value for every word is obtained) has been pre-designed to illustrate the message of the passage. Large numbers have to be factorized and the factors then show the meaning (1 and 3—the Godhead; 4—the world; 5—Grace; 6—the number of man; 7—perfection; 13—sin, etc. But Christians have not always agreed on these numbers. St. Augustine said 6 was the number of perfection.)

Many Jews still use a similar system in order to interpret the Old Testament. It is assumed that passages with identical numerical values (or *gematria*) have identical meanings. Thus the expression: 'and lo three men' = 701 (Gen. xviii, 2). But the words: 'These are Mishael, Gabriel, Raphael' also add up to 701, which reveals the identity of the men. But even so, according to the Kabala, the Bible cannot be accepted literally as it stands. New meanings are spelt by first and last letters: thus in the words—'who shall go up for us to heaven' (Deut. xxx, 12) the first and last letters together spell *circumcision*, while the final letters spell *God*—so God pointed the way to heaven by circumcision. In addition there are more elaborate cryptograms, resembling secret codes, while Bible names are interconnected by means of magic squares (Mary = 153. Construct a magic square out of 1, 5 and 3 and it adds up to 888 in all directions. But Jesus = 888). See C. W. Oliver, *An Analysis of Magic and Witchcraft*, 1928. Chap. iii.

It seems clear that 'numerics' might easily destory the meaning of the Bible and replace spirituality by competence in juggling with figures. Nevertheless there is no doubt that the Ancients did think in terms of numbers much more than we do today, so it is only to be expected that we shall find evidences of this in the Bible. There is a scribbling on one of the walls of Pompeii (destroyed A.D. 79) which reads: 'I love the girl whose number is 545' (Cf. Rev. xiii, 18). The Apocalypse is obviously written with full regard to the meaning of numbers. Such methods may well have served to prevent a corruption of the text of ancient writings and they might also serve to divide a book into natural divisions (seven seals, vials, bowls of the Apocalypse) in much the same manner as our chapter headings.

TWO VIEWS OF GOD AND HIS WORLD

When the new volcano Paricutin erupted out of a field in Mexico some years ago sightseers arrived in plenty at the nearest hotel. The conversations, we were told, were of the most varying kind. Artists commented on the beauty of the scene at night, geologists thought of the early ages of our planet, engineers talked of the terrible waste of energy, enough they said to feed the power stations of the entire world and all going to waste, farmers thought of the poor man who had lost his field, mineralogists of the mineral wealth that might or might not be brought to the surface. And so on.

The accident at Three Mile Island a few years ago is creating a similar welter of thinking. How did it happen? Who was to blame? Or what? D. L. Sils in a review of Charles Perrow's *Natural Accidents*.

(See Nature 309, 185) tells us that the electrical engineering magazine *Spectrum* has been collecting some current thoughts on the subject. The result of many investigations and much thought is that after the accident people tended to view it in ways which conformed to their training and predisposition. 'Political scientists saw the accident as a regulatory failure; human-factors engineers focussed upon the confusion in the control room; lawyers saw liability; and sociologists [claimed] that it was a social system that had failed.' All this to say nothing of the view that it was an engineering failure, that the manufacturers were at fault, that there had been an operator error, or just that the relief valve had been badly made.

Such differences are as important to religion as to technology. We tend to a view of God which is a reflection of our own disposition. The unprofitable servant who hides his Lord's money takes a dim view of his master—a hard guy, he reckons, who reaps the fruit of other men's toil. 'To the pure thou wilt show thyself pure; and with the perverse thou wilt show thyself froward' (Ps. 18:26) says the Psalmist. It is the same with every calamity. How comes it that a loving God allows a dear one to die in pain, or permits men to fight one another in savage wars? When the judgments of God are in the earth men blame God rather than man—a reflection of the type of human character which first of all puts the blame on others rather than self.

The question of multiple causation also arises. Looked at from different points of view, all the explanations of the Three Mile Island accident may be correct. The Bible affords many similar examples. It is both God and the devil who cause David to number the people. The movements of the sun, moon and stars across the sky is the result of the operation of the laws of heaven and earth yet they may be thought of, and often are, as the workings of God. Baruch and Jeremiah are told to hide themselves ('Don't let any one know where you are' Jer. 36:19) but when the king tries to arrest them we read 'The Lord had hidden them', v.26.

In everyday life we think and talk similarly. On the TV we might truthfully say that we heard a politician make such and such a promise yet we know that what we saw was a recording and that the politician in question was not hiding in the box of electronic gadgetry in our sitting room. A man might say that he built a house in a chosen place but we do not think he is a liar because he has no knowledge of building. If we say that a king declared war we do not necessarily think of him as a fighter.

It would seem that Christians are often muddled. Some passages in the Bible seem to speak of God as the direct cause of all that we see and hear—he clothes the lilies of the field, makes his voice to be

heard in the storm, upholds the universe, feeds the lions and so on. On the other hand we are faced with the clear statements that the workings of nature are not all the direct activities of God—for the Scripture makes it clear that God has implanted laws in nature and it seems to be implied that these laws operate on their own.

Thus Job is asked if he knows the ordinances of the heavens and whether he can establish their rule on earth (Job 38:33). In such passages as Jer. 31:35 and 33:25 God claims that his promises are as reliable as the laws of nature as seen in astronomy. Similarly on earth the bounds of the sea are controlled by a perpetual decree. (Jer. 5:22) Similarly the heavens and the clouds were created and established by God by a 'decree which shall not pass away.' (Ps. 148:6; 104:19; Prov. 8:29 etc.) The general teaching is, or seems to be, that God created the whole system of nature and implanted laws with which he does not normally interfere. If this be so, we must interpret those passages which seem to speak of God's immanent presence in all nature in much the same way as we speak of our television personalities, of the doings of actors on the stage, or the sayings of great writers who have pointed to ever-present truths but who, despite the present tenses which we naturally employ, have long since been dead and buried.

If this is not the right way to read the Bible, what are we to make of such a passage as 1 Ki. 19:11 'A great and strong wind rent the mountains, and brake in pieces the rocks before the Lord; but the Lord was not in the wind: and after the wind an earthquake; but the Lord was not in the earthquake: and after the earthquake a fire; but the Lord was not in the fire . . .' It would be difficult to imagine a clearer statement of the fact that, despite common ways of speaking, we are not to imagine that God is at work in all the activities of nature.

We are often reminded that events which appear to be due to chance are not necessarily so. Half a century ago the late F. W. Westaway reminded us of the fact that few activities can appear to be more at random than the movements of a man who is putting on his shirt, yet in fact the over-all activity is highly purposeful. Similarly today MacKay draws attention to the seemingly random last figures of telephone numbers in a directory, these being in fact anything but random! It is easy to multiply examples of this kind. They prove beyond a doubt that apparently random events may be designed—a typical Biblical example being that of the man who by chance shot an arrow at the Israelite army and killed Ahab, so fulfilling Michaiiah's prophecy. (1 Ki. chs. 21, 22). What they emphatically do not prove is that there are no random events; that all events are under the direct surveillance of God.

That this is not the case would appear to follow from the need for prayer in the Christian life. In the Book of Acts we are told that the apostles cast lots to find out who should replace Judas among the twelve Apostles. (Acts 1:24f.) But they did not merely cast lots, they asked God first of all to direct the lot so that his will would be made clear. If God controls every casting of lots, it seems strange that the Apostles could not leave the matter with him. But in fact they apparently assumed that unless he intervened the lot would be cast at random. In short does not the theory that God controls every event directly all the time amount to fatalism? If God is working directly in every event, why should I want to interfere by making requests?

A Christian might also argue the case in another way. If God is acting all the time directly and in every event, what kind of God must he be? Surely a Being who is concerned in the main with trivialities. Imagine the vast number of molecules in a room full of air, or (more easily) think of all the grains of sand on all the beaches in the world. Is God concerned with the movements and positions of every one of them? Does not such a view of God trivialise religion? Or again, imagine the stupendous number of events which involve repetition—electronic orbits jumping up and down, and emitting or absorbing quanta of light, wheels, planets, stars turning with perfect regularity—is God concerned to send stimuli of some kind to ensure every repeating movement? If God acts so, in what conceivable sense can he be a Person? Personality is shown by spontaneity and thoughtfulness, not by endless repetition. Surely to hold such a view of God is to depersonalize him.

Why then, we may ask, has the view of God we have been criticising become so popular of late? There would seem to be at least two reasons. First of all it is widely held because it seems to link up so neatly with evolution. Materialistic biologists have been claiming for many years that purely random mutations followed by natural selection of the fittest provides the essential mechanism by which evolution operates. That evolution has taken place, is shown by the increasing complexity and adaptability of biological species with the passage of time. Evolution, then, is a kind of law of nature (though not necessarily a deterministic law) and the wonderful end result must, for the Christian, be attributable to God. This provides an incentive to look for the hand of God in the random changes, or mutations which are supposed to provide the raw material of evolution. Out of such ideas 'process theology' is born—the universe is an evolving system because it is entirely, and at all times, actuated by God. Evolution in the language of the late C. E. Raven is the activity of the Holy Spirit. Such a view neatly removes the supposed contrast

between science and religion; since God is everywhere and in all activity, the distinction between nature and supernature simply disappears.

There is no space here to develop this theme. It must be emphasized however that it is not a biblical one. The biblical doctrine is much more in accord with the second law of thermodynamics than with the supposed evolutionary process. Nature is becoming less, not more, ordered. The heavens are the works of God's hands, they shall perish but not God, 'they all shall wax old as doth a garment' (Heb. 1:10f.).

A second reason for the popularity of this semi-fatalist doctrine may be that it is an over-reaction to Deism. The Deist claims that God created the universe, laws and all, wound things up, so to speak, then left them to unwind. After that he did not have to intervene. This view implies a denial of the personal relationship between God and man and naturally enough it horrifies Christians. What easier way to refute it than to go to the opposite extreme and claim that far from leaving the world alone, God is active all the time in everything? But easy though it is, we have seen that this view gives rise to difficulties which are hardly fewer or less harmful than those of Deism.

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H. Montefiore, *The Probability of God*, S.C.M. Press, 1985. 190pp. Paperback. £6.95

Hugh Montefiore writes (p.132) . . . 'I am looking, not for proof, but for probability: and it seems to me more probable that God is the explanation for the existence of matter and for its propensity towards order and complexity than the alternative view that matter exists without explanation, and that it has this particular propensity as a brute fact.'

This explains the purpose of his book: To look at the natural sciences and all that has been discovered, and is being discovered, about the world in which we live, and to see if God as Creator is still a possible explanation.

Most readers will be amazed that a busy Anglican Bishop, whose disciplines are theology and classical literature should have had the ability to compass so much of modern scientific thinking to be able to attempt such a task. It appears to have been a task which has excited him for a considerable time and he used a sabbatical period off from his Diocese to forward his interest.

Has he done it well? That question can only be assessed by those who are competent to understand the scientific theories he has described, and most of his readers who are theologians will not be so competent. However, as one such, he has conveyed the clear impression that today many scientists are, at least, agnostic about the possibility of a Divine Intelligence behind the structures of the world. Whether they would accept the Bishop's 'probability' or not, may depend on whether, like the Bishop, they approach their subjects with a religious faith already.

Was it worth doing? He writes, 'Why ever should anyone in this secular society be interested in Jesus as the Son of God without a prior conviction about the Reality of God?' That is well said indeed, and I think this book will help some to that conviction . . . and reinforce the convictions of others.

D. A. TASSELL

John Durant (Ed.), *Darwinism and Divinity: Essays on Evolution and Religious Belief*, Oxford: Basil Blackwell, 1985. pp. x + 210. £15

This symposium derives from a conference organised in 1982 by the British Society for the History of Science to celebrate the centenary of the death of Charles Darwin. It opens with an account by John Durant

of the century of debate between Darwinism and Divinity down to the present day. This is followed by a careful investigation by John Hedley Brooke of the relation between Darwin's scientific beliefs and his religious outlook; it deals *inter alia* with the puzzle whether Darwin's reticent and withdrawn religious profile was a deliberate defence mechanism against the scandalised reactions of the pious. Jim Moore paints a likely and amusing picture of the way in which in late nineteenth-century North America Darwin was overwhelmed by the flamboyant figure of Herbert Spencer, with an imbalance from which liberal Protestantism was long in recovering. Arthur Peacocke, on 'Biological Evolution and Christian Theology—Yesterday and Today', contributes what is really the pivotal essay of the book; he argues that evolutionary biology 'has brought to light again and reinvigorated an older, immanentist aspect of the Judeo-Christian doctrine of creation that was in danger of being submerged.' Vernon Reynolds and Ralph Tanner, with inevitably somewhat imprecise statistical material, investigate 'The Effects of Religion on Human Biology'; they conclude that 'religions everywhere take a very close interest in human biology'. Mary Midgley, in a rollicking article on 'The Religion of Evolution', does some timely work of debunking. 'The theory of evolution . . .', she writes, 'is our creation-myth. Because it tells us how we got here, we expect it to tell us what we are. Up to a point it can indeed do this. And because it has this real explanatory force, distortions can also be used to misinform us in disastrous way.' And again: 'We venerate an extraordinary range of things—from speed to mechanical ingenuity—and use the name of science in a manner quite unrelated to its proper function, as a general banner for our veneration. Thus what has been ceremonially ejected at the front door re-enters at the back one in a different guise. The ideas collected into the cult of evolution are a prime case of this and urgently need our attention' (p.178).

Finally, Eileen Barker, under the title 'Let there be Light: Scientific Creationism in the Twentieth Century', reveals, in a way that an English reader can only find astonishing that, by many people in the United States, the biological theory of evolution and the theological doctrine of creation are still taken as being two mutually contradictory positions on the same metaphysical level and that this assumption is clearly present both in the decisions of certain courts and the enactments of certain legislatures.

The editor tells us that this book 'is best regarded not as a series of definitive statements, but rather as a number of contrasting views from within different disciplines' (p.6). As such it will fill a real need.

E. L. MASCALL

D. Stanesby, *Science, Reason and Religion*, London: Croom Helm, 1985. 210pp. £19.95

The author describes his purpose as being 'to examine the intellectual basis of science in order to demonstrate that the philosophical problems it throws up have much in common with those at the philosophical roots of religion' (p.3). He begins by showing how for over thirty years the 'received' and almost totally dominant view of scientific theories was that they were axiomatic calculi interpreted by correspondence rules and that, 'despite the fact that the Logical Positivist thesis ultimately proved abortive, the Verification Principle abandoned, and the Received View totally discredited, such has been the force and appeal of positivism and its heir, logical empiricism, that it continued to set the standard of rationality long after its demise' (p.35); it even contributed to the desupernaturalising and demythologising of Christian theology. However, Dr. Stanesby points out, the positivist case had been demolished before its birth by Karl Popper, and he devotes the central and major part of his book to an exposition and criticism of Popper's views. 'The Popperian view of science . . .,' he maintains, 'has remarkably fruitful consequences for religion, and yet philosophers of religion have never exploited them. The main reason for this is that the Received View of science has had such a powerful hold that Popperian ideas were read as part of the positivist programme.' (p.100). Nevertheless, Popper's adoption of falsification instead of verification as his basic methodological rule, his rejection of induction as a means of acquiring knowledge and his repudiation of historical inevitability and determinism are all seen by Dr. Stanesby as providing at least a talking-point with theism. And it is significant that, while he discusses the movement from the positivists to Popper under the rubric 'The Retreat from Authority', he can only describe the views of Kuhn, Feyerabend and the later Wittgenstein as 'The Retreat to Irrationality'.

'The plain fact of the matter', writes Dr. Stanesby, 'is that scientists do believe in an objective world which is the subject of their investigations, and religious people likewise believe in the objective reality of God' (p.179). But I find tantalising and insufficient the seven pages at the end of his book which have the title 'Science, Religion and Rationality'. He has told us that 'Wittgensteinian fideism represents the philosophical counterpart, and may well have added impetus, to the strong current tendency in Christianity to play down credal statements and doctrinal formulations, and to locate the centre of religion rather in 'a personal relationship with Christ'. But such a Christ-centred faith makes little sense without the presuppositions of objective belief, however loosely formulated in credal statements

(p.182). He tells us that 'the attempt to provide an alternative to positivism, to scepticism, to relativism, made by Popper, has received most attention in this book' (p.195), but he never tells us precisely what his own philosophical alternative will be. My own impression is that it will have to be the kind of realism in which the mind employs the apparatus of the senses in order to grasp the intelligible reality which lies beyond them. He tells us himself that 'philosophy is never finished' (p.189), but I believe there is a good deal more that he needs, and is able, to say. I hope he will write another book in order to say it.

E. L. MASCALL

G. J. V. Nossal, *Reshaping Life: Key Issues in Genetic Engineering*, Cambridge University Press, 1985. 158pp. Paperback, £6.95

Genetic engineering was born just twelve years ago in 1973 when geneticists first succeeded in constructing biologically functional DNA molecules which combined genetic information from two different sources. It was four years later in 1977 that the first protein was produced by insertion of its gene into the DNA of bacteria. Since the mid-seventies, the development of these genetic engineering techniques has been remarkably rapid and their practical applications have burgeoned to such an extent that a whole new DNA industry has begun to emerge. Although much has been written on this meteoric growth of biotechnology, G. J. V. Nossal the author of *Reshaping Life* perceived a gap in the literature between the rather sensationalist approach of many science popularisers and the dry scientific tomes of the academics. The aim of his book is thus '... to present the essential elements of genetic engineering within a slim volume in a manner requiring no background in biology and for a readership with no technical expertise in the field.'

The subject matter of *Reshaping Life* divides into three distinct sections. In the opening three chapters of the book, Nossal describes the basic structure and organization of animal and plant cells, and then against this background he attempts a simplified explanation of the mechanisms involved in the techniques of genetic engineering. The following six chapters contain a comprehensive review of the various present applications of this technology and also some of the areas where it may be of value in the future. The final three chapters then examine the broader social issues relating to genetic engineering—the possible dangers of DNA manipulation and exploitation, and

the degree of legislation to which scientists and industrialists working in this field should be subjected.

G. J. V. Nossal is well-qualified to write a book such as this, having been directly involved in the development of genetic engineering technology as Director of the Walter and Eliza Hall Institute of Medical Research in Melbourne, Australia. Indeed, I found the central section of *Reshaping Life* in which present and future applications of genetic engineering are systematically examined, both interesting and clearly put forward. Many of these applications are in the field of medical therapy—hormones, vaccines and diagnostic probes may all be manufactured more cheaply and in larger quantities using the new technology—but the book also looks at possible benefits in other areas such as agriculture, chemistry, waste disposal and the mining industry.

Although I can commend this book for the large amount of useful information that it does contain, there are actually two criticisms which qualify my enthusiasm for it. The first of these is the difficulty that I had reading through the opening chapters—the written text explaining basic cell biology and the mechanics of genetic engineering was very heavy-going, mainly due to a stilted (almost annotated) style, while the associated diagrams managed to confuse rather than clarify. Nossal's suggestion in the introduction that these chapters might be skipped by the casual reader seems to imply an unnecessarily defeatist attitude, particularly if the aim of the book is to help non-technical people understand biotechnology.

My second criticism concerns the final few chapters in which Nossal advocates the minimizing of legislative restrictions on scientists conducting genetic engineering experiments. His arguments rest on the undesirability of obstructing the search for scientific truth, the difficulty of writing up-to-date and very technical regulations and making them stick world-wide, and also the unlikelihood of accidentally producing medically or environmentally dangerous organisms. I would suggest that for geneticists to be given a virtual free rein in their research activities, the single most important point which must be established is not the *unlikelihood* of hazardous microbes being constructed and released, but the *impossibility* of such an event. After reading Nossal's book by no means all my doubts about the safety of genetic engineering experiments were dispelled and to reassuring statements like '... it is important to recall that none of the conjectural hazards that have been mooted have in fact materialized' I wanted to add the word 'yet'!

In conclusion, *Reshaping Life* is perhaps not the best book for someone wanting to understand the techniques of genetic engineering

or looking for a balanced discussion of related ethical and moral issues; but as a review of the present and future applications of the new technology it would indeed be an ideal choice.

BARRIE BRITTON

Models in Science and Religion, Booklets 1-7, The Bloxham Project, 1984. 50p each

The Bloxham Project was conceived in 1969 as a modern-day attempt to advance education in relation to the Christian religion. It was intended for Independent schools—presumably with a Christian tradition—although the material may be purchased by any school (from Rev J. Kerr, Winchester College).

There are five Pupils' Readers and two source documents for teachers. A guide for teachers is to be produced also. The Readers are written for 14-16 year olds and each has from 6 to 12 pages a little larger than those of the average paperback, so they are not formidable in appearance.

The topics dealt with include the way we use language, the manner in which models are used in science and in theology, and the kind of evidence we gather to substantiate our beliefs, in day-to-day living as well as in science and religion. The language used is straightforward and free from jargon.

The authors have done an excellent job, not least in exposing common fallacies—for example, that scientific knowledge is somehow 'better' than other kinds—and in stimulating young people to think again (or perhaps to begin to think seriously) about both science and the Christian faith. I suspect that many adults without a science education would gain valuable insights into the nature of the scientific enterprise.

One quibble—in the second booklet (*Models in Science and Theology*) we read that scientific models differ from theological ones because the former may be expressed mathematically. The author here betrays his background—nuclear physics! In the life sciences especially, non-mathematical models are used: what matters is their ability to explain, or at least correlate facts, even if the mathematics is beyond us at present.

The booklets are written by Michael Poole (a lecturer in physics education and a V.I. Council member), Peter Hodgson (a lecturer in nuclear physics), David Haynes (a school head of physics), and Rev.

Graham Hellier (a teacher). Perhaps subsequent revisions will include a biologist!

D. A. BURGESS

M. L. Stackhouse, *Creeds, Society, and Human Rights: A Study in Three Cultures*, Eerdmans Publishing Company, 1984. 320pp. Hardback. £19.95

Is there a set of principles defining human rights which may be accepted by all nations and all cultures, by all religions and political groupings everywhere? After the end of the 1939–1945 war a 'Declaration of Human Rights' was signed in 1948 but legal standards alone, however universally declared, are not enough for they are ignored to some degree by nearly every state in the world, including those who shout loudest in criticism of the Iron Curtain countries.

Karl Marx wrote that 'philosophers have only interpreted the world in various ways. The point is to change it.' He could well have added theologians to his philosophers and the statement would still remain true. Max L. Stackhouse, an eminent Christian Ethicist in the USA is seeking a way to change the world. He considers that the denial of Human Rights to any individual is the prime evil in our world. This book is his attempt to discover if there are universal principles determining Human Rights and if there are, to discover ways of implementing them. He has chosen to examine Human Rights in three countries, U.S.A., the G.D.R., and India. He has spent a great deal of time in each of these countries and read as many relevant books as possible. At the end of the book is a list of works cited in the text. He studies each country from three points of view. First he traces the subject matter through its influences from the past. Then he attempts a cross-sectional analysis to identify the dominant structures in a given society. Finally he compares and contrasts the three cultures under consideration. Stackhouse holds the interest of the reader throughout and though the task of defining human rights seems to become more and more difficult his conclusions are full of hope. This is not surprising for he is a Christian Ethicist and as a matter of Faith he looks forward to a 'new heaven and a new earth where there shall be an end to death and to mourning, and crying and pain, for the old order will have passed away'.

This book is one of the most fundamental treatments of Human Rights and necessary reading for all those interested in changing the world for the better.

L. CAMPION

The New Bible Atlas, IVP/Lion/Tyndale House Publishers, 1985. £9.95

There are a considerable number of Bible Atlases in print at the moment. The list certainly runs into double figures, even if the really weighty academic volumes are ignored. The competition for a new atlas is thus strong; one thinks of Martin Gilbert's *Illustrated Bible Atlas* (Macmillan), Longman's *Illustrated Atlas of the Bible Lands*, and the Paternoster *Bible History Atlas*, edited by F. F. Bruce. In a smaller format, the new *Lion Bible Mapbook* (1985) concentrates on a single idea per map, the graphics being computer-generated. How does *The New Bible Atlas* fare in this sort of company?

To my mind, the Atlas is a winner. A companion to *New Bible Commentary* and *New Bible Dictionary* it is a fine production. It is thoroughly modern in its methods of representation, and wide in its coverage of relevant topics. For instance, it is valuable to start with a geographical section, which focuses very effectively upon the climate, vegetation, and geological structure of the Holy Land. Good use is also made of the archaeological findings and historical time charts, while colour photographs are used with discretion. The Editors emphasise that the maps themselves are the really important element.

Coverage of the major Old and New Testament events is well-chosen, with just enough biblical history to aid rather than impede the reader. Similarly, sections on the major empires and peoples which influenced the biblical scene, and on the historical development and crucial significance of Jerusalem are presented with great clarity and accuracy; they compel interest and study. The Atlas is rounded off with a short section on the Holy Land today, while there is an adequate index.

I can see this new atlas winning support in most centres of education, especially in schools and colleges. It ought also to be taken up by the churches, where biblical teaching is rarely sufficiently grounded in the geographical and historical contexts. Indeed for anyone with an enquiring mind, the atlas would make an ideal present, for it is a fascinating new route through the main events and places of biblical history.

W. A. HAYWOOD

Norman Anderson, *An Adopted Son*, Inter-Varsity Press, 1985. 301pp. £3.95

The title of this work (sub-titled *The Story of my Life*) refers to the author's adoption into the family of God.

Sir Norman Anderson, President of the Victoria Institute from 1976 to 1985, planned to write a book on certain biblical texts and themes in which he was specially interested, illustrating them from personal experience; the book that has actually appeared is an autobiography in which at appropriate points, he deals with texts and themes that have meant much to him.

Sir Norman has had a varied and distinguished career: missionary in Egypt; liaison officer with Arab guerillas during World War II; Secretary for Sanusi Affairs with the Middle East Forces (Civil Affairs Branch) at the end of the war; Warden of Tyndale House, Cambridge; Professor of Oriental Laws and Director of the Institute of Advanced Legal Studies, University of London; Chairman of the House of Laity in the General Synod of the Church of England—these and other high responsibilities he has discharged in a manner that has won spontaneous admiration and well-deserved recognition. Throughout this career he has borne a consistent Christian witness: whatever his own misgivings may be on this score, his friends have no doubt about it. Outside his professional circle he is probably best known and appreciated as an able apologist for the truth of Christianity, by spoken and written word alike. *God's Law and God's Love* and *Jesus Christ: The Witness of History* are two of his finest works in this field.

The biblical themes considered in this autobiographical context include the Victorious Life, the Problem of Holiness, Divine Guidance, the Humanity, Temptations and Obedience of Jesus and the example they set for his people. These discussions are marked by mature wisdom: one pays the more respectful attention to what Sir Norman says on such subjects because he and Lady Anderson have had their faith tested by domestic tragedy of an order which very few of us (mercifully) have had to experience. Their response to this trial of faith has in itself been a specially telling testimony to the power of the gospel.

F. F. BRUCE

M. Goldstein and I. Goldstein, *The Experience of Science: An Interdisciplinary Approach*, New York: Plenum Press, 1984. 400pp. Boards. £0.00

'Science is fun' is a frequently-expressed view of the practising scientist. How fortunate are those whose life-work is also their hobby. Or, as it is sometimes put, 'How wonderful to be paid to do something you enjoy doing'. This is, happily, the lot of most scientists, whether or

not they would call it 'fun', they would certainly agree that it is all-absorbing. It is this which the authors of the present book have tried to convey to their readers, especially to the younger reader: - 'to give some feeling for the intellectual excitement and aesthetic satisfactions of science'. The book is aimed at two audiences: - non-scientists who need acquaintance with scientific culture, and also science students, in order to develop a broad perspective before they focus on their particular discipline. Several chapters outline the 'culture', e.g. the nature of science, facts, logic, statistics, and experimental testing. The central core of the book uses three examples to illustrate the interdisciplinary approach; how a problem requires an attack from many angles. The examples are: - the etiology and eradication of cholera (which leads into a similar approach to cancer), the nature of heat (two rival theories), and the nature of madness, in particular of schizophrenia.

It is a fascinating book to read, and those who have spent a lifetime in science will probably wish that such a volume had been available earlier in their careers. The pit-falls of science are very well explained e.g. facts are 'theory-laden', the scientist is part of the world he is trying to understand, etc. All these matters are part of the culture of science, and would enter into a course on the philosophy and history of science. But such courses are often a 'luxury' during training, and rarely would the cultural background be so clearly and simply explained as in this volume.

The three examples referred to, which have been used by the authors to illustrate the scientific method, are fascinatingly described. They are very personal accounts, with biographical details of the actors in the dramas, together with photographs and quotations from the original communications. This will certainly appeal to all readers, whether scientists or not. But the general reader will also be captured by the more basic science in the book, the nature of facts, inference, mathematics, and so on. This is a book to dip into, and to read in depth. It is a volume which could, and should be given to every aspiring scientist, but also a book which every intelligent lay person with any curiosity about the world around will find compulsive reading.

A. B. ROBINS

G. Newlands, *Making Christian Decisions*, Mowbray, 1985. 127pp. Paperback. £4.50

One of the responsibilities that we cannot escape as human beings is

that of choice, of making decisions. Many decisions are trivial, some are very important. How do we decide, and especially how do we, as Christians, make our decisions? Some choices have been around as long as humanity, that between peace and war for example. Some are very new, such as that of surrogate motherhood. Ethical questions such as the latter are going to increase in complexity in the future. Can we, as Christians, get guidance to help us make up our minds?

I read Professor Newlands' book while preparing for a series of discussions on ethical matters such as those mentioned, and I found it very helpful indeed. It is not a text-book on ethics, but is just what it claims to be—guidance for the ordinary Christian to help with decision-making. It is also a spur to action, if we read it aright. The subjects tackled are set out in a separate index, and each chapter concludes with notes and references. The author lays particular emphasis on Karl Barth. After chapters on making decisions, and on the Church and the world, current issues are tackled in the order; peace and war, sex and moral values, medical issues, and justice and hunger. Arguments are given for both sides of a question, and it is interesting to observe that the author, though less committed in the early chapters, comes to express his own views in later chapters, even to identifying his own political stance.

The book is built around the concept of God's love for all mankind, and what this can, and must mean for each Christian. How easy it is, on occasions, to inveigh against some lesser evil, and fail to mobilize ourselves against the greater, more insidious evil. The matter of peace and war in a nuclear age receives most attention, since the author believes that this is the paramount problem of today, not only destructive, but wasteful of resources. Some issues are fraught with difficulty in decision-making, '—a choosing between risks and dangers, a lack of absolutes. This is part of Christian life 'between the times', and should be accepted'. If this leads to 'situation ethics' on occasions, then that is what, in conscience, we are forced to. Professor Newlands writes 'No man or woman can or should decide for another', and we must proceed by sharing our ideas and experience. The author does not claim to give authoritative pronouncements, but considered suggestions. Undergirding everything he has written is the statement that 'God is love', and this runs like a thread through the discussions of the issues he has considered, binding them together.

A. B. ROBINS

F. F. Bruce, *The Real Jesus*, Hodder and Stoughton, 1985. 232pp. Paperback. £5.95

Professor F. F. Bruce has brought to the writing of his latest book the same meticulous scholarship and lucid style that characterise all his work. He has made a valuable addition to the Jesus Library.

It may seem strange that two thousand years after Christ an author should write a book to answer the question 'Who is Jesus?' But it is a question that needs to be asked anew in every generation, partly because new insights into the meaning of Scripture provide us with fresh perspectives on Our Lord's life and ministry. There is another reason, however, why the question is of perennial importance. The Jesus of history is also our contemporary. Hence the present tense in the question which Professor Bruce asks. It is undeniably true that the influence of Jesus lives on, but for the Christian there is the more important fact that Jesus is alive today.

Throughout his book Prof. Bruce holds together the historical and the contemporary aspects of the life and ministry of Jesus. Christian faith rests upon and is buttressed by facts, so the historical evidence concerning Our Lord's life is examined, as is also the historical setting. The life of Jesus is described from beginning to end, and the spiritual significance of His words and acts is drawn out in perceptive comments. There is a specially suggestive chapter on 'Jesus' last meals', linking together some of His parables, the Supper at Bethany, and the Last Supper. The doctrine of Christ's second coming is considered with a proper warning against the kind of literal forecasting that has so often made Christians look foolish. Suffice it for us to know that the future belongs to Christ.

This book would make an excellent study guide. It comes from the pen of a very gifted teacher.

KENNETH G. GREET

J. Peters, *C. S. Lewis: The Man and His Achievement*, Paternoster Press, 1985. pp.143. Paperback. £4.95

C. S. Lewis was one of the most brilliant apologists for the Christian faith in this or any other century. He had an extraordinary gift for making profound theology palatable and even exciting. His apparently effortless utterances were the result of wide reading, massive intellect and disciplined living.

All of this and much more is reflected in the pages of John Peters' book. After introducing us to the man himself, successive chapters present Lewis as visionary and allegorist, apologist, writer of science fiction, and a correspondent who wrote countless letters to ordinary folk who sought his help.

In describing his work as a tutor in Oxford and Cambridge there is a frank recognition that, though a superb lecturer, Lewis was not able to suffer fools gladly, and could become bored and impatient with duller pupils who quailed before his rather overwhelming intellect. Like many others, however, he mellowed with the passing years.

C. S. Lewis wrote many books. Their sales still reach two million a year, and hence those who have not yet become acquainted with his work will have no difficulty in securing the volumes that will open the door onto fresh vistas of understanding. John Peters' book will prove a helpful introduction and guide.

KENNETH G. GREET

Alister E. McGrath, *Luther's Theology of the Cross*, Blackwell, 1985, 199pp, Hardback, £15

What is this book about? The title is somewhat misleading since only pp. 148–181 are actually devoted to Luther's theology of the cross. As the author himself puts it, the book is 'concerned primarily with the gradual emergence of the theology of the cross, as Luther gradually broke free from the matrix of later medieval theology' (p. 176). Thus half the book is devoted to Luther's medieval background at Wittenberg and to 'Luther as a later medieval theologian'—his first course of lectures on the Psalms (1513–1516). Of the second half of the book, the bulk is devoted to Luther's so-called 'tower-experience', his theological breakthrough, rather than to his theology of the cross. The subtitle—*Martin Luther's Theological Breakthrough*—is a more accurate guide to the contents of the book.

Who is it for? Not the layman. We have here a technical discussion which interacts with the whole range of Luther scholarship in its assessment of a vitally important stage of the reformer's career. The reader will have to cope with the frequent use of Latin, together with the occasional German and even Italian. In short, this is not a popular introduction to Luther but a specialist work written for those with some familiarity with the field. But this does not mean that it is dull. It is a well-written account of an important phase of Luther's life.

How good is it? Dr McGrath has made an important contribution to

our understanding of a very important and highly controversial aspect of Luther's development. The early chapters of the book may be frustrating to those who are eager to turn to Luther himself, but they contain much valuable information about his medieval background, about which too little is known. The footnotes contain a wealth of bibliographical information and are a valuable guide for anyone wishing to pursue further one or another aspect. There is a helpful select bibliography at the end. One omission is surprising, in the light to the wide ranging discussion of Luther scholarship. This is F. E. Cranz's *An Essay on the Development of Luther's Thought on Justice, Law and Society* (Harvard University Press, 1964), which contains much that is relevant to the theme of this book.

Is Dr McGrath's interpretation of Luther correct? This is a highly controversial area and there have been many different interpretations of both the date and the nature of Luther's 'theological breakthrough'. I would agree with Dr McGrath in dating it to 1515 and in recognising that this is the beginning rather than the end of the emergence of Luther's Protestant doctrine of justification. I would not be as dismissive as is Dr McGrath (pp.143f.) of the idea that Luther's breakthrough took place in two parts. It is perhaps a pity that he does not trace the outworkings of Luther's breakthrough further forward into the early 1520s and the emergence of a fully Protestant doctrine of justification—but doubtless all will be revealed in his forthcoming three-volume work on the history of the doctrine of justification.

In short, we have here a valuable contribution to an important area of Luther studies.

TONY LANE

C. Stephen Evans, *Thinking About Faith*, Inter Varsity Press, 1985, 192pp, Paperback, \$6.95

This book is one of the most useful introductions to philosophy of religion that I have read. It is clearly written and covers all the important areas. It will thus be most helpful to those readers who know little about philosophy. However, Dr Evans does not yield to the temptation of trying to make philosophy simple and thus the book will also prove stimulating for those who know their way around the subject.

Dr Evans is commendably honest about his own presuppositions. He states in his general preface that the 'Contours of Christian Philosophy' series will explore the implications of the various philosophic views for Christian convictions. In this book, which is one

of the aforementioned series, Dr Evans does just that. In 192 pages he takes us through the major areas of religious philosophy. Firstly he defines the task by asking, 'what is philosophy of religion?' He then goes on to examine such topics as, natural theology, the classical arguments for God's existence, religious experience, miracles, natural science and religious philosophy, the problem of evil, religious language. Dr Evans concludes the book with an examination of religious pluralism and personal faith.

Two very useful additions to the actual text of Dr Evans book are the notes and the suggested further reading. These few pages at the end of the work will prove invaluable for the interested reader, for they show him or her how he or she can follow up this general introduction by more detailed reading.

The one thing that gave the book rather an odd feel was Dr Evans' use of the feminine personal pronoun. I can understand the argument against referring to human beings in general as 'he', but to substitute 'she', seems to fall into the same 'sexist' error and thus compound the problem. I think I would have found, he/she, a better way of getting around the sexist language. Perhaps shock was the intended tactic—if it was it worked.

MICHAEL W. ELFRED

Donald Robinson; *Faith's Framework; the Structure of New Testament Theology*, Paternoster Press, 1985, 149pp, Paperback, £4.20

This book, written by the Archbishop of Sydney, is a helpful guide to students and readers of the New Testament. The author traces the formation of the Canon through the period of struggle in the early Church, when each book was evaluated and eventually secured its place in Holy Scripture. Behind the written word was the faith of the Apostles in their Risen and Living Lord.

Archbishop Robinson reminds his readers that the theology of the New Testament includes the selection of the various books, as well as their teaching content. The Gospels contain what the Messiah said, Acts and the Epistles present the living faith of the Church. These documents support the New Covenant, and there was need to guard the truth against distortions from within the Church, and assaults from religions outside.

There is a clear analysis of the word 'euggelion' (=gospel), as used by the four evangelists when giving their accounts of the life and teaching of Jesus. Paul is essentially a proclaimer of 'euggelion' when applying his message to the newly-founded Christian communities.

The epistles of James, Peter, and John, together with Hebrews all support the exposition of the 'Good News'.

In the third chapter, the author reminds his readers that the New Testament is not to be read in isolation from the Old. The theology enshrined in Israel's history is essential to the understanding of the fulfilling work of Christ in His Church. The concept of the Kingdom of God has its origin in ancient Israel; the message of the prophets was to remind the people of their special covenant relationship with God. One fact which is often overlooked when considering the formation of the New Testament is the position of the Jewish element in the early Church. Archbishop Robinson reminds us that in 'Acts', Jerusalem was the centre of Church life, and that although Christianity was later freed from the worst restrictions of Judaism, Christians should not forget their debt to Jews. Jewish Christianity was the platform from which the mission to the world was launched.

Christian writers of subsequent centuries, like Justin Martyr, and Miletus, Bishop of Sardis, drew attention to the loss of inheritance by Jews when they rejected their Messiah. It should be remembered that Jesus proclaimed his message to Jews and Gentiles, who were willing to listen. Hebrews, James and I Peter are cited as examples of apologists who wrote what Jews were thinking and saying within the Church.

The Church was already in existence when the New Testament Scriptures were written, and the author examines in some detail what Paul's letters would have meant to their original recipients, as well as the high regard in which they would have been held by second and third generation Christians. The issues raised in the epistles, and the advice given by an Apostle would be of great value to believers in congregations outside the immediate circle. These letters were received, acted upon and preserved for posterity.

Towards the end of the book, Archbishop Robinson takes up again the theme of 'Apostle and Gospel'. The Gospel implies an Apostle to proclaim it; Apostle means that there is a Gospel to spread. The substance of the Gospel was understood in terms of the authority of the Apostles, who themselves were conveyors of the 'euggelion'. Paul's apostolic authority was impressed upon his readers from the beginning, together with the gospels of Matthew, Mark, Luke and John, which also had behind them the status of an Apostle. Other writings, including Revelation had to receive Apostolic status.

Considering the present, and looking to the future, the book points out that all branches of the Church accept the New Testament Canon, even if they emphasize aspects which coincide with their own theological views. There may be attempts by some to arrange a

Canon within the Canon, but the Church has to respond to a Gospel message conveyed within the wholeness of the New Testament.

H. G. LEWIS

Gary Scott Smith, *The Seeds of Secularisation. Calvinism, Culture and Pluralism in America 1870–1915*, Christian University Press, Grand Rapids, Michigan, 1985. Paternoster, 1985, 233pp, Paperback. £16.75

A few years ago the debate about secularisation had become sterile. The same arguments were worked and reworked and little progress was made. But a few recent publications have changed this and enabled us to delve behind the generalisations and examine the issues at much greater depth, often with the help of specific historical analysis. Gary Scott Smith's book on the defeat of Calvinism in America between 1870 and 1915 adds to that literature most helpfully. It sets out to explore why a vigorous and coherent system like Calvinism, which had an enviable track record in terms of imposing its will on societies, should have lost its fight against secularism.

Part of the value of his work lies in its documentation of the ideas of Calvinists on how to keep America a Christian country. It clearly sets out their views and the alternative approaches others adopted both inside and outside of the Church. After examining the general principles of their approach, the book explores the debates about education, science, morality, work and industry and social improvement. It shows the traditional stereotype of Calvinism to be inaccurate, for it was neither as homogeneous nor as negative about this world as usually assumed. The debate concerning Darwin serves as a good illustration. All Calvinists rejected scientific naturalism and feared the atheism which was implicit within it. But few took Abraham Kuyper's views and argued that truth could not be discovered by the unbeliever and therefore the whole apparatus of modern science should be rejected. Most sought some reconciliation between contemporary science and the teaching of the Bible. The majority sided with James McCosh of Princeton in accepting that some form of progression could be discovered in creation and thus implicitly accepted some form of evolution, whilst a minority, led by Charles Hodge, advocated a more static view of creation and rejected any idea of evolution at all. Its chapter on social reform deals, among other things, with prohibitionism and prisons, and shows that the Calvinists were not as negative in their approach to ethical issues as the popular view would have us believe.

The intention of the book, however, is more than descriptive, since

much of the description is available elsewhere. It sets out to propound a theory as to why in spite of all the advantages of Calvinism—namely, its powerful system, its massive erudition, its widespread support—it failed to keep America as a nation avowedly Christian. How could it be that most people should have at first preferred a separation between Church and State and then should have been prepared to accept humanist values enshrined in the state. Smith's thesis is that the Calvinists made a fundamental error in the strategy they adopted. They sought a religious monopoly, rejected pluralism and sought to squelch secularist ideas wherever they appeared. If only they had not sought to dominate everything, if they had accepted the right of alternative viewpoints and taken their place in the vigorous public debate as one voice among many, Smith believes the outcome would have been different.

History as it might have been is, of course, a difficult science! It is difficult to produce full evidence to support Smith's alternative scenario but he puts up a plausible case. The European experience must however erect a question mark over his thesis. The place of religion in Europe is very different from that in the USA, but in England the Church effectively took the road Smith advocates, notwithstanding the Establishment of the Church of England. It took its place trying to sell its wares along with others in the market place, but the battle against secularism was certainly not won. The defeat may have been delayed until the 1960s, although it was present, if in disguised form, long before. So perhaps in the end the thesis fails to convince. Perhaps secularisation is bigger than the question of strategy. Even so, his criticism of the Calvinist strategy may well be right on other grounds, and the book itself remains very valuable.

There are a number of details which are arguable, in particular his examination of the post-war resurgence of Calvinism. I wish too, he had given greater space to the millennial views of the Calvinists, which he mentions but does not develop. But these are minor criticisms. He writes as a Christian and as a historian, concerned to learn the lessons of history. In so doing he not only produces an extremely important book on secularism but provides a good illustration of Christian history.

DEREK J. TIDBALL

Gabriel Fackre, *The Christian Story* (Revised edition) Eerdmans, 1978, revised ed. in 1984. 315pp, Paperback. £12.95

With the decline of serious Christian publishing for much of this

century, a considerable gap has opened up between the major Christian works which called for concentrated reading and the more lightweight publications which have poured off the presses in great abundance. As a consequence of this, a communication gap has been created between the the serious student of theology and the man-in-the-pew. Gabriel Fackre, who, as Abbot Professor of Theology at Andover Newton Theological School can be classified as the former, has sought to facilitate better communication between the student of theology and the man-in-the-pew, by writing a popular text-book in which the Christian faith is presented theologically as well as historically—as a story.

The aim of the book is clear and justified. If the polarization in Christian publishing is to be remedied, then more of this type of book will need to find a publisher. The fact that *The Christian Story* is now appearing a second time in a revised edition is itself an encouraging sign.

As it is breaking new ground, however, it gives evidence of the need for more hard thinking, if the traditional language of theology is to be adapted to convey to us in a 20th-Century idiom, the truths which found acceptance among Christians in the past. There are here two problems. The first has to do with language and the second with what Christians now believe. In the 1980s we use a whole range of words and expressions which have no natural affinity with Christian language. The Christian message must be communicated to societies which are dominated by the use of scientific and materialistic concepts. Some Christians are very conscious of this, and have argued that we should give a higher priority to communicating the Christian message in an up-to-date idiom. And yet, if we fail to relate traditional Christian teaching to what is being expressed through modern concepts, we could end up saying something which is far from Christian. At page 245 we read:

Some have spoken of the continuance of the dead "in the mind of God", or more recently in the language of computer technology in the "memory bank" of God available for "printout" on the last day."

The attempt to introduce contemporary scientific jargon into the story of the Christian faith is commendable, but does the attempt in this example sound convincing? With the new jargon we can import concepts which are far from helpful. Fackre has tackled an important and difficult area with considerable courage, but his attempt, in places, demonstrates that much hard work still remains to be done if traditional Christian teaching, which, in its essential character must never be altered or diluted, is to be translated into the language of the late 20th-Century.

The bibliography at the end of the book shows that Fackre has consulted a wide range of works, and it makes his style imaginative and rich. This gives his text-book a big advantage over a technical text-book on theology, but it should not be used entirely on its own apart from the early period of introduction to theological studies, and should in time be supplemented with a basic one-volume text-book such as *Systematic Theology* by L. Berkhof.

Some of the diagrams are of questionable value, e.g., on page 48. Although typical of the diagrams beloved by many North American popular writers, they often detract from what has been expressed already in writing. To merit inclusion in academic text-books, diagrams should convey something meaningful, in a precise, self-explanatory form. Sometimes it is not appreciated that there is much in Christian teaching which does not lend itself to diagrammatic presentation. Symbolism, through a drawing or painting is quite a different matter because that takes us into another medium. This book deserves a wide readership, but much of its potential to serve as a corrective to the 'pious novelties which carry the label Christian', of which Fackre complains, will be reduced if the book is left as it is. There is still room for further revision, because much in the book is good and it is certainly meeting a need.

MALCOLM MACRAE

R. Tudor Jones, *The Great Reformation* IVP, 1985, 288pp, Paperback. £3.95

The author states in his preface that 'this book is addressed to the Christian reader who wishes to know a little by way of introduction about the Protestant Reformation'. He qualifies the last phrase, and explains his own title, by acknowledging that the upheaval took many forms, and indeed included non-Protestant Reformations. Not that he gives much space to the 'Catholic Reformation'—one chapter only out of 38 is devoted to 'the revival of Roman Catholicism'.

This pin-points the major problem which this book faces. Tudor Jones has written just over 250 pages to cover 200 years which, in the author's own words 'together represent a momentous revival of Christianity, the greatest since the age of the Apostles'. Consequently Wycliffe is dealt with in under one side, whilst Erasmus and Hus merit just one side each. Later, prominent Reformers in their own countries have perforce to be treated very summarily in order to maintain some kind of balance.

Tudor Jones is a man of scholarship, and he gives good insights into

the two main Reformation figures, Luther and Calvin. His treatment of Luther's initial stand and the development of the stages of his rebellion against Rome are clear and effective. Similarly, he summarizes the main outlines of Calvin's thought concisely and faithfully; yet he has to acknowledge that 'no synopsis can do justice to Calvin's *Institutes*'. What is bound to be lacking is that amount of detail which brings a character to life, such as Roland Bainton (also writing a popular introduction) did for Luther in 'Here I stand'.

Again, Principal Jones' attempts to be almost comprehensive in his coverage of Reformation movements around Europe,—for example Wales, Ireland and Scotland, not to mention the Scandinavian countries (including Iceland), are given their own separate section—leads this reader to feel that he is on some kind of American holiday package! The material is sound enough, but it has had to be spread too thinly. One is led to ask 'Who would read this book, and gain from it?' Despite the evidence of considerable powers of scholarship and occasional flashes of brilliance,—for instance, the chapter on 'The heart of the Reformation' is a fine piece of writing—one cannot see a large market for the book. The historian would be frustrated, the student would require more detailed treatment, and many 'ordinary Christian readers' would, I suspect, find it not compulsive enough reading to sustain their interest. A brave effort it certainly is, but the nature of its format means that it is unlikely to achieve its objects.

W. A. HAYWOOD

Julien Green, *God's Fool—The Life and Times of Francis of Assisi*, Hodder and Stoughton, 1986, 273pp, Paperback, £5.95 (French Edition 1983, Harper and Row 1985)

Another biography of St Francis of Assisi! Can anything new be said on this Medieval Italian saint? Can the accepted facts be given a sufficiently original interpretation to warrant yet another publication on Francis' life and times? Julien Green, the experienced French novelist and diarist has, to my mind, been successful both in his personal insights and in his gifts of characterisation, not only of Francis himself, but also of his family and of others whose lives were changed under the impact of this simple, yet extraordinary man.

The general facts are secure. Green has researched well, and incorporates many touches of authentic detail. To give one small example: 'Assisi was a populous town, especially if we add the

monasteries and the German garrison, which were not included in the census' (p.14). He allows himself a certain amount of license adding his own 'inventions' to give more detail, within the accepted historical framework. His style is good, even elegant, and with its very short chapters, the book makes very easy reading.

Part I 'Idle Youth', covers the first 25 years of Francis' life, and brings out well some of the incidents which led to his conversion, for example, the crucial experience with a beggar (pp.43-44) and the mysterious episode of the 'night in Spoleto' (p.59). For me, however, the book really comes alive with Part 2, 'God's Fool', when the change in him is worked out. There is an interesting account of his impetuous pilgrimage to Rome, which brings to mind the much later Martin Luther. As Green points out, though, while they saw many things in Rome with similar eyes, the outcome for Francis was very different. 'Francis' filial love for the Church of Rome remains one of the most striking aspects of his character. From his youth to the day he died, his fidelity to it never wavered' (p.92).

The consternation of his family is very effectively portrayed—the suffering of his mother, the rage and incredulity of Pietro his prosperous father, and the sarcastic view of his brother Angelo, who profited by becoming his father's sole heir. There is much here which speaks to us today. The change to absolute obedience to God is not easy. Particularly poignant is the account of his return to his youthful companions for alms—that must have been very hard.

All the major incidents of Francis' life are dealt with graphically by Green in Parts 3 and 4, 'Facing the world' and 'God alone'. They cover the spectacular farewell to the goods of this world before the bishop and the crowd in Assisi, the joy of travelling across the country in pairs, in their brown habits, because that is how Jesus had sent out his disciples, the miracle of the wolf of Gubbis, his love for birds and animals and their trust in him, the beautiful relationship with Sister Clare and the Poor Sisters, the mystery of the stigmata, the writing of the canticle of Brother Sun, and the gradual establishment of the Franciscan Rule and Order. Throughout, Francis' own simplicity and obedience, coupled with his joy, even in adversity, comes through strongly. The long agony of the end of his life is movingly narrated in the chapter 'Sister Death'. 'Francis accepted death with the heartfelt joy that had never totally abandoned him, even in the most sombre days'.

This is a book which can be wholeheartedly recommended to all Christians, to those of other faiths, and to those of none. One minor point of criticism:— for English readers, the 'Americanisms' of the translator are sometimes annoying. One can live with spellings such

as catalog, miter, or favorite, but it is not easy to come to terms with 'Francis hadn't gotten the cross of martyrdom he had coveted'. This is not the fault of Julien Green, however, and his book merits much praise.

W. A. HAYWOOD

Mary Stewart Van Leeuwen, *The Person In Psychology* IVP, 1985, 259pp, Paperback, £8.95

This fine book brilliantly expresses many of the concerns and conclusions that I have learned over the years in my own struggle to integrate psychology within a Christian framework. Mary Stewart Van Leeuwen states in her introduction that Christians in psychology have two tasks, 'to expose the ideology (naturalist, humanist, Marxist, or whatever) in the guise of supposedly neutral science, and secondly, to clearly articulate their own Christian control beliefs in all phases of their work.' In Part One, in relation to the person in psychology, she takes the reader on a brief but succinct tour of the philosophy of science. Mesopotamian, Hindu, Buddhist and Greek views of the person are presented and then the Biblical world view is summarised as 'both a theory and a drama'. Her clear and lucid style makes what might be very heavy reading (because of the weighty content) into an enjoyable experience.

In Part Two she reviews contemporary debates about the person, evaluating what is true or false in each view. In the chapter on the brain-mind debate the author also reviews the debate between dualists and perspectivalists and suggests limitations in each. In the remaining chapters she describes the limitations and insights of behavioural, cognitive, social and personality psychology, showing how there is a current of dissatisfaction with the limitations of the scientific method which often reduces the person to an environmentally determined animal. She also recognises that psychology has 'two cultures' and believes that there are signs that the gap between the two may be closing:

'... on the one hand, that of academic psychology (with its stress on operationalization, control, and probabilistic generalizations)' ... (in which she was trained) ... 'and on the other hand, that of the clinic and the counselling office (with their stress on the individual case-study, the phenomenology of the whole person, and the primacy of effect and values)' ... (in which I was trained!) (p.176).

It is certainly necessary for each branch of psychology to recognise that it has a very limited view of the whole person.

'Within the various theoretical systems of psychology there is a marked tendency to view the person in either reduced or inflated terms—that is, either as the mere product of natural causes at one extreme, or as the autonomous, self-correcting, crown of evolution at the other. Because we as persons are indeed related both downward to the material creation as well as upward to a transcendent creator, there is a moment of truth in each of these extreme positions. But the first (reductionist) view takes too little account of the image of God in persons, while the second (triumphalist) view takes too little account of human finitude and sin. (p.xi-xii)

The final chapter is a challenge to Christians to greater activity in this field. A Christian psychology needs to be built within a biblical theological framework in contrast to the psychology of the last century which was built within the humanist and positivist framework. This is not a book for first year psychology students but for those who have already wrestled with the questions of the integration of psychology and theology. For them it will prove a rich source of information and challenging ideas.

R. WINTER

Dick Keyes *Beyond Identity: finding yourself in the image and character of God*, Hodder & Stoughton, 1986, 260pp, Paperback £4.95

I first met Dick Keyes at a conference organized by the Bristol Christian Arts Group in the early 1970s. I was particularly impressed by his insights, humour and communication skills as he lectured to us on the subject of identity. His study of the Scriptures and observations of life on this integral part of our humanity has continued, and we now have this excellent book as an outcome. In *Beyond Identity*, Keyes (educated at Harvard and Westminster Theological Seminary, a pastor at the L'Abri-linked Presbyterian Church in London and now a director of L'Abri Fellowship in the United States) brings a refreshing style and jargon-free language that are acceptable both sides of the Atlantic. Although scholarly, his approach is never dull. He writes with system and thoroughness, the text continually lightened by well-told illustration, apt quotation and a vein of humour. The eight, somewhat lengthy chapters are followed by helpful notes and a comprehensive index.

The overall thesis of Keyes' book is suggested by its subtitle: *Finding Your Self in the Image and Character of God*. Our sense of identity—including the components of 'self-sameness, internal cohesion, and self-respect'—is seen as the product of a 'continual process of

house cleaning, consolidation, and reorganization' (p.5). In the first chapter he shows how our awareness of who we are relates to our moral values, the people we set up as our ideals, the degree of mastery we have in what we do, and the extent to which we love and are loved. Crucially, he argues, we need to find our identity *beyond* ourselves. Jesus knew the relevance of this when he declared, 'where your treasure is, there will your heart be'. Keyes writes that the heart is our 'psychological and spiritual centre of gravity' (p.13) and all of us seek someone or something as our 'treasure', our prized possession. Put simply, we have the option of finding that treasure in God or in something made by him.

In the latter part of Chapter One, Keyes outlines society's attempt to manufacture identity. Rejecting or ignoring God, men and women turn to something 'beyond' themselves to give a sense of self. These efforts polarize, Keyes suggests, into a 'New Victorianism' (materialistic, pragmatic, goal-oriented, driven by the desire for success) and a 'New Romanticism' (emphasizing feelings, spontaneity and freedom). The Christian route to identity is a third way, gradually unfolded through the rest of the book.

Chapter Two explores humanity's loss of identity through the Fall. This identity was originally caught up in Adam and Eves' image-bearing: they were like God both in their being (ontologically) and in their doing (morally). Keyes rightly stresses that this ontological likeness was *not* forfeited by mankind's rebellion (Gen. 5:1-3, 9:6; Jas. 3:9), although moral similitude was. The erosion of identity is seen in moral guilt, the shame that comes from falling short of those we most admire, the way we lose control and are, in turn, controlled by our emotions and, most devastatingly, in the loss of the ability to love.

Perhaps the pivotal point of Keyes' book is found in Chapter Three where, quoting C. S. Lewis, he underlines once more that human self sufficiency is 'vain arrogance' when seen in the light of the one who alone can say 'I am that I am'. Keyes puts us all in our place most eloquently:

God is not a theological means to a higher psychological end. God is not a means to any other end. God is the Alpha and the Omega, the beginning and the end. Our true identity is found in accepting our status as creatures of this infinite Creator God and in rooting our sense of identity in his. Our identity is an identity derived (p.76).

Self-acceptance, an integral part of personal identity is 'rooted in a reconciled relationship' with God (p.98).

It is in Chapter Four that Keyes pursues our need not only for self-acceptance but for self-coherence—and that sense of inner consistency is to be sought in a relationship with Christ. The Christian has a

new model, the 'hero and perfecter of our faith' (Heb. 12:2). This Jesus is 'the image of God in perfect focus' (p.109) and it is in him that the 'self that we are is gradually integrated with the self that we ought to be' (p.130).

I found Chapter Five especially hard-hitting for it is here that Keyes challenges us with the need for a 'higher honesty' that expresses itself in confession, forgiveness and restoring one another. Chapters Six, Seven and Eight deal helpfully with anger (a perceptive and practical section), identity and the family (key aspects dealt with more briefly) and living with oneself (including a convincing interpretation of Romans 7) respectively.

Many books on emotional and psychological perspectives written by Christians tend to over-simplify the issues in their attempt to be readable and accessible. Dick Keyes' book is exceptional in that the *complexity* of human interaction is not explained away. For example, he faces up to the question, 'Why is confession so hard?' (pp.138ff.) and to the vexed situations that parents sometimes meet in 'letting go' their children (pp.236ff.). At the same time, he teases out biblical principles in an imaginative way so that prayerful readers cannot sidestep the practicalities of the call to find their identity in God.

Generally, the text has been well proof-read. The error on page 122, line 21, where the '*righteous* man' is likened to a 'muddied spring or a polluted fountain' is self-evident. Sometimes I wonder whether Keyes' division of modern views into a 'New Victorianism' and a 'New Romanticism' is perhaps a little too tidy. However, given the constraint of developing his important thesis within the compass of a book of manageable length, his analysis has the value of highlighting Christianity's 'third way'. All told, this is a well-argued book which will prove a valuable resource for many years.

ROGER F. HURDING

Richard J Foster, *Money, Sex & Power*, Hodder & Stoughton, 1985, 260pp, Paperback, £3.95

This is a book, subtitled 'The challenge to the disciplined life', that gives very practical, down-to-earth advice on Christian behaviour, and calls, with precise examples, for committed obedience to the gospel. The closing words show clearly the author's intention. 'The time is now for a great new movement of the Spirit of God . . . Perhaps the vows of simplicity, fidelity and service could form the common commitment of such a movement'.

Of the three related themes examined in the light of Scripture, the

first, Money, is the most unusual; the second, Sex, the most controversial yet sensitive; the third, Power, the least satisfying.

I was arrested by the early statement: 'Jesus spoke about money more frequently than on any other subject than the kingdom of God'. That surely was an exaggeration! But a quick and incomplete mental check—the parables of the Unjust Steward, the Talents, the Labourers in the Vineyard, the challenge to the rich young man, the woman searching for a lost coin, the widow's mite, the coin with the head of Caesar—shows that he is right.

The way that we use money and think about it is a salutary test of commitment. Foster argues that money has such attraction that it cannot properly be understood simply as a neutral means of exchange. I take his point, but would contend as an economist that in itself it is neutral. All depends on how we regard and use it. It is a good servant and a bad master. Hence: 'You cannot serve God and Mammon'.

More than elsewhere, this section reveals that the book was addressed to an American audience. There is no attack on the 'evil of capitalism', just a condemnation of bad capitalists. Making friends by the mammon of unrighteousness is illustrated as financing a young friend to help him to go to university. But the conclusion is universal. 'Money does not deserve our respect. It deserves to be conquered in the power of the Spirit. Once defeated and converted to the way of Christ it can then be used without being served'.

The section on sex dodges no issues: romantic love, divorce, masturbation, homosexuality, the celibate by choice, the unmarried not by choice. Foster is blunt because he is perturbed by what has been the traditional witness of the Church. Soon after the apostolic age, he says, it departed from the biblical perspective. It taught that physical pleasure is bad and that sexual intercourse should be reserved for procreation. His remedy, in line with much modern thinking, is to distinguish between sex and sexuality. Sex means genital intercourse. Sexuality is present in friendship and affection.

There is an elaborate analysis of the Song of Solomon, used to confirm the judgment that true love is intense, restrained and mutual. Scripture teaches that homosexual intercourse is sinful, that the Christian pattern for men and women is chastity before marriage and fidelity within marriage—but also with the consoling word for those who have failed that if there is true repentance there is forgiveness.

With sex and money we know what we are considering. But what about power? Richard Foster never clearly defines it. Is it strength or authority or domination or ability? Here is the dilemma. Power corrupts—yet you shall have power when the Holy Spirit comes upon

you. In the end the power we should earnestly seek is that which accords with the rule of God and enables us to live the Christian life, the inner strength that comes from total obedience to Christ. On the other hand, the power of an oppressive dictator, of an exploiting employer, of a tyrannous father, is clearly wrong. Dr Foster was not satisfied by his first draft. I doubt if he is entirely happy with his second attempt. It is a pity that an otherwise excellent book is weakened by confusion at its climax.

EDWARD ROGERS

Vernon White, *The Fall of a Sparrow. A Concept of Special Divine Action*, Paternoster, 1985, 208pp, Paperback, £7.50

This is what I would call a real 'sandwich' book, beginning and ending with chapters which are light and easy to digest with plenty of strong meat in between. The book began its life as an M.Litt thesis only to be re-worked so that, in the words of its author, 'it might be made more accessible to the non-specialist reader'. It is White's contention that many modern theologians have 'reasoned God out of the universe' (as is evidenced by the charge of Deism levelled at John Hick by Michael Goulder—p.95). This book is a modest attempt 'to help faith reason him back in'.

The central thesis proposed by White is that God acts through *all* events, specifically for us. The writer's task is to show *how* this could be so by bringing together a number of strands, which, once elucidated, form an attractive and compelling conceptual framework. It is within this framework that we begin to see how God could act in the world in a way which is personal, specific, yet universal in scope and guaranteed to fulfilment by his sovereign efficacy.

White's starting point is our own everyday experience; that riddle which we encounter whereby on the one hand the world does seem to be brimful of meaning (that 'chance' event appearing to be part of some greater design) while yet on the other it seems that it is *we* who organize and integrate our experience and endow *them* with meaning. Also, what is one to make of that 'surd' element in life, the pain, the evil? The riddle is a persistent one and gains greater potency within the decidedly Christian framework of a belief in God who has purpose for our lives and interacts with them on a personal level. Here the riddle takes on a new twist throwing up many familiar questions: 'Is God in all events or just some?'; 'Is God's relation to evil such that he can only take certain events as a means to a higher end?'

Having considered the demands of experience, White turns to the

demands of revelation and faith, adopting a phenomenological approach to the Bible. By teasing out the major themes pertaining to the riddle of providence, White demonstrates that one must do justice to the Biblical witness that 'God acts personally, universally, with priority and sovereign efficacy; he acts in relation to particular events in which he finds ends as well as means' (p.55). Much of recent work in theology compromises at least some of these demands as is made clear by the works of Wiles, Ogden, Baelz and Vanstone. White likens the task of trying to relate the demands of revelation to the categories of experience to the endeavour of re-stringing a guitar, no sooner has one string been adjusted another has loosened! Judiciously and with great clarity, the writer shows that the theological guitars of Wiles, Ogden *et al* are wildly out of tune, with the strings of God's sovereignty, personal initiative and specificity being so slack as to render the instruments almost useless.

After acknowledging his debt to Austin Farrer, White engages in masterful and often detailed, construction of an alternative model, attempting to accommodate the claims of revelation outlined earlier. It is argued that the relationship between events, ends and purposes of God are such that the ends are always internally related to all those involved. In other words, every event is an 'end' and never purely a 'means'. This is not to say that an event which is an end cannot also be externally related to some further end; in fact it is stressed that the meaning and value of an event is derived from its position within a wider context of meaning. It is this context which is ultimately provided by God and so secures sovereign efficacy.

After a helpful discussion on time and eternity and an all too brief section on theodicy, White returns to the riddles of faith and experience, earthing the valuable insights he has gleaned in the touching problem of pain and forgiveness.

This is a first class book which tackles a deep and complex issue with honesty, humility and an intellectual rigour which in itself is a delight. At many points the writer unpacks some of the central concepts to help us see more clearly what is meant when we speak of 'an event'; 'God's purpose'; a 'special action' and so on. Yet, surprisingly, nowhere does he make clear in what sense he is using the notion of 'freedom' in relation to man (is this contra-causality, the choice of alternatives, or plain irreducible?). Some may also feel a little uncomfortable with White's implicit universalism (pp.170-171) and it would have been of great value had he said a little more of the *kind* of universalism envisaged.

It is questionable whether the author has succeeded in making the subject available to the non-specialist since many of the arguments

employed are of a specialist nature; but there can be little doubt that this is a major and significant contribution to the subject of providence and is highly commended to all those who wish to grapple with this great riddle.

M. TINKER

Robert N. Wennberg, *Life in the Balance*, William B. Eerdmans, 1985, 184pp, Paperback, £7.95

Although the spate of books on the abortion debate continues, so do the changes in legislation, techniques and public attitudes. This book written by the Professor of Philosophy at Westmont College, California, justifies itself in part by addressing the argument for many of these recent changes. The method of argument throughout the book is philosophical and approaches the issue with the minimum of prejudice. In fact, although Wennberg's position is both Christian and conservative he succeeds in sustaining the debate in a way that makes it difficult at times to infer his own position. The author early in the book faces the crucial question of judging abortion on the basis of some moral theory. He points out the important implication that the moral nature of an act is not necessarily dependent upon the consequences that ensue from it. This is especially important in debates on abortion, where the 'slippery slope argument' bases its objections on the possible link between abortion, infanticide and euthanasia. Our initial attitude to abortion can colour our assessment of the consequences of its performance.

At the heart of the debate is the question of moral authority. The appeal to Scripture may be criticised because interpretations vary and therefore it may be deemed unreliable, but Wennberg reminds us that precisely the same can be said of the appeal to reason or to any other secular authority.

The major theme of this book, is the question as to whether the foetus is a person, and if so, when. The linked question is that of the right to life. However, Wennberg points out that the establishment of the personhood of the foetus does not of necessity confirm its right to life. The key to the author's position may be summarised in his statement 'the only way to have a morally permissive position on abortion is to deny that infants have a right to life, for as soon as one holds that infanticide is intrinsically objectionable, abortion will inevitably be rendered problematic and morally risky'. He correspondingly favours conception as the time of the establishment of the right to life. Conversely when Wennberg considers the right to bodily

self-determination on the part of the woman he concludes that women ought not to be forced to carry through with unwanted pregnancies. Once this stance is adopted we are virtually left with abortion on demand. He denies that abortion involves a conflict between the woman's right to bodily self determination and the foetus' right to life, because the right of the foetus does not entitle it to the continued use of another's body for life-support purposes. This is an example where moral philosophy defies common sense.

One criticism of the book is that the discussion on the right-to-life aspect becomes repetitious. The fourth chapter dealing with the various theories has already been anticipated in the preceding chapters and continues to be elaborated in the subsequent ones. In any case the chapter ends inconclusively.

If abortion is allowed for certain indications, then the moral or philosophical arguments justifying it should be correlated with these different reasons. This is a weakness in Wennberg's argument, because apart from dealing with the various indications for abortion in the second chapter, which is little more than a list of medical and other grounds for abortion, he subsequently seldom differentiates between these in the remainder of the book. It should be stressed that the genuinely medical reasons for abortion are nowadays exceedingly rare. In fact Wennberg rather clouds the issue by dismissing the possibility that many or even most of the million and a half women annually seeking and obtaining abortions in the United States are doing so without substantial reasons. He counters this with the statement that 'good reasons or substantial grounds for abortions do exist'. If he is confining his subsequent discussion to the latter group then this should be clearly stated.

The gradualist variant of the potentiality principle which holds that the right to life gradually becomes stronger as the newly fertilised ovum develops into a newborn infant, is described as being in accord with the intuitive beliefs of most people. This means there is a continuous and gradual development in the right to life. Devine criticised this concept because the analogy with abortion leads to the killing of old people. Wennberg rejects this criticism of the gradualist theory because the implication is a monstrous one. But this begs the question in that euthanasia for the senile is not a monstrous concept to those who propose it—in other words a gradual increase in the right to death!

The one point where Wennberg's position sits uneasily with a conservative Christian one is his assessment of *Homo sapiens* as recipients of divine valuation. He is reluctant to acknowledge unequivocally God's role as the creator and dispenser of status. He

seems to prefer that man's special status should be inextricably tied to his nature as a person, or potential person, who can respond to God. This leads to the deduction that God does not confer a distinctive status on those who cannot participate in his purpose, because they do not have the potential for personal life.

The important point is made that although anti-abortion groups may stress the alternative of support for the pregnant woman this should not obscure the burden and hardship in cases of unwanted pregnancy. He rightly points out that the decision is hard and there is no easy middle way.

Some of the strongest objections to abortion are shown to be non-religious—or at least non-Christian. Wennberg quotes the testimony of Baruch Brody who initially thought there was no moral issue involved but as he examined the question came to realise, or doubt, that abortion was ever morally justifiable. Furthermore, the opposition of religious groups to abortion should not be dismissed simply because of their motivation.

Two important aspects are discussed, albeit briefly, in the closing section. One is that abortion may be morally wrong even if no right to life is established. The second is the weakness of the legal position. The book ends on a rather pessimistic note where the only answer to current attitudes is that of moral persuasion coupled with compassionate assistance. The book is well written, apart from some repetitiousness. It is worth reading for an up-to-date assessment of the moral arguments involved in a major ethical dilemma for patients and their doctors. It is difficult to envisage that reading the book will help anyone in a genuine dilemma over the issue, leave alone change attitudes already assumed. The inconvenient and uncomfortable truth may in the end be that the room for compromise between a strict pro-life stance and a permissive or compassionate position becomes increasingly untenable.

D. E. B. POWELL

William Lenters, *The Freedom We Crave*, Eerdmans/Paternoster, 1985, 177pp, £12.95

Christian books about addiction usually describe types of addiction and addictive behaviour and then point to faith in Jesus Christ as the answer. This book is not typical of that genre. Certainly the author believes that faith in God does enable recovery, but equally recognises that this solution is too simplistic. In fact he devotes a

chapter to addiction to religion! Other chapters consider addiction to alcohol, romantic love relationships, fitness, work and eating.

Lenters maintains that addiction happens to everyone at the deepest level. It is the 'itch' to do something which makes one feel good and to perpetuate this 'itch'. It is the fascination with guilt that leads to euphoria and is part of the paradox of freedom. Addiction is freedom turned in on itself and is characterised by the preoccupation with the self which can be observed in the workaholic, the fitness freak and even in the romantic attachment where the partner is loved not for him/herself but as a means of self-gratification. The author claims that any situation can become addictive when it erases self-awareness and self-esteem and becomes obsessive.

Although not disputing the biological basis of addictions like alcohol dependence Lenters argues that addiction is primarily a behavioural disorder. This being so he claims that addictions can be rectified and hence the purpose of the study is to provide a strategy for recovery. This he does by getting the reader to ask questions about particular relationships and obsessions. He does this both in the text of the book with Case Studies at the end of each chapter and in an appendix where the reader is encouraged to answer a personal questionnaire based on principles used by Alcoholics Anonymous giving 'Steps to Healthy Living'.

The chapter that intrigued me most was the one dealing with religion and addiction where the author demonstrates a more than superficial resemblance between alcohol and religious addiction. Religion becomes addictive when there is a mindless dependence on a religious leader, ritual or doctrine and a magical view of prayer. He writes, "I surrender all" . . . is sentimental trash, symptomatic of a pathological religious experience, unless it is followed up and counter-balanced by the readiness for engagement in life.'

I did not find it an easy book to read and therefore do not feel it can be put directly into the hands of an addict. It will be probably best used as a source book for counselling, but all who persevere with it will gain insight into what the author describes as, 'the drama of the human spirit responding to the stress of life' and probably also discover things about himself that he did not know before.

R. S. LUHMAN

David Sheppard, *Built as a City*, Hodder and Stoughton, 1985, 467pp, Paperback, £2.95

This is the 'Revised edition' of the book originally published in 1974. A

quick comparison between the two editions seems to show that the only revision is the addition of the prologue. The book loses none of its powerful advocacy for the urban scene with the passage of time, and needs little revising.

Since its original publication, we have had David Sheppard's *Bias to the Poor* and the recent report of the Archbishop's Commission on Urban Priority Areas, 'Faith in the City'. (A commission on which David Sheppard was, I should think, a powerful member.) Together they make up a considerable Christian critique of urban life and the need for Church and State to supply its needs.

The book is most readable, divided into small sections, and is the fruit of many years' experience of life in the inner city, and of much thought and prayer about its problems. It is very well resourced and covers a very wide ground so that some of its matter is rather thin.

Its sub-title is 'God and the Urban World today' and he faces squarely the criticism from those who would ask why a Christian minister should be so concerned about the economic and social aspects of urban life, and not concentrating on 'Preaching the Gospel'. 'A Gospel' he writes, 'which is only a personal and family gospel ignores the fact that God has deliberately made the world corporate. Only corporate action can bring about many of the changes which are needed'.

It should be compulsory reading for any minister working in urban priority areas, but is not just information, but a call to action . . . and sacrifice . . . for the whole Church.

D. A. TASSELL

Howard Davis and David Gosling (editors), *Will the Future Work?* World Council of Churches, Geneva, 1985, xviii+118pp.
(no price marked).

'How can the Churches evaluate and make informed and practical responses to the problems and opportunities created by emerging patterns of work?' (p.vii).

This is the question which a workshop convened by the Church and Society sub-unit of the World Council of Churches and the Church of Scotland's Society, Religion and Technology Project set out to answer. The book is the result.

The speed and intensity of technological change increases; unemployment devastates communities; passivity is the result; and

'the deep divisions in the industrial countries with high unemployment are being allowed to deepen further when the priority should be to set goals for the kind of society in which 'good work' is available for all,' (p.x).

A period of transition ought to be a breeding-ground for debate. 'One of the reasons why this debate has not really taken off is that the ethical questions are not seriously addressed by those with the power to make socially significant decisions. To let the market decide is to abdicate responsibility for matters which do lie within the sphere of political decision and which are open to general understanding and judgment,' (p.xiii).

The introduction ends with a plea to the Churches to keep the question on the political agenda. Then follow the three main sections of the book.

In the first, Theodor Leuenberger says that there is no longer any hope for full employment. He and David Simpson believe that change must be accepted—and that it can be controlled. New technology is here to stay. 'At the very least, it means that people can be miserable in comfort,' (David Simpson, p.37) (!)

Bruce Willams believes that innovation *can* create employment. Labour-displacing change *can* be balanced by labour-*creating* change.

Part II includes views from industry, Trades Unions and the Manpower Services Commission. This survey of current employment policies and assumptions tells a story of crisis management. But Lynne Amery has not lost hope. It is still possible to recover idealism, and to 'design a better world,' (p.52).

The third part asks about 'An Alternative Work Ethic'.

David Bleakley wants the truth to be told. Work is not always humanising, and the loss of paid employment not always demoralising. But still: 'Unemployment bears little relationship to the amount of work that needs to be done,' (p.79).

Peter Cressey sees that worker-participation declines in a recession. In such circumstances, a new work ethic is urgent yet unimaginable,' (p.92).

But Goran Collste *demand*s a new 'work ethic', a new normative theory with which to evaluate technological change. 'A "new work ethic" . . . is not just about changing values and attitudes which are no longer appropriate to an age of computing and highly automated systems—it is a practical step towards achieving a more humane technology and a more responsible society because of a more involved workforce,' (p.100).

The book closes with conclusions about declining industrial

communities; the social impact of new technology; youth, education and training; and international strategies—and with recommendations to the Churches: for instance—a renewal of the study of corporate responsibility in the Old Testament; Christian action to promote new social policies; closer links with non-Church bodies in local initiatives amongst the unemployed; the encouragement of alternative patterns of working.

The book is a good introduction to the current debate on the future of work—a debate in which the Churches have a proper role to play. It would have had more impact if there had been a single theological focus: for instance, Jesus' 'Kingdom of God'. Without such a focus, a discussion of future social policy remains reactive. *With* such a focus, and such accompanying middle axioms as 'fundamental human equality', a picture of the kind of society we would like to see can be built up, and the future of work can be discussed in that context.

The book is right in its insistence that radical change is necessary. 'The challenge of technological unemployment and changes in motivation will not be met with adequate responses because the centralised, corporatist solutions of recent decades will be more of a hindrance than a help in finding new and flexible patterns and structures,' (Theodor Leuenberger, p.16). And page 19 sees 'the inherited work ethic with its adulation of the worker and moral condemnation of those who do not work' as 'increasingly anachronistic and unhelpful in an age where jobs have become a scarce resource,' (quoting Roger Clarke's *Work in Crisis*).

But relevant specific solutions are not offered—perhaps because no critique of the economy as a whole is offered as a context within which to discuss the future of work. For only a change in our taxation and benefits policy can enable employment patterns to change, and here the Christian insistence that wealth is given as well as earned would suggest a universal basic income (which would, incidentally, result in a more flexible labour market, which would in turn enable some of the changes the book demands to come about).

New social structures cause attitudes to change—not vice-versa. So the essayists should have offered us some specific policy options, and discussed their likely results in terms of changed attitudes.

But the book is a comprehensible, diverse, undogmatic, question-raising discussion. It is well-worth reading, but I cannot tell you whether it is worth buying. My copy had no price on it.

MALCOLM TORRY

John Polkinghorne, *One World. The Interaction of Science and Theology*, London, SPCK, 1986, pp.xiv+114, Paperback, £4.50

Until 1979 Dr John Polkinghorne held a chair of theoretical physics at Cambridge; he is now an Anglican priest and Vicar of Blean in Kent. His earlier book, *The Way the World Is*, was described by him as 'my personal *apologia* for the faith I hold' and was sub-titled 'The Christian perspective of a scientist'; the present one, sub-titled 'The Interaction of Science and Theology', takes the topic of *One World* into further detail. After an introductory chapter on The Post-Enlightenment World, he opens up his theme with two chapters on The Nature of Science and The Nature of Theology respectively. On the first of these he firmly and persuasively rejects the hypothetico-deductive doctrine of science which liberal theologians have found so attractive, 'the simple account of science' which 'sees its activity as the operation of a methodological threshing machine in which the flail of experiment separates the grain of truth from the chaff of error. You turn the theoretico-experimental handle and out comes certain knowledge. 'The consideration of actual scientific practice,' he tells us, 'reveals a more subtle activity in which the judgments of the participants are critically involved' (p. 12). This is a point which Bernard Lonergan has made in an even wider setting:

Method can be thought of as a set of recipes that can be observed by a blockhead and yet lead infallibly to astounding discoveries. Such a notion of method I consider sheer illusion. The function of method is to spell out for each discipline the implication of the transcendental precepts. Be attentive, be intelligent, be reasonable, be responsible. Nor does the explicitness of the method make the occurrence of discoveries infallible. The most it can achieve is to make discoveries more probable [*Philosophy of God, and Theology* p. 48].

Polkinghorne himself claims the support of Michael Polanyi in emphasising the role of judgment in scientific work, 'Skill' as he calls it. He admits that 'once one has acknowledged the part that personal discrimination has to play in scientific endeavour the whole enterprise may seem to have become dangerously creaky' (p. 12). Nevertheless he considers that Thomas Kuhn's view of scientific revolutions is just 'scientific mob rule' and 'greatly overdone' (p. 13), while Paul Feyerabend is simply 'a self-proclaimed scientific anarchist' (p. 14). Karl Popper's rejection of verifiability in favour of falsifiability on the grounds that there is no exhaustively specifiable set of rules which enable one to lay down a *proxi* when induction is justifiable is seen by Polkinghorne as a denial of the possibility of human skill and of what scientists believe themselves to achieve. I would in fact hold that the

notion of understanding as itself a self-understanding of the nature of human mentality has an even wider reference than he himself gives it.

No account of science [he writes] is adequate which does not take seriously this search for understanding, together with the experience of discovery which vividly conveys to the participants the impression that understanding is what they are actually attaining. I have never known anyone working in fundamental physics who was not motivated by the desire to comprehend better the way the world is [p.20f].

I will only note in passing his refutation of the subjective idealism of Henry Morganau and A. S. Eddington. I freely endorse his judgment that

the natural convincing explanation of the success of science is that it is gaining a tightening grasp of an actual reality. The true goal of scientific endeavour is understanding of the structure of the physical world, an understanding which is never complete but ever capable of further improvement . . . In my view [he adds] this means that science is not different from other kinds of human understanding involving evaluation by the knower, but only different in degree (pp.22, 25).

Polkinghorne concludes this chapter with some brief remarks on Gödel's theorem, the remarkable discovery that in any mathematical system that is complex enough to include arithmetic there are propositions that can be stated but cannot be either proved or disproved. Quoting Hofstadter that this shows provability to be a weaker notion than truth, he offers the variant that 'truth transcends theoremhood' (p.25). I suggest that the real implication is even profounder and more congenial to Polkinghorne's position, namely that the existence of the world cannot be derived from logical necessity (the critics of the ontological argument were right about that) but only from the will of a being that is (not logically but ontologically) self-existent; Dr Stanley L. Jaki has argued this in more than one place (*The Relevance of Physics*, 127ff, 49ff; *Cosmos and Creator*, 49ff; *The Road of Science and the Ways to God*, 253, 319.).

Passing on now to discuss *The Nature of Theology*, Polkinghorne declares that 'the view of the theological enterprise which [he] would wish to defend is summed up in a splendid phrase of St Anselm: *fides quaerens intellectum*, faith seeking understanding' (p.28), and it is this that governs what might otherwise seem to be a rather conventional Anglican appeal to scripture, tradition and reason. The fact is that his deep acquaintance with both the disclosures and the mysteries of science altogether preserves him from that simple elimination of the supernatural which is so often taken to be natural outcome of the

scientific attitude. And I think there is a close link between his rejection of subjectivism, idealism and positivism in his account of the nature of science and his rejection of the antisupernaturalism of Feuerbach, R. B. Braithwaite and Don Cupitt in the realm of theology; and this, not because he is assimilating his theology to his science but because of his conviction that there is only One World and that God is its creator. In words that remind one of that valiant champion of theology in the scientific age Dr Thomas F. Torrance, he writes:

Theology differs from science in many respects, because of its very different subject matter, a personal God who cannot be put to the test in the way that the impersonal physical world can be subjected to experimental enquiry. Yet science and theology have this in common, that each can be, and should be, defended as being investigations of what is, the search for increasing verisimilitude in our understanding of reality (p.42).

(Torrance would, however, hardly accept his judgment on Karl Barth's neo-orthodoxy as 'in danger of turning theology into one of Wittgenstein's self-contained "language games" '(p.42)!

Going on to consider the Nature of the Physical World in more specific terms, Polkinghorne describes it as having ten interconnected and highly complicated features. To discuss them here in detail is impossible, but even to list them will show the contrast between the mysterious and problematic nature of the world as seen by contemporary science and the neatly delineated picture of it in the popular (including the theological) mind, which is almost a century out of date. The headings under which Polkinghorne lists 'the scientific view of the world that we currently hold' are: (1) elusive, (2) intelligible, (3) problematic, (4) surprising, (5) chance and necessity, (6) big, (7) tightly-knit, (8) futility, (9) complete on its own terms, (10) fundamentally incomplete. Two points out of many that stand out from his account are (1) that, in spite of the subjective character of our individual *sensory* experiences, the *intelligible* objectivity of the world persists, and (2) that in order for life and man to be possible a number of events of quite amazingly low probability (e.g., 1 in 10^{60}) had to occur (the 'anthropic principle'). This and cognate questions receive further discussion in the chapter on Points of Interaction and it is impressive to see the wide range of alternatives which Polkinghorne, in developing his own views, finds as compatible both with his science and with his thoroughly orthodox theology. This appears, for example, in his discussion of free-will in relation to quantum indeterminacy and in his attitude to miracle and the unexpected. He sees no place for the dogma, embraced by such theologians as Dr M. F. Wiles, that God never does anything in any

particular events substantially different from what he does in all events. Finally, in the chapter on Levels of Description, he gives a fresh critique of materialist reductionism, in which he remarks that 'the emergence of mind from matter is only a degree more mysterious than the emergence of objectifying measuring instruments from the fitful quantum world' (96).

This is a small book but I believe it is an important one. It is also an entertaining one; think of that unfortunate creature Schrödinger's cat (p.48). We have had many books in recent years about science and religion, but they have often been weak through their adoption, often implicit and even unconscious, of a basically idealist and subjectivist metaphysic. Polkinghorne's strength is in his refreshing realism. 'When order and intelligibility are introduced into any realm of experience by the use of certain concepts' he writes, 'then that is *prima facie* a reason for believing in the reality of the entities to which those concepts refer' (p.40). And again, 'Scientific theories which consistently work are likely to do so because they represent with some degree of verisimilitude the structure of the physical world. Theological stories will only have power if they too mirror reality' (*ibid.*).

E. L. MASCALL

Niles Eldredge, *Time Frames*, Heinemann, London, 1986, 240pp, Hardback, £12.95

When in the *Origin of Species* Darwin propounded his theory, he envisaged evolution as having taken place by slow and gradual changes from one species to another. In arriving at this view he appears to have been influenced more by contemporary biological dogma (*Natura non facit saltum*) and sociological ideas of progress than by palaeontological evidence. He recognized, however, that there were difficulties in this view, one being that the fossil record did not exhibit the numerous intermediate forms that his theory led him to expect. He got round the problem by pointing to, amongst other factors, the imperfection of the geological record; and this has been the stock explanation of most palaeontologists ever since. Despite this, it remains an unsatisfactory explanation.

In actual fact the fossil record affords little support for the slow gradualism that Darwin postulated. Most species are remarkably constant throughout the period of their existence, and when they are replaced by related forms the succession in the rocks is abrupt.

In 1972 Niles Eldredge and Stephen Jay Gould put forward a new theory to explain the geological facts. They called it 'the theory of punctuated equilibria'. In essence the theory states that over most of the geographical range of a species the ecological conditions are such that the species is well adapted; and, as long as the environment is stable, there is little need for the species to undergo modification. These are just the conditions that give rise to a high population of the species, and therefore to a relatively large number of fossils. At the extreme limits of the range, however, environmental conditions are stressful and numbers low. But these are the circumstances conducive to rapid evolution. Because of the small population, and probably small area, involved, the rapidly evolving forms produce very few fossils to tell the tale. Now if the stable species over its central range suddenly (geologically speaking) encounters adverse environmental changes it dies out; but if the new conditions happen to be favourable to a new species emerging on the periphery the way is open for that species to invade and recolonize the central range of the extinct species. The new species then begins to leave fossil remains. So when the palaeontologist later invades the area, and hammers away at the rocks, he finds two periods of 'equilibrium' (constancy of form) 'punctuated' by sudden change.

In his new book, Eldredge describes in popular, and often humorous, language the events that led him and Gould independently to the same theory. Eldredge had been working on Devonian trilobites in the Midwest of the USA, and Gould on Pleistocene land snails in Bermuda; and both had been impressed by the prolonged constancy of species and their sudden replacement in the fossil record. Their resulting joint 1972 paper, given originally at a palaeontological symposium, is reprinted here as an appendix. That paper stimulated a vigorous debate, during the course of which their concepts were, according to Eldredge, sometimes misunderstood and sometimes misrepresented. So he discusses at length the implications of the theory for biology and palaeontology. He acknowledges that he and Gould do not always see eye to eye on these.

The theory will probably remain debatable for some time, but it does appear to offer a satisfactory explanation of the fossil record of speciation. But some writers have attempted to extrapolate from the formation of new species to the incomparably larger changes involved in macro-evolution. This I find hard to accept. That all the changes necessary to convert a dinosaur-like reptile into a primitive bird could have occurred in small peripheral populations without giving rise on the way to a number of successful and widespread species seems a very remote possibility; and that it could have

happened time and time again in the evolution of new orders, classes, and phyla, is even more unlikely.

There is nothing new in this book, apart from the popular style in which the theory is presented: but the layman who wants to understand one influential theory in current thought would be well advised to read it.

GORDON E. BARNES

M. Denton, *Evolution: A Theory in Crisis*, Burnett Books, 1985, 368pp, £17.50

As its title suggests this book is an exposition of what the author considers to be some fatal weaknesses in the theory of evolution. It differs from many other books on this subject in three ways. Firstly, in the detailed nature of the argument. The author is a molecular biologist but is clearly well-read in the other fields which he discusses. Although the argument becomes quite detailed in places it is clearly presented and should be comprehensible to a lay-person not familiar with the subject. Secondly, whilst the argument is put forcefully at times, the book is free of the kind of polemicism that sometimes mars books on this topic. Finally, this book is especially interesting because Dr. Denton is not arguing for any creationist alternative to evolution. Indeed it is not clear from the book whether he has any religious beliefs at all. The book is simply an attack on current evolutionary theory. This may lead some to reject it as purely destructive, but sometimes demolition is a necessary prelude to rebuilding.

The first three chapters of the book are primarily historical. They provide a brief but adequate survey of the factors which led Darwin to propound his theory of the origin of species, and to its general acceptance. Denton stresses that Darwin was aware of unresolved problems facing his theory, especially the almost total lack of fossilised intermediate forms, the absence of a credible mechanism for change, and the problem of conceiving how complex and well-adapted organs, such as the eye, could arise by gradual, random, changes. After presenting cogent evidence for the reality of micro-evolution, the development of new species by mutation and natural selection, he turns to examine the evidence presented in support of macro-evolution. This takes up the rest of the book.

Denton argues that the problems which Darwin recognized have not diminished but increased. Darwin could hope that future field-work would lead to the discovery of the missing fossil links. Denton

examines the few that have been proposed, and finds them unconvincing. No-one has yet set out a possible route from, say, a light-sensitive patch to the human eye, let alone estimated the probability of such a route. At first, Mendelian genetics seemed to provide the mechanism for evolution. However, Denton argues, a random search process, which is essentially what evolutionists propose as the mechanism for evolution, is hopelessly inefficient and an inadequate mechanism for macro-evolution. He illustrates this by discussing the probabilities of producing meaningful words and phrases from a block of randomly chosen letters by such procedures. Other problems are also discussed. The modern system of taxonomy called cladistics is a non-evolutionary classification system and a number of its exponents insist that 'no species can be considered ancestral to any other'. Denton argues that it supports a discontinuous, hierarchical, view of nature rather than the continuous one required by evolution. So too, he argues, does the study of homologous organs and of homologous proteins such as cytochrome C. Attempts to explain how life arose from a 'prebiotic soup' are discussed and found wanting.

At times the argument becomes repetitive, and just occasionally it becomes purely rhetorical. However, this reviewer thinks that he has made out a good case for his claim that evolution is a theory in crisis, even if it is far from yet being overturned. It is to be hoped that evolutionists will not dismiss this book as just another attack by someone with an ideological axe to grind and so fail to give its arguments a fair hearing.

E. C. LUCAS

Jim Brooks, *Origins of Life*, Lion Publishing, 1985, 160pp, Casebound, £8.95

In its production, this book is what we have come to expect from Lion—beautifully laid out and well illustrated. For layout and visual appeal it compares favourably with Attenborough's 'Discovering life on earth' and 'Planet earth' and hopefully it will corner the same market.

The title and the sub-title ('From the first moments of the Universe to the beginning of life on earth') describe the book's contents except for a topical aside on the fate of the Dinosaurs. After the introduction the book falls into three main sections. The first deals with Geology, both the Column and measuring of Geological time. It is a clear

concise statement of the finding of orthodox Geology interspersed with superb photographs. No references or concessions are made to Creationism, here or anywhere else in the book. It would have been better if, when referring to the history of Geology, the author had named names—William Smith, Buckland, Sedgwick etc—instead of referring vaguely to 'devout Christian men'.

The second section of the book deals with astronomy in a clear and readable manner, especially the origin of the Solar system. It is the third and main section that deals with the title of the book—the Origin of Life—and this forms half the book. Here we are given a good summary of the state of play today. There is a useful two-page inset on 'Defining life'. However, the chapter on 'Chance or Purpose' is the worst in the book. Statistical computations on typewriting monkeys are thoroughly arid and pointless, and the work of Eigen and Prigogine has progressed well beyond that and sees an important place for chance in the Universe. The chapter on the Biosphere is good and that on 'Pre-Cambrian rocks and early life' is excellent and should convince all that pre-Cambrian fossils *do* exist. (On page 106 a 19th century drawing of trilobites is lacking its description.) The 'primitive soup' is rejected and then we are treated to a very useful section on organic matter from space, which was illuminating and challenging to this reviewer who has always laughed at Evolution from Space. In a sense, the author comes to no firm conclusions on the precise origin of life, concluding on Page 144 that 'bio-motive molecules e.g. glycine can be formed in three ways—(a) in Urey-Miller type processes, (b) in cold interstellar clouds or (c) in circumstellar shells. This lack of dogmatism makes a refreshing change from the scientific fundamentalism (to use Langdon Gilkey's choice phrase) which bombards us with atheistic science. The Last chapter on 'Science and Creation' is an apologetic appendix.

This book could be far bolder and aggressively Christian, but it contains the warning that Christians often avoid the fray on 'Origins' (for fear of naturalistic explanations) and leave it to others (e.g. Oparin and Haldane) who have an atheistic axe to grind. Today there are very few good 'Science and religion' books and *Origins of Life* fills an important gap which is liable to be filled by Creationist or Evolutionary works with an anti-Christian bias. The level aimed at is the 'A' level student and those with a reasonable grasp of 'natural history' (e.g. Attenborough readers). As such one hopes that it will be read as the first in a long line, hopefully if highly competent and well produced books on Science and Religion written from a definite Christian standpoint.

M. B. ROBERTS

Gerald Feinberg, *Solid Clues*, Heinemann, London, 1986, 287pp, Hardback £12.95

Solid Clues is an attempt to give some understanding and information about modern science. The author looks at some important questions, e.g., what happened before the 'Big Bang', and the aging process in man. The three main areas of the book are Quantum Physics, Molecular Biology and the Future of Science. There are about 60 topic headings with titles such as Properties of Space, How things happen in the Quantum World, What can be understood from Particle Physics, Science of Life, Long-Term Future of the Universe, Origin of Life on Earth, Hunting Cosmic Fossils, Snapshots of the Nano-world, Mathematics, Classical Language of Space, Time and Change, Computers, Launching into a New Age, Place of Science in the World, External threats to Science, Rise of New Sciences. Each topic covers up to six pages of text.

An unusual feature of this book is the last section, dealing with science in the 21st century, which discusses present and future discoveries in science, and their relationship to the corresponding resulting technologies. It deals with the rise of new sciences, and demise of old sciences.

This is a popular work in the sense that it does not use the language of mathematics, and is therefore aimed at a wide readership. Nevertheless, the would-be reader should have some preliminary basic scientific knowledge. This might be supplied by the useful glossary, but this could have been greatly expanded.

Religion is hardly touched upon; this is not a religious book. However, the author is surely out of touch with mainstream religion when he says that the results of science could lead to a modification or abandonment of religious belief. The author should take note that the Bible is not a scientific text-book; it is a book about religious truth, and such truth as it contains is spiritually discerned.

I enjoyed *Solid Clues*. It is a fresh book, stimulating in its thought and ideas, whether or not they are eventually proved. It has the important benefit that one can retain much of its content.

B. W. COOK

Donald Coggan, *Paul—Portrait of a Revolutionary*, Hodder & Stoughton, 1986, 255pp, Paperback £2.25

In *Paul—Portrait of a Revolutionary* Lord Coggan introduces us to Paul the pilgrim, apostle, church founder and leader—a man

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*Reviewed in Faith and Thought (1985) **III** 121.

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