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ABOUT THIS JOURNAL

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FAITH AND THOUGHT

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A Journal devoted to the study of the inter-relation of the Christian Revelation and modern research

A record of the Annual General Meeting for 1981 was inadvertently omitted in our last issue. It is printed below.

ANNUAL GENERAL MEETING, 1981

The Annual General Meeting of the Institute for 1981 was held in the Chemistry Lecture Theatre, Chelsea College, Manresa Road, London, S.W.3, on Saturday, 16th. May 1981 at 10 a.m. In the absence of the President the Chairman of Council presided.

Apologies for absence were received from the President, Dr. R.E.D. Clark, the Rev. J. Stafford Wright, Messrs. Geoffrey Robson and Richard Bell.

The Minutes, previously published in this JOURNAL (107 No 2), of the Annual General Meeting held on the 17th. May 1980, were taken as read and adopted.

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

The appointment of Mr. Terence C. Mitchell, M.A., co-opted since the last Annual General Meeting to fill a vacancy on the Council, was formally ratified.

Mr. G.E. Barnes, M.A., Prof. R.L.F. Boyd, C.B.E., and Mr. P.E. Cousins, M.A., B.D., who formally retire from the Council, were re-elected for a further period of service.

A summary of the Annual Accounts for the year ended 30th. September, 1980 was presented by the Assistant Secretary, who reported that it had been impossible this year to have them audited in time for the Meeting but that copies of them would be available to members on application to the office after completion of the audit. The Accounts were adopted *nem. con.*

Messrs. Benson, Catt and Co. were re-appointed to act as Auditors.

The Chairman gave an informal report, summarized below.

THE CHAIRMAN'S REPORT

The Chairman reported that the Council had invited Prof. Malcolm A. Jeeves, of the University of St. Andrew's to become a Vice-President, and Prof. Derek C. Burke, of the University of Warwick, to become a member of Council. Both had accepted, but their replies had been received too late for their appointments to be included in the Agenda for this year's A.G.M. They are therefore co-opted by Council until formal ratification in 1982.

It had not been possible to appoint a new Hon. Treasurer, and Council would welcome any suggestion of a suitable person for this appointment. The Council was indebted to the Assistant Secretary who was acting as Treasurer in addition to carrying out his secretarial duties.

The Chairman referred to Mr. Weller's success in collecting arrears of subscriptions, which partly explained last year's excess — approximately £1100 — of income over expenditure. This surplus would offset some of the increasing costs of journal production this year, when it was hoped to break even. Estimates of next year's expenditure, however, indicate that, with present subscription rates and a 10% inflation rate, the Institute would incur a deficit of approximately £2000. The only alternative to an increase in subscription rates, which would be counter-productive, is a large increase in membership. So once more, the Chairman repeated his appeal to members to do all they can to recruit new members. It was gratifying to note that there had been a steady increase in the Institute's numbers; but this growth was not matching inflation. The Council proposes to meet in November to consider a more aggressive publicity policy.

The Chairman expressed the Institute's gratitude to Dr. Robert Clark for his untiring efforts to maintain the Journal during a long period of very difficult domestic circumstances culminating in the

recent death of his wife. He expressed the Society's condolences and the hope that the Editor's own health would soon improve.

He reported that the policy of refereeing papers had now been implemented; but regretted that, with the present financial constraints, it had not been possible to put into effect the suggestion of a separate publication containing the *News and Views* and *Short Notes* sections at present carried by the Journal. This, however, remained the ultimate policy.

The date of the A.G.M. and Public Meeting for next year was announced as Saturday, 22nd. May; for which it was planned to invite papers on a number of different topics, as a change from a whole-day symposium on one subject, as in recent years.

Finally, the Chairman reiterated that the Council was always pleased to receive from members constructive criticisms of, and comments upon, the Institute's activities; and, in particular, suggestions of topics and speakers for meetings: and that the Editor would welcome unsolicited papers and other contributions for consideration for the Journal.

PUBLIC MEETING
SATURDAY 22nd MAY, 1982

Room 3019 at Chelsea College, University of London, 552 Kings Road, subject to advance bookings.

CHAIRMAN and SPEAKERS

Chairman: **Gordon Barnes, M.A.,** *Chairman of Council*

Speakers: **Kenneth Brownell, B.A.** *Pastor, Cholmeley Evangelical Church, Highgate*
THE WILLING SORTE: VOLUNTARYISM & THE HERITAGE OF 19th CENTURY PROTESTANT NONCONFORMITY

Michael J. Collis, B.A., B.Sc., Ph.D., *Member of Council*
THE THEOLOGY OF CHARLES EARLE RAVEN: A 'SCIENTIFICALLY INTELLIGIBLE THEOLOGY'?

Prof. Sir Norman Anderson, O.B.E., Q.C., LL.D., D.D., F.B.A.
PRESIDENTIAL ADDRESS:
SOME THOUGHTS ON THE INCARNATION

Prof. Robert L.F. Boyd, F.R.S. *Vice President*
CREATION OF THE COSMOS

EDITORIAL

Congratulations to Dr C.A. Russell who has been appointed Professor of History of Science and Technology at the Open University.

The Society has learned with regret of the death of the Rt. Rev. G.R. Delbridge of Sale, Victoria, Australia, in a car accident in June 1980; also of the death of Pastor G.H. Ramsay, of Norwich. Both were long standing members of the Society.

The Paternoster Press (3 Mount Radford Crescent, EX2 4JW) inform us that they have launched a Book Grant Scheme which enables *bona fide* students to order theological books published by the firm at a reduction of 25%. The minimum order is £10. Details are available from the Paternoster Press.

Major C.W. Hume, a convinced Christian and founder of the Universities Federation for Animal Welfare died recently (22 Sept. 1981) at the advanced age of 95. He was responsible for the production of the first edition of the much used UFAW *Handbook on the Care and Management of Laboratory Animals* and the author of *The Status of Animals in the Christian Tradition* (1957) and *Man and Beast* (1962). He once commenced a Christian journal to be devoted to animals but found it too difficult to obtain enough suitable "copy" on the subject — difficult because animals cannot talk to us! His earliest publication, which he gave to his student friends, was a scholarly Christian apologetic. (*A Contribution to the Ethics of Religious Doubt*, with Introduction by Bishop Taylor Smith, 1913.) Though I do not think he jointed the VI he came to meetings occasionally where some of us used to meet him. He will be long remembered for his stimulating and helpful advice and writings — for example "In Praise of Anthropomorphism" in UFAW Courier No.16 (1959). His letter to the *Times* concerning Charles Darwin (24 Dec 1963) is well worth quoting especially as it is little known.

> *Darwin's Ill-health.* Sir. — If Darwin's ill-health was of psychological origin it may have been due to mental conflict arising as follows. Darwin's chosen profession was originally the Church. He greatly admired Bishop Butler and put a quotation from the *Analogy* at the beginning of the *Origin of Species*. He ended that book with a devout observation. He subscribed all his life, I believe, to the South American Missionary Society. He once devised and sent to Romanes an argument for theism whose validity he neither asserted nor denied. In Downe he had a reading-room which he first lent and then gave to Fegan, a Plymouth Brother, and members of his household attended services there.

On the other hand he remained for practical purposes an agnostic, and must have been repelled by the unfortunate way in which many ecclesiastics treated his work. Does not this situation suggest the possibility of deep mental stress? Was Charles Darwin a *Prêtre manque*?

Errata This volume p.18. In paragraph 2 the date of Klaproth's work on pitchblende is given as 1879 instead of 1779. In line 5 from bottom of page read *saleuō* for *salenō*.

The reference to K. Denbigh on p.11 should be *Chemistry in Britain* 1981, vol 17(4) i.e. April issue number 4 (not page 4 as printed) the page reference is 168.

NEWS & VIEWS

DARWINIAN CONTROVERSY

Darwin died on 19 April 1882 and book publishers, magazines and journals have been hard at work commemorating the centenary. The *New Scientist* (15 April 1982) devotes almost an entire issue to Darwin and natural selection: it also contains many book reviews. For the most part the tone is pontifical. "Darwin's theory is now supported by all the available relevant evidence, and its truth is not doubted by any serious modern biologists" says Richard Dawkins. ("So little faith in the evidence for evolution" that he pontificates, thinks a student at Liverpool where anti-evolutionists are not rare. Letter 13 May). Dawkins goes on to tell us that "natural selection has no trouble in explaining the evolution of adaptive improvements of indefinite complexity" — surely much more than even Darwin would have claimed! Brian Charlesworth, reflecting that natural selection can accomplish sheer marvels, wonders why an organism like the lampshell *Lingula* has barely changed at all over the last 400m years. The answer of course is obvious: in such cases "natural selection acts to preserve the *status quo* rather than to promote change." This is because the population of the species is large but one seems to remember that though few in numbers the near extinct coelacanth existed also without appreciable change over a long stretch of geological time. Natural selection, it seems, explains just about everything.

Later Leslie Orgel tries to explain how there was "Darwinism at the very beginning of life", the subtitle being "Even before there was life there was natural selection". He starts with prebiotic soup which "is easy to obtain" partly from cyanoacetylene (assigned a wonderful formula containing six-valent carbon atoms!) and plenty of HCN (but no explanation as to why if this was ever present in the earth's atmosphere there are now no cyanide minerals in existence — not even Prussian blue). But later he is honest enough to say "I must admit that the attempts to reconstruct this evolutionary process are extremely tentative." Readers who were misled by the subtitle will be disappointed.

For the past couple of years American creationists have also been in the news. Correspondence, comments and articles on the evolution *v.* creation controversy have continued almost interminably in scientific journals such as *Nature*, the *New Scientist*, *Science* and also the

newspapers, notably the *Times*, until recently. Many useful, sometimes amusing, points have been raised but on both sides prejudice has sometimes surfaced.

Correspondence and comments in the *New Scientist* have been at a low level, the Editor being very reluctant to permit anti-evolutionists (other than Sir Fred Hoyle, rarely) to have much of a say. Thus, according to one contributor (Dan Greenberg, *New Scientist* 26 Jan. 1982) sensible scientists are faced with "the menace of creationist crackpots" whose "witchcraft is a self-limiting disorder". *The Times* and *Nature* in particular have set a much higher standard. Let us start with the *Times*.

Sir Fred Hoyle's views, of course, came in for criticism — not always well informed. Sir Brian Pippard of the Cavendish Laboratory, draws attention to the sudden changes which occur in nature as a result of small changes in the environment, e.g. a slight rise in temperature turns boiling water into steam. So why not a sudden onset of the moral and religious sense in man at some point in his evolution? A poor analogy, one might think, for the sudden changes with which we are familiar are not meaningful and are potentially predictable — in fact they have sometimes been successfully predicted (e.g. the crystal lattice of *solid* argon was correctly predicted on the basis of the properties of the *gas*). Andrew Huxley PRS professed himself horrified at the calculation by Hoyle that the chance formation of 2000 enzymes necessary for life is $10^{-40,000}$, for the chance that "some far simpler self-replicating system, capable of development by natural selection" being formed on the surface of the earth over geological time must be far larger. But Hoyle's calculation is evidently based on the chance of the formation of the simplest theoretically conceivable self-duplicating system (though perhaps he does not make this too clear) in which case the criticism misses the point. (Both letters in *Times*, 21 Dec. 1981).

The point seems also to be missed by those who argue that since only one (or a few) short length of an enzyme chain is catalytically active, it is this short length only which should be reckoned with in probability calculations. But short catalytically active chains will be active in catalysing many reactions. To simplify still further, hydrogen and hydroxyl ions will catalyse innumerable reactions. The important feature of an enzyme is that it has a *specific* shape which prevents all save the molecules for which it is designed coming near to the active centre. It is this specificity which makes life possible. Unlike his critics, Hoyle did not overlook this point. In principle his calculation seems to be correct.

Inevitably another text book argument in favour of the plausibility of evolution was to surface. "It is just not true that no explanation exists for cases where the intermediate stage in the evolution of an

adaptation appears to be useless" writes John R.G. Turner of Leeds. A fish might have evolved an electric organ for transmitting radar-like pulses to determine its position in muddy waters and then have progressed to using electric discharges to ward off its enemies (*Times* 22 Ap. 1982). Just possible, perhaps, says Nigel V. Halliday (1 May issue) but in most instances explanations along these lines do not as yet convince the sceptical. To what alternative use can an animal put its half-evolved wing and what conceivable use is a hole in the head before an eye is formed?

Professor H. Lipson, a physicist, disclaims any religious motive for thinking that "Darwinism is scientifically indefensible" and cites, in particular, the difficulty of imagining that chance processes could produce the eye. "I myself can see no alternative to the hypothesis that living matter was designed. The origin of life is not explainable in terms of standard science nor is the wonderful succession of living creatures formed throughout the thousands of millions of years of this planet's existence" (*Times*, 29 Dec.).

Much ink has been spilt on Popper's contention that to be scientific a theory must be capable of disproof. On this basis Popper reckoned that widely accepted beliefs such as evolution and Freudian theories of the unconscious mind are unscientific, though not necessarily untrue. However is 1977 he changed his mind about evolution saying that at least some aspects of it were potentially disprovable.

Professor J.M. Thoday, the Cambridge geneticist, drew attention to the fact that several issues are involved in the debate — e.g. the claim that evolution has happened and the claim that it is explained by a particular mechanism, are often confused, (12 Dec. *Times*). Professor E.H. Andrews replied that the blame for such confusions must be laid squarely at the evolutionist's door. The media and text books alike have always insisted that mutation plus natural selection (i.e. neo-Darwinism) is the explanation of evolution and "the average person must be forgiven for thinking that evolution and Darwinism are one and the same thing." But why has the insistence been so shrill? he asks. "Surely it is because evolution, without a convincing mechanism, is a hollow theory... Unless a mechanism can be proposed that permits the diversification and elaboration of life from one original form, the claim that evolution has occurred lacks *scientific* credibility. It becomes a statement of faith, an assertion, no different in kind from a belief in creation." Thoday claims that evolution provides a unifying view of nature. But it is naive to claim that unification is achieved by mere assertion that all living things arose from a common ancester. "The idea of creation is philosophically more satisfying by far, it embraces the origin of matter and energy *ex nihilo*, the existence and nature of scientific law, the existence of intelligence and the compatibility of intelligence with the created order... In terms of philosophical usefulness, therefore, creation wins hands down" (16 Dec. 1981).

One of the strangest letters came from Professor Chandra Wickramasinghe. With Sir Fred Hoyle he insists that it is ridiculous to suppose that the random shuffling of constituent molecules could create life, and wrong so to teach children — undoubtedly a Creator is called for. But he suggests that the Creator "emerged naturally according to the laws of physics within the Universe" and claims that such a view cannot be lightly dismissed (*Times*, 15 Dec. 1981). The idea that the laws of physics would produce a Creator in empty space is certainly novel. What laws has he in mind? one wonders. To his credit Chandra went to America to testify in the recent creation-evolution trial, even though he has no sympathy with much of what American fundamentalists teach — he is said to be a lapsed Buddhist. Most regrettably he had threats on his life, taken seriously by the police, when he came home.

Religion has not been highlighted in these discussions but it is of course true that many devoted Christians are to be found on both sides of the fence. In the *Times* (22 Dec. 1981) Dr E.L. Mascall, returned to a favourite theme — all that matters, he said, is whether the progress of development is or is not under the creative activity of God. He quoted Aquinas: "The preservation of things by God does not take place by some new action, but by a continuation of the activity by which he gives existence, an activity which is outside change and time" — a statement which I find unusually obscure (*Times*, 22 Dec. 81).

Though for many there is no conscious clash between belief in evolution and in God as Creator, it remains true, as Clifford Longley says (*Times* 11 Jan 1982) that "everyday impressions support the view that Darwinism has a great deal to do with "the decline of belief in Christianity and the decline of morality. People imagine that a "quasi-miraculous explanation of the existence of life is no longer required, science having moved in to explain the mystery." Applying Occam's razor they think that God is an unnecessary concept.

Turning to some of the *Nature* correspondence T.H. Jukes, ever faithful evolutionist, quotes Sir Fred Hoyle as saying that " 'for higher life forms to have evolved by chance is comparable with the chance that a tornado sweeping through a junk yard might assemble a Boeing 747 from the materials therein'... The simile is glib, meretricious and deceptive. No evolutionist has suggested that higher life forms are assembled by chance from debris". The analogy is quite inept. Jukes continues by comparing the evolution of the aeroplane with biological evolution. "The brief history of aircraft technology is filled with branching processes, phylogeny and extinctions that are a striking counterpart of three billion years of biological evolution." Hoyle and Wickramasinghe "should note that protein molecules evolve by elongation of small polypeptides and that living organisms acquire ever-increasing complexity from gene duplication as now revealed in DNA sequences. Also that wide-bodied jets evolved from small contraptions made in bicycle shops or

in junkyards". So says Jukes (*Nature* 295, 548; also 296, 796).

To which C. Darnbrough of Glasgow University asks, "Is Jukes a secret believer or merely an unwary fox in among the fundamentalist chickens?" For the ancestral relationships he discerns in aircraft evolution is one of design not of descent, which is "a striking counterpart of the creation process" (*Nature*, 296, 192). In a later letter S.R. Austin of Colorado remarks that Hoyle's analogy, far from being inept, is very apt. "Every additional step in the development of the 747 is a result of creative minds. Without such creative genius, and with or without any number of tornadoes, a junkyard is still junk, albeit with useful materials for creative minds; and without a Creator, atoms and molecules, which He created, are still only atoms and molecules... Jukes has most elegantly refuted his own argument." (296, 284). Jukes replied later (296, 796).

The issue of *Nature* for 8 April 1982 contains a number of interesting reviews of books on evolution. Among them is a review of Michael Ruse's *Darwinism Defended* (Addison Wesley, 1982, £8.40) by Niles Eldridge who speaks of Ruse's "dedication to the almighty principle of natural selection". Ruse tells his readers that the lenses used in trilobite vision are of mathematically "perfect" shape, thus affording "exquisite evidence of the power of natural selection". The reviewer comments, "I confess I cannot fathom the difference between Ruse's argument and the older creationist argument from design: see this organ system; observe its intricacy! Only (God, natural selection) could have fashioned such a marvellous organic machine... used in this inappropriate fashion, natural selection becomes a mere substitute for the Creator. It tells us nothing, really, about trilobite eyes or anything specific or meaningful about how they came into existence" (*Nature*, 296, 509).

Despite the high credentials of many who have participated in the discussion, it is strange to see popular misunderstandings and errors still living on. It is taken for granted by some that homologies between the structures of widely different life forms proves a connection dependent upon what lies *within* biological structures: no one would dream of using such an argument when comparing structures made by man. David Attenborough says that in pre-Darwinian days the church taught that "each species of animal and plant was individually and separately created by God and immutable" (*Times*, 31 Dec. 1981). This is nonsense. Some scientists did for a relatively short period hold such a view, but it was never difficult for the church to defend spontaneous generation as the source of many new species, if not of man. (Samson found bees in the bones of the lion he had killed!)

On the whole (though others may differ) I think that the creationist has by far the better of the argument. Even so, creation is not science for we have no idea how God creates: no disciplined thinking

on the theory of how He does so has proved possible. Yet when one thinks of the hard headed highly self-critical work of such scientists as John Hasted (see review elsewhere) it seems reasonable enough to accept creation as a fact, however mysterious it may be. It is of course easy enough to make fun of psychical research with which charlatans have always been connected — as they sometimes have been with orthodox science! (A recent book on these lines is James E. Alcock's *Parapsychology, Science or Fiction?*, Pergamon, £14.50). But some facts at least seem as well established, and indeed have proved as repeatable, as some of the most assured facts on which much orthodox science is based.

SCIENTIFIC WARFARE

The BBC2 Horizon interview on 23 Nov 1981 ("The Pleasures of Finding Things Out") was of unusual interest. R.P. Feynman, the founder of quantum electrodynamics, told how someone threw a dish into the air at a lunch party. On it there was a blue spot which seemed to rotate less rapidly than the dish. For his amusement only, Feynman considered the phenomenon mathematically and in time was drawn into the rotation of electrons and eventually into the work for which he gained a Nobel Prize.

Though as a scientist Feynman is a deep thinker his talk served to illustrate how little some scientists think about moral and spiritual matters. At the beginning of WW2 Feynman was asked to join in the attempt to make an atomic bomb, an outcome which he knew to be theoretically possible. It was an interruption in the work he was doing, yet he accepted the invitation *only* because, awful as the prospect was, he felt that otherwise Hitler might have the bomb first. But near the end of the war, when Hitler was defeated, he confessed that he did not think his position through once more — there was after all no risk whatever that the Japanese would have the bomb before the Allies. Later when the Los Alamos team had succeeded and a bomb had just been dropped on Hiroshima the scientists, including Feynman, were beside themselves with joy. They sang, danced and drank to excess in party mood, while tens of thousands in Japan were caught in the horrendous catastrophe, the direct result of the work of Feynman and the rest of the team.

In their book *A Higher Form of Killing* Robert Harris and Jeremy Paxman (Chatto and Windus, 1982, £9.95) demonstrate, though reluctantly, that unenforcible agreements, aimed at limiting the applications of science to warfare, are an irrelevance. They quote Sir John Dill, Chief of the Imperial General Staff who, with reference to gas warfare declared in 1940: "At a time when our national existence is at stake, when we are threatened by an implacable enemy who himself recognizes no rules save those of expediency, we should not hesitate to adopt whatever means appear to offer the best chance of success."

Despite agreements not to do so, both sides used poison gas freely in WW1. The 1925 Geneva Protocol on chemical and biological warfare had little effect on subsequent events: Mussolini used poison gas against Abyssinia in 1936. Only the belief that nerve gas would be used against Germany in WW2 restrained Hitler from using chemical weapons against the Allies, but he used gas to murder Jews. Plans were made to use anthrax against Germany at the end of the war but difficulties were encountered in developing the weapon. At one point Churchill wanted to use gas (but not anthrax) in retaliation when V-weapons were used against England. In minor wars both chemical and biological weapons have been used repeatedly. Reports keep filtering through to the effect that the Russians are using poison gas both in Afghanistan and in Laos, Cambodia. The so-called "yellow rain" that is being used is said to contain mycotoxins, extracted from highly poisonous fungi. It is difficult to protect against them as they can be dispersed as aerosols, in water or in food supplies. (*Times* 15 Sept 1981)

It is difficult to see how, in the last resort, any man can feel bound to honour his agreements unless he believes that he is responsible to God. In a war he may use the cruellest weapons and if he is killed, he will just disappear (so he thinks) and that will be the end of the matter. At the present time it appears that the Russians have more than 115,000 tons of stockpiled chemical weapons and 70,000 specially trained chemical troops deployed on the Central Front. Philip Goodhart (MP for Bromley) wonders why so many people think that unilateral nuclear disarmament by the West would produce a sympathetic response by Russia when Nato's unilateral chemical disarmament has apparently stimulated them to specialise on chemical weapons. (Letter, *Times*, 15 Feb. 1982)

A problem likely to face mankind increasingly in the days to come is how to dispose of scientific weapons when they become dated. Over the years 1971 to 1975 SIPRI published six volumes on the Problems raised by chemical and biological warfare. They have now added another (*Chemical Weapons: Destruction and Conversion*, SIPRI, Taylor and Francis, 1980). Here the manufacture and properties of such compounds as sarin are described: it is reckoned that 20% caustic soda might prove to be the best destructive agent for sarin but risks of contamination are very real. It causes slow muscle necrosis and changes in brain function while even inhibitors can cause morphological changes. There are still stocks in U.S.A., though not now usable. The destruction of large quantities will prove hazardous.

A similar problem arises with old nuclear submarines of which the US navy are now proposing to dispose of up to a hundred in a Pacific trench. The Navy contends that because cobalt-60 has a half-life of only 5 years there will be little danger, but several

scientists are concerned about nickel-59 with a half-life of 80,000 years and niobium-94 which is also long-lived. It is argued that leakage is likely to take place after 20 years and that radioactive materials will then enter the food chain. There is said to be enough radioactivity — 50,000 curies — in just one submarine to equal half of what has been dumped in the sea over the past twenty years throughout the world. (*Times* 19 Mar. 1982)

It is discouraging to hear scientific warfare discussed by Christians at the purely political level. We have all sinned; scientists more than others. Repentance is more important than discussion as to whether or not others will respond favourably to unilateral disarmament. A vast effort to convince the communist world that there *is* a God and that in the end man will destroy himself if he continues to neglect this fact would be more effective for world peace than deterrence and treaty-making with men who feel free to break their word.

THE HIDDEN COMPASS

For several years now interest in the effects of magnetic fields on various forms of life has been increasing. There is a species of termite — the so-called magnetic or compass termite — which builds large block-like nests, very tall and wide, but also very thin, and they always build so that the long axis of the nest lies in a NS direction. There are bacteria which contain tiny particles of magnetic material — magnetite — arranged in straight lines which make their dead bodies behave like little compass needles so that when they die and fall to the bottom of a lake they become oriented in the earth's field. Bees are sensitive to magnetism and the mystery of their magnets was solved a few years ago by the discovery that a bee's abdomen contains a little magnet with polarities lying across the body of the bee, from left to right, or the other way. Some birds are also magnetically sensitive; they can use magnetism in navigation. Oddly enough their circadian rhythms — the rhythms of life which in us men tell us when to go to sleep at night and when to awake in the morning — may be affected by magnetism.

What of man? Is he magnetic too? Many claims to this effect have been made over the centuries. In the 19th century the explorer von Middendorf was baffled by the ability of Esquimos to find their way home in arctic snows without the slightest difficulty, although, so far as he could see, there was no way of distinguishing one direction from another. Sometimes he would ask them how they did it, but they only looked at him as if he was silly. Charles Darwin was puzzled by what he had learned about an expedition to northern Siberia led by von Wrangel. The party passed "for a long distance through hummocky ice with incessant changes of direction and with no guide in the heavens or on the frozen sea." Yet the natives could find

their way with ease. Von Wrangel "an experienced surveyor, and using a compass, failed to do what these savages easily effected." How was it done? Here was an undoubted hint that man contains a hidden compass, but because anatomists could not find one, responsible scientists hardly dared make the suggestion.

Today the subject is in the news once more following the work of Dr Robin R.Baker and his colleagues at Manchester University. (*Human Navigation and the Sixth Sense*, Hodder and Stoughton, 1981, 138pp., £4.95) Well conducted experiments have shown that students blindfolded and brought to unfamiliar localities can successfully point the way home and have a sense of the bearing of the compass, though how they do it, they cannot say. When they wear helmets which counteract the earth's field their sense of direction disappears. So somewhere in the brain a compass must lie hidden which can give us a bearing. Indications as to whereabouts it — a line of magnetic particles — lies in the human brain have recently been reported.

Dr Baker's attractively produced book tells the story of his researches in which he applies to human beings the methods which have been used to demonstrate the magnetic sense in animals. The results seem convincing enough and Dr Baker's approach scientific. There have been criticisms, of course. "We know humans do not have a magnetic sense otherwise we should feel it. So whatever your results show, it isn't that" was the response of one scientist.

In America several teams have attempted to repeat Baker's work but, curiously enough, without success even when Baker went to America and participated in a further series of three tests. (*Science* 212 , 1061; *New Scientist* 25 June, 1981, p.835) The reason is not known, but human homing seems to be "an elusive phenomenon". "Baker's original results were so compelling that this is surely not the end" comments the *New Scientist*. Perhaps there is some simple explanation. For example, it may be that the diet available in some localities gives little opportunity for people to inbibe the small particles of magnetite out of which animal magnets are made. Meanwhile it seems reasonable to accept Baker's conclusions even though they may not apply to all mankind. Magnets have been found in so many life forms by now that it would be almost strange if man does not possess them. It is worth adding that the magnetic sense is easily confused. With their eyes shut students were able to point in the direction of home, but on opening their eyes and looking around their pointings became at random.

The discovery sets us thinking. For one thing, just because we cannot point to a sense organ and say "there it is!", it becomes fatally easy to reason it out of existence. The von Middendorfs and von Wrangels of the past had not the faintest idea how to find their way without their carefully constructed compasses. Like the natives who accompanied them, they too probably had compasses

inside their heads, yet they had no idea how to use them. It is almost as if men who did not know they had eyes could sometimes see and sometimes not — for they might shut their eyes without knowing it! Perhaps American students, disbelieving the Baker's theory, shut their magnetic 'eyes' unconsciously! It seems that the belief that what we cannot see or feel is not there kills powers which we should otherwise be able to use.

Baker's work is of no small Christian interest. If God can speak to man, then there must be in man an ability, a mechanism (or call it what we will) which is capable of response. Because incoming messages are not sensed consciously, they may, like a magnetic response message, be reasoned out of existence. Certainly we are fearfully and wonderfully made and wrong attitudes can make it impossible for us to receive messages which we ought to be able to pick up with ease.

ERNÖ'S CUBE

News of the impact of the Rubik cube upon our ways of life and thought seems never ending. Book after book appears telling one how to rearrange the colours so that all the minicubes on each of the sides are coloured the same way. We are told that the MIT now holds 'cube-ins' for the best brains in Boston; that cube brokers are opening up businesses in West Germany which (for a fee) will come rushing to help cube fans solve their cubes; also that psychoanalysists have now diagnosed the "cube dream" in which the sufferer dreams of solving his cube but on awaking in the morning feels down-crested and depressed, knowing that he is no nearer success than before. (*Times* 24 Nov. 1981)

The most intriguing story of all is told by Sir Fred Hoyle. Starting with a scrambled cube and no instructions he struggled hard with Ernö Rubik's invention. It took him a week to master, and still he is bothered because the mathematics seems so impossibly difficult. However, having once tasted success his time for a solution has now dropped to a few minutes.

Before long Hoyle began to imagine a blind man playing with a cube. What are the chances that he will solve it, seeing that there are 4×10^{19} possible scramblings? And so, to quote, "imagine 10^{50} blind persons each with a scrambled cube and try to conceive of the chance of them all *simultaneously* arriving at the solved form. You then have the chance of arriving by random shuffling at just one of the many biopolymers on which life depends. The notion that not only the biopolymers but the operating programme of a living cell could be arrived at by chance in a primordial organic soup here on the Earth is evidently nonsense of a high order." Hoyle is hoping

that biologists, of the Haldane-Oparin soup variety, who fondly live in "the twilight fringes of thermodynamics" will now be helped to see the error of their thoughts with the aid of Rubik cubes. Astronomers he is sure will see the point at once but may not accept it because "they will be assured by biologists... the biologists having been assured in their turn by others..." that modern mathematical miracle working is quite in order. The others believe that "tucked away in nature, outside of normal physics, there is a law which performs miracles (provided the miracles are in the aid of biology)." (*New Scientist*, 19 Nov. 1981, p.526f)

No doubt cube psychoses will increase in days to come for a new 'cube' — only this time it is in the form of a sphere — has been invented. Two hemispheres are articulated together and 56 coloured balls slide over their surfaces. You have to arrange the balls in concentric rings, but now there are 5×10^{26} possible misarrangements which puts Erno's contraption into the shade (*New Scientist* 15 Ap. 1982). There is also a 'cube' which can take the shape of a rod.

MAGNETIC FIELD AND EARTH'S AGE

Data obtained from the satellite Magsat show that the intensity of the earth's magnetic field is decreasing at the rate of about 1% per decade. (*New Scientist* 3 July 1980, p.4) The rate of variation, however, is far from constant.

A study of potters' kilns outside Minoan palaces in Crete (dated by the thermoluminescence method) shows that between 2000 and 1700 BC the earth's magnetic field was slightly weaker than at present. It then rose quite rapidly, doubling in two centuries (*Nature* 1980, 283, 34). (See also this VOLUME p.19)

Five Chinese geophysicists in Peking have recently studied changes in the earth's field over the period 500 BC to AD 1900 at Loyang the ancient capital of nine dynasties. The many relics of former populations make this locality peculiarly suitable for archaeomagnetic research. Samples used consisted of (1) baked earth from ancient pottery and brick kilns in dated residential structures, (2) grave bricks some of which are engraved with accurate dates and place of their baking, and (3) bricks from ancient buildings and city walls. A graph showing how the field has changed is reproduced below.

Similar results have been obtained at other places. The curve for Japan is similar to that for Loyang, though there is a time delay over the whole interval. "This is also the case in comparisons with data from Athens, Czechoslovakia and central America [references are given]. It may be related to the westward drift of the non-polar

field". Going back further in time, it appears that every now and again the field may take a sudden large change in direction and then return to its former alignment, which happened last 13-14 thousand years ago (*Nature* 1977,265, 430). Every 50,000 years to a million

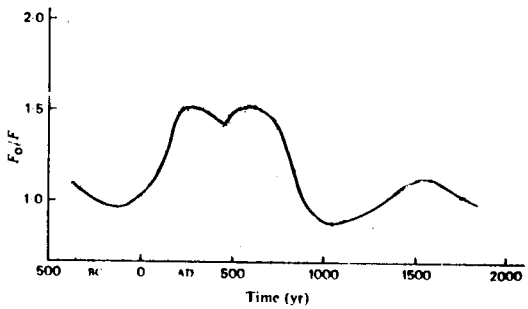

Fig. 1 The change in the ratio of the ancient intensity of the geomagnetic field, F_0, to the present-day value F, in Loyang region.

After Wei, Li, Cao, Zhang and Wang, *Nature* 1982,296,728.

years the field reverses completely. Various views have been advanced as to the effect of such reversals on the earth but there is as yet no agreement. In view of the uncertainties, extrapolation backwards in time is unwise, yet a favourite argument with American Creationists is that because the field is now decreasing it must have been impossibly strong around ten or twelve thousand years ago if the earth then existed, which is said to prove that the earth cannot be more than a few thousand years old.

GAIA AGAIN

The stimulating ideas of J.E. Lovelock have been featured more than once in this JOURNAL (102 , 17; 108, 68-72). In a recent paper with M. Whitfield he (*Nature*, 296, 561) considers once again the remarkable way in which the earth's temperature has remained steady ever since early times, say 3.5 aeons (3.5×10^9 yr) ago. During this period, according to the astronomers, the sun as a main sequence star must have been getting hotter, its energy output increasing by 25%. Why, then, has the earth not got hotter — too hot in fact to support most forms

of life? It is suggested that the greenhouse effect due to CO_2 is responsible. Throughout the entire period volcanic gases have supplied CO_2 but the CO_2 in the atmosphere has fallen steadily. This is explained partly chemically and partly biologically. If there is a small rise in temperature, photosynthesis increases and so also does the reaction of CO_2 with silicates, to form free silica and carbonate, so that CO_2 falls, the greenhouse effect is lessened and the temperature falls. On the other hand if the temperature falls, photosynthesis and chemical weathering diminish, both becoming near zero at 0°C. The supply of CO_2 from tectonic sources continues, however, unabated, so that the CO_2 rises and with it the greenhouse effect, raising the temperature once more.

Over a long period, however, there is an overall loss of CO_2 as silicate rocks are decomposed and fossil fuels form. It is reckoned that at 3.5 aeons ago, the atmosphere contained 0.7% CO_2 whereas today the figure has fallen to 0.032%. In time to come it will become lower still, but when it falls to around 0.015% photosynthesis will cease and life will no longer be possible. This is not likely to happen within the next hundred million years, a vast period humanly speaking, but geologically but a small fraction of the total time during which there has been life on earth.

Another interesting discovery concerns the influence of termites on the earth's atmosphere (*New Scientist*, 15 Ap. 1982, p.143). By covering a termite nest with a bag and analysing the gases present, it was discovered by Patrick Zimmerman of Colorado that they generate large quantities of CO_2 and also of methane. Man's activities appear to be raising termite populations and methane in the atmosphere is increasing by 2% a year — which must aid the control of the oxygen concentration (see J.E. Lovelock, *Gaia*, 1979, Ch.5).

SHORT NOTES

The No-God of the Gaps. Many Christians these days are anxious to follow F.H. Bradley (1846-1924) in disclaiming belief in the 'God-of-the-gaps'. The reasoning behind this is, of course, that if we argue that God must be the explanation of whatever we cannot explain by science, then as science expands its bounds, God will be squeezed out till He becomes no longer necessary. In a letter to *Nature* (1981, 294, 302) three workers from the University of Glasgow point out that, nevertheless, there is a sense in which a scientist who is a Christian will accept the God-of-the-gaps for, if he believes in God as Creator he will naturally expect to find more and more pointers to God as present gaps in knowledge are investigated by scientists. And as for the 'God-of-the-gaps' argument, as they point out, it is equally correct to think of the situation in reverse. The atheist who believes that in the end science will explain everything without God,

will naturally expect that those features of science which seem to point towards Theism will slowly become less in number: he will be likely to put to one side what he regards as discordant data "in the belief that future study will show it to be either erroneous or, given further study, assimilable to his present beliefs." As scientific evidence is "analysed within a completely objective framework" the atheist, too, may find that his 'no-God' is squeezed out of existence.

Oil in Israel. When at his death Moses blessed the tribes of Israel he said "Blessed be Asher...let him dip his foot in oil" (Gen. 33:24). Oddly enough the land assigned to Asher has the shape of a leg from N to S with the heel at Haifa and the toe at Caesarea. The oilmen have been looking for oil in Israel for years but so far unsuccessfully: it was found in Sinai but that has had to be returned to Egypt. Despite discouraging views expressed by geologists, Andrew C. Sorelle Jr, a Christian oil man from Texas, believes that the words of Moses must be a pointer to where oil will be found in Israel. An oil company is interested and drilling is now proceeding. There have been many difficulties but each time, we are told, the trouble has cleared up after "some concentrated prayer". (Reported, *Challenge*, May 1982)

Dating. In the process of crystallisation of a mineral deposited hydrothermally, small liquid inclusions are often trapped. In the case of silica crystallising as quartz, the quartz is normally very pure, so that the tiny drops of entrapped liquid have little opportunity to lose metal ions or to exchange them with other elements in the vicinity. In this way droplets (smaller than 20 μm in diameter) are preserved in complete isolation over long periods of time. Droplets taken from silica in the tungsten deposits at Carrock Fell, Cumbria, which contain enough strontium and rubidium for analysis have been obtained and the usual isochron method gives an age of 392 ± 5 million years in excellent agreement with the potassium-argon dating of 387 ± 6 million years for the vein micas in the locality. (*Nature* 1981, 290, 578) Although when carelessly or thoughtlessly carried out radioactive datings can be somewhat erratic, differing methods of dating are now tending increasingly to give identical results.

Are we Alone? This question, posed 40 years ago by Enricho Fermi is discussed by R.T. Rood and J.S. Trefil in a recent book with this title (Scribner, 1981, 14.95 dollars) Though no evidences of life elsewhere in the universe is forthcoming, despite the fact that it would be possible to detect signals over interstellar distances, scientists interested in such speculations reached the conclusion in the 60s that other civilisations must exist in large numbers. Over the past decade the tide has turned. Young astronomers now realise that "life is a far more unlikely phenomenon than had once been thought, and there is a strong possibility that it is unique to our planet." (Review in *Nature*, 294, 25) Life here on Earth depends

on Earth's critical (within 1 or 2%) distance from the sun and upon an "extraordinarily lucky series of accidents, by which the temperature remained remarkably constant for most of the age of our planet." Even so space colonies are feasible technically near other stars. Given such colonies they could spread across a galaxy in 0.01 to 0.1 per cent of a galactic life. The fact that they do not appear to have visited us in the past convinces younger scientists that Fermi's positive answer to his question is correct.

Reincarnation. The December 1981 issue of *The Christian Parapsychologist* (Churches' Fellowship for Psychical and Spiritual Studies, St. Mary Abchurch, Abchurch Lane, London, EC4N 7BA) is devoted to reincarnation and contains some interesting and informative articles. David Christie-Murray writes on "Reincarnation and the Christian" and in Gerald Bostock's "Origen and Reincarnation" it is shown that Origen believed in pre-existence rather than reincarnation. The most interesting article, perhaps, is Dr. C.T.K. Chari's "A New Look at Reincarnation". Dr. Chari is a Hindu and might be expected to marshall and support the evidence for the belief, but in fact his very scholarly study tells the other way. Although many of the stories sound convincing, a study of their geographical distribution raises serious doubts. Thus in Northern Indian states cases of supposed reincarnation abound, but they are singularly absent in the four southern States and this despite the fact that Hinduism is equally prevalent in North and South India. Similar examples from other countries are cited. Suspicions are aroused when ever cases are investigated and even when no explanation can be advanced it is difficult to discard other interpretations of the facts.

In an Editorial the Editor (Michael Perry) points out that about a third of the population in this country now believe in reincarnation. In view of its obvious importance he wrote to the Principals of 16 Anglican theological colleges to ask what training their students received in the subject. Six did not reply and "at only one of the colleges was there a really positive response."

The Genesis Flood? Sapropel mud from the bottom of lakes and seas is formed when dense salty water is covered by lighter fresher water. Owing to the density gradient little mixing takes place, the lower layers become oxygen deficient and organic matter which they contain darkens (free carbon, sulphides formed as a result of the reduction of sulphate). Layers of sapropel mud are found at the bottom of the Black Sea (see this JOURNAL 100, 174) and French scientists have now discovered them in cores taken from the Eastern Mediterranean. Dating of the carbonate in the layers below and above the uppermost sapropel layer shows that this must have been deposited between 6000-7000 BC which is now known to be much too late for the overflowing of fresh water from the Black Sea at the end of the last ice age. (This gave rise to a layer of sapropel mud, dated before 11,500 BC.) The three authors of the paper (After the Deluge... *Nature* 1982, 295, 105-110) believe that a vast rainfall on the African continent must have been

responsible, the water spreading over the Eastern Mediterranean from the Nile delta. In the summary of this paper published by the *Times* (26 Jan 1982) the staff of *Nature* wonder if the floods in the Nile delta may be linked with the biblical Flood. If so, the dating does not differ greatly from that suggested by the sapropel mud deposits in the Black Sea. Though the authors suggest that there may have been a millenium of exceedingly wet years in Africa, it would probably be difficult to distinguish between a sapropel layer resulting from a single vast flood and one resulting from a succession of smaller floods.

Armaments Trade. Charles Levinson in *Vodka-Cola* (distributed by Biblia, Partridge Green, Horsham, Surrey) documents the activities of transnational industries in supplying arms indiscriminately to *any* buyer, friend or enemy. Otis Lifts, the well know manufacturers of lifts, for example, supply lifts for missile launchers in Russia. Such sales seem difficult to stop and, apparently, are quite legal. (From Professor F.T. Farmer) We do not seem to have advanced far beyond the days of Alfred Nobel who sold nitroglycerine without questioning to any one who asked for it, and in any quantity, even when it was obvious that it was required for criminal activities.

Fallen from Heaven. According to an article in the *New Scientist* (24/31 Dec. 1981, 896-898) the giant jelly fish of fire seen over the city of Petrozavodsk on 20 Sept 1977 (see this JOURNAL 105, 18) posed quite a problem for the officials in Moscow. It was caused, in fact, by the accidental break up of a satellite launched from the secret rocket centre to the East of the city at Plesetsk. The Russian authorities who do not believe in UFOs (the popular explanation) and did not wish their secret rocket station to be mentioned could give no convincing explanation of the event!

Origin of Life - Clay. According to a suggestion which has been taken very seriously in recent years, life started on clay. Experimental evidence in conformity with this view was first forthcoming in 1979 when it was found that amino acids shaken up with clay adsorbed the L- acids rather than the D-, and D-sugars in preference to L-. (*Science* 203, 1243) The experiments have now been repeated using carefully sterilized clay and radioactively labelled specimens of amino acids and sugars (*Science*, 212, 1145); it transpires that in each case the two forms are adsorbed to exactly the same extents. Repeating the descriptions given of the earlier experiments, the researchers found that microbes growing on the surface of the clay samples were still alive. When clay is not properly sterilised it is easy to confirm that optically active forms are preferentially adsorbed. (*New Scientist*, 13 Aug. 1981, p.407)

The Devil quotes Scripture. (Cf. the Temptations in the wilderness.) Some interesting cases are cited in Brian Easlea's recent work, *Witch Hunting, Magic and the New Philosophy* (Harvester Press, 1980, about

£20). The RC witch hunters proved that witches make a pact with Satan by quoting Is. 28:15 ("We have made a covenant with death...") (p.7); that witches can fly through the air transported by Satan by quoting Mt 4:5 ("the devil...set him on the pinnacle of the temple"); (p.21) and that witches ought to be burnt to death by quoting Jn. 15:6 (those who do not abide in Christ are like branches cast "into the fire, and they are burned") (p.32).

Japan. The violence which is affecting the West is now spreading to Japan. In several instances children of 14 and 15 have turned on their teachers to beat them up after attempts have been made to administer discipline. Teachers are appealing to the police for protection: cases of violence in schools increased by a third last year. "We have never had to deal with disobedience on this sort of scale in the past," says a Japanese social scientist. "The previous generation were obedient and polite when they were at school. This could be evidence that Japanese society is on the brink of drastic change" (*Times*, 3 Feb. 1982)

Religion — 'Opiate of the People'. In an interesting letter (*Times Literary Supplement*, 26 Feb. 1982) M.A. Rose of Dusseldorf points out that Marx knew nothing of Victorian England when he used the phase in 1843. The phase had been used by others also and did not necessarily carry overtones of criticism or disapproval. From the 16th century and onwards pictures of Christ were commonly displayed by the apothecaries or housed in monasteries and convents which showed Christ dispensing herbal drugs and remedies. Opium was not then regarded with the horror that is common today, for it relieved pain and made life bearable for those who suffered. Marx was however condemning the politically blinding effect of religion on those who had taken it as an opiate.

Talking Apes. (Cf. this volume, p.18). A further paper on this subject confirms the previous view that, despite claims to the contrary, only man possesses true language ability. Chimpanzees readily learn arbitrary signs or symbols for a large number of objects and can name people correctly. But having learned words they cannot create new sentences as human beings can. D.M. Rumbaugh of the Yerkes Primate Research Centre, Atlanta, taught the chimp Lana the artificial language "Yerkish" and studied 10,000 examples of Lana's chatter, some of which suggested the presence of an inborn sense of grammar (e.g. "Please visitor tickle Lana"). This led him to believe that language was being used. C.R. Thompson and R.M. Church of Brown University (*Science* 1980, 208, 313) now show that six standard sentences, machine producible using a simple computer, will account for all Lana's performances. Lana does not apparently exceed other animals in its ability to make its wants known. A pigeon can be taught to peck at keys in the correct order in order to obtain food. Rumbaugh still hopes to persuade chimps to talk to one another in Yerkish to see if they can improve their performance.

Automation. The Japanese are offering completely automated factories for £9m which operate for 24 hours a day. Whereas in a normal factory 250 workers would be required for each of three shifts, only six technicians and workers are required for two shifts in an automated factory, in the third shift the factory operates in complete darkness for 8 hours and turns itself off if anything goes wrong which the computers and robots cannot right. A model factory is situated at Oguchi in central Japan and manufactures a wide variety of lathes. (*Times* 29 Oct. 1981) The Japanese have also made a robot factory to make robots. As such factories become widespread yet further increases in unemployment seems inevitable.

Young Offenders. Borstal sentences seem to have little reformatory effect on those who are detained. The 1980 *Prison Statistics* published by HMSO (1981) records that 83% of male borstal trainees between the ages of 15 and 16 were reconvicted within two years of discharge. (For 14 to 16 the figure was 76%; for all males under 21 it was 70%).

Dishonesty and Drugs. The enormous cost of many modern drugs is opening up a market for dishonesty in the sale of supposed drugs. In Brazil hospitals are being supplied with the 'drugs' *ziricillin* and *ampicillin* both of which are pure starch. (*Nature* 295, 90) In America the drug *krebiozen* has achieved a ready sale as a cure for cancer — a fraction of a milligram costing 9.50 dollars. When a government department asked for a quote for larger supplies they were offered the material at $170,000 a gram. It turned out to be the quite inexpensive chemical creatine. (*Nature* 295 , 351)

Humanism. Free Inquiry, a journal published by American humanists, (Letters, Spring 1981) has published a letter by J.G. Flint, of Guildford, England who reckons that he has made a striking discovery. To quote: "Over recent years I have read the Bible four times and consider that I have unearthed sufficient evidence to point to the fact that the Jews arrived from another planet, which was on the verge of nuclear self-destruction. Jesus was probably the King's or the President's son, a do-gooder motivated by moralistic principles and able to perform apparent miracles with the assistance of advanced drugs and electronic aids of the kind that will be available here on Earth in about forty years' time, if we survive that long."

Simplicity (?) of Nature. Astronomy lecturer starts, "Stars appear to be very simple objects". Voice from the back, "You'd look pretty simple too at a distance of a hundred light years!". Astronomers used to think galaxies were even simpler... During the past six years this naive picture has been obliterated and replaced by "that complexity, masquerading as simplicity, that is the hallmark of all natural phenomena" (John Barrow, *Nature* 295 , 440)

DAVID D. BRODEUR

Palestine and the Victorian Restoration Movement

Dr Brodeur has already told the story of Blackstone and Hechler, Christians who in earlier days worked tirelessly to promote the Zionist cause. (See this JOURNAL, 100(3), 274-298)
Continuing his researches Dr Brodeur has brought together the stories of Jews, and also Christians, who devoted wealth, time and prayer to the cause of Zionism during the decades prior to Hertzl. We are privileged to publish some of his more recent findings.

The Restoration Movement

Some say that the English fascination with the idea of a political restoration of the Jews to Palestine was inspired by the Rights of Man of the French Revolution; others simply attribute it to the rise of capitalism, which had such a profound influence upon colonialism. In fact, the political process that achieved the social and political emancipation of the Jews in 19th century England had firm roots that go back at least to 16th century England. Those origins were consistently religious, and predominantly Protestant, a reality that is as puzzling to Arabic scholars of Zionism, like E.W. Said and A.M. Elmessiri, as it was unsettling to socialist commentators on Zionism like Moses Hess and Karl Kautsky.

One of the first Englishmen upon whom the idea of a Jewish return to Palestine, prior to the millenial reign of Christ, forcefully took hold was Thomas Brightman (1562-1607). This sign-of-the-end times view was supported, among others, by Oliver Cromwell, Hugo Grotius, and Puritans and the great Puritan dissenter Roger Williams, founder of the Baptist church in the American colonies. There were also millenialists in France. Issac de la Peyrere

(1594-1676), a French diplomat, went as far as initiating diplomatic negotiations with the Turks for the acquisition of Palestine for the Jews, the first of a long line of French and English statesmen to approach the Sublime Porte on this ticklish matter.[1a] During the 18th century, writers and poets joined the ranks of the Christian Zionists, or millenarial Zionists as Jews sometimes call them, Lord Byron contributing Hebrew *Melodies*. In England, the movement peaked in the 1840's; in the United States, a half century later.

Many of the early Christian Zionists, like those of the present century, desired a return of Jews to Palestine so that they could be converted to Christ — and thus fulfill Christian interpretations of Zechariah in the Old Testament and Romans in the New, others were inspired by humanistic motives; they were revolted by the continued suffering of Jews in the Diaspora and wanted to restore them to the dignity of full nationhood. Perhaps there was also a third, smaller group, Christian, and non-Christian, mystics and romanticists who, whether they were aware of it or not, venerated the Greek and Roman classical era which ended, for the Jews of Palestine, with their decimation and dispersal under the emperor Vespasian. Two outstanding examples of such humanistic-mystic gentile Zionists in the 19th century were George Eliot and Laurence Oliphant.

Because most of contemporary writers and scholars of Zionism, Jewish and Moslem, today assume that the paramount if not exclusive motive of Christian support for the Jewish return to Palestine was *proselytism*, the Restoration Movement as it effloresced in England during the early 19th century is worth careful study. For there can be no Islamic, Communist, or Third World understanding of the complex, protean phenomenon that is Zionism without an appreciation of the formidable and continuing impact of biblical Christian support.

Although not all Protestants endorsed the movement, it is broadly true that 19th century English Protestantism more or less held the Restoration Movement on its broad shoulders in the manner that Atlas balanced the world. Few Catholics offered support, the Curia being more concerned with preservation of extraterritorial privileges over its several shrines in the Holy Land than in advancing the cause of the Restoration. And then, there was the long Catholic practice, the so-called 'teaching of contempt' to contend with when more liberal Catholic spokesmen opened an ear to the Zionist petitioner Herzl in 1904.

Among more than a hundred Protestant denominations and cults in the United States and England, the majority of which have actually arisen since the first glimmerings of the Restoration Movement, dozens dismissed the Old Testament Covenant of Abraham and the Davidic Renewal as a dispensation that was totally eclipsed when Christ spoke of fulfilling the law and Paul averred that it was

superceded by grace. However, there remained those, like the Plymouth Brethren, many Methodists, Presbyterians, and others who rejected the 'New Departure' thesis for one that held, as Paul said, that someday the Jews would be grafted back into the fuller faith: "natural branches ... grafted back into their own olive tree" (Rom. 11:24). The secular beginnings of this long process may have actually begun with the first Zionist colonies of just a century ago.

It was in his letter to the Galatians (see esp. 3:17-18) that the vigorous second generation apostle demonstrated how absurd and untenable is the notion, later enshrined for centuries in Christian Church teachings, of the theological rejection of the Jews. Beyond any doubt, as the world witnessed anew in the first four decades of this century, the idea that the Jews were rejected by God and cursed as outcasts contributed significantly to pogroms and to the Hitler Holocaust by preparing undiscerning and ignorant minds for acquiescence and acceptance.

The Oak Tree Grove

At the turn of the Eighteenth Century, there lived a wealthy, young barrister named Lewis Way, a thoughtful man who was familiar enough with the Scriptures to perceive that the Jews could not be 'rejected'. Informed that a solitary grove of oaks that belonged to a neighboring squire was protected from encroachment by that family's fiat until the Jews had been fully restored to their homeland, Way was prompted to recall a few of the Bible verses his mother had read to him when he was a child. He embarked upon a study of the biblical prophecies relating to the Jews, and became convinced that many of them spoke of a time and condition that matched none in Israel's long past. In 1815, Way took over the debt-ridden London Society for Promoting Christianity Among the Jews, converting his own estate into a college for training Jewish converts for missionary work among their own people.[2a] It was during a visit to one of his missionaries in Russia that Way became aware of the shocking reality of the living conditions of eastern Jews.

Efforts to convert Jews in any great number to Christ, even the best intentioned ones, have never been crowned with much success. And so it was with Way. About 1825, he sold his estate, broke connections with the *Jews' Society*, as it was then called, and moved to Paris where he served as minister to an English congregation. Despite his break with the *Jew's Society*, Way retained his convictions concerning the increasingly popular doctrine of the *premillenial* advent of Christ, the belief based in part upon a passage in Zechariah, that in the end time Jesus would return to Jerusalem to intervene against the decimation of the Jews at Armageddon.

To expound his views about the return of the Jews to Palestine and their crises in the latter days, Way published a widely read series of articles under the pseudonym Basilicus. The articles did much to spread the Protestant doctrine of premillenialism (also known as millenarianism) in England — from whence it spread, in the 1850's and 1860's — to the United States.[2b]

Victorian Men of Action

During the first half of the 19th century, English politicial personalities who included George Gawler (1796-1860), Lord Palmerston (1784-1865), Lord Shaftesbury (1801-1885), and military figure Colonel Charles Henry Churchill (1828-1877), wrote, spoke, and agitated on behalf of Jews in Palestine, and for large-scale Jewish migration to that backwater of imperial Turkey.

In the quaint nomenclature of the English, the seventh Earl of Shaftesbury, or Lord Ashley, as his colleagues called him, was the very mortal Anthony Ashley Cooper. Although he was born to high privilege, Lord Ashley stands today as one of the greatest social reformers of the 19th century. By the sheer force of his personality and pen he rammed through Parliament, though not a member of that body, much of the industrial and punitive reforms of his day. Self-effacing, he shunned appointment to high office in order to give the widest possible credence to his high convictions.

A student of Biblical prophecy, Shaftesbury was convinced that a return of the Jews to Palestine should go hand in hand with the completed social emancipation of Europe's Jews. A trusted advisor to Foreign Minister Lord Palmerston, the reformer expounded his Zionist views with such fervour[3] that the agnostic Palmerston took steps to assure the former that the Ottoman authorities in Palestine would respect the integrity of the Holy Land's Jews. Encouraged, in 1840 Salisbury submitted to the Foreign Office a plan for settlement of the Jews in Palestine under English auspices.[1b] And to the present day, historians argue whether Salisbury's motives were religious or political.

Very possibly they were both. Balfour Declaration historian Leonard Stein reports that Salisbury, early in his public career, objected "to the removal of political restrictions against British Jews as an 'insult to Christianity'".[4] A member of the London Society for Promoting Christianity Among the Jews, Shaftesbury evinced concern for Israel by study and mastery of the Hebrew language, a tongue required neither for the conversion of Jews in England nor the practice of English commerce in Syria and Palestine.

Late in life (1875), Salisbury was appointed president of the Palestine Exploration Fund. In his opening address, Ashley advised the fund:

> Send out the best agents...to search the length and breadth of Palestine...drain it, measure it, and, if you will, prepare for the return of its ancient possessors, for I must believe that the time cannot be far off before that great event will come to pass...[5]

The language here is unmistakably eschatological, that of the pietistic sentiments of a Christian believer, not that of a colonial strategist.

As a former governor of the desert state of South Australia, Colonel George Gawler, on military assignment in the Lebanon, formulated detailed schemes for Jewish settlement in Palestine, because of that region's strategic location between Syria and Egypt and considerations of "colonial and foreign trade."[4b] However, he had motives of genuine compassion also. Convinced that Jewish blood libel charges in Turkish Lebanon might best be defused by promoting Jewish prosperity in their ancient homeland, Colonel Gawler wrote to Dr. Abraham Benisch, editor of the *Jewish Chronicle* (London), outlining a scheme, similar to Salisbury's, which included Great Power protection of the Jews of Palestine. He contended, "So long as the (Turkish) empire stands, Jewish civilized settlement in Syria (Palestine) would be a strength and blessing to it..."[6]

In the decade that had elapsed between Salisbury's proposals and Gawler's, Prussia, Austria, France and Russia had begun to take a closer look at Palestine; the rivalries of their regligious establishments in Jerusalem would, in fact, soon lead to the bloody and useless Crimean War. No longer, therefore, could an Englishman speak of English sponsorship of the Jews in Palestine. And this multi-national 'claim' to a political, rather than purely religious interest in Jerusalem, extends to the present day. However, Prussia no longer exists as a state, and the Russians have political motives that have been entirely severed from their old Orthodox antecedents.

As early as 1845, Gawler urged on England to "Replenish the deserted towns and fields of Palestine with the energetic people whose warmest affections are rooted in the soil.[7] In 1852, he founded the Association for Promoting Jewish Settlement in Palestine.[1c]

Despite their obvious disinterest and even hostility of the Vatican, Italy was not without its Christian Zionists. An Italian philosopher and statesman with the somewhat startling but perfectly respectable name of Benedetto Musolino (1809-1885), urged Lord Palmeston and the Rothschild family to settle Jews in Palestine.

He received no reply. His book *Jerusalem and the Hebrew People* (1851) remained unpublished for a full century, when it finally appeared in Italian.

The Millenialists

Establishing a home for the Jews in Ottoman Palestine received some timely support from a movement that suddenly sprang up among pious Protestants at Plymouth, on the Channel Coast of England. Under the international leadership of their founder, John Nelson Darby (1800-1882), the Plymouth Brethren, as they came to be called, infiltrated the various Protestant sects, including the dominant Church of England, with their conviction that prior to the second coming of Christ a remnant of Jews would be restored to the Holy Land, where they would first prosper, encounter all kinds of troubles, and eventually convert to an eager expectation of the Messiah. Because of their division of world history into several great periods of graduated divine enlightenment known as *Dispensations*, the followers of Darby came to be known as *Dispensationalists*. The new movement spread to America, injecting new life into the rather lifeless Puritan doctrine of the Jewish dispensation at the end of the Church Age. These Dispensationalists (*Darbystes* in France, where they survive as a small Protestant sect) injected new life into the premillenialist doctrine of the Second Coming. For they held that a remnant of Jews would return to Palestine *in unbelief* to await the Messiah and the End of the Age. Reinforced by a trans-Atlantic visit (Canada and USA) by the founder, the Darby doctrine was to have considerable influence upon William Blackstone, pioneer in American political Zionism, and his acquaintance Cyrus Scofield whose notes still appear in the almost venerable Scofield Edition of the King James Bible.

Within seven years of the founding of the Plymouth Brethren (1832), the Church of Scotland dispatched two scholars, Andrew Bonar and Robert Murray M'Cheyne, to Palestine to report on the condition of Jews living there. Their commission pointedly referred to Palestine as the land of the Jews — not of the Turks, or Arabs.

After publication in *The Times* of London, the Bonar-M'Cheyne report was widely publicized in Britain, and stimulated many months of speculation on the subject of England helping the Jews to secure Palestine.[8] In the same year, 1841, the P & O Line opened regular steamship service between England and India, by way of the Red Sea. Passengers and goods had to disembark to transfer to camel trains over the isthmus of Suez.

The Christadelphians were one sect that practised philo-Semitism. This Christian fellowship was established by English physician

John Thomas who had been influenced by the teachings of the Plymouth Brethren. Thomas came to America with some followers, and eventually the group became more active in the States than England, becoming popular during the upheavals and crises spun off by the Civil War, when the group adopted its present name. Today, whenever Israel appears to be faced with a severe crisis, the fundamentalist Christadelphians, who are active from Israel to Australia, set up free public lectures in major cities to champion the cause of Israel and the Bible.

Marvellous Montefiore

It is doubtful that Rabbi Judah Alkaly of Zemun, Hungary, had ever heard of the Plymouth Brethren, when, in 1837 he proposed to his fellow Jews that they exert every effort to get themselves back to the Holy Land. More likely Alkaly's impetus came from the same source of the legendary English philanthropist and rescuer of the Holy Land's Jews, Sir Moses Montefiore (1784-1885). That source was the short-lived conquest of Palestine by a rather enlightened and progressive Egyptian adventurer, Mehemet Ali (1769-1849). During his long life, Montefiore made seven trips to Palestine, the first in 1839, just before Ali lost his hold on Syria. From Ali, Montefiore secured a charter for Jewish agricultural settlement in Palestine, proposing to the Egyptian establishment of a joint stock company, with a capital of £1 million, and branches in Alexandria, Cairo, Beirut, Jaffa and Jerusalem.[1d]

The scheme never materialized. Wishing to see a strong and stable Ottoman Empire maintained across the Bosporus and the Fertile Crescent, to thwart Russia's old ambition for a warm water port in the Mediterranean, the Great Powers, led by England, assisted Turkey in ejecting Mehemet Ali from Syria. Of course, the restored Turks immediately declared Montefiore's charter null and void.

During the course of his ten decades, Moses Montefiore made several more journeys to the Holy Land. On each visit, he played godfather to the destitute Jewish *yishuv*, pleading, with mixed success, with the Turkish authorities to make sorely needed civic and public health improvements in Jerusalem. Invariably, Montefiore would camp out under the stars with his retinue, his large figure bedecked in eastern clothing not unlike that of a prosperous desert sheik. One of his first successes was a small textile plant, established in Jerusalem in 1849. In 1855, he laid the cornerstone for a hospital in the Holy City which, for lack of cooperation from the Turks was not completed. However, the English patron was successful in establishing both a boys'and girls'trade school for Jews. He also persuaded the Turks to relocate the public slaughtering place or communal abbatoir out of the Jewish Quarter in Jerusalem where

it had been sited since the days of Omar.[9a] Perhaps his most lasting achievement was simply to persuade Jews that the practice of crafts was a respectable occupation![10]

Montefiore also affected subtle yet innovative changes in the demographic distribution of Jews in Palestine. While he was rebuffed in Safed, he managed to initiate the westward expansion of Jerusalem which continues to the present day. On Montefiore's initiative, Jerusalemite Jews purchased some land in the Judean Hills (1855). It was to wait almost forty years until it accommodated the mosha of Motza Tahtit.[11,1e] In 1860, the great benefactor built a row of almshouses for impoverished residents of the Holy City, on land he thoughtfully acquired during his visit in 1857.[12,9b] Named Michkenot Sha'anamin, it was able to house up to eighty Jewish families.

The right of nonresident Jews to buy and hold land in Palestine was instituted with the revision of the (Ottoman) Land Code in 1867. This was truly the Magna Carta of the Jewish Return. For while the Sublime Porte, alternately pressured by Arab Nationalists and the Great Powers, suspended this concession several times between 1900 and 1914, it afforded the Zionists their principal means of economic and political penetration of Palestine. It ranks, therefore, with the advent of the Blackstone Memorial, the Jewish Colonization Association (both 1891), and the Balfour Declaration (1917). The first rowhouses, built with Montefiore funds, took place under the Ottoman *firman* (charter) the following year. The settlement was named Nahlay Shiva.[14] It determined the direction of Jerusalem's growth for the next several decades, an expansion fuelled by the influx of the first and second *aliyahs*.

Installation of street lamps, and daily street cleaning, did not come to Jerusalem until 1866, and then only because Montefiore offered to foot the bill.[14a] His energies effected the erection of four more small districts, outside the walls, in 1870.[14b] And in 1878, the year that Jerusalemites attempted to restart Petach Tikva (this time on the Yarkon River near Jaffa) the latter day Moses of the Promised Land set up a last residential community outside the walls. The settlers naming it Yemia Moshe, in his honor.

Christian Workers in Palestine

Such prodigious activity as Montefiore offered set a fine precedent for Christian efforts to improve the primitive conditions in Palestine: and Montefiore frequently urged Christian philanthropists to work out new schemes. An example was a settlement for Jews promoted, in 1848, by Warder Cresson, later U.S. Consul in Jerusalem. Historian Samuel Katz has described Cresson's

community in the Vale of Rephaim, an effort supported by a Jewish-Christian committee in England, as "probably the first forerunner in modern times of the Jewish agricultural revolution in Palestine..."[8] And Jewish historian R. Fink offers:

> Warder Cresson (1798-1860)...would stand with... William E. Blackstone, not only as a friend of the Jews, but as a pioneer Zionist, whose strain of mysticism and religious zeal, like that of Laurence Oliphant, led him to intense absorption into the yearnings and beliefs of the early Jewish pilgrims to the land...[14]

Indeed, until Blackstone began circulating Restoration petitions, both nationally and internationally, Christian support for a return of the Jews to Palestine was in the main philanthropic and based upon spiritual, not upon political considerations. During the period 1838-1841, two things took place in the Holy Land that were to influence strongly the destiny of the Jews there. England, Prussia and the United States took steps to establish permanent consular representatives; and the pioneering American biblical archeologist Edward Robinson discovered that the names of many of the Canaanite and Arab villages were transliterations of the names of sites occupied by Jews in classical and ancient days. However, the full impact of the significance of this discovery was not to be felt for some eighty years, that is, until after the Balfour Declaration.

To a certain extent, the American consuls could rely upon the intimidating power of the British navy when intervening with the Turkish authorities on behalf of persecuted Jews and Christians. Despite Islam's reputation for religious tolerance, the former experienced many a bad moment, particularly those in the exposed 'window' of the Holy City. Fortunately, the American colony in Jerusalem enjoyed a certain amount of respect from the Turks because of Washington's initiative in arranging a commercial treaty with the Ottoman Empire (1830), a step that did not make the aggressive Yankee ship traders very popular in European ports. Prior to the signing of the commercial accord, the United States and Turkey had communicated chiefly through the merchants of Salem, Newburyport and Portsmouth.

Jerusalem's Emancipation

In the settlement that followed the expulsion of rebel Egyptians from Ottoman Syria-Palestine in 1840, England's Munk teamed up with France's Cremieux to squeeze a compensating concession from the Sultan. The result was the *firman* (charter) that recognized that

the *vishuv* of Jerusalem had certain civil rights. Turkish approval was also secured for a *bakkam bashi* (chief rabbi sitting in Jerusalem) to represent all Jewish interests in the Ottoman province.

That same year, the Jerusalemite Jews invoked the *firman* obtained by Montefiore when he quelched the ritual murder libel against the Damascus Jews, to combat a similar charge brought against them by the Holy City's Greek Orthodox community.[16] In 1841, the Turks agreed to abolish the quota that permitted only 300 Jewish families to reside in Jerusalem. However, the Jews there still could not own property; they had to rent the most squalid of hovels from Arab landlords. In February, Lord Palmerston authorized the English ambassador to accept Jewish complaints against the Turkish authorities.[17a]

The situation of the Jerusalemite Jews remained dismal. An English lady, travelling through Palestine at this time, wrote:

> Nothing is more striking than the accurate fulfillment of the prophecies concerning them. They live in a constant state of fear and insecurity; individuals often come to Mr. Young for protection, as in the cases of injustice or insult they have no redress from the Mussulman authorities.[18]

A more sympathetic portrait of the status of the Jerusalem *vishuv* was contributed by a visitor to the Holy City in 1359, who reported:

> ...holes in the ground which Europeans would not have converted into living quarters even for their cattle. The dampness of the winter and the lack of air in the summer brought upon...them all kinds of aches and maladies...[19a]

This account was augmented by that of a visitor who came to Jerusalem the following year:

> The price of living accommodations in Jerusalem is beyond belief, and impoverished Jewish families are paying very high rental fees for horrid homes, the kind which Jews in London would not have rented out for cattle or sheep.[19b]

Such was the price that devout Jews had to pay for the privilege of living in the City of David, for most of the past twelve centuries a squalid Islamic backwater. Like certain elements in Christendom, at heart Islam seemed convinced that the Jews were being punished for some sin, and that the pitiful remnant in the Holy City were little more than a retribution for a divine curse that had snaked its way down the corridor of time.

Concessions to the West

During 1844, British and Prussian pressures had wrung two *firmans* from the Ottomans. The first gave minorities the right to practise their religion anywhere within the empire. The other abolished the death penalty for apostasy from Islam.

Therefore, religious tolerance in the Ottoman Empire began to emerge at a time when Jews were being urged to return to the Holy Land by Jewish and gentile visionaries. It was at this time that Czar Nicholas I of Russia remarked to Lords Aberdeen and Palmerston, during a state visit to England, that "Turkey is a dying man. We can try to keep him alive, but he will and must — die." Sick men can take a long time to die. Turkey proved to be no exception.

The Red Cross Founder's Frustration

A most difficult thing for contemporary Arab scholars of Zionism to comprehend was the phenomenon of selfless Christian men of affairs in the 19th century, who for humanitarian and philanthropic — not colonial — reasons wanted to see the Jews restored to Palestine. Such a man was the Swiss Protestant philanthropist and founder of the International Red Cross Jean Dunant (1828-1910). In the 1860's, Dunant established an association for Jewish colonization in Palestine, advocating the development of Jewish agriculture in the Holy Land, and the development of a Jerusalem-Jaffa railroad which was built some forty years later. Dunant travelled far and wide in this endeavour. Among others, he failed to interest either Moses Montefiore or Adolphe Cremieux, two influential Jews, in his success. In later years, Dunant attributed the failure of his Palestine plan to the remarkable indifference of the Diaspora Jew, an observation that Montefiore himself would uphold. However, Dunant lived to witness one vindication. In the closing speech of his first Zionist Congress (1897), Theodor Herzl referred to the Swiss philanthropist as a true "Christian Zionist."[19]

Clarion Calls

Moses Hess (1812-1875) that rorty, Bohemian Rhinelander, was the founder of German socialism, the movement that went on, in a number of countries, to attract more than modicum of Jewish leadership and membership in the rank and file. Hess was also what some scholars term a "proto-Zionist", a forerunner of the Pinskers, Blackstones and Herzls of the 1880's and 1890's. An assimilated

Jew, with a penchant for French culture, an aspect of his life and existence that he shared with the better known Heinrich Heine, the iconoclastic Hess was a freemason who further disdained convention, and the spiritual tradition of his people, by marrying a French woman of questionable moral character.

When just 29, Hess published *Die Europaeische Triarchie* a bold, imaginative polemic that urged England, France and Germany to enter into permanent political union. Had this brave vision been attainable, it might have conceivably forestalled the War-to-End-All-Wars that broke out in 1914. Hess's most remembered work, however, was *Rome and Jerusalem*. Like the work of Pinsker and Herzl, it was inspired by recent injustices and outrages perpetrated upon Jews. In this case, Hess was reacting to the false accusation of blood libellevelled against Damascus Jews in 1840. At the beginning of the work, Hess confessed that "A thought which I had stifled forever in my heart is again vividly present...the thought of my nationality, inseparable from the inheritance of my ancestors, the Holy Land and the eternal city..."

The Jewish national concept evoked by Hess was based upon a keen understanding of the character of German anti-Judaism. Hess exclaimed: "Even Baptism will not save them from the curse of German hatred. The Germans do not so much hate the religion of the Jews as their race.[20] In light of Germany's eventual adoption of the crackpot racial theories of Renan, Gobineau, Chamberlain, and the Nazi Julius Rosenberg, Hess was prescient to a most disturbing degree! Accordingly, Hess urged his fellow Jews to recognize their nationality in exile, and to strive for a political restoration to Palestine.

Hess felt that the Jewish religion was the only means for preserving the latent nationality of Jews until a state could be established, and the Sanhedrin revived. He correctly guessed that the restoration would be accomplished by a modest number of Jews.[21] Even today, the majority of Jews in the world choose to live outside the State of Israel.

The spiritual successor to Hess was Perez Smolenskin (1840-1885), Russian-born Hebrew novelist, editor, and philosopher of Jewish nationalism. Born into a family that suffered persecution, Smolenskin wandered over southern Russia, and eastern Europe, before finally settling in Vienna, where he was employed first as a teacher of Hebrew, and proofreader. In 1868, Smolenskin founded a monthly, *Ha-Shahar* (The Dawn). In its pages, he exposed Jewish obscurantism as a fraud and a cultural dead-end. He also exposed the pitfalls of assimilation, and other self-imposed traps of European Jewry.[22]

Rabbi Kalisher of Thorn, Hungary, was another spokesman of the practical Jewish future. In 1860, he wrote to Orthodox brethren:

> Cast aside the...view that the Messiah will suddenly sound...on a great trumpet...On the contrary, the Redemption will begin by awakening support among the philanthropists and by gaining the consent of the nations to the gathering of...Israel in the Holy Land.[23]

The philanthropy of Moses Montefiore had, as we have seen, already been aroused. However, Rabbi Thorn left nothing to chance. Writing to both Montefiore and Edmund Rothschild, he "urged them to finance colonization societies, buy land, transport immigrants, set those who knew farming on free tracts..."[17b] A few years later, historian Heinrich Graetz would echo Rabbi Thorn's sentiments by observing that "The Jewish people must be their own Messiah."

Somewhat prophetically, the year that he died, Smolenskin argued that *both* the Hebrew language and religion, and not just religion alone, would serve to secure Israel's future in Palestine. He also envisaged Palestine as the cultural and spiritual centre of the world Jewry, a concept later expanded by Asher Ginsberg (Ahad Ha-Am). Toward the end of his life, Smolenskin huddled with England's La rence Oliphant concerning the best way to effect large-scale Jewish settlement in Palestine.[24]

Temple Christians

In 1868, the year that Smolenskin founded his influential journal, a body of Wurtemberg State Christians calling themselves Temple Christians, or Lovers of Jerusalem, purchased land at Jaffa and Haifa. Originating in 1851, they became convinced that they could make Palestine once again into a land flowing with milk and honey. Failing to establish a colony near Nazareth (it succumbed to malaria), they finally established themselves at Saronia, near Jaffa, incorporating there in 1872. They then established a second plantation, Wilhelmina, nearby, which was based upon olive and fig culture.

Like many a Zionist of the *aliyahs*, some Templers, discouraged by hardship, returned to their native land. Others pressed on to establish communities in Jerusalem, Nazareth, Ramleh and Haifa. According to De Haas, by 1875 there were over 300 Templers in Haifa, and, by 1883, over a thousand in Palestine. On the eve of World War I, they numbered 1,400 in Haifa, having for several years controlled the wholesale trade of Palestine.[25] Some idea of just how depressed was the economy of Palestine during the last third of the

19th century, on the eve of the influx of Christian and Jewish enterprise, can be gleaned from a French-language guide of the day. The guide reported that Haifa, the best natural harbour on the whole eastern Mediterranean from Alexandretta to Alexandria was a dismal town of 6,000 souls shipping out, from time to time, small amounts of wheat, cotton and sesame. The writer offered that it could be crossed in five minutes.[26]

Jerusalem: New Agricultural Start

The Universal Israelite Alliance had been set up in Paris in 1860, a collaborative effort of the aforementioned Munk and Cremieux, to stimulate and encourage Jewish agricultural enterprise in Palestine. The Alliance's most outstanding achievement, perhaps, was the purchase of a tract at Jaffa on which the agricultural training school that was to assist many of the Hibbat Zion pioneers of the 1880's was established (1870).

Despite the steady trickle of holy place tourists that came each year, the economic situation of Jerusalem was hardly more encouraging than that of Haifa. Historian Ernest Renan summed up his impressions (1861) in a letter to Mercellin Bertholet as "...an unrivalled medley of the ludricrous and odious..."[27]

Two firmans issued in 1867 by the Ottomans, under pressure from the Powers, helped the oppressed Jerusalem *vishuv* to begin to improve its lot. One removed the three-century old edict that had confined Jerusalem's Jews to a small, virtually subterranean ghetto situated next to the leper colony, allowing the descendants of Israel to settle outside the Walls of Suleiman, walls which Krupp breach-loading, wire-wound canon had made thoroughly obsolete.[27] The other firman gave the Jews, and other minorities, the right to purchase land anywhere in the empire without becoming subjects of the sultan. Bokharan Jews from what is now Soviet Uzbekistan took advantage of the relaxation to settle in Jerusalem, in 1868. The picturesque quarter that they built, including several synagogues, survives bearing their name.[28]

The Finns of Jerusalem

Inspired both by Moses Montefiore and by American Consul Warder Cresson, James Finn and his energetic wife undertook the first successful initiative to liberate Jerusalem's Jews from their grinding poverty by means of an agricultural enterprise. Finn was the colourful Consul of Great Britain to Jerusalem and Palestine, and in

1852 he purchased the tract that he called the Industrial Plantation. Later, he wrote: "The idea of labouring in the open air for daily bread had taken root among the Jews of Jerusalem — the hope of cultivating the desolate soil of their own Promised Land."[29] Funds to defray the wages of Jews engaged in land clearance and cultivation on the Industrial Plantation came from England, the United States, even as far away as India. When work finally got under way on the project in 1854, Consul Finn placed a Polish-born Jew in charge of the operation.[30]

Depending upon the level of remittances from abroad, from five to fifty-odd men and boys were employed on the Finn project. The founder soberly summed up the balance sheet of progress in these terms:

> Systematic agricultural training was...impossible under such conditions...Some building, some planting were accomplished; a little wine was made, a little oil refined. Brooms were manufactured...and crops of corn, lentils and fruit were grown. Thus, a few were kept from starvation; and valuable experience and knowledge of the land, crops and seasons was acquired, in hope that some day funds might be forthcoming to enable us to turn this knowledge to account.[30b]

There can be little doubt any more that Finn's long forgotten enterprise helped to arouse overseas and native Jewish interest in scientific farming. It remained a fact of Jewish life in Palestine that most of the Jerusalemite Jews subsisted in a state of semi-starvation. Ultra orthodox Ashkenazai rabbis opposed all schemes for technological progress, including those of Montefiore and Finn.

Thus Montefiore, Cresson, and Finn can be seen as the godfathers of the moshava, the agricultural village experiments that began with Petah Tikvah, and continued with the first Russian and Rumanian Zionist settlements. One year after the establishment of the Industrial Plantation, Montefiore doggedly tried to establish another rural settlement for local Jews. It failed. The Montefiore biography published on his 100th birthday (1875), assigns blame for the failure of this scheme to the fact that the "Jews considered it was not part of their duty to work or to learn to earn their living, and protested that their task in life was sufficiently filled by prayer and religious exercises."[9b][31]

Consul Finn, a scholarly man noted for his work on the remote Jewish communities in China, arrived in Palestine with his wife Elizabeth Ann (1825-1921) in the year 1845. Finn soon discovered that the number of Jews in the Anglo-Prussian congregation was barely 20. They sang psalms in Hebrew, however, and that was a

good forty years before Ben Yehuda arrived in Palestine to start the scientific revitalization of the ancient tongue among his fellow Zionists!

Elizabeth happened to be the daughter of Alex McCaul, executive director of England's Jews' Society, the man who had given Hebrew lessons to Lord Shaftesbury. Immediately, she assumed responsibility for the welfare of many of the destitute Jews of the Holy City, constructing a house, reputed to be the first ouside the Walls of Suleiman, and employing local Jews to work the land around it.

According to Israeli historian Ze'eve Vilnay,. Elizabeth's "secret purpose...(was)... to convert them to Christianity."[1d,17c] Historian Barbara Tuchman took a broader view of the situation, noting that:

> They organized work projects, not only to give unemployed Jews paid labour, but also to make headway toward land reclamation...though with pitiful results, for most of the beneficiaries were too weak to walk the mile to the field.[17c]

"Enough (supporters) were found, however, to finance purchase of a tract of land, which they named Abraham's vineyard" which she describes as "temporary relief for the able bodied and the destitute." Under various names, the Society for the Promotion of Jewish Agriculture in the Holy Land managed to survive until the British Mandate.[17c]

As the Finns were without funds for transport, the Industrial Plantation, though only a mile or so distant from the Walls of Suleiman, was inaccessible to many of the enfeebled Jews who did not have the strength to walk to and fro from the tract much less perform heavy work. Obviously puzzled by the perserverance of the Finns, fledgling historian Tuchman finally concluded that proselytizing motives were behind these efforts to bring employment to the Jews.

Lazarus Came Forth

As a member of Parliament, writer, journalist, restless traveller, and steadfast philosemite, Laurence Oliphant (1829-1888) spun out several schemes for Jewish Holy Land settlement in the 1870's and 1880's, one of them a joint proposal with fellow Parliamentarian Edward Cazalet for a commercially-oriented Jewish Palestine colonization. In May, 1882 Oliphant promised help to the Jews of Iasi, in Rumania, organizing for Holy Land settlement; later that year

he headed up a semi-official English committee of enquiry sent out by the Mansion House Relief Fund to investigate the conditions of Russian Jewry in Odessa and its hinterland. Oliphant, whose exuberance often exceeded his ability to deliver meaningful help, had recently published a proposal to settle Jews in the Hauran Plateau (*The Land of Gilead* 1880). While the scheme was never implemented, it may have helped to inspire the trans-Jordan settlement venture of Baron Edmund Rothschild a dozen years later.

Although Oliphant's schemes and Zionist advocacy was condemned by at least one New York Jewish editor as 'Oliphantasy', his writings inspired Emma Lazarus (1849-1887), whose Zionist feelings were aroused and articulated also by another English writer. George Eliot's novel *Daniel Deronda* had encouraged many a Jew to rekindle hope for a large-scale return to the Holy Land. While not an original thinker,[32a] Emma Lazarus wrote stylishly and prolifically during her 38 years, leaving her eloquence enshrined on the base of the Statute of Liberty. Writing for *Century Magazine*, she dared to assail comfortable, well settled American Jewry for its frequently expressed contempt for the hordes of penniless, eastern European Jews who were streaming through Ellis Island in ever increasing numbers.[33] Her capstone was "An Epistle to the Hebrews", a series of fifteen essays carried by the *American Hebrew* (1882-1883). In Epistle VI (Dec. 8, 1882), Lazarus wrote, with prophetic insight:

> The enterprise will succeed if the philosophers do not err who have taught us that violence, crime and injustice are to disappear from this world, to leave room for nothing but virtue and liberty.

Hounded since its inception in 1948, the State of Israel has yet to prove conclusively that it can survive a truly concerted attack from Arab and other Islamic enemies. Lazarus concluded, however, that:

> A race whose spiritual and intellectual influence upon the world has been universally accounted second to none, and whose physical consitution has adapted itself to the vicissitudes of every climate, *can be whatever it will.*[32b]

Such provocative talk as that stimulated much discussion among American Jewish intellectuals. The *Jewish Messenger* launched sarcastic attacks upon Oliphant and Lazarus, heaping contempt (Feb 9, 1883) upon "Mr. Oliphant's project of colonizing a strip of land in Gilead" which it termed "a phantasy", and "Miss Lazarus's plea for a separate nationality an unwise echo of that phantasy."[32c] The influential *American Hebrew's* support of Zionism, dating as it did from 1882, may well have stemmed from the persuasiveness of the pen of Emma Lazarus.

First Jewish Farming Community

The first Jewish-directed pioneering village of the late 19th century, expressly formed for the purpose of applying principles of scientific agronomy was *Petah Tikvah*, a native effort. As early as 1872, a band of Jerusalem Jews, most of them Orthodox, purchased a large tract in the malarial Jordan Valley not far from the village of Jericho. However, the Turkish authorities voided the sale on the grounds that the purchasers were foreign subjects. It was not until 1888 that Jews would be allowed to purchase land and settle on it — and then only singly.

Six years later, a band of Orthodox Jews from Jerusalem, mostly of Hungarian origin, including a few who had participated in the Jericho venture, purchased land on the coastal plain — probably by bribing the Ottoman authorities — near the Yarkon River. The name Petah Tikvah was retained for the settlement.[1f] While the site was only about seven miles from Jaffa, the fairly prosperous port of entry for the majority of those who entered Palestine by sea in those days, the colonists immediately ran into trouble in the form of malaria from the nearby swamps. Then, buildings that were ill-founded simply collapsed during the first rainy season; roving Bedouins harassed the remaining survivors who returned to Jerusalem. The modest Door of Hope seemed to be closed. However, in 1882, only a year after abandonment of the Yarkon site, another Jewish group purchased land in the nearby village of Yahud.[34] In 1883, the year following their arrival in Palestine, a handful of Russian *Bilu* Zionists went to the aid of Petah Tikvah to assist in its resettlement. However, finance was non-existent, and the people had no knowledge of scientific farming. Then a remarkable thing happened. Hearing about the plight of the Petah, Rishon le Zion, and other new settlements, wealthy French Baron Edmond James de Rothschild (1845-1934) came to their rescue with financial aid.

In 1887, four years after he began to send assistance, the baron made the first of several visits to Palestine. That same year, the U.S. Consul to Jerusalem, Henry Gilman, also provided assistance to distressed Jewish settlers,[35] while his successor, Edward Wallace (1893-1898), a Presbyterian Minister, used his office to protect Jews from arbitrary jailing and expulsion by the Turkish authorities.[36]

Edmund Rothschild, the chronological and spiritual successor of Moses Montefiore, was a towering figure whose contributions have been duly acknowledged by Chaim Weizmann who called him the "leading political Zionist of our generation", and David Ben Gurion who admitted that his Zionist contributions were "matchless".[37] Squarely in the tradition of 19th century humanism, the assimilated Rothschild insisted that new communities in Palestine be the spearhead of a

balanced Jewish revival: culture and nationalism. He also agreed with Ben Yehuda that the lingua franca of the colonies should be Hebrew. His methods were autocratic, and his generous subsidies tended to encourage some farmers to neglect their land (these were the pre-kibbutz years). However, without his early (1883) and most generous interventions, Zionism would probably have had many fewer 'facts' on the ground — to employ the favourite term of the latter day generals Sharon and Dayan — before the timely collapse of the Ottoman Empire (1918), and the informal commencement of the British mandate (1922).

Pressured by the irascible Russian agnostic Rabbi, philosopher and dissident Zionist Ahad Ha'am (Asher Ginsburg), Baron Rothschild agreed (1900) to terminate his system of direct-patronage-cum-resident-manager, which Ginsburg apparently considered to be demeaning to Jewish self-respect, and to place his charges in the control of the Jewish Colonization Association (ICA),[16b,38] founded in 1891 by Baron Maurice de Hirsch, the Hungarian Jewish pilanthropist with whom Rothschild had briefly co-ventured for the settlement of eastern Palestine in 1893.

In the light of the extraordinary amounts of assistance that political Zionism has received from the Diaspora, and the United States Government, one wonders, in retrospect, what the fuss was all about. Ginsburg and Rothschild had much in common. Both men believed that cultural and religious values were paramount to the success of Zionism. Both were Jewish nationalists; and yet both also accepted the permanence, or at least the continuance, of the Diaspora. Both are reputed to have assisted in promoting passage of the Balfour Declaration whereby England, mostly for political reasons, promised the Jews a "national home in Palestine".[16b] The difference in the two men may have lain in Ginsburg's strong conviction that no Jew should assimilate himself to the point where he could possibly become "Italian", "French", or "English". Now, the Baron was a most cosmopolitan individual. Possessor of an enormous, discriminating art collection, he became recognized as an authority on art. He took his sone James, a future M.P., to England to become a British subject. James eventually became his father's successor in administering the 12,000 acres and 30 settlements in Palestine.[16b,39]

Multi-faceted and ambiguous, Ginsburg has been claimed as a spiritual father by Zionists and non-Zionist Jews alike. Obscurantism such as that, a trait characteristic also of Zionist theologian Martin Buber, could hardly be attributed to Baron Rothschild who visited Palestine as many times as the indefatigable Montefiore. Despite the continuing separatism of his maverick ICA, the Zionist movement showed its gratitude to Rothschild by allowing him to be appointed honorable president of the Jewish Agency a legal entity of the English Mandate, in 1929.

The Scientific Spying of the Land

Perhaps the most remarkable scientific event affecting Palestine and its future in the 19th century, overshadowing even Edward Robinson's archaeological discoveries of the Hebrew origin of the land's place names, both occupied and unoccupied, was detailed topographic surveying and mapping of all Palestine west of the Jordan River carried out by English engineers in the 1870's. The instrument of the survey was the Palestine Exploration Fund, founded in 1865, and inspired by an English literary coterie established shortly before in Jerusalem. The Finns were active in the venture. Under the patronage of Queen Victoria, the survey got under way in 1874. It was completed, as it happened, in 1882, the first year of Zionist settlement — in spite of malaria, Bedouin uprooting of markets and monuments — in just eight years. Many of the 26 sheets produced were still in use by the government of Israel until well into the 1950's. One of the surveyors, Lieutenant Horatio Kitchener, even went on to English immortality. A keen Bible student, this career officer volunteered for the work which was well served by his celebrated self-discipline and determination. En route to his 1915 martyrdom at Scapa Flow, the mustachioed, mule-riding surveyor — this pompous, woman-shunning bachelor — lifted the siege of Khartoum and provided the vital iron will necessary for England to overcome Boer insurgents who (for four years) rewrote the books on guerrilla warfare in South Africa.

Somehow, the Palestine Exploration Fund has survived to the present day. It commenced publication of its Annual Report in 1869 — the year the Suez Canal opened — a tome detailing its various activities which included archaeological digs in the Holy Land. The last of these was the excavation of Solomonic Jerusalem, supervised by Kathleen Kenyon, daughter of the distinguished English scientist Sir Francis Kenyon. As a guarded, thoroughly venerable English tradition, the Annual Report still appears, a symbol of the spiritual affinity the British feel for Palestine, a bond that goes back at least to the Crusades of King Richard.

Several of the Palestine Fund surveyors published accounts of their service in the Holy Land. One was Sir Charles Warren who in *Land of Promise* (1875) observed that the productivity "will increase in proportion to the labour bestowed upon the soil, until a population of fifteen million may be accommodated there."[5b] Another Palestine surveyor, Lieutenant Claude Regnier Condor, was equally optimistic about what hard work would do for the land. When he penned his account, there was still not a single mile of paved road in Palestine, and no railroad.[40]

The First Aliyah

Credit for the establishment of the first organized Zionist community on Palestinian soil belongs to a White Russian Jewish Zionist, Zalman David Levontin (1856-1940) who, in July, 1882, founded the *moshava* (limited cooperative) of Rishon L'Ytzion (First in Zion) a few miles southeast of Jaffa, on the coastal plain. A scholarly member of an Orthodox family, Levontin was a member of the new *Choveve Zion* and prior to an inspection trip to Palestine established settlers associations in two Byelorussian centres. Upon his return, he convened a group of Russian and Rumanian settler-association representatives who, in turn, set up the modest organization that enabled Levontin to embark again for Palestine with ten migrants. In spite of financial assistance from a wealthy uncle, and timely help from the British Vice-Consul at Jaffa, within a year after its establishment Rishon was foundering, and Baron Rothschild was persuaded to come to its rescue.[41]

Levontin's brave work notwithstanding, perhaps Rumanian Zionists deserve the greater credit, and not the Russian pioneers, for spearheading the birth of what was later to be called *practical* or *labour* Zionism, in contrast to the Great Power soliciting political Zionism of end of the century Theodor Herzl. The Rumanians started to organize for the return rather early. In 1856, Israel Benjamin of Moldavia, an eastern Rumanian province, published a travelogue in which he advocated Jewish settlement in Palestine. Within a year, a Hebrew library had been established in Iasi, the principal Jewish commercial and cultural centre of Moldavia.[42] As early as 1873, 100 Jewish families from Nicoresti joined those from other communities, including an Iasi contingent, and migrated to the Holy Land. The climax of this stirring came in 1882 when the *Hevrat Yishuv Erez Israel al Yedai Avodat Adamah* (Society to Settle Israel by Working the Land), with chapters in 30 or more communities, began to meet for more comprehensive migration.

The Rumanian Network

During February, 1882 when the Russian pogroms were in their second year, the Rumanian Prime Minister declared that his government would support a parliamentary resolution advocating establishment of a "Palestinian" Jewish kingdom. Nothing came of the scheme. Instead, anti-Semitism was fast becoming popular politics in this former Russian province. The major centre of Rumanian anti-Jewish feeling was the city of Iasi (Jassy) close to the border of what is now Moldavia, USSR, and only a few miles northwest of Kishiniev, the provincial seat of Moldavia, where terrible slaughter of the Jews

took place in 1903, converting many German dissidents in the Zionist movement to the Palestine-now faction. The year of the Bucharest governmental resolution witnessed the establishment of a new university at Iasi which immediately became a hot bed of Rumanian nationalism and anti-Judaic feeling — probably because Iasi had a large Jewish merchant class which had over the centuries suffered persecution at the hands of Moslems and Christian Orthodox. Anti-Semitic congresses were held in Iasi in 1882 and 1884. During 1892, 196 Jewish shops were closed down and many tradesmen expelled from the centre.[42]

In this volatile setting of eastern Rumania, the *Avodat Adamah* called together delegates from the 32 Rumanian chapters in January and again in May. The second meeting was addressed by Laurence Oliphant, who happened to be travelling in Rumania. Oliphant, whose Zionist schemes were touched upon earlier, promised the Jewish migrants financial aid from English gentiles. Samuel Pineless, Rumanian Zionist leader, secured the approval of the Turkish ambassador in Bucharest for the settlement of 100 Jewish families in Palestine. The scheme was initially endorsed by the Turkish cabinet, but rejected by the Sultan who was irate over the recent English takeover of his next to last African domain![43]

The Porte's November, 1881 reaffirmation of its policy to discourage large, organized groups of Jews from permanent establishment in Palestine was probably influenced by Rauf Pada, the *mutasarrif* or leader of the Jerusalem district (i.e. southern Palestine) who fought Jewish immigration tooth and nail from 1877 to 1889.[44] In the face of this opposition, Rumanian Jews, singly and in families, slipped away to the Holy Land even as Pineless was engaged in negotiations with the Ottoman authorities for entry permits for large groups.

Despite the Sultan's refusal, the authorities relented, and in August some 228 Rumanian Jews, comprising 39 families emigrated *en bloc*. The nucleus was from Moinesti. They went on to establish the village of Rosh Pinnah. By the end of 1882, 1,322 Rumanians were settled. The first *aliyah* was under way.

The Zionist Bilu Experiment

On January 21, 1882 an emigration society was founded in the Russian city of Kharkov in reaction to the terrible pogroms of the previous year. BILU (*Beit Ya'akov Lekhu ve-Nelkhah = House of Jacob, come let us go*)[45] formed when Israel Belkind invited some young Jews to his home to discuss the crisis state of Russia's Jews. Initially, the group called itself DAVIO, an acronym based upon Exodus 14:15 (*Speak to the Children of Israel that they go forward*). Among the

aims was creation of "a political centre for the Jewish people." Another was to establish "an economic and national-spiritual" presence in Syria-Palestine. Thus we find the complex elements of political Zionist ideology: political (and cultural) centre, nationalism, spiritual centre all expressed over fifteen years before Herzl's first Zionist Congress.

As its seal, the Bilu adopted the Star of David, the old Badge of Shame, now infused with a new hope. The incorporated text read "The smallest shall become a thousand, and the least a mighty nation" (Isa. 60:22).[46] The Bilu had grit, but they lacked resources. Part of the group wanted to head out to Palestine and trust to hard work for their salvation and success. Ze'ev Dubnow, a Bilu leader, wrote: "The aim of our journey is rich in plans. We want to conquer Palestine and return to the Jews the political independence stolen from them two thousand years ago. And if it is willed, it is no dream. We must establish agricultural settlements, factories, and industry...and put it in Jewish hands. And above all, we must give young people military training and provide them with weapons. Then will the glorious day come, as prophesied by Isaiah in his promise of the restoration of Israel."[46] The reference to weapons was made more than a decade before exigencies forced pogrom-weary Russian Jews to form secret defence units to protect their lives and property.

Dubnow's blueprint for survival in Palestine resembles strikingly Herzl's detailed plans. Yet, the author of *The Jews' State* (1896) professed that he had been completely ignorant of Jewish settlement societies, referring to their oft clandestine Palestinian settlements as a policy of "infiltration".[47] Almost a century later, the regimes of Golda Meir, Yitzhak Rabin and Menachem Begin would tolerate, and promote, another kind of *settlement-infiltration* on the occupied West Bank of Jordan, some of which took place even while Israel was negotiating the future of the territory under the Camp David Accords.

Biblical or Orthodox Jews in Russia, Rumania and Poland provided a significant part of the inspiration and membership of these societies, the most successful of which was Russia's *Hibbat Zion* (Love of Zion), and its spinoffs the *Choveve Zion* (Lovers of Zion) and *Shove* (Colonizers of) *Zion* groups[48] that formed in west Europe and the United States throughout the 1880's and into the 1890's, when Herzl's movement and related societies seized the reins of the horses which were gathering momentum now in the push for Palestine. However, it should be quickly pointed out that all sects and schisms in world Jewry were divided, at the very beginning of the modern return, on the goals and propriety of the world Zionist movement, and even on the aims of these humble societies. And so, while the devout Orthodox lifted his face each morning to pray: "Save us, O God of our salvation and gather us together and deliver us from the

nations", with many of them piety and humility demanded that they should act only at the behest of the Almighty. *Next year in Jerusalem* really meant *some day* in Jerusalem...

Soon after its establishment, the Bilu society moved its headquarters from Kharkov to the Black Sea port of Odessa, the embarcation place for Palestine. However, serious schisms arose amongst its members. One branch advocated immediate departure for *Eretz Yisrael*. Another party contended that no settlements should be attempted until official permission and guarantees could be obtained from the Ottomans. Still other factions arose. The result was that the Bilu became too ineffective in order to have any prospect of becoming a powerful influence upon Palestinian settlement. The *political-guarantee-first* splinter hurried off to Constantinople where it consulted with the Oliphant Commission that had come out to investigate ways to alleviate the sufferings of Russia's Jews.

Impatient with bureaucratic delays and nebulous promises of assistance from English fact-finding commissions,[49] the *Palestine-now* Bilu splinter sailed from Constantinople on June 29,[50] reaching Jaffa on July 6. A handful of the tiny group of *Biluyim*, as they styled themselves, immediately offered themselves as labourers at the Mikve Israel agricultural school at Jaffa. Others, encouraged by Charles Netter, a Jaffa resident, a founder of the Universal Israelite Alliance, pressed on to help out at Rishon L'Ytzion, a Russian community established that same month. Unfortunately, Zionist historians are unable to establish an exact date for the establishment of Rishon, whose group, as earlier mentioned, was led by David Levontin.

Zionist historians do not agree on exactly what role Judaism played in the Bilu motivation. Howard Sachar describes them as "all...young men in their teens and early twenties" who "combined Marxist zeal with Jewish nationalist fervour". Yet he acknowledges that the petitioners of the Porte ended an appeal to their brethren with "Hear, O Israel, the Lord our God, the Lord is One, and our land, Zion, is our only hope." The Palestinian Bilu appealed to the *Cheveve Zion* society for help, but failed to gain steady support. The Russian Bilu withered for lack of interest. And in 1884 the Palestine Bilu numbered just 28 members. However, encouraged by linguist Eliezer Ben Yehuda, with whom they celebrated the Passover that year, the Bilu struggled with Hebrew and sang Hebrew songs. A remnant at Constantinople, petitioners of the sultan who had returned to Russia, moved on to Palestine. Still other Bilu proceeded to the United States.

The Palestine Bilu were given timely assistance by the writer and teacher of religious Zionism Yehiel Pines (1843-1913). With the help of Pines, Gederah, the first all-Bilu community was established, in December, 1884.[51] A native of Belorussia, Pines had

settled in Jerusalem in 1878, persuaded to go to the Holy Land for the Moses Montefiore Testimonial Fund which, as mentioned, had built several housing quarters for Jews outside the walls of Suleiman.[52]

In 1882, the year of Rishon-Le-Zion, the total Jewish population of Palestine was barely 25,000, even though Jerusalem claimed to be half Jewish.[53] According to historian Jacob de Haas, some 7,000 Jews settled in Palestine, more than half of these in Jerusalem.[54] In fact, as early as 1844, an Ottoman census revealed that there were 2,000 more Jews than Moslems living in the Holy City.[55] Some portion of the dramatic pre-aliyah increase should be credited to improved public health conditions — to the Christian and Jewish clinics independently established in Palestine after 1860, to the loosening up of oppressive Ottoman regulations (also the work of Christian compassion and enterprise — some of it with political but hardly proselytizing motives), and the stimulus afforded to both Turkish and Jewish development by the wondrous Palestinian topographic survey.

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ANDREW J. KIRBY

QUANTUM CONCEPTS AND THE ANTHROPIC PRINCIPLE

ANTHROPIST: I am a meaningful part of the Universe, which has developed in just such a way that I should appear.

MECHANIST: You are the improbable result of random processes. Had things turned out in a slightly different way then you would not be here to marvel at how purposeful everything is.

ANTHROPIST: But they didn't!

MECHANIST: But they might have! If the present state of the Universe *was* a coincidence (which I believe is the case) then you would have exactly the same evidence for purposiveness that you have now.

ANTHROPIST: And if the Universe was purposive (which is what I believe to be the case) then you would have exactly the same evidence for coincidence that you have now.

The above dialogue outlines the two basic positions that have been taken on the question of cosmology; the study of the existence of the Universe. The Mechanist is a well known character of philosophical disputation, but who is the Anthropist?

In recent years, largely due to the work of Brandon Carter and R.H. Dicke, the Anthropic Principle has found some support in cosmology. The Principle is perhaps best appreciated in contrast to the Deductive Principle, that which underlies the methodology in which one posits a set of initial conditions for the Universe and extrapolates (hopefully) to the present. One thereby assigns no particular importance to the emergence of Man as a self-regarding and Universe-regarding agent. He[1] becomes nothing more than the chance product of a material Universe.

The Anthropic Principle on the other hand, takes as its starting point the *fact* of the existence of Mankind and tries to elucidate the circumstances which developed in just such a way as to bring it about. To quote Calder,[2] "in its strongest form the Anthropic Principle noted that the overall character of an observable universe had to be suitable for the creation of observers". "The initial conditions of the Universe are not known", writes Gale[3], "and the physical laws that operated very early in its history are also uncertain; the laws may even depend on the initial conditions. Indeed, perhaps the only constraint that can be imposed on a theory reconstructing the initial conditions of the Universe and the corresponding laws of nature is the requirement that these conditions and laws give rise to an inhabited Universe."

The anthropic approach has arisen in large measure from the failure of the mechanistic empiricism that has formed the basis of deductive science. It is only recently, for instance, that biologists have admitted that Evolution is not a scientific theory in quite the same sense that, say, structural engineering is. Evolution cannot form the basis of experiments and is not therefore subject to proof or falsification; whereas if a structural engineer uses the wrong theory then his bridges fall down.[4]

The palaeontologist can at least test models of evolution for goodness of fit to parts of the fossil record other than those in the context of which they were devised, the cosmologist cannot even do this. There is only one Universe, and only one solar system that is available for direct observation. A few heavy planets may have been located orbiting other stars, but we know nothing about them, nor about how common planets actually are.[5] The condensation theory supposes that, as a primordial gas cloud collected under its own gravitation, the planets condensed out of it soon after the sun was born. This view would lead one to conclude that most sun-like stars have planets. Michael Wolfson's model of the established sun dragging a ribbon of gas from a passing protostar would predict a low probablility of planets, since stars do not tend to pass near one another, and a correspondingly low likelihood of life. There are those who believe that planetary probability is a red herring, Hoyle and Wickramsinghe for example regard comets as more conducive to the development of primitive forms of life. Planets would still presumably be necessary for the development of intelligence however.[6]

It is by no means definite that we should actually recognize extraterrestrial life, were we able to find it. Olaf Stapledon has speculated on the possibility of sentient stars[7]; and similar difficulties surround the identification of intelligent life. Dr. Lilly has claimed that there are two intelligent species upon the earth — man and dolphins — whereas some cynics might deny that there is even one, in the tradition of Gandhi who, when asked what he thought

of Western civilization, replied that he thought it would be a good idea.

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Perhaps the most startling work on the Anthropic Principle, the way in which the Universe exists in just such a way as to make intelligent life possible — perhaps even inevitable, is R.H. Dicke's development of certain ideas of the quantum physicist P.A.M. Dirac. Dirac found startling numerical relationships between the orders of magnitude of some of the basic values of the Universe. In particular he noted obvious relationships between values for the number of massive particles (protons and neutrons) in the visible Universe (10^{80}), the age of the Universe in atomic units — one such unit being the time required for light to traverse a distance equal to the radius of a proton (10^{40}) — and the gravitational coupling constant (10^{-40}). Coupling constants describe the energy of a particle in a field of force: the gravitational coupling constant is one based on Newton's constant for gravitational attraction expressed in terms of the mass of a nucleon, (a neutron or a proton).

It must be noted that these are dimensionless numbers, that is they hold irrespective of the units of measurement used. Moreover they indicate orders of magnitude, and are therefore not significantly affected by the slightly different values which the data upon which they are based are now taken to have as a result of better experimental determination since the time Dirac was writing. Dirac regarded these relationships as meaningful, although he was unsure what they meant.

The real surprise came when Dicke showed that while there was a *necessary* relationship between the number of particles and the gravitational coupling constant[8], the relationship between these values and that for the age of the Universe is *contingent* — that is to say it now happens to be the case; it was not so in the cosmological past and will not remain so in the cosmological future. It happens in fact to be the case for precisely that part of the lifetime of the Universe when one could expect there to be intelligent life around to which it would be meaningful. (I should explain here that the chemical conditions necessary to sustain life as we know it are best met with at certain times in the existence of certain sorts of planet orbiting certain sorts of star in a particular way. This is most likely to happen, as it has happened for us, in the central section of the lifetime of the Universe.)

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Brandon Carter[9] has tried to relate the Anthropic Principle to Everett's Many Worlds Interpretation of Quantum Mechanics. The title gives some indication of the relevance of this idea. The Anthropic Principle invites comparison between the world as it is and the world as it might have been, Everett obligingly provides an ever increasing number of 'might-have-been' worlds. In order to understand Everett's theory it is necessary, briefly, to place it in its quantum mechanical context.

Although light is always registered by recording devices as particles (photons), in space it behaves as a wave. Light beams can interfere and cancel one another out in the same way that two sets of water ripples can create smooth patches of water where the peaks of one and the troughs of the other coincide. In quantum mechanics this is described by the Schrödinger Equation. In the ideal situation a coherent wave of light from a source impinges at the same instant upon two equidistant slits, 1 and 2, with a light detector placed at the back of each. If the combined energy of the wave reaching the slits corresponds to that of a single photon of light (and levels as low as this have been achieved in interference experiments) then either one or the other, but not both, of the detectors will record the light. The Schrödinger Equation describing the situation developing over time makes use of six dimensions, three for each slit. The probability of an observation being made at a particular point is equal to the square of the amplitude (height) of the Schrödinger wave at the appropriate point. When one of the detectors is activated the wave function is said to collapse, giving a 100% probability for one outcome and 0% probability for all the others, there is only one other in the simple, ideal case described.

How, why and indeed whether this collapse comes about is one of the most hotly debated questions in Quantum Mechanics. Everett[10] proposed in 1957 that it does not happen at all. The Schrödinger function for the whole Universe splits in two, and in one Universe the photon is registered at slit 1 and in the other Universe at slit 2. Brandon Carter used this idea as the basis for discussing universes in which life did not appear as opposed to those within which it did. He suggested, for example, that the gravitational coupling constant (and therefore gravitation generally) would have to have about the same value that it actually does have for stars to develop of the size and stability necessary to support planets with life as we know it on them.

This kind of development rests on a misunderstanding of Everett's idea. When the wave function of the Universe splits (if it does) then the two universes that result are identical in every respect except that of the position of the particular photon (or electron, or proton) with which we are concerned. Of course the

photon might be the one that triggered King Harold's eye so that he ducked the arrow at the Battle of Hastings, and the electron might be the one that enabled an unstable base to exist in a replicating strand of DNA and thus caused one of the important mutations in one of our prehominid ancestors, but the underlying laws of nature will be the same in all of the ever-dividing universes. The laws of "our" Universe will go back to every point of division. Carter, or anyone else for that matter, is quite free to speculate on what would have happened if the fundamental characteristics of the Universe had not been as they are, but Everett's theory is of no real relevance.

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Another interpretation of quantum mechanics however, may offer rather more understanding. Niels Bohr developed Complementarity to come to terms with the Jekyll and Hyde nature of light outlined above. What he did was in a Zen-like manner to "unask" the question of whether light (and matter) "really" consisted of particles or of waves. In free space light behaves as a wave, in macroscopic interactions it seems to be corpuscular; the same goes for matter. The basis of complementarity was that it is perfectly acceptable for something to possess contradictory qualities, so long as it does not possess them at the same time. "Andrew Kirby is in London" is sometimes true and sometimes false, but since it is never both at the same time then there is no real difficulty. Similarly the wave and the particle pictures compliment one another; in any particular context either one or the other fits, but it never necessary or desirable to decide between them.

Although Bohr developed Complementarity in the context of Quantum Mechanics, there is no doubt that "he considered such relations of complimentarity the dominant feature in all fields where describing experience requires considering the conditions under which experience is gained" to quote Peterson[11]. Bohr used the example of a living organism, which can only be mechanically studied by depriving it of precisely that quality which is the object of study.[12] There is a complementarity between mechanistic and vitalistic interpretations of life.

The Peterson quotation would seem to be particularly relevant to the Anthropic Principle. What deductive cosmology tries to do is to give an account of the way in which the Universe has come about without considering that it has done so in just such a way that we are here to seek for such an account. I suggest that what we have here is a clash between a mechanistic, causal account and a teleological (end-oriented) account. The mechanistic cosmologists have chosen a standpoint which makes them unable to recognize any purposiveness in the unfolding of the Universe. The Anthropists, having taken that as their starting point, must elucidate the cir-

cumstances that brought it about. The possibility of reconciling the two is on a par with that of a man playing on the white squares of the board playing a meaningful game of draughts with a man using the black squares.

Perhaps the best argument for the application of the Anthropic Principle is that the limitations of mechanistic empiricism are at their greatest when dealing with unique events that cannot be replicated. The Anthropic Principle offers a philosophy of hope, the hope that our existence is more than a quirk of improbability, and this is something that cannot go unexamined.

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ROBERT C.J. CARLING AND OTHERS*

ANIMALS IN MAN'S SERVICE

The authors consider the current debate on the use of animals for food and experimentation in the light of biblical teaching.

According to the Bible man was given dominion over nature (Gen. 1:26,28; Ps. 8:6). What is the meaning of this teaching? The subject is of considerable importance, since some argue that the 'dominion' doctrine is responsible for the present ecological crisis[1,2], though others have refuted this suggestion.[3,4] Our attitude to animals may well reflect our attitude to the environment.

Creation Theology

Our view of the relationship between the animal world and man will depend on a correct 'exegesis' of creation theology. The created order owes its present existence not to just one creative act of God in the past, but to His *continual upholding* of nature (Col. 1:17, Heb. 1:3; Rev. 4:11b; ICor. 8:6; Job 12:10). Thus He is not unconcerned with what man does with His world. Deists from the late 19th century thought of God as one who had created only in the past. The Created order then continued to run like a clockwork toy which was in some senses independent of its Maker. As a result some thought that God was so far removed from creation that He was either impotent to deal with man if man exploited or damaged the world, or that He was unconcerned. Although God did indeed 'rest' from creating (Gen. 2:2,3; Psalm 102:25) this cannot be taken to mean that He is no longer involved with His world. The Christian God continues to uphold the whole of reality; He is the Creator/ Sustainer.

Christ's use of the analogy of His Father being an 'absentee landlord' (Matt.21:33; 25:14f; Luke 12:35f etc.) makes the point that His Father is judge and will call his servants/tenants to account. The landlord/tenant image is useful since it conveys the idea that we can use God's world as his tenants by studying it and applying our findings to great benefit; this, however, gives us no excuse to exploit nature since we are accountable to the landlord. Moreover, the lack of use of resources to avert ecological disaster or to improve the welfare of animals and man is to ignore our duty as God's tenants (Gen. 1:26,28; and c.f. Matt. 25:14f).

Historical Roots of Animal Welfare Attitudes

A study of the history of attitudes to animal welfare will illuminate current outlooks and practices. Attitudes to animals and the man/nature relationship change over the years depending on man's changing views on ultimate reality. C.W. Hume in 1957 argued that neo-platonic attitudes to animals lowered their status and as a result of these views on the capacities of animals (e.g. their inability to rationalize or communicate by language) a less 'neighbourly' practice toward them prevailed.[5] In the middle ages there were two major schools of thought regarding animals. The Franciscan view held them in high regard (see also White[1]) whereas Thomas Aquinas' views led to the conclusion that there was no way of distinguishing them from machines. They only moved "through sense and appetite... so that the body is perfected with powers directed to its being moved rather than with powers of moving."[6] Hume indicates that Cartesian attitudes which were heavily influenced by Thomist philosophy led to horrifying practices. People "..dissected dogs without pity to observe the circulation of the blood" and animal screams were "...simply the creaking of the gearing and the turnspit."[5a] Thus historically, rationalistic ideas tended to lead to practices detrimental to animal welfare.

Animal Ethics and World Views

If we compare Christianity with other world views we see different approaches to such concepts as pain and cruelty (e.g. pain can be 'illusion' or 'maya', the Will of Allah etc.). A pantheistic view of reality will have problems in fighting against pain, cruelty and injustice since ultimately these things are only part of the reality which is 'god' in the pantheistic sense. Albert Camus' book "The Plague" has a similar tension as pointed out by Schaeffer.[7] In Islam there is a degree of fatalism where if an animal or even a human being is suffering "It is the Will of Allah" is a frequent reaction and little may be done to help. Berry points out that primitive mysticism is prevalent in many arguments where nature is defended by invoking spiritual capacities within 'her'.[8]

Thus there are several views of man's relationship to nature. We would argue that the Christian world view does give a sufficient basis for responsibility. To gain a biblical balance Schaeffer's analysis is useful here.[9] To answer the question of man's relation to, and yet distinction from, animals we need to go back to medieval theology to see how an unbiblical emphasis on man's relationship to nature gave rise to problems:[5,9]

INFINITE	PERSONAL
GOD	GOD
	Man
Gulf	
Man	Gulf
Animals	Animals
Plants	Plants
Machines	Machines

Theologically, man was viewed by medieval theologians as *separate* from nature and the right hand side of the diagram was emphasized.[9] This led to the problems discussed by Schaeffer but here we note that this led to a detrimental attitude to animal welfare.[5,9] Later in history, Darwin and others, maybe partly as a reaction to this emphasis on the separation of man from nature, re-emphasized the left hand side of the diagram. Clearly man is related to animals, but the reaction of the established church was antagonistic. This is understandable since this re-emphasis seemed to lead to the erroneous conclusion that man was *only* an animal, (albeit complex) and much worse, that it appeared to do away with God. There was no-one above the gulf. The church's insistence on man's separation of man from animals (e.g. by arguing that animals have no intellect or language, no soul or awareness of God) gave rationalistic thinkers the excuse to reject the churches stance since it tended to ignore that man *is* an animal. The agreement that man is an animal in no way allows the 'thin-end-of-the-wedg-' to come in; it merely recognises the apparent.[10] Man, if looked upon *from the point of view of finiteness* is in the same position as animals; he is totally different from God. But if we look at him from the point of view of his *personality*, the Bible makes it clear that he is distinct from the rest of creation by virtue of his being made in the image of God (Gen. 1:26a).

The implications of this for animal welfare are that on the one hand we do not fall into the trap of treating animals as though they are essentially the same as human beings; on the other hand, we treat animals as though they have a capacity to feel pain and we know that we should not exploit them (see also under 'The assessment of pain/stress' below).

Given this broad outline of animal ethics, are there any specific Biblical guidelines for us to follow? (i.e. are animals mentioned directly?) Like many areas of ethics it is an attitude of mind that affects how the Christian should act since we are not told many things explicitly. However, the following points are

worthy of menion and implicit in Christian thinking is the abhorrence of both cruelty and exploitation.

Animal Theology

(a) Sabbath Law applied to animals as well as human beings (Exod. 20:10) and Ninevah's salvation applied to 'much cattle' as well as man (Jonah 4:11). To the Jew salvation meant much more than just 'spiritual' salvation — it included land and animals as well.

(b) Solomon's wisdom recognized that cruelty to animals was a trait of the foolish (Prov. 12:10). (c.f. Balaam's foolishness! Num. 22:21f).

(c) Jesus himself noted cruelty to animals (Luke 14:5; 13:15) and he could well have used the sight of labouring oxen in front of him and his hearers as a vivid illustration of his compassion (Matt. 11:30). However, when he spoke of dogs in the New Testament, the cultural setting needs to be remembered; they were scavengers in Christ's Palestine (Matt. 15:26; Isa. 56:10; I Kings 4:11; Psalm 22:16) or occasionally used to protect flocks (Job 30:1).

(d) Animals are rarely mentioned in Old Testament Law except when relating to sacrifice. Negligence of owners of animals is mentioned (Exodus 21). Also a kid was not to be cooked in it's mother's milk (presumably to counteract a particularly insensitive practice! Exod. 23:19). Oxen were not to be muzzled when treading out the corn (Deut. 25:4) and Paul's use of this (ICor. 9:9) to defend his rights as an apostle does not abrogate the literal as some have argued.[11] If the young were found in a nest the young could be taken but the mother was to be set free (Deut. 22:6,7).

(e) Predators were to be controlled. Wolves, lions and bears etc. are frequently mentioned in God's word and David's protection of his flocks is well known (I Sam. 17:36; see also Matt. 10:16; John 10:12; Habbakuk 1:8). The lion is said to seek his meat from God (Psalm 104:21).[12]

TABLE 1. The Average Protein content of raw foods (In g/100g)

Animal source		Plant source	
Cheese, cheddar	26	Soya bean	40
Beef	17	Peanuts	24
Eggs	12	Cereals	10
Milk, cows	3	Potatoes	2

The Necessity of Using Animals for Food

God's covenant with Noah allowed him to eat meat provided it did not contain its lifeblood (Gen. 9:3). Gen 1:29 may indicate that man originally received his protein from plant sources and that animals were herbivores before the Fall (Gen. 1:30). But vegetarianism was not necessarily God's original pattern (see Ps.104:21) and Ref.12).

Paul underlined the personal nature of decision for or against vegetarianism (Rom. 14:1-3). He also instructs Timothy to beware of hypocrisy in teachings on abstinence from certain foods (1 Tim 4:3). Such teachings are abundant today in various food 'cults' and 'fads'.

Wealthy countries are by no means efficient in producing protein from animal sources, even though they resort to factory farming techniques which have come in for much criticism on moral grounds. An example of this inefficiency is the fact that at least 10lbs. of feed protein is used in the production of 1 lb. of beef protein.[14] Various commentators have suggested that by the turn of the century the Western diet will be heavily dependent on sources of protein other than those from animals.[14a,15] Over the next twenty years, it is unlikely that livestock will disappear completely from the rural scene. By grazing on otherwise unproductive land and feeding on waste products from vegetables which are indigestible by man, they may still play a minor role in food production — meat on special occasions will probably still be a fact of life in Western cultures for a long time. It seems, however, that high yield mass production of meat and animal products will eventually disappear.

At present, about a third of the protein in the average British diet comes from plant origins such as legumes, cereals and root vegetables.[16] Such sources compare favourably with those from animals in the proportion by weight of protein they contain (See Table 1 above). The biggest problem with protein obtained from plant sources is that the overall proportions of amino-acids in any single food differ from those that man requires. Hence food technologists are beginning to juggle with various mixtures of vegetable proteins as well as textures, flavours and shapes in order to arrive at products which are commercially viable, acceptable to Western palates and nutritionally balanced. When man learns to live with the greater part of his protein food obtained from plants, the inefficient use and sometimes moral abuse of animals will cease on economic grounds if no other! A telling fact in this inefficiency lies in the possible use of one acre of prime arable land. Supporting beef cattle, it can supply a man's protein needs for 77 days; however, if the same land were planted with a soyabean crop it would supply a man with protein for 2,224 days.[17]

Pain in animals

The pioneers of science in the sixteenth and seventeenth centuries felt that in some way they brought about a reversal of the fall of man. Francis Bacon wrote, "Man by the fall fell at the same time from his state of innocence and from his dominion over nature. Both of these losses, however, can even in this life be in some part repaired; the former by religion and faith, the latter by the arts and sciences."[18] As we have said above, animal pain is not explicitly dealt with in scripture, but the picture of man as steward of God's creation would indicate that the infliction of avoidable pain is not inexcusable. "It is the infliction of avoidable pain which is morally reprehensible...a lion disembowelling an antelope may cause far more suffering than the ill-aimed shot of the hunter, but only the hunter can be accused of cruelty."[19] Thus avoidable pain is clearly a category which must be seen to be dealt with in both law and practice. It is argued here that *if in the long term* pain and suffering in man and animals may be avoided by the use of animals in research, then we have a precedent, perhaps even a duty, to use them if no other alternative is appropriate or available.

The assessment of pain and stress in animals

If research is to be justified, then the assessment of pain and stress in animals is of crucial importance. Studies of the physiology, anatomy and ethology of animals will illuminate this area. The activity within the peripheral nerve is the beginning of a chain of events which is a pre-requisite for the perception of pain, but it is not in itself an indication of pain perception.[20] Also the removal of the cerebral hemisphere does not remove unconditional responses which are often taken as indications of pain perception (e.g. dilation of pupil, increase in heart rate, blood pressure, respiration etc.).[20] The brainstem reticular formation can alter cerebral receptivity and the finding that the placebo effect may involve the release of endogenous peptides could well be related to this phenomenon.[21] Thus care must be taken in the assessment of pain and stress in animals from a purely 'observational' viewpoint. Thorpe has pointed out two further pitfalls: "The first is the error of supposing that domestic animals in their feelings and anxieties are essentially like human beings: the second is the equally serious error of assuming that they are mere insentient automata."[22] Animals must be given the benefit of the doubt in cases of uncertainty, but the commonsense belief that animals do feel pain of a similar nature to man is corroborated by the evidence of similar pain pathways in animals and man.[22,23]

Do Animals have Rights?

Animal rights have been invoked to argue for the abolition of all vivisection which removes the right of an animal to live.[24] Historically some have thought that animals could even have the 'right' to representation in law.[25] Rights are defined and conferred by the existence of laws and since animals are protected by several laws then in a sense they do possess 'rights'.[26] But to confuse the right of an animal to live with its rights under law is to misunderstand the status of animals. As we have argued the dominion of man gives him the freedom to use animals in his service, with the limitation of responsibility to the God who made them. The notion of an animal's rights to live brings problems when we consider the limitations that man must put on animals in some situations. For example is the right of a predator to kill to live upheld in *all* situations? Clearly, the right to live of a rogue tiger would not be considered on a par with that of a threatened human being (see Genesis 9:5). Additionally there is unavoidable denial of the right to live of animals in many situations such as in the day to day predator/prey situations, natural disasters etc. One suggestion, is to treat animals *as if* they possessed rights, made in an excellent report of a working committee on animal ethics.[19a] However, the rights of animals only have a sufficient basis within the Christian framework which involves the characteristic of care and respect for a part of God's creation.

Alternatives to Animal Experiments

There is a growing feeling in society that alternatives to animal experimentation should be used wherever possible. The reasoning may be economic as well as moral; there can be no doubt that animal research is costly. However, the debate centres upon what constitutes an acceptable alternative. Some anti-vivisectionist organisations take the view that *no* animal experiments are necessary.[24,27] At the other extreme, some advocate that no alternatives are possible or even needed.

It is likely that the majority view lies somewhere between these two extremes. The late Prof. Smyth's book covers a wide range of alternatives summarized by his three 'R's'; Reduction, replacement and refinement.[27] Sadly, many people's ideas that computers and synthetic models can totally replace animals have little foundation in reality. Tissue culture and other in vitro systems can provide better alternatives in many cases and are already in wide use. However, these only allow limited information to be obtained about whole body physiology and the full systemic effects of drugs. Furthermore it is a legal requirement for safety reasons

that drugs be tested in the whole animal.[26] It would be wrong, however, to assume that we can never replace animals in a given field of study.[28]

One positive approach to the problem might be to reduce the number of animals used for experimentation by cutting down 'wastage'. Wastage can be caused by poor or inappropriate choice of experiments. A lack of knowledge of the literature combined with the pressure of career advancement can mean that duplication of experiments, far above that required by the normal processes of scientific validation, can occur. A better knowledge and selection of statistical methods could also reduce the number of experiments in some cases.[29]

A demonstration of the strength of public feeling on the abuse of animals is the growth of sales cosmetics made by companies such as "Oriflame" who produce items containing 'no animal products'. This increase in public pressure is obviously going to be an important force in making the scientific business world consider alternatives. Every Christian involved with research must feel the obligation to be highly aware of all the paths open to him.

Does the Law Need Changing?

The law relating to animal experimentation has been criticized for its outdated stance and two bills recently before Parliament sought to update legislation;[30] the EEC is also reviewing the situation.[31] Anomalies in the present law arise since animals that evoke more 'emotional' appeal are better covered by the law. This ambivalent attitude has led to the requirement of special certificates to work on horses, dogs, cats and lately primates, whereas some invertebrates which clearly have a highly advanced nervous sytem and pain mechanisms (e.g. Cephalopods) are outside the scope of the law.

Many experiments that fall within the category of experiments without anaesthesia (Certificate A under the 1876 cruelty to animals act) include such minor changes as alteration of diet etc. Thus disagreements over the statistics of animals involved in painful experiments is common.[32] A wider and more detailed knowledge of experimental procedures would be extremely advantageous for two reasons: (a) To give those not involved in research an *accurate* picture of laboratory practice; (b) To help those involved in animal research to be aware of their moral responsibility to justify their research.[29]

The irresponsibility of the media does not help here. Cases of scientists 'torturing' animals are exaggerated and emotionalism can often lead to entirely unfounded accusations and abuse directed at scientists, as Lord Halsbury's committee has reported.[33] The

occurrence of attacks on research establishments does not further the case for amending the present law,[34] but equally attitudes from those in science to the effect of "Leave us alone, you're all ignorant" also damages informed and rational discussion.

We would argue that society cannot be ambivalent in its attitudes where the demand for newer and safer drugs is pitted against the lobby to reduce the number of animals used in research. This 'consumerism' is taken to task by Shuster.[35] However, it should be recognized that there are criticisms of some aspects of current practice such as the LD50 test.[36] The Carpenter report referred to earlier puts it thus: "There should be legal control over the proliferation arising from commercial competition of products which require testing on animals."[19a]

Anti-Science Attitudes

The wider implications of the anti-vivisectionist lobby are also of interest to the Christian. It could be argued that along with disquiet in areas such as genetic engineering and the nuclear power arena, anti-vivisection is a symptom of a general anti-science feeling in society. There is a general distrust of scientists, particularly those engaged in areas of technology that affect man's environment and well-being directly. However, the scientific enterprise frew out of a liberating effect of Biblical theism in society [37,38,39] (*pace* Tonybee[40]) and thus the scientific method of studying God's world has no threats to man *as man* as is commonly feared. This fear stems from the misconception that man is only an accident in a hostile universe and that he is *only* an animal or a machine. There has been much written about the decline of modern science in the western world[18,41,42 &18a] and for the Christian, the anti-science feeling makes his task of communication all the more difficult. He is to affirm that man does have meaning in God's world through Christ's redemption and he is also to affirm that the Scientific enterprise, instead of threatening man, is a method of applying our minds constructively to subdue God's world (Gen. 1:26,28; Psalm 111: 10). This we can do responsibly and reverently provided we recognize that we live in a world that is contingent upon the Creator/Sustainer God described in the Bible.

In conclusion, from a biblical point of view, it seems clear that the Christian needs to think through and communicate the implications of the relationship between man and animals. Considering the controversial nature of the use of animals in research and food, there is surprisingly little written on this subject from a Christian perspective. The biblical concept of dominion *and* responsibility to the Creator-God gives as a way forward in this issue.

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ESSAY REVIEW

METAL BENDING AND DUALISM

Most writing on psychic matters is uncritical in the extreme. It soon becomes clear that the authors are not at all interested in evidence as such: all they do is to make dogmatic statements and parade them as fact or faith. Here, for example, is a quotation from a recent book on reincarnation: "Usually the two types (man, woman) of incarnation will alternate, the individual being a woman, if he has been a man last time and a man if he has been a woman last time."[1] (E.F. Capel, *Reincarnation within Christianity*, Temple Lodge, 1980). It matters not at all that others have said the opposite and that others again hold that more often than not the next incarnation will be in animal rather than human form — enough that a statement is made without a pretence of evidence save (in this case) that Rudolf Steiner made it before. No wonder that most educated people reject writings on psychic subjects as rubbish and get on with the business of living.

Is it possible to discuss such matters at the academic level achieved by science?

John Hasted, Professor of Physics at Birkbeck College, London, who has made many contributions to orthodox physics believes that it is. But he is very fully aware of the prejudices which may be aroused.

The conclusions he reaches in his latest book[2] are so surprising that, after glancing through it casually, one might imagine that members of the Magic Circle have been enjoying a field day at his expense. Do not the findings which he reports of themselves throw his results into question? One can only ask the sceptic to read this book carefully together, preferably, with accounts which have been published by the Society for Psychical Research, and by other bodies. Let us remember too that in this field of research, every single investigator who has been convinced of the paranormal has been subjected to a smear campaign. So determined are some writers to discredit the results obtained that they resort to making flagrantly untrue statements to discredit them. Joseph Hanlon, for example, asserted in the *New Scientist* that certain obvious precautions against fraud were not taken by Hasted when, in fact, they were.

Satanic?

Prejudice is not confined to scientists or academics. Many Christians faced with the facts recorded in this book may be

inclined to dismiss them on the assumption that if such things happen, they must be the work of the devil. As a Christian it seems to me that the devil easily enters the sphere of the paranormal but that he is just as dangerous when he enters the sphere of the normal — what can delight the heart of Screwtape more than the nuclear bomb? This is hardly a reason for *not* studying physical science. There are, of course, some areas of psychical research which, as Christians, we believe to be forbidden and sinful — attempts to talk to the dead (whether to the wicked dead, or to so-called 'saints', would appear to be immaterial) is a case in point. However, there is nothing in Hasted's work to suggest that he transgresses this boundary.

Hasted's book is concerned mainly with investigations of normal, or near normal, children aged 12 plus or minus, who pursue their studies and hobbies just like any other children born into academic families. In a typical experiment pieces of metal in which are embeded strain gauges are hung up well out of reach of a child who is busy with his hobby or study. Recordings are made automatically and sometimes video-recordings too.

A suggestion that the children might be vaguely aware of an alien personality which speaks to them, or enables them to bend metal, led to instant denials. Some of the children were too young and unsophisticated to feel surprise at what was happening. Sometimes it just felt as if an arm had quite naturally become long enough to touch objects which had been out of reach before. No cause for alarm!

> "It occurred to me" says Hasted that strain gauge signals were similar in many ways to the paranormal raps produced on table-tops and elsewhere by 'sitter groups' when a question is asked of a discarnate entity'... the answer is usually given paranormally by code in raps. During successful resistive strain gauge sessions, the metal-benders and I have occasionally asked questions in order to obtain answering signals but have been vouchsafed none." (p 156)

Or again, consider what metal bending, if it be genuine, involves or might involve if caused by malevolent spirits. In the presence of metal-bending children would it ever be safe to use a bicycle or car on the road, let alone allow such a child to fly in an aeroplane? In the home one would hardly expect clocks, telephones, electric or gas meters, radio or TV sets to function reliably. But in the cases of the children studied none of these sinister possibilities are realised — again suggesting that no devil is at work. Again, this is not to deny that mischievous or evil personalities do sometimes make use of the powers — there is in fact evidence for this among those who dabble with the occult, but not with the Hasted subjects.

It would seem, then, that such investigations cannot be dismissed as evil. But they are, as Hasted says, important. If genuine the effects could lead to disasters: especially in the air, or to explosions in chemical plants. Hasted urges that we need to know more of what happens and why, and especially if the phenomena can be controlled. In the days when little was known about physical science lightning also seemed an arbitrary phenomenon. No one knew what it was, or why the lightning struck one building rather than another. Nor did any one know how it could be controlled or the damage it caused minimized. Many thought that dark clouds were full of devils (see the old witchcraft books!) who hurled their sulphurous darts at men and had to be frightened off by the ringing of church bells. The introduction of the lightning conductor was of great importance and today the damage caused by lightning to aircraft is largely prevented by ensuring proper welding between metal parts in aeroplanes. What can we discover which may stop the potential danger of paranormal metal bending?

Fortunately industrialists are aware of the problem. Dr Charles Crussard is the chief scientist of the French non-ferrous metals Pechiney Company which made the alloys for Concorde and Mirage aeroplanes. With his firm's approval he has been encouraged to investigate paranormal metal bending, making available the extensive metallurgical facilities of the firm's laboratories.

Planning Research

In view of the silliness and inconsequential nature of so much that has been published on psychical matters, Hasted asks first what precautions should be kept in mind when an investigator starts work in this field. The points he mentions are:

First, when a person begins to realize that he possesses apparently supernatural powers, the temptation to make use of them for his own benefit will be immense. Sooner or later there will be an offer of an opening as a public entertainer, a magician perhaps, or a TV personality. But psychic powers are never under the complete control of those who possess them. At the critical moment, before camera or audiences they will often fail. Therefore, it is necessary for a showman to have tricks up his sleeve: he cannot just walk off the stage when people have paid good money to see him perform! Now a magician must practise day after day to perfect his tricks: he must learn the art of distracting attention, of hiding things up his sleeves and replacing objects in which change is supposed to have taken place. But expert trickery is difficult to detect. Even if an effect was supernormally produced, the very fact that the man investigated was a stage man will render suspect any conclusions which those who investigate the phenomena may reach.

The public, and with them the scientific world, will simply suspect that another professor has been fooled. Progress in the study of the paranormal will be at a standstill.

So the first requirement for a serious investigation of the supernormal is that stage men who claim supernormal powers shall not be the main subjects ofinvestigation.If they are, evidence of the existence of the supernormal must not be made to appear dependent on the results obtained with the co-operation of such people.

With this point in mind Hasted decided that children must be used. They are uncomplicated and unsophisticated; if they cheat, detection is easy. Often they and their families accept what is happening quite naturally. It seems like a kind of game and the interest of the parents draws the family together. The curiosity motive is encouraged and some even feel affection and joy at being so near to the wonders of nature. They are not paid for results, and they are discouraged from appearing on TV, or from thinking that they can make a career out of their unusual powers. As an incentive the production of artistic forms from strips of metal may suffice.

A second important point is that children being experimented upon must feel at home. Bring them to London into a sophisticated laboratory and they will be nervous and inhibited. So Hasted decided to visit them in their own homes with the co-operation of their parents. They sit as usual at the desk or table where they glue their aeroplanes together or do the home work which school teachers demand.

A third requirement is this. If we wish to know whether the course of nature is sometimes being altered paranormally, we need to investigate systems about which a great deal is known, rather than those of vast complexity about which we know little. It is better, then, to forget about visions, predictions, faith cures, alleged communications from the spirit world and so on. Both the body and the human mind are exceedingly complex and our understanding of them correspondingly limited.

What, then, should call for investigation first? Simple forms of crystalline matter, especially the metals, would seem to be the answer. The importance of metals to civilization (trains, ships, cars, aeroplanes) is enormous and vast expenditure both in money and brain power have been devoted to their investigation. The metallurgist knowns just how atoms are arranged in a metal and how the arrangements are altered as a result of temperature change, creep, metal failure and so on. Some years ago Uri Geller, the spoon bender, set the ball rolling, so to speak, by claiming to be able to make metals soft. To his credit, though he may have resorted to dishonesty on occasions, Geller pointed a way to scientific investigation of paranormal phenomena.

Lastly, many new alloys have been discovered in recent years which possess curious and unexpected properties about which children, or even magicians, are unlikely to know anything. These offer scope for research and can easily be used to make cheating virtually impossible.

Training and Control

In investigations of this kind, the first requirement is to find the children who are able and willing to produce the phenomena. But how can a boy be trained to bend metal paranormally?

Hasted has developed a feedback technique. Let us first consider this outside of the paranormal context.

We all possess muscles which, if only we knew how to use them, would enable us to wriggle our ears, or even to move one ear without the other. But only a few of us can do this. Suppose I wish to be trained to move my ears, how will a scientist teach me how to do it?

A technique was worked out many years ago.[3] Tiny electrodes are inserted in the muscle: when stimulated electrically the ears move. The stimulus is repeated over and over again, but is gradually made weaker. Meanwhile I try to imagine that I am helping or stopping the shocks. It assists to make some other near-by muscle contract at the same time, for example the skin of the forehead may be raised. In the end, so physiologists have found, a person will have learned to move his ears without the aid of electric shocks.

About two decades ago some interesting discoveries were made about the voluntary control of muscles — the muscles which we operate by will power.[4] It has long been known that those which move our hands, feet, limbs etc. are controlled by means of nerves which branch out from cells called neurones situated in the spinal cord. Just as a telephone cable consists of a large number of fine wires so a motor nerve consists of a bunch of fine fibres, called *axones* which, like the wires in the telephone cable, can carry a message independently of the others. The motor nerve which ends in a small muscle will contain perhaps a hundred or more axones. Now a muscle itself consists of a fat bundle of say 10,000 or more very fine muscle fibres. Near the end of an axone it branches and the branches end in a number (again say 100 or so) muscle fibres.

The fine wires in a telephone cable can carry many kinds of messages — dots and dashes, human speech, computor directions and so on. But this is not so with axones: they can only send one message. It tells a muscle fibre to contract and then, immediately after, to relax. An axone keeps on transmitting the same message but it can

do so at different rates — say 2 or 3 a second up to 50 or more a second: some axones work faster than others. And the axone messages are not all identical even though they tell muscle fibres to do the same thing: they seem to specialise in the exact form of the message they send. This is noticed in the different shapes of the voltage curves which they transmit.

Basmajian made exceedingly small electrodes — so small that they are not even felt by subjects — and pricked them into a small and little used muscle of the hand near the base of the thumb. He was able to pick up, magnify and record the voltage changes when his subjects tried to contract the muscle. Since his electrodes only entered single muscle fibres they responded only to messages reaching the muscle along individual axones. The magnified responses were both heard through a loudspeaker, and made visible on a TV tube. When several microelectrodes were pushed into the same muscle, they entered muscle fibres operated by different axones. So it became possible to recognize an axone by the sound and shape of the signals which it transmitted.

The picture we gain of muscle action is, then, something like this. If we want to flex a muscle slightly we use only a few of the axones to send signals: if we want to exert force we make a large number of the axones which send their messages work together. Thus, if an axone is activated it sends a stream of impulses to the muscle fibres with which it is connected. Each of the impulses lasts a few thousandths of a second and each muscle fibre sends them at a characteristic maximum rate — usually between three and 50 a second. Both the sounds and shapes of the impulses differ, making recognition of the activation of a particular axone possible.

Basmajian let his subjects see and listen to the signals coming from different microelectrodes. Soon they learnt the 'feel' when they brought one or other of the muscle fibres into play. In the end a subject would often be able, unerringly, to pick out particular fibres. He could call them up one by one and could even play tunes to order on the loudspeaker!

Consider what this means. There are more than 10,000 million cells in the brain. The main descending pathway from the cortex contains over half a million impulse conducting fibres some or all of which actuate the neurones in the spinal column. Yet in an instant of time the mind, by mere thought, can pick out the cell which will transmit a message to the descending column, it can send its message down the column, hit on the correct neurones, and apparently choose the correct axones in the nerve which leads to the muscle so as to call up a particular feeling connected with a particular sound heard through the ears and seen through the eyes. All this seems to suggest that the mind can operate directly upon exceedingly small particles of matter, on quite small groups of atoms. It is difficult

to conceive how this could happen if the mind acts only in conformity with the principles of physical science. There is something forward-looking and purposive in the whole operation.

We may now return to Hasted. He uses basically the same technique as Basmajian. A few yards away, and well out of reach, he hangs an object such as a key or a spoon. The objects are specially prepared and contain strain gauges which are electrically connected to recorders. A recorder, which the child can see, is adjusted to maximum sensitivity and the child watches the pen moving up and down in a random manner. Some of the movements of the pen are larger than others and the child is asked to see if he can 'help' the pen to move by just willing it to do so. Slowly the sensitivity is reduced and the random movements of the pen disappear, the line it draws on the recorder paper ceases to be wavy and becomes straight. But superimposed on the line there may be strongly marked ups and downs which are connected with real physical bending, sometimes too small to be visible but sometimes actually seen, of the metal object. This stage may be reached within an hour or so. Basmajian's subjects took a similar time to learn. After that the child settles down to his work or hobby but every now and again when he feels so inclined he suddenly tries to bend the metal and make the pen move, after which he immediately relaxes. The recorder can now be taken out of sight while the piece of metal remains hanging several yards away, still well out of reach.

The metal may vibrate rapidly or there may be little twitches just now and again showing that the strain gauge has been pulled or compressed. Or the effects may be greater, leaving a permanent bend. Each individual twitch lasts a few thousandths of a second, roughly the same time period found by Basmajian.

Since the signals coming from the gauges are electrical, a balanced circuit being used, stray potentials are a possible source of error. But this was ruled out by shielding. If a man-made fibre carpet was electrostatically charged by rubbing and then touched against a key, quite a large deflection might be obtained (corresponding to not more than 12 mV) but even this did not reach the considerably larger signal levels obtained during the experiments. When recorders were left running for 20 hours or so, the noise level corresponded only to about 0.5 mV.

Many of the experiments were conducted with the boy Nicholas Williams who has very little conscious control of the bendings which, with him, often take the form of violent oscillations. In later experiments two or even three, keys were hung separately well out of the reach of Nicholas and well separated from one another. It often happened that the oscillations of the key bending occurred with exact synchronicity in time. Even if Nicholas had been able to handle the keys, which he showed no desire to do, he could not possibly have

handled more than one at a time and could have made them bend rapidly in unison. "The signals can therefore be regarded with confidence as due to paranormal metal-bending pulses produced in the presence of the subject" says Hasted. The latchkeys were not touched during the experiments. In one session videotape recordings of a single sensor was made in synchronism with the chart record.

As he explained in a TV interview in 1981 Hasted, trained as a physicist, is extremely surprised at these results, for they prove the existence of forces quite outside what is known in science. Today he construes his job as one of investigating facts.

Hasted suggests that an oscillating "surface of action" must often exist over which "paranormal bending forces are potentially exerted on solid specimens placed in that surface". The surface appears to oscillate, to be flexible, to move around and often to rotate. When two sensors happen to be in the surface both are acutated. (This happened on over half the occasions during one series of experiments.) Any metal thrown through the surface bends — it even proved possible to obtain a stroboscopic photograph of a spoon bending in flight! Wires may be bent into complex shapes: spirals are common, but sometimes the shapes reveal obvious artistic merit! The surface moves vertically at speeds of up to a metre a second. There was no direct evidence that a surface originated with Nicholas Williams or any of the other children. Long strips of aluminium were sometimes bent very accurately into parabolas — quite a difficult achievement in the normal way!

Hasted records that a piece of metal once softened soon becomes hard again, as happens in spoon bending. One coin which had been softened clearly shows the imprint of a thumb. The 'force' is certainly not transmitted spherically outwards like a wave front, for this would reach a nearer sensor first. Bending of latchkeys was not stopped by screening, either non-metallic or metallic (eg. a key hung in a large brass vase) — in fact the effect was often increased, a key breaking when surrounded by brass. Synchronicity was however destroyed and bending was stopped by complete enclosure. It is therefore evident that electro-magnetic forces are not involved.

When strips of metal were used they were sometimes folded or twisted. The forces involved were often enormous. Professionally bonded flat pieces of aluminium alloy were obtained from Messrs. Ciba Giegy and presented to Nicholas and to other boys with similar 'powers'. Often the metal was bent, the resin bonds fracturing. But sometimes there was no sign of bending. The force required to fracture the bonds by straight pulling was over half a ton weight and "such forces could not be exerted physically by normal means". On 19 occasions the pieces were pulled apart without a sign of bending. These bond breaks were not observed directly, but they took place in Nicholas's house where no machinery for pulling test pieces was installed!

What ever the force or power which bends metal may be, it seems that it can act directly upon individual atoms, or else small zones containing relatively few atoms. In France, Jean-Pierre Girard (who unfortunately is a magician and not a child!) by mental concentration and gentle stroking has changed quite large areas of stainless steel in the austenite form to the martensite structure, a change which normally requires either violent vibration or heating to 600-700°C. Similarly regions of alpha brass were converted to beta brass. Such changes probably imply manipulation on the atomic scale.

Sometimes magnetic zones are produced in a metal which were not there before, and which could not have been produced by anyone who manipulated magnets from the outside. New subsidiary magnetic poles may be formed in spoons, an effect which cannot be produced by bending. When metal is fractured paranormally, the appearance of the fracture is often strange. Very thin platinum wires were broken and microscopic examination gave the impression that the metal had melted; yet in none of the experiments in which temperature was measured was there a change of temperature of more than a fifth of a degree. New dislocations in the atomic structure of metals is not uncommon. In regions of grain boundaries atoms are rearranged.

What possible interpretations can be given to results of this kind in terms of orthodox science? Firstly the force or quasi-force is in no way suggestive of a wave. Two main effects on metals can be distinguished. If there is disturbance at the grain boundaries in a metal, the metal becomes soft, but it nearly always hardens later. If, on the other hand, new dislocations (loop dislocations) are formed, the metal becomes harder. It is important to remember that the results obtained with metal leave permanent imprints. They cannot just be dismissed by asserting that X was a careless experimenter and was fooled by a trick. The point is that results are later available for all to see, and expert metallurgists to study: in many cases experts simply do not know how they could have been produced in laboratory or factory.

Towards the end of the book Professor Hasted makes a noble attempt to puzzle out whether some of the results could perhaps be brought into line with some of the strange ideas about nature which mathematical physicists have thought up in recent years — tunnelling in quantum theory and the notion of Hilbert space, for example. In the end he admits defeat. It seems clear that there are forces and activities in nature which are quite outside the thinking of current science, or even an imaginary science of the future.

The use of modern technological products now offers new ways to avoid fraud. One metal, a steel, breaks if it is stretched by 20%: therefore when a rod of the metal is subjected to a sharp bend

it must crack on the surface where the strain is greater than this. But with paranormal bending there is often no cracking. The nitinols (alloys containing nickel and titanium) have a 'memory'. If we take a piece of nitinol wire we can bend it into a desired shape above a certain temperature. If we now cool it and bend it into another shape it still retains a 'memory' of its shape when it was hot and bounces back on heating. One half of the children tested were able to destroy the memory in the pieces of nitinol given to them. A rod of a bismuth-tin-cadmium alloy feels soft. It can be bent (by creep) but only very very slowly, the process taking hours. Try to bend it quickly and it snaps immediately. But Hasted's children can bend a rod of the alloy through a large angle within minutes. In France Jean Pierre Girard bends pieces of metal which are completely sealed in pyrex tubes. When strain gauges are completely enclosed in metal it is often found that the metal stretches or contracts *inside* a block of metal but not at all on the outside which is unaffected, and this although there is no temperature change. The forces, too, operate in ways quite outside the domain of physics: despite Newton's laws reaction and action and reaction are no longer equal and opposite!

Usually thick pieces of metal are not bent. But they are hardened locally. Examination using an electron microscope shows that the number of dislocations is vastly increased. In one specimen studied it would have taken a crushing weight of 5 tons to produce the measured increase in hardness, but the strains measured were quite incompatible with such a treatment.

As for repeatability, Hasted finds that results are at least as repeatable as in many branches of physical science. Moreover they have been confirmed in other countries, notably France and Japan. At the time of writing he says that ten groups of scientists were working in the area, all confirming many of the findings. What more do sceptics want?

Conclusion

Such are the facts. What conclusions may we draw? Firstly, that it is difficult to avoid mind-matter dualism. "In the dualistis approach which we favour" writes Hasted (p.248) "a mind is capable of operating according to its own laws, without these being determined mechanically by the laws of physics: only the interface must conform to physical laws".

Secondly, it seems natural to conclude that we are normally dealing with a natural power of the human mind. Just as we are potentially endowed with the ability to move our ears independently, or to select and bring individual axone fibres of a nerve into action, so we might look upon metal bending (and other cases of

action at a distance) as potentially within the abilities of all men, even though they are exceedingly rare. (They may not however be as rare as we imagine. A screening of a thousand English adults by Julian Isaacs for small strain gauge effects suggested that one to two per cent possess the ability.) Though these powers are doubtless sometimes used to harm, and demonic personalities may occasionally be involved, there seems to be no reason to think of them as intrinsically evil in nature. They form no part of the occult arts — such as divining or seeking to communicate with the dead — which are condemned so emphatically in the Bible.

Basmajian suggested that there may sometimes be a direct action of the mind upon neurones in the spinal column. It is tempting to wonder if mind can thread its way among atoms to accomplish its desires. If so, need its activities always be confined to what it can find inside the skull (or skull plus spinal cord)? Do not Hasted's results suggest that it can sometimes reach further afield, influencing atoms in metals which are physically separate from the human frame? To the writer at least it seems as if the only objection to such a view is an unreasoned prejudice against mind-matter dualism.

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REVIEWS

D.S. Russell. *Daniel: The Daily Study Bible*, Saint Andrew Press, Edinburgh, £2.95

The three schools of thought about Daniel may be recognised by their explanation of the little horns in chapter 7 and 8. The Futurist, following the early church fathers, applies them both to a future Antichrist. The Historicist finds their fulfilment in the Papacy and the Moslem Caliphs, while the Preterist thinks both denote Antiochus Epiphanes, king of Syria, 175-164 BC. It is this last theory that is expounded by D.S. Russell.

It follows from this supposition that the last of the four world empires foreseen in Daniel 2 and 7 must have been that of Greece, out of which arose the Seleucid kingdom of Antiochus. So instead of the sequence Babylon, Medo-Persia, Greece and Rome, the writer of Daniel is supposed to have believed in an empire of the Medes, making the sequence Babylon, Media, Persia and Greece. But the Medes were conquered by Cyrus ten years before Babylon fell, so the Book cannot have been written in the sixth century BC, but is a piece of propaganda written in 167 BC to give hope to the Jews who were being persecuted under Antiochus. Thus all the main prophecies end with the salvation of God's people, the downfall of their enemies, and the establishment of the kingdom of God. Since this failed to happen when it was expected in the second century BC, the prophecies would appear to be false, and it is surprising that the Book survived at all, let alone that it was accepted by the Jews as Holy Scripture.

Russell provides no clear explanation of Daniel's symbolic descriptions of the four empires. They are, he says, "quite obscure and should not be unduly pressed". The third beast like a leopard with four wings and four heads, may, he says, "represent the speed of Persia's conquest", but in fact Xerxes took over four years to launch his attack on Greece. It describes better the speed of the Greek conquests under Alexander the Great. As for the ten horns, it is supposed that they represent the Seleucid kings who succeeded Alexander, but any Jew would know there were only seven of these before Antiochus Epiphanes. Regarding the three horns that were uprooted by the little horn after it had arisen, these are said to be "the three others who had laid claim to the throne" before Antiochus. If they did no more than lay claim to the throne then, whoever they were, they were not kings, and could not properly be counted among the ten kings.

The exploits of the little horn in chapter 8 do not correspond with those of Antiochus. The horn is said to grow exceedingly "toward the south, toward the east, and toward the glorious land." Russell says this refers to Antiochus' invasion of Egypt, Parthia and Palestine, but the sequence is wrong — he invaded Parthia after Palestine. The sequence is, however, true of Mahomet, to whom the prophecy more probably applies.

The Seventy Weeks of Daniel 9 are correctly taken as 490 years. The Bible says the period began with "the going forth of the word to restore and build Jerusalem," but Russell reckons it from the fall of Jerusalem in 587 BC, at which time nothing was said about Jerusalem being rebuilt. Moreover 490 years from 587 comes to 97 BC, over sixty years after the time of Antiochus. This discrepancy he finds not surprising "when we bear in mind the dearth of historical evidence during this time" (p.189). On the contrary, the Jews' religious calendar of sabbatic and jubilee years would immediately have shown it up. No Jewish writer could have made such an error, nor would the Jewish authorities recognise as canonical a Book that made such a blunder. Far simpler is the historical fact that from the mission of Ezra in 458 BC (Ezra 7:7) to the Crucifixion in AD 33 is 490 years exactly.

All agree that Daniel 11:1-20 gives an accurate summary of history from Cyrus to Antiochus Epiphanes, and that verses 21-30 apply to the latter king. Preterists believe that verses 31-35 also apply to Antiochus, thus placing the abomination of desolation in the second century BC, whereas Christ regarded it as future in His day (Matt. 24:15). It is true that the heathen altar set up by Antiochus is called the "abomination of desolation" in 1 Maccabees 1:54, but that was only the author's opinion based on his understanding of Daniel's prophecy with which he was well acquainted (1 Mac. 2:59-60). Russell agrees (p.191) that this expression could just as well refer to the setting up of the Roman standards in the Temple in AD 70.

The "Wilful King" described in verses 36-39 is said to "give no heed to the gods of his fathers." This could not apply to Antiochus Epiphanes who excelled in honouring the Greek gods, particularly Olympian Zeus to whom he had the sanctuaries at Jerusalem and Gerizim dedicated (2 Mac. 6:2). It is incredible that any Jew, with this evidence before his eyes, could suggest that Antiochus failed to regard the gods of his fathers. Verses 40-45 predict an invasion of Egypt, but Antiochus never invaded Egypt again, so at last the Preterists admit that this was a false prophecy, meant only to give the Jews the hope that Antiochus would soon "come to his end with none to help him" (v.45).

The views expressed by Dr Russell are taught in many theological

colleges, where students have to accept them. No wonder the Bible has fallen into disrepute!

W.E. FILMER

John C.L. Gibson, *The Daily Study Bible: Genesis, vol 1*, Saint Andrew Press, Edinburgh, 214pp, PB, £2.95

This volume covers Genesis, chapters 1 to 11: two further volumes on Genesis are due to follow later. John Gibson is Reader in Hebrew and Semitic Languages in the University of Edinburgh; he is also the General Editor of this recently launched *Daily Study Bible*. In a general Preface he says "I can assure those who use these commentaries that they are in the hands of competent teachers who know what is of real consequence in their subject and are able to present it in a form that will appeal to the general public." Regrettably, not all will endorse this assessment.

The text of Genesis chs 1-11 is here dealt with in some detail and there are many helpful comments. But whether the overall effect of a book such as this will be good or bad is another matter. Gibson takes the view that early Genesis is a collection of fairy stories "composed to entertain and instruct ordinary folk" by the imaginary authors J,E and P. He tells us that "modern scholarship" assigns chapter 1 to P (p.51) but seems to forget that the hypothesis is more than a century old. (Imagine a scientist referring to a theory a century-old as the result of modern scholarship! In the inadequate bibliography he refers to books by U. Cassuto and D. Kidner but does not tell his readers that both reject this hypothesis.)

There is no reference to P.J. Wiseman who held that Genesis was originally written on tablets, nor of course to the confirmation of Wiseman's views by the tablets discovered at Ebla where the colophons (equivalent to chapter headings) are found at the end of the tablets just as Wiseman suggested for the structure of Genesis.

Gibson's views, of course, land him in difficulties of which, however, he seems unaware. He is greatly puzzled (p.77) for instance as to why P, a priest in the post-exilic era, speaks of man as made in the image of God whereas elsewhere in the OT such language is always associated with idolatry. The natural conclusion that Gen.1 was written before the rest of the OT, (in which the 'in-the-image-of-God' language became associated with idolatry) is not even hinted at.

Of course "there never was a garden of Eden" (p.100). It is a garden of the mind and, to illustrate this theme, we are regaled

with the story of Cinderella. The ancient Hebrews (even as late as J, E and P?) believed in a flat earth — an imaginary diagram of which is duly supplied (did they? See this JOURNAL 107, 155!). The first chapter of Genesis tells us nothing about the early earth or heaven which a Hebrew would not have known already (p.56: sheer nonsense, I am afraid). Stories like that of the Lord God walking in the garden, of the talking snake and the eating of the forbidden fruit have, of course, no basis in fact. And so on.

What is likely to be the effect of teaching of this kind on the young of today? Of course nice moral points emerge from time to time — parts of the book are helpful if read eclectically — but why do we need to look to Genesis for such enlightenment? Would not other fairy stories do instead? Could not the theologians of our universities concoct better stories bringing out the same good points but omitting the errors and ambiguities of Genesis? Gibson never faces the fact that if the Bible is to be thought worthy of daily study, we must accept it as a revelation from God. And if in any sense God, the God who is Creator of the universe,wrote it, then might He not easily have slipped in occasional reference to scientific facts beyond the ken of man (even though we may fully agree that the Bible is not a scientific textbook)?

As a scientist I am appalled by the author's dogmatism. How can he assert so dogmatically that Genesis tells us nothing about science not known to ancient Hebrews? He is greatly puzzled as to why things should have started off in chaos: he would have expected P to say that God would have made things perfect from the start. A little knowledge of geophysics would have removed the mystery, but the author shows no flicker of interest in any scientific findings which might have suggested to him that, after all, God did sometimes talk a bit above the heads (scientifically speaking) of those to whom He spoke. Why need he dogmatically reject such a possibility? How can he be so sure that there never was a Garden of Eden? What right has he to say that only foolish people go hunting for Noah's Ark? (He does not even mention the genetic evidence that mankind has passed through a "bottleneck" in which the population of mankind was reduced to a few individuals within the past ten thousand years or so. See this JOURNAL 100, 107) Why must he assert that Paul's argument in Gal. 3:16 is "simply wrong" when all he means is that Dr Gibson does not understand it?

It is a pity that the reputable St Andrew Press have embarked on this series. If this and the book on Daniel reviewed by Mr. Filmer are representative of what is to follow, let us hope that sales will not warrant the continuance of the project.

REDC

David Lyon, *Karl Marx: a Christian Appreciation of his Life and Thought*, Lion Publishing, 1979, 192 pp, £1.50.

It is a brave person who dares to add yet another contribution to the fund of criticism and exegesis of Karl Marx. This has been accumulating for a century and even the specialist reader is hard put to absorb each new volume of criticism and interpretation. There is an almost continuous flow of partisan commentaries linked with identifiable political tendencies or movements and there are works in the 'history of ideas' tradition which stand more aloof. Far fewer in number are those writings which aim for what might be called a 'sympathetic understanding' without abandoning their open commitment to an alternative world view. Not surprisingly, it is this latter group (which includes a handful of Christian authors like Jean-Yves Calvez and Helmut Gollwitzer) which has provided some of the most rounded and intelligent discussions of Marx' contribution to social, political and economic thought.

David Lyon is clearly aspirant to this last category of 'marxologists'. He has written with an eye to the widest possible audience but he makes it clear from the outset that he is writing an appreciation, a 'Christian commentary on the development of Marx's thought'. He steers a careful course between the abstract confrontation of 'Marxist' and 'Christian' world-views on the one hand and minutely detailed exegesis on the other, by adopting a biographical approach. This gives the book a definite shape and serves to anchor extremely abstract ideas in the everyday life of Marx's household and the endemic problems of society in nineteenth century Europe. The reader will find much here that illuminates the life and mind of Marx, enlivened with fascinating biographical details. We learn for instance, that Marx suffered from boils when he was writing *Capital* and he was sometimes heard to wish that they might have been given to a Christian, who might have 'turned them to good account'.

The feature which makes this book distinctive is the way in which it first allows the facts of Marx's life and thought to speak for themselves and then places them under Christian scrutiny. Unlike the fuller biographies and histories the framework is explicitly evaluative but it does not preclude the possibility that Marx may have expressed or discovered for the first time truths about the human condition. For instance, in his diagnosis of 'alienation', Marx

> penetratingly discerned that a certain relationship — to property — was the cause of problems. But instead of seeing the *distortion* of property relations as the basic difficulty, he thought that property itself was wrong. .... Marx had mistaken the symptom for the disease. The disease is not property as such but its misuse and misappropriation. And that has even deeper roots. (pp. 60-61).

Lyon's argument often has this form: Marx gives us a perceptive analysis of social forms (property, capital-labour relations, class, ideology, etc.) and their pathological results in capitalist societies but this analysis falls badly short because he cannot provide an effective remedy. He is never able to transcend the adversities of his own existence, let alone the adversities of the industrial working class, because his rebellion against God merely repeats the original sin.

But Lyon is saying that we should take seriously Marx's claim to be a social thinker. What is the basis for this? Lyon makes much of what he perceives to be a twin impulse in all of Marx's activities: the intellectual impulse to describe and explain, accurately and scientifically, society and the practical political impulse to change it. The first of these apparently leads to more or less reliable knowledge about socio-structural questions and the workings of the capitalist system, the second to rather shaky policy conclusions. If this is so, and there is a much deeper divide between Marx's theory and practice than he himself would have admitted, we have the makings of a positive critique and a positive approach to marxism as social science. However, Lyon seems to draw back from these questions of epistemology and methodology and expands instead on subsequent movements and ideas which have carried Marx's name. These are important issues but they divert attention away from the man and his ideas, causing this reader some disappointment at the failure to develop the core problem of how Christians should approach Marx. A proper appreciation of Leninism, Maoism, Castroism, the varieties, aberrations and excesses of 'socialism' for which Marx can hardly be held responsible, deserves separate treatment.

The conclusion we are offered is that while Marx challenges Christians to greater commitment, consistency and reflection, his radical humanism prohibits any convergence between or synthesis of the two world-views. However, could it not be that some parts of Marx's thought are more interesting and enduring than the whole and allow Christians to make positive selective use of his conceptual categories, hypotheses, analytical methods and models of explanation? It is not Marx's world-view as such but his political economy and his theory of social change, for example, which gives such a strong stimulus to social analysis, both positively and negatively. Until more comprehensive and consistent theories of society are developed we are obliged to use at least some of Marx's work as a springboard to something better. David Lyon shows us that in this respect at least, Christians are in Marx's debt, especially the social scientists among them.

Marx can be likened to a Charles Darwin in the realm of the social. We might do well to apply some lessons from that earlier confrontation between religious and scientific thought.

HOWARD H. DAVIS

New Bible Dictionary, Second Edition, IVP, Leicester, 1326 pp, £17.50

The text of this beautifully produced one-volume work is the same as that in the 3-volume *Illustrated New Bible Dictionary* which appeared in 1980 (about £35). The first edition appeared in 1961 and has been widely used ever since. The format, appearance and even the number of pages (though the print is smaller) remain much the same as in 1961 and some of the articles remain unchanged, though additional references have often been added. As before the work is especially strong on archaeology: on the scientific side it is rather weak. J.D. Douglas remains the organising editor, with N. Hillyer as Revision Editor and three of the original consultant editors (F.F. Bruce, J.J. Packer and D.J. Wiseman) remain, assisted now by D. Guthrie and A.R. Millard. The work involved in preparing this edition, especially that in illustrating the 3-volume work must have been immense. For what they are, both works represent wonderful value for money: they may be confidently recommended.

REDC

I. Howard Marshall, *The Acts of the Apostles. An Introduction and Commentary (Tyndale New Testament Commentaries)*, Inter-Varsity Press, Leicester, 1980, 427 pp., HB £5.95, PB £5.50

The original Tyndale Commentary on Acts was the work of the distinguished New Zealand classical scholar, Professor E.M. Blaiklock. Two special factors have weighed in the production of this replacement volume, (1) that Professor Blaiklock set himself the limited task of writing a "historical" commentary, but trends in scholarship since its publication in 1959 have brought theology increasingly into the focus of attention, (2) that recent German scholarship in the tradition of Dibelius and Conzelmann has culminated in the massive commentary of Ernst Haenchen, which has worked out the new look in Acts study in a systematic historical scepticism. Thus the older Tyndale Commentary has become dated historically as well as theologically by a development which has not yet been systematically evaluated.

This new commentary is longer and more academic than most in its series, and two and a half times the length of Blaiklock's. It goes without saying that like all Professor Marshall's work it is scholarship of the highest quality. It must be said forcibly that a commentary on Acts would not now be satisfactory unless it came to terms with the issues which have made a storm-centre of the book. In the event the Tyndale series is singularly served in this masterly response to the special need. Doubtless this is not a model for its future revisions and replacements, but in the long run a series is only as good as its components, and here is a commentary which reflects the highest credit on the publishers and their series. But the layman should not be deterred. Marshall writes clearly without unnecessary technicality, and it is good for the reader to be reasonably stretched where real issues of belief may be at stake. There is (and must be) more discussion of critical issues and secondary literature than usual.

There is still often a gap between the concerns of the scholar and of the ordinary reader. Yet the problems of the Lucan writings are of basic significance for anyone who seeks to give a reason for the faith that is in him. Luke and Acts together are focal documents, widely agreed to be the double work of a single writer, and so linking Jesus with Paul, the Synoptic Gospels with the Epistles. It is still important to know whether we can trust the historicity of the narrative framework of Acts, where sharply polarised opinions are on offer. Is this essentially the work of a companion of Paul, who was an eyewitness of some latter parts of his story, or of a sub-apostolic writer who sacrificed accuracy to theological point?

In fact history and theological purpose may go together, as Marshall repeatedly shows. Even a very conscientiously factual author writes with hindsight, and his facts are selected, digested and interpreted. It is perfectly right for a commentator to look at the process of editorial digestion, even if his results can be no more than tentative. Professor Marshall is often very cautious, content to clear the ground for the mere viability of a more traditional view, while leaving many questions open. I could wish on occasion that he would commit himself further. The significance of Acts for Christian origins is greater than he ever seems to say explicitly. Of course authorship by a companion of Paul (which he favours) does not simplistically guarantee historicity; it does affect the framing of the questions about Acts and the whole complex of New Testament documents with thich it links. It does not guarantee that Luke mastered Paul's thought or was concerned to expound it in the terms modern interpreters require of him in retrospect. But the eyewitness (if such he was) can still give what others cannot: his perspective may be partial, but it is also indispensable.

Marshall's views of the critical problems of Acts are stated relatively briefly in the introduction. The purpose of Acts is not to be categorised simplistically. It is more than either evangelistic or apologetic. The double work, and Acts in particular, should be seen in the light of Luke's own words in his preface: it is intended 'to strengthen faith and give assurance that its foundation is firm' (p.21). On the date and provenance of the book Marshall is very diffident, content to repeat the suggestion that the completed work may have been issued towards AD 70, and defending the viability of this option on the ground that the case for placing the Synoptics later is not conclusive. The discrimination of sources in Acts is notoriously problematic. Something at least of Luke's method can be seen from the Third Gospel, where his source material is partly preserved or inferrable. The stylistic uniformity of Acts should not blind us to his use of sources here also. For the earlier chapters he is likely to have obtained information from the churches and possibly from some of the chief actors. The speeches are of special interest. They are often treated as a prime quarry for finding Luke's editorial theology, but Marshall argues that they have primitive elements, and are probably based on tradition, abbreviated and adapted to Lucan style.

Marshall keeps a very low profile on many of these issues, some of them acutely controversial and of far-reaching implication. No doubt the strength of a commentary is in its detailed treatment of the text, and here he excels, working slowly towards the larger picture. There is more of the exegetical spade-work than the strong conclusions for which the time may not be ripe. On some of the difficult issues, like the speeches and the miracles, he tends to be less than explicit, sometimes where the reader may be looking for clearer guidance. Yet this frequent reserve stands with the running debate with Haenchen and Conzelmann over details throughout the book. It is easy to categorise this as a predictable reaction: it is often rather an attempt to redress the balance of argument on questions which have been no less predictably weighted in the opposite direction. It is of course a pity that a commentary needs to be an *argumentum ad homines*, but it is very proper to be worried by some of their methods, where for instance they want to eat their cake and have it (e.g. pp.133, 235). There is actually I think ground for a more radical criticism of Haenchen's arbitrary treatment of historical evidence out of its representative context, where Marshall himself is often content to rest his historical studies on the appraisal of secondary sources.

The volume is well produced and convenient to read and handle. There is a short but well chosen bibliography, but no index. This conforms to the pattern of the series, but the lack is regrettable in a work of this special calibre: an index of subjects, and perhaps of authors, would be invaluable.

The small difference in price makes the hard-back a specially good buy for a book which merits the hard wear of constant use and reference.

COLIN J. HEMER

[For a fascinating account of the construction of old-time ships and the need to undergird them as described in Acts see J.E. Gordon, *The New Science of Strong Materials*, 1968 (revised edition, Pelican, 1975) — Ed.]

E.W. Fudge, *The Fire that Consumes*, Verdict Publications, PO Box 1311, Fallbrook, California, 92028, USA, 1982, 500 pp., 17.50 dollars.

The doctrine of the unending ("eternal") punishment of the wicked has probably done more to prevent non-Christians becoming Christians than any other doctrine held by Christians. It was largely responsible for the agnosticism of Charles Darwin, the centenary of whose death has recently been celebrated. The reaction of most Christians today is to ignore the doctrine — it is rarely preached and as G.G. Coulton rightly pointed out, the modern RC has little in common with the medieval theologian who pictured not only the wicked, but even unbaptised babies who had died young, but still guilty of original sin, as in a state of torture in the fires of hell, or limbum which according to Aquinas is a department of hell. Father J. Furniss's book *The Sight of Hell* (Dublin 1850), judged suitable reading for children until well into this century, describes the exquisite tortures of naughty and unbaptised children in horrendous detail; the *Catholic Enclycopaedia* of the day boasted that more than 4,000,000 copies had been circulated. One naughty child is thus described: "See! It is a pitiful sight. The little child is in this red-hot oven. Hear how it screams to come out. It beats its head against the roof of the oven. It stamps its little feet on the floor of the oven. You can see on the face of this little child what you see on the faces of all in Hell — despair, desperate and horrible!" (See G.G. Coulton, *Infant Perdition in the Middle Ages*, 1922.)

Protestants, too, have often held the traditional view, though often not without intense pain. But until recently it has been almost impossible to pursuade evangelical Christians to look at the Bible once more to see if it really teaches what it is supposed to teach. When H.E. Guillebaud, an accepted writer for the Inter-Varsity Fellowship, changed his mind as a result of a sermon he heard preached in St. Paul's Church, Cambridge: he wrote a short book on the subject but for many years no publisher could be found. "Liberals" and "modernists" had denied the doctrine which proved enought to frighten off evangelicals!

Fudge's scholarly book relies only on Biblical teaching: it examines the subject anew. The book has been warmly commended by such writers as F.F. Bruce, C.H. Pinnock and J.W. Wenham. It is well written and persuasive, coming to the conclusion that the traditional view is based much more on Greek mythology than on the Bible. Of course it is true that the Bible teaches eternal punishment, but some passages make no sense at all unless we assume that in its biblical sense "eternal" means not "unending", but "once for all". Again, we are taught that God only is immortal and that saints put on immortality at the second coming of Jesus. One passage and one only seems to say that the devil will continue to suffer for ever, but this is not said of men. These at least are the conclusion to which Dr. Fudge comes: his book is worthy of careful study. It is beautifully printed, but the absence of an index is regrettable.

REDC

R.E.D. Clark, *God Beyond Nature*, Paternoster, 1982, 112 pp., £1.95.

It is good to see a new edition of this excellent book published originally in the U.S.A. in 1978 and reviewed in *FAITH AND THOUGHT*, 1978, 105, 132. It has been revised and updated (e.g. with fresh material from Hoyle, Lovelock, Lorenz, Hasted and Grassé). My immediate reaction has been to send it off to a young don who appears to be seeking God.

JOHN WENHAM

Michael Griffiths, *Shaking the Sleeping Beauty*, IVP, 1980, PB, 207 pp, £1.75

Michael Griffiths' latest book seeks to explore the issue of mission which he feels the church needs reawakening to. Therefore this book covers a wide area concerning missionary work but without weakening the main message – to stay alert for the coming Prince. D. McGavran's church growth ideas are assessed in the light of recent criticism, and the whole area of culture is given a thorough study.

Social involvement of both the missionary and the local church are discussed with many examples from Michael Griffiths' own past. Other areas included in the debate are universalism and the nature and working of God's grace today. The book concludes with a challenge to work towards the perfection of the church before Christ returns, and the specific areas of racism, sexism, clericalism, and

denominationalism are highlighted as giving much cause for concern.

At the end of each chapter are suggestions for further reading and questions for individual and group discussion. These, together with an appendix of words used in the New Testament for the first missionary activities, make this book a valuable contribution to any dialogue on the church's mission within the world. In aiming for the theological student as well as the average Christian Mr. Griffiths has written a very readable and thought provoking book, which, thanks to the reasonable price, should be read, enjoyed, and discussed by many.

GRAHAM DOVE

E.A. Martens, *Plot and Purpose in the Old Testament* (Leicester: IVP, 1981) pp. 271, £4.95.

Dr. Martens, Professor of Old Testament at Fresno Seminary in California, offers here a potted theology of the Old Testament. This is summarised in four themes: God's plan of salvation, covenant community, knowledge of Himself, and the land of Canaan. It is the working out of these divine purposes that constitute the plot of the Old Testament.

After two opening chapters the book divides into three main sections covering (a) the Pentateuch, (b) the former prophets and writings and (c) the prophets. In each section an attempt is made to show the importance of salvation, covenant, and knowledge of God, and the land.

This is a valiant attempt to understand the Old Testament theologically and to demonstrate its continuing interest and relevance to the Christian. Nevertheless it does not always succeed: this is not because it adopts some unconventional views, such as a non-substitionary view of sacrifice, but because its style is somewhat heavy for lay readership.

G.J. WENHAM
Department of Semitic Studies,
Queen's University of Belfast

John R.W. Stott, *I believe in Preaching*, Hodder & Stroughton 1982, 351 pp. £5.95

This must be the most comprehensive study of the subject of preaching that has been published for a very long time. The author is a recognised authority on the subject both on the basis of his own personal ministry at All Souls', Langham Place, and also on account

of his theological acumen. To John Stott Biblical preaching is really the only kind worthy of a Christian minister though at the same time he allows that evangelical preachers should not bar social and political issues from the pulpit. This he admits is a point of view to which he himself has arrived only after some years. His argument, however, for expounding Biblical principles in controversial matters and urging Christians to develop 'a Christian mind' cannot be faulted. But it needs courage for too many occupants of the pews will disagree and no preacher wants to stir up opposition in his own congregation if he can avoid it.

This book is full of theological teaching and practical advice about the art of preaching. It is when we come to the latter that we feel the author's experience of almost always preaching to large attendances, either in his own famous church or at the many meetings he has been invited to address all over the world, needs balancing by the views of someone more accustomed to smaller, less well educated congregations. Surely the technique of addressing a homely Cotswold or Cambridgeshire village congregation of twenty or thirty is vastly different from speaking in a place where the preacher can hardly see the expressions of those at the back. But apart from this weakness, and also the author's questionable suggestion that too many pressurised preachers who have difficulty in finding time for study owe it to sheer laziness, this is an invaluable treatise on a subject much written about but seldom better than in this book.

H. EVAN HOPKINS

Derek Kidner, *Love to the Loveless*: The story and message of Hosea. Inter-Varisty Press, 1981, 142 pp. PB, £3.25

This commentary in the series *The Bible speaks today* keeps up the high standard of the volumes that have already appeared. Hosea is not an easy book to follow through, since after the opening three chapters it is broken into sections that do not follow on naturally from one another. Hence there is special value in a commentary like this one, which links many of the sections to the theme of chapters 1-3. Moreover the student is helped by a detailed summary of the subjects of the book in a table at the end.

I use the term 'student' in the sense of a serious reader of the Bible, but not in the sense of the theological student who needs a commentary for examinations. At the same time even the simple student will be helped by occasional footnotes that explain some point of difficulty in the Hebrew text. It is good to see that Mr. Kidner gives a good reason for not following many commentaries and translations in their refusal to allow Paul's application of Hos. 13:14 to his theme in 1 Cor.15:55.

The commentary keeps us in the atmosphere of the New Testament. While finding the beginnings of a literal application to the Northern Kingdom of Israel in their link with Judah after their country had been devastated, references in the New Testament bring ourselves and other Gentiles into the stream of Hosea's warnings and promises, so that we are not left sitting in contemplation of bare history.

J. STAFFORD WRIGHT

Bernard Lovell, *In the Centre of Immensities*, Granada Pub., Ltd., 1980, PB, 174 pp, £1.50.

Sir Bernard Lovell, Director of the Radio Astronomy Laboratories at Jodrell Bank, and author of this small but fascinating book, seeks to contribute part of an answer to the question posed by Carlyle 150 years ago — What is Man? — standing as he does in the 'centre of Immensities' of time and space; in the 'conflux of Eternities'.

We are first reminded of the development in understanding of the origin of the universe and of the Solar system and are led on to modern speculations on the possible origin in space of molecules needed as precursors for organic evolution. After highlighting the delicate atmospheric and gravitational balance that a planet needs to develop and sustain life, the author points out that, at the initial formation of the universe — time zero — if the rate of expansion of the 'big bang' one second after time zero had been reduced by one part in a thousand billion, the universe would have collapsed after a few million years — too short for organic evolution to have occurred. Out of all possible universes 'the only one which can exist, in the sense that it can be known, is simply the one which satisfies the narrow conditions necessary for the development of intelligent life'.

The formation of helium in the early universe is also crucial to our existence today. Most helium was formed during the first 100 seconds, from neutrons and protons leading to deuterons then to helium. But why were not all the protons used up in this way? If little hydrogen had in fact remained, the result would have been catastrophic; thermonuclear processes in the stars, including our Sun, would have been explosive if deuterium were involved instead of hydrogen as at present (cf. the 'hydrogen' bomb, which uses deuterium). On the other hand, if nuclear reactions in the first 100 seconds had converted all the protons to helium, then no long-lived stars like the Sun could have been formed.

In the later part of the book the author contrasts man's immense advance in scientific knowledge with his lamentable lack of moral development. He has no answer to this dilemma. Nor, we

may add, is one likely to be found except through humble acceptance of God's declared purpose — to make us what He meant us to be.

D.A. BURGESS

A.E. Wilder-Smith, *The Creation of Life: a Cybernetic Approach to Evolution*, Master Books, San Diego, 1981, PB, 269 pp, £4.35

The main thrust of the book is that it is virtually impossible for information such as genetic coding to arise from random processes, or noise. The author is a chemist and Part I gives a useful review of the chemical complexity of living systems. He offers a serious critique of abiogenesis (life arising spontaneously from non-living matter), with special reference to the concept of 'biochemical predestination' as postulated by Kenyon and Steinman.

Part II reviews the field of cybernetics, where it appears that intelligence has been divorced from neuronal networks and allied to transistors and integrated circuits. Efforts are being made to separate consciousness and emotions from biological systems and make them also a function of semiconductor technology.

The author then argues that, since intelligence, consciousness and emotions may not be contingent upon a human brain, there is no reasons, *a priori*, for supposing they may not be associated with a Grand Designer of the universe.

Although somewhat repetitious, the book offers significant insights into the weaknesses of Neo-Darwinism and goes a considerable way in re-establishing the intellectual respectability of the Argument from Design.

My only cavil, and it is I think an important one, is at the equating of 'information' with negative entropy: see this JOURNAL, 108, pp. 10-12, and 104, pp. 84-87.

The book is well bound and produced. Only one misprint was observed — p.214 — 'conscious' for 'unconscious'. There is a useful glossary of the more technical terms used, a comprehensive index and a bibliography.

D.A. BURGESS

John Lewis, *The Uniqueness of Man*, Lawrence and Wishart, 1974, 197 pp., PB, £1.90

This is a book which attempts to redress the imbalance of the 'nothing but' syndrome common to much of modern science, or at least of

its popularisation. The author is especially critical of the reductionist views of Jacques Monod and Francis Crick and points out that it would be a mistake to regard the whole scientific world as committed to the philosophy of 'nothing but' The propagation of pseudo-science — that is, speculative reductionism — "can disintegrate rational understanding of nature and man by the inextricable confusion of fact and fiction". This is particularly dangerous at the present time, he ways, when there is need as perhaps never before to apply rational methods to the solution of social problems.

The reductionist views of J.Z. Young, Monod and Crick regarding the relationship of body and mind are contrasted with those of Steven Rose and T. Dobzhansky. There is continual emphasis on man's unique place in nature. The author accepts the orthodox biological picture of man as linked to the primates in an evolutionary sequence but gives a strong warning to beware of the tendency to represent us as 'nothing but' a kind of ape with a few extra tricks.

Then follows criticism of the view that our ancestors were beasts of prey with strongly aggressive tendencies. Rather the (slight) evidence suggests that, if anything, prehistoric man was more peaceful and co-operative than we are.

Although the author does not write as a Christian, he says (p.94) "for all practical purposes Man is a separate special creation". His distinctive speech, social structures and psychological traits run counter to the pseudo-scientific arguments that man is only a 'naked ape'. Dr. Lewis offers trenchant criticism of the behaviourism of the Skinner school. The reactions of pigeons are simple, mindless and measurable; subject man to the same method and human psychology becomes scientific. Consciousness, thinking, choosing and valuing must be ignored. Under the influence of behaviourism, psychology first lost its soul, then its mind, and finally lost consciousness.

How then does he see man? Not as created in the image of God but as a unique product of evolution; able now to control his own evolution, not by the slow processes of genetic change, but by the breakneck speed of social evolution, of the creation and developments of civilisation. Human nature is essentially that of social man, with a high premium on his ability to co-operate.

The author believes that we need to return to the doctrine of the Common Good, overshadowed since the 18th century by laissez-faire doctrines; sheer individualism has destroyed individuality. Behaviourists and those who would reduce man to the level of the animals have failed to grasp the necessity for shared responsibility and social objectives for the full development of self-consciousness.

This is not, he maintains, the good of 'society' — a non-entity — but the good of the individual, who is served and enriched by the fellowship of shared goals. To be fully ourselves we need others and they need us.

The author writes vigorously and with sincerity. Probably most Christians would agree with his perceptive analysis. Nevertheless, at the end of the book one is left somewhat bemused. Is it always true that when a person enters into the society of his fellows, he becomes part of a whole — larger, better than its part? Is an army 'better' than an individual soldier? In what sense is a gang of thugs 'better' than one of its members? Surely what matters is the purpose of the sharing; the nature of the goals. Gratuitous assumption that these will be 'good' is a naive reading of history.

D.A. BURGESS

Noel G. Coley, and Vance M.D. Hall, (Editors), *Darwin to Einstein: Primary Sources on Science and Belief*, Longman in assoc. with The Open University Press, 1980, PB, 338 pp., £5.95

Colin Chant and John Fauvel, (Editors), *Darwin to Einstein: Historical Studies on Science and Belief*, Longman in assoc. with The Open University Press, 1980, PB, 335 pp., £5.65

These companion volumes were compiled for students of the third level OU course A 381, Science and Belief: From Darwin to Einstein. Their purpose is to illustrate and discuss interactions between scientific ideas and metaphysical standpoints which arose during the century c.1850-1950.

The first book, "Primary Sources" (PS) offers a variety of case studies from the biological, human and physical sciences. There are selections from more than forty contemporary writers, from Agassiz to Wallace. Although some offerings are brief, they appear to be perceptively selected. The anthology is a fascinating collocation of richly diverse views and a unique and valuable introduction to some of the metaphysical bearings taken by natural philosophers which have affected — and effected — their work in science.

The book contains a comprehensive index of names and subjects; it is clearly printed and strongly bound. It represents exceptional value for money.

The associated volume, "Historical Studies" (HS) is an anthology of studies by present-day historians of science published between 1968 and 1980. These studies may obviously be read as a collection of informed views on Western belief structures over the last century or more. However, the editors point to another level on which the book may be used. Historians of science have their own patterns of belief, which may or may not influence their historical studies in a manner equivalent to that for scientists and *their* beliefs. The book is said to provide no answers, but to provide a range of approaches which will serve as primary sources for such an inquiry.

A wide range of perspectives is discussed, including evolution and theology in Victorian Britain, biology and nineteenth-century French politics, physicochemical analogies applied to American social science and developments in quantum physics in relation to Weimar Germany.

The format of HS is similar to that of PS but the name index is separate from the subject index. Once more, good value for money.

D.A. BURGESS

M.D. Stafleu, *Time and Again:- A Systematic Analysis of the Foundations of Physics*, Wedge Publishing Foundation 1980. Specialists only.

Time and Again is a study of the foundations of physics and the framework in which this is made is derived from Dooyeweerd's "Philosophy of the Cosmonic Idea". Clearly a working knowledge of this would be desirable, although the author claims that this is not strictly necessary and provides an outline of the essentials needed. The main part of the book is then devoted to a study of the history of physics and physical ideas from this viewpoint.

The author concludes from this that Time is not the unifying principle often claimed, but rather a diversifying one; that the laws of physics are not "merely convenient thought patterns" but the discoveries of "an historical endeavour" intended to open up creation by applying them to physical reality. Thus the claim is made that Time is "a lawful pattern of relation between things and events" and "physics, so far as its foundations is concerned is little more than time keeping".

This book predictably suffers from trying to do too much in handling these large themes in 237 pages – more space and time is needed to do them justice. The potted account of the philosophical

framework provided may be adequate, but the severe compression of this material makes a very stiff and rather intractable opening to the book. A large quantity of specialist vocabulary cloaks this section and mastery of this is clearly essential for those like me who are not conversant with Dooyeweerd's work.

This is a great pity because the book has undoubted merits and the later sections provide a discussion of the history of physics which is an admirable survey. The writing here is in a clearer style, free from the earlier dullness. A work for specialists then. Physicists would certainly enjoy this wide ranging journey from Euclidean geometry and number theory to Quantum Theory whilst not I think accepting all the conclusions drawn. I cannot speak for philosophers! An extensive bibiography is provided and reference to the source material would be very helpful in meeting the above criticisms.

G. BATTY
Dept. of Physics, Cambridgeshire
College of Arts and Technology

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Abbreviations. Asterisk (*) - the first page of an article; c - correspondence; d - contribution to a discussion; f - and pages following; r - review; rw - writer of a review.

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