

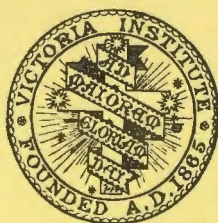
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A Journal devoted to the study of the inter-relation of the
Christian Revelation and modern research

News & Views

NEWTON'S ALCHEMY

B.J.T. Dobbs has written an interesting book describing Newton's work on alchemy (*The Foundations of Newton's Alchemy or 'The Hunting of the Green Lyon'*, C.U.P. 1975 £10.50).

Newton was firmly convinced of the truth of alchemy, indeed that "any body can be transformed into any other, of whatever kind". He devoted much time to experiment, wishing throughout his career to integrate alchemy with mechanical philosophy. Bodies are, he believed, combined together in a hierarchy of complexities; to effect transformation one has to break the hierarchies down somewhat. His work was highly 'classified' for with Boyle he believed that if a way of making gold cheaply was discovered its public disclosure would harm mankind irreparably — and they both thought they had come pretty near the great discovery!

The chemistry of what alchemists did is still obscure. Both Boyle and Newton dissolved gold in mercury, sealed it up and heated it for over 6 months. Both saw "very pretty vegetations [and] ... odd changes in colour". Crystalline alloys, perhaps? There were

no thermostats in those days, and only a coal or charcoal fire was available. It is not the kind of experiment we should like repeating today! It must have been very difficult in those days to tell just what was happening.

Another supposed change was afforded by Pewter cups containing antimony which were used to produce a useful emetic — wine was left in them over night. No one knew that traces of antimony dissolved instead the cups were believed to replenish their virtue by drawing in "irradiation and influence from above". Centuries later, when radium was discovered, a similar view was proposed. How difficult it is to nail down, for sure, the source of some new property. The debate continues today. Is the source of organic organization intrinsic in nature, or imposed (at least in origin) from outside the physical world?

NEWTON'S RELIGION

Of books about Sir Isaac Newton there is seemingly no end. Now that most of his MS writings have been collected in university libraries and colleges where they are accessible to scholars we are learning more about him and his opinions. D.T. Whiteside has been ploughing through the Cambridge Scientific and Mathematical material which is now appearing in large and impressive volumes. The religious material, over a million words of it, is mainly located in Jerusalem where F.E. Manuel (an ardent student of Newton, see his *Isaac Newton Historian*, this JOURNAL 93, 112 and *A Portrait of Isaac Newton* 1968) has been busily at work. The results are published in *The Religion of Isaac Newton* (Oxford 1974, 141pp) which contains many previously unpublished quotations from the manuscripts.

After this length of time we can hardly expect much that is new to emerge. Manuel repeats his belief (see his 1968 book) that Newton conceived of himself as all-but-divine, having been sent by God to reveal the truth to man, a kind of substitute Christ who taught men nearly all they would ever learn about science and mathematics. He admits, however, that Newton never *said* this, even in his most private writings, and one may doubt if the words he quotes ("one and the same am I throughout life in all the organs of the senses; one and the same is God always and everywhere" p.20) support such a view.

Newton turns out to have been more orthodox than many have imagined — certainly not a Deist or a Nineteenth century Unitarian. Hartill's view of him (see this JOURNAL, 78, 75) is upheld. On the Trinitarian question Newton believed implicitly in Scripture. He believed that Christians should use the *language* of scripture in

formulating their beliefs. It is easy to argue that Scripture *implies* this or that, but once these implications are given credal status, the way is opened for conflict and sectarianism.

We are commanded by the Apostle (1 Tim. 1:13) to *hold fast the form of sound words*. Contending for a language which was not handed down from the Prophets and Apostles is a breach of the command and they that break it are also guilty of the disturbances and schisms occasioned thereby. It is not enough to say that an article of faith may be deduced from Scripture. It must be expressed in the very form of sound words in which it was delivered by the Apostles. Otherwise there can be no lasting fixity nor peace of the Church catholic. For men are apt to vary, dispute, and run into partings about deductions. All the old Heresies lay in deductions; the true faith was in the text" (p.54).

The chief villain in the history of the Church was Athanasius but Newton censures Arius, too, for corrupting the plain language of Scripture with metaphysical subtlety: "Both of them perplexed the Church with metaphysical opinions and expressed their opinions in novel language not warranted by Scripture" (p.58).

As for Jesus, he is the Messiah, and the Son of God. After His resurrection He commenced to prepare heavenly mansions for the elect in some remote part of the Universe (p.61).

So firm is Newton's faith in the very words of Scripture that he uses Rev.20:10 to prove that heaven will be another planet, for day and night continue after this Earth has passed away (p.42).

All persecution for wrong theological opinions within the Church is wrong:-

"Lest they pluck up the Wheat with the Tares ..."
 the Church "may excommunicate but not force into communion. Christ never instituted that as a means of her propagation and preservation. If we would have them one with us we must use the proper means to beget faith in them, and not urge them by violence to do what is contrary to their persuasion, seeing whatsoever is not of faith is sin. By violence a Church may increase her numbers but ever allays and debases her self with impure mixtures, force prevailing with none but Hypocrites... Every Persecutor is a Wolf, Matt.10:16,17, and every Christian that preaches it is one of the fals Prophets called Wolfs in sheeps cloathing, Matt.7"

In the doctrine of emanation Newton saw one of the greatest errors of his time. Cabbalists, Platonists and Gnostics held that lesser spiritual beings are break-offs from God and so made of divine substance. The true Christian doctrine, by contrast, is that of creation.

Chapter 4 in Manuel's fascinating book deals with prophecy — a subject dear to Newton's heart throughout his whole working life. Daniel and Revelation were his favourite books. The subject of prophecy, he deemed, was of vast importance. Often he quoted Jesus on the hypocrisy of the Pharisees in that they could discern the face of the sky but not the signs of the times. To interpret prophecy was a matter of duty.

Wherefore it concerns thee to look about thee narrowly lest thou shouldst in so degenerate an age be dangerously seduced and not know it. Antichrist was to seduce the whole Christian world and therefore he may easily seduce thee if thou beest not well prepared to discern him.

In interpreting Revelation Newton generally followed Mede's historical method. He aimed "to choose those constructions which without straining reduce things to the greatest simplicity" (p.98). As with most Reformers, the Antichrist was Popery.

On science and religion Newton quotes the scripture which speak of the scroll of the heavens being unrolled: therefore nature is to be read like a book. There are therefore two books — Nature and Scripture. But we must read them apart: when Newton was President of the Royal Society he did not allow authors to quote Scripture. Nevertheless the purpose of science is to teach us about God — it is definitely not utilitarian. Both books, written by the divine writer, are to be read in the same spirit.

"It is the perfection of God's works that they are all done with the greatest simplicity. He is the God of order and not of confusion. And therefore as they that would understand the frame of the world must endeavour to reduce their knowledge to all possible simplicity, so it must be in seeking to understand these visions". As Manuel comments "Instead of highlighting the differences between the two books [as others did] Newton was discovering a spirit common to both of them, a divine simplicity in Nature and in Scripture, as befits the works of one Master Creator" (p.49). Of course much science seemed to have no close connection with theology, 'Never mind' said Newton, in effect, 'it all helps!' "And though every true step made in the Philosophy brings us not immediately to the knowledge of the first Cause, yet it brings us nearer to it, and on that account is to be highly valued."

IDOLATRY AND PHYSICS

Richard Olson's *Scottish Philosophy and British Physics 1750-1880* (1975) is an unusually interesting book. Full reviews must be left to historians of science but there are several points of Christian interest.

Put briefly, the Scottish Common Sense School of Philosophy (Thomas Reid, 1710-1796; Dugald Stewart, 1753-1828; Thomas Brown, 1778-1820; Sir William Hamilton, 1783-1856) exerted a profound effect on scientists who studied at Edinburgh University — notably David Brewster, J. Leslie, J.D. Forbes, J.J. Waterston, W.J.M. Rankine, and J. Clerk Maxwell. Until around 1850 all students at the University attended a two-year course on philosophy, variously called Humanities, Rhetoric or Logic. The aim was to impress the young with the importance of mental activity in all spheres of study. Today, one might think that there was not, after all, much to say, but in fact the sheer volume of the philosophers' writings is most impressive. Dugald Stewart's collected works alone (edited by Hamilton) cover eleven large volumes of quite close print: it is good well thought-out material, too. Maxwell, as a student, found Hamilton's lectures the most meaty he attended: he would suffer the greatest inconvenience rather than miss a single one. Though philosophical rather than theological the numerous volumes bequeathed to us mention God very often indeed, while analogical arguments for belief in Him are not missing.

Thomas Reid discovered, but did not pursue, a non-Euclidean geometry. He started as a believer in Berkeley (no real external world) but revolted from this position asserting that God has endowed us with enough common sense to believe in external physical nature. He recognized that our knowledge of nature is of relations only but he was rather critical of analogical thinking. Nevertheless he realised that it is difficult if not impossible to think at all without analogies.

Thus if a man bred to the seafaring life and accustomed to talking only of matters relating to navigation enters into a discourse upon any other subject, it is well known that the language and notions proper to his own profession are fused into every subject, and all things are measured by the rules of navigation; and if he should take it into his head to philosophize concerning the faculties of the mind, it cannot be doubted that he would draw his notions from the fabric of the ship, and would find in the mind, sails, masts, rudder and compass (*Works*, 6th ed. p.202.)

Stewart continued the tradition but saw much more value in analogies, though he insisted that whenever possible their validity must be checked by observation or experiment.

The thinking behind this approach is that since God has created the world we are likely to find a unity in the general plans governing its constitution. If, then, you discover a law in say, gravitational physics, or mechanics, you may look for the same kind of law (operating of course between different entities) elsewhere — say in magnetism or electricity, or even the mind. The laws are analogous but not identical.

If we are looking for the explanation of an unfamiliar phenomenon we may (1) try to keep our thinking as abstract as possible, as did the continental scientists of the time (Lagrange, author of *Mechanique Analytique* prided himself that "one will find no figure in this book"!) or (2) explain it as being like some simpler more familiar thing, which becomes the model. The first procedure is too sophisticated, giving (to common sense mortals) no feel of comprehension: the second is too simplistic by far!

Stewart, the Common Sense Scotsman, prefers the second to the first approach. Following Reid he knows that (unless one sits for ever in an ivory tower!) it is impossible in ordinary language to avoid 'models', metaphors or analogies. To do so, as d'Alembert pointed out, one would have to write an entirely new language which nobody would understand. So where do we go from here?

To this Stewart replies, "No one has hit on the only effectual remedy against this inconvenience — to vary from time to time, the metaphors we employ, so as to prevent any one of them from acquiring an undue ascendancy over the others, either in our own minds or in those of our readers. It is by the *exclusive* use of some favourite figure, that careless thinkers are gradually led, to mistake a simile or distant analogy for a legitimate theory" (*Works* 5, 173).

Where did Stewart get this idea from? Remember this is Scotland — Bible-loving Scotland. Though unconsciously perhaps, did he not get it from the Bible? The Bible everywhere encourages changes in mental symbolism: it chooses the symbolism, the analogies, according to the particular aspect of man's relation to God (or even some one else) which it is desired to stress. So sometimes the Lord is our shepherd with rod and staff, green fields and still waters: at others He is the Master and we are the slaves — or He may be the Lion of Judah, the Lamb dumb before her shearers, the evening and morning star, the rock that is higher than a man, and so on almost endlessly. Similar imagery is used of men and of nations, particularly in the prophetic books.

Thought imagery of this kind is right, for it can be changed quickly and easily. But not so the physical model. A golden image of the deity depicted as a shepherd, or householder, or Lion or Lamb, in synagogue or church would violate the second commandment. Because an idol is something of value, in that precious materials (gold, silver) or devoted labour has gone into its making, it cannot be changed quickly or at will. The symbolism is therefore fixed: the reality and the symbol become identified. The resultant deity must be accepted, warts and all.

Stewart is saying the same with regard to science. To hold to one analogy only is "to mistake a simile or distant analogy for a legitimate theory".

Olson shows, giving instance after instance, that this is the message which went right home in the minds of the students who listened to the philosophy lectures. Positivists, like Comte, insisted that all scientific knowledge is true and so made little of hypotheses. But the Scottish physicists (Kelvin, who was a student at Glasgow, not at Edinburgh, is excluded from Olson's study) realised that analogies were hypothetical and could be changed. We can understand now why Maxwell, invited to join the Victoria Institute, declined fearing that by popularisation his hypotheses (especially that of ether) would be given a fixity in mens' minds which would be linked with religion and that when or if the idol was destroyed, religion too might go by the board. In semi-popular lectures (as at the British Association) Rankine and Maxwell virtually quoted the Common Sense Philosophers, perhaps almost without knowing it, so fixed were these ideas in their minds.

When Pierre Duhem complained that the models used by British physicists were not even assigned a physical reality, or when he complained that he could find several alternative and mutually exclusive models applied to the same phenomenon in one theoretic paper in seeming violation of all the canons of logical coherence, he was right. Brewster accepted the particle theory of light but in one paper used the wave theory; Maxwell, preferring Faraday's ideas, rejected action at a distance but later, when it proved helpful, introduced his $\frac{1}{r^5}$ law between molecules.

In his papers on electricity and magnetism Maxwell quite deliberately changed the theoretical bases from which he built up his theories. In one paper he attempted to express Faraday's electrotonic state of matter in mathematical form. But why do so? he asked. Everyone can understand the formula for attraction, why not leave it there? "I would answer that it is a good thing to have two ways of looking at a subject, and to admit that there are two ways of looking at it" he replies.

The approach of the Scottish physicists links up closely with complementarity; but it seems odd that after so much was written along these lines in the nineteenth century, the world should have had to wait for a Bohr to remind us of the principle once more. All said and done Brewster, and even Newton, was familiar with the fact that sometimes the wave and sometimes the particle theory of light are called for in physical investigations.

BY CHANCE

Jean Piaget's and B. Inhelder's book, *The Origin of the Idea of Chance in Children* (R. and K. Paul, 1975) has at last been translated from the French 1951 edition. It makes for fascinating reading.

Christians hold different opinions about chance. Some believe that chance is of real cosmic significance, others that it is unreal because God controls all events. The Bible can probably be used in support of both positions. In the Bible the casting of lots, to the lay mind the most typical of chance events, is over-ruled when matters of importance are at stake, as for instance in deciding on a replacement for Judas, Acts 1:26. But is it *always* over-ruled? If so, why did the Apostles think it worth while praying that it *would* be over-ruled? Such considerations lead one to think that in biblical teaching chance is real enough — but it can be wonderfully over-ruled too. Ahab's death, prophesied beforehand, came about apparently by chance. "A certain man drew his bow at a venture" (1 Kings 22:34; 2 Chron. 18:33).

Piaget and Inhelder argue that, apparently, we are not born with an idea of chance (uncaused events). The questions of young children indicate that they are looking for reasons for everything. Why does not Lake Geneva stretch all the way to Berne? Why is there no spring in our garden? Why are you so tall and yet have such small ears? are questions children ask. They seem to be looking for hidden causes in fortuitous events.

To a large extent this attitude persists among primitive peoples, who do not accept that death, sickness, accident or misfortune can ever be uncaused; rather they are due to the activities of hidden power behind the scenes. Levy-Bruhl considered that the notion of chance is foreign to the primitive mind but was he right? Piaget and Inhelder have their doubts. If natives lose a tool do they not, like us, look first in the place where they deem it is *most likely* to be found? Even the shooting of an arrow implies judgment of probability, or highest chance expectation, that it will find its target.

In speaking of chance we recognize the existence of events which are not (though the point can be argued) the result of determinism or miracle. Yet almost every common sense act involves the notion of chance as well as a kind of spontaneous estimate of the more or less probable character of the feared or expected event. (E.g. we reckon that the chance of finding a lost object in a small space is better than in a large one; in crossing a road we choose the route and time to give the lowest chance of being run over).

The idea that every event is caused — caused, even, by materialistic laws — has bitten into the soul of civilized man. The study of chance is a useful reminder that a large part of our lives is dominated by an entirely different principle.

GOLDEN BOUGH

The late Sir James Frazer's *Golden Bough* has often been quoted in an anti-Christian sense. Though Frazer all but ridiculed the idea that Jesus might not have existed as a historical personage he did develop the theme that myths of dying and resurrecting gods or god men have formed part of the culture of most third world peoples, which septs took to mean that there is nothing unique about Christianity.

In a recent letter to the *New Scientist* (3 June 1976) E.K. Victor Pearce writes: "Frazer never did any field work and his theories have little weight among anthropologists". He quotes J. Beattie's *Cultures* (1964): "It is reported that even at the end of the nineteenth century the celebrated Sir James Frazer, when asked if he had ever seen one of the primitive people about whose customs he had written so many volumes, tersely replied, 'God forbid!'"

In this connection the Editor well remembers a conversation with the late L.S.B. Leakey, around 1925 or 26: Leakey was then a close friend. Leakey said that if an Englishman tried to communicate with a foreigner, very ignorant of the English language and English ways, he might well talk child's language, telling stories about Jack and the Beanstalk, Alice in Wonderland or Father Christmas. This is exactly what natives do to Europeans, but without expecting them to take their mythical and cultural stories as statements of believed truth! But Frazer, Leakey said, had solemnly collected such stories by the thousand and taken them all quite seriously. The result was as ludicrous as if Kikuyu tribesmen had visited England and written books on our culture based on stories for children.

ON MATTERS MEDICAL

Half a century ago, when the Editor was a student, there always stood a set of bottles on one of the shelves in the chemical laboratory containing compounds for identification. They were labelled with numbers only. One of these contained a cream coloured powder which, warmed up with weak acids, gave the smell of almonds. It was in fact amygdalin, obtained easily enough from the kernels of apricots by extraction with solvents. On hydrolysis it gives glucose, prussic acid and benzaldehyde.

Some years ago a certain Ernst T. Krebs Jr made the startling claim that amygdalin cures cancer. A few animal experiments, which proved not to be repeatable, seemed to confirm the claim and before long the compound was on the market, at a fancy price (often 20 dollars per day's supply), under the silly name of *Laetrile*. Today it finds a large market in USA where it is smuggled in, usually from Mexico. In 1963 the FDA banned it from interstate commerce and it appears that in most states it cannot be sold legally. It is often given by injection, and there are always doctors (one of whom has been banking money at the rate of a million dollars a year) who will give injections for a fee. Traffickers in the drug claim that it is or contains the valuable vitamin B17 — a vitamin which no one else has heard of. Hundreds, perhaps thousands of sufferers from cancer think that the wicked government is acting to prevent them getting the only possible deliverance from near certain death. In a recent case taken against the FDA, the FDA lost so that at least in one state *Laetrile* may now be prescribed, though its possession is still illegal! Fortunately, if the drug does no good it appears to do no harm either. Meanwhile we are told that a dozen other useless but innocuous drugs are following in its wake, one called *Tekarina* being, apparently, an extract of Mexican seaweed. (Constance Holden, *Science* 1976, 193, 982; T.H. Jukes, *Nature*, 263, 543).

In these days when really dangerous drugs are being smuggled around the world in every increasing quantities, the story of amygdalin is a salutary reminder of the enormous difficulties associated with any form of drug control. Ethical issues not unlike those associated with mercy killing are involved. How far is it right to restrict those drugs which, in themselves, are harmless, seeing that efforts to protect the public from sheer swindlers may create a black market and undermine law and order by creating the impression that the wicked powers that be are determined to prevent what is good from reaching the needy — a point which might be particularly important in a racist connection? The tendency for infectious disease to become resistant to drugs raises a similar issue. In a recent epidemic of typhoid in Mexico 100,000 patients

were found to be resistant to chloramphenicol. Even in general hospitals in this country the fear of enlarging the pool of bacteria resistant to drugs leads doctors not to treat infected patients with drugs which would cure them. (The subject was featured in the BBC programme *Horizon*, 17 April 1975) Such a situation, especially in some countries, might easily lead to a black market.

Turning to another medical issue, earlier this year considerable publicity was given to the case of Karen Quinlan who fell into a coma after taking tranquilisers with alcohol and was kept 'alive' for over a year by intensive care at a cost to the State of New Jersey of £225 a day. Her father, giving up all hope of recovery, went to law to force the doctors to turn off the artificial respirator. Permission was refused but, after appeal, was granted and the respirator was turned off. Surprisingly Karen refused to 'die'. What then of the artificial feeding and antibiotics on which she was (or is) still dependent? We asked Dr Vincent Edmunds, Editor of the *Christian Medical Fellowship* magazine, to comment.

If this case were occurring in this country, and here again one is speaking without full possession of the medical details, accepted at its face value, I can well imagine that the respirator would have been switched off many months ago. There is of course little problem when repeat electro-encephalogram (EEG) examinations over the course of days show no evidence of any brain activity; no-one would hesitate under those circumstances to switch off the respirator.

Where, of course, there is continuing unconsciousness but some EEG activity, the problem is greater, and here one could well see delay of weeks or even months before it was decided that the chance of sentient life returning was nil when this supporting measure would be withdrawn.

The irony in this case, of course, is that the respirator having been turned off, the body of Karen continues to breathe, and it now looks as though it will require another Court Order before the doctors are prepared to withdraw extraordinary means of feeding.

If one can generalise for a moment, I think the thoughts that go through every doctor's mind on such occasions are enshrined in questions such as: Am I prolonging life or prolonging death? What was the quality of life this patient enjoyed before his present illness, and is it right for me to continue extraordinary measures of treatment so that he may return to his disability or pain, or what have you? These are not always easy decisions, but they have to be made, since advances in medical treatment have made it possible to treat

and salvage many patients suffering from illnesses which a few years ago would have been inevitably fatal, and which humanly speaking would have been a merciful termination of much suffering. Advances in medical treatment have made it possible to keep these people alive, so that a dilemma presents itself of 'is it always right to treat my patients?' Quality of life rather than quantity is what we try to aim at, and to prolong life when it really is life and not simply death.

To return to the case of Karen, it would seem not unreasonable not only to turn off the respirator but also to withhold antibiotics and forms of special feeding. Such an approach to the nursing staff may appear negligent, and one has to explain what one is doing so that they are fully in the picture and able to co-operate.

For my part I find it difficult not to give fluid in some form to the unconscious patient with no hope of recovering, though Professor Sir Norman Anderson in a lecture at the City University last autumn, regarded such an attitude as quite illogical and maintained that all life-preserving measures should be withdrawn once a decision is made that the unconscious patient is in an irreversible state.

THIRD WORLD GUINEA PIGS?

A recent article ("Untested Drugs being Sold") in the *Times* (13 Oct '76) quotes a report by WHO: "New drugs are being marketed in developing countries before being fully tested ... Early clinical trials are to some extent shifting to nations without strong regulatory agencies". Does the Western world think of the third world as a reservoir of experimental guinea pigs?

In view of the callous indifference of much of the third world to its own health problems it need hardly surprise us if this is so. The point is brought home by an article on blindness by Tony Smith in the *Times* (11 Oct). Trachoma, easily prevented by inexpensive drugs or by improved sanitation, now affects hundreds of millions of villagers in the poorest parts of the world. In these localities multitudes of flies breeding freely in rubbish and in human excreta, swarm round the eyes and faces of the unfortunate inhabitants. "Virtually every child has infected eyes, and WHO surveys have shown that as many as one eighth of the adults may be blind." Blindness is particularly widespread in the countries bordering the Sahara but also "in many of the rural areas of the new aristocracy of oil-rich states" where "the rural population is ignored by the city politicians: out of sight out of mind."

In these countries vast sums are spent on skyscraper hospitals where all the medical technology of the West is in evidence while European medical journals advertise highly paid posts for medical specialists willing to take them. But "there are no advertisements for doctors willing to travel from village to village talking about sanitation and treating children with sticky, fly-infested eyes. Public health medicine lacks both glamour and prestige". So the millions are left to suffer. Thus far only the Chinese and their disciples in other countries such as Tanzania have learned the lesson.

SHORT NOTES

Dreams. Ann Faraday in her simple book *The Dream Game* (1974, Temple Smith) makes the useful comment that any imposed technique for interpreting dreams is exciting in the early stages but soon becomes boring. The Freudian looks for possible sex symbols and ignores what cannot be so interpreted; the Adlerian looks for power symbols and so on. A teacher in Georgia had worked with his dreams along Jungian lines for years but "eventually this approach became stale. There was a discouraging sameness in the archetypes from day to day ... Eventually I stopped dreaming so much, neglected to remember my dreams, and became despondent about the whole business... I professed to have become bored with dreams." Then the Perls Gestalt technique came to the rescue. But the moral is not that Perls is right and others wrong but "as soon as a certain 'monotony of interpretation' strikes us, we know that our approach has become doctrinaire and hence sterile". As Christians will recognize, this comment is highly relevant to Bible reading. It is vital to keep an open mind at all times or the Bible will serve only to tell us again and again what we know already.

Race and IQ. Prof. Jack Tizard, President of the British Psychological Society has described recent work on intelligence at London University (reported, *Times* 30 Jly, 1976). Arthur Jensen and Eysenk claim that the low IQ showings by black people are genetic in origin. Tizard disagrees and thinks the argument dangerous: he shows that the difference falls and even disappears when the environments are made more similar. A profound long-term effect on IQ is exerted by the environment up to the age of five.

Chargaff. Chargaff's attack on the un wisdom of experimenting on gene transfer in organisms closely associated with the human species, (see this JOURNAL 103, 68) brought an inevitable rejoinder. M.F. Singer and P. Berg are "deeply disturbed by the distortions, derision and pessimism... He appears to see science as a curse on our time and men as feeble..." (*Science* 193, 186).

Since Chargoff wrote the Williams Committee on Genetic Manipulation has published its report (summarised in *New Scientist* 2 Sept. 1976, p.475). In effect the Report gives Britain the go-ahead. As Bernard Dixon points out, (p.474) delay till the hazards involved could be better assessed, a delay for which Chargoff pleaded, would have been wiser. He points out also that though physical containment of the products of biological engineering has been kept in mind "the failure to insist upon *biological* containment is remarkable. It is an omission that could have very serious consequences". Apart from this, though Britain may pass laws to reduce danger, other countries, including USA, are less likely to do so.

Krypton-85 with a half-life of 10.76 years is formed in atomic power stations and stays in the cans till they are dissolved when it is liberated into the atmosphere. It is a beta emitter, the maximum range of electrons being 1.2 metres in air, and it produces rubidium (stable). A single reprocessing plant will liberate 10 million curies a year and the ionisation now being produced in the atmosphere is comparable with that from natural sources. W.L. Beck (*Science* 193, 195) speculates on what the effect may be over the next fifty years. The electrical resistance of the atmosphere will be considerably reduced, enhanced coalescence of cloud droplets may increase rain, especially cloudbursts, and there may be other effects which are difficult to predict.

Life Elsewhere? In his review of R.K.G. Temple's book, *The Sirius Mystery* (see this JOURNAL 103, 11) Michael Ovenden, Professor of Astronomy at the University of British Columbia, speaks of those misled by "Calculations of the 'probability' of life on other worlds, which are simply the prejudice of the respective writers dressed up in a spurious numerical precision". (*Nature*, 261, 617)

Russian Scientists A recent issue of *Nature* (30 Sept 1976) gives details of some of the persecution which scientists in Russia are suffering. Stalin, ever determined to fit science into the procrustian bed of orthodox Marxism, made orthodox genetics illegal in Russia and wanted to confine research in physics to what was compatible with Newton's laws. The physicists, however, managed to convince him that without modern physics there could be no nuclear arsenal with the result that physicists were given freedom. However until Stalin's death the text books were liable to contain face-saving clauses to the effect that, for example, the second law of thermodynamics is "a local phenomenon in this part of the universe". Having saved themselves the physicists sought to help their colleagues in other disciplines with the result that genetics was permitted in 1964 though not funded till 1974. Today, with the increasing availability of typewriters and duplicators, scientists

are widely engaged in do-it-yourself publication, since publication in official journals is often forbidden. Researchers are frustrated in many ways. "They expected me to order all the equipment and reagents before I started, but if I'd known exactly what I wanted, I wouldn't have needed to do the experiment" says one of them. The issue of *Nature* contains several articles about some of the persecuted scientists. Once they fall from grace, they not only lose their posts but even library tickets are taken away. Many have been sentenced to imprisonment merely for requesting the authorities for a greater degree of freedom or for permission to emigrate.

Mars G.A. Soffen of the Viking Project Office, NASA, Virginia, reports "No complex organic compounds have been detected on Mars in the two samples analysed. The detection limits are in the region of 10-100 parts per billion. The biology experiment is indeterminate but has yielded some clues to the chemistry of the surface". (*Science*, 1 Oct issue; 1976, 194,58)

REVIEWS

J.D. Birchfield *Lord Kelvin and the Age of the Earth*,
Macmillan, 1975. 15 dollars.

To Hutton and Lyell, co-founders of the science of geology, the earth's age was virtually eternal. Cyclic changes, occurring age after age, had destroyed all "vestige of a beginning" nor was there any "prospect of an end" said Hutton. All the changes in the earth's surface in the past had come about through the operation of forces such as may be seen operating today : none were the results of an original creation or of later catastrophes such as the biblical Flood.

William Thomson (Lord Kelvin), brought up in a devoutly Christian home, set out from an early age to destroy this myth. In a schoolboy essay, written at the age of 16 he spoke of the impossibility of a planet cooling continually and for ever. Soon he saw that the mathematical techniques of Fourier made calculations on the cooling of bodies tractable and his overriding interest in earth science was born. By working backwards he hoped to establish an upper limit to the date at which creation had taken place. With Forbes of Edinburgh he measured the heat conductivities of rocks and by making various assumptions he obtained figures of the order of 100 to 1000 million years, later raised to 4000 million. Primarily, however, he was never interested in the exact figure : it was the destruction of the doctrine of uniformitarianism which was of first importance.

At first Kelvin's conclusions were put forward with great modesty: he often emphasised the tentativeness of the assumptions he was making, for so little was known about the internal state of the earth or its conductivity at great depths. But when most of the geologists took no notice whatever of his arguments, in fact consolidated their doctrine for three decades around 1840-70 he became unduly dogmatic. Here P.G. Tait egged him on, for ever demanding that he should reduce his too generous estimates to the

discomforture of the geologists. Over a large fraction of his long life Kelvin held to 100 million years as the most probable figure but when towards the end of the century Tait insisted that he ought to have made it 10 million, geologists who had accepted the earlier estimate readily enough became incredulous. Not till around 1890 however did the subject cease to be the preserve of a few British scientists: around that date investigators from the continent and USA entered the field and much work was done to show how changes in arbitrary assumptions could modify the results in no mean way. It made all the difference, for instance, whether the land was a crust on a liquid interior or whether the earth was solid throughout its bulk. Estimates varying from a few millions only to many thousands of millions were possible using the limited information which was at that time available.

A further question arose when the sun became the centre of interest. Considered as a cooling body, the sun could not have been pouring out heat for more than a few million years. When Kelvin started to think on the subject the sun's energy was supposed to be chemical. But Kelvin quickly followed those who suggested that it arose from bombardment by meteors, a vast swarm of which, observable as the zodiacal light, was supposed to inhabit the space within the orbit of the earth. At that time and for many years to come the universe was supposed to have started as a swarm of atoms distributed through space which condensed to forms suns and galaxies. The primary energy of the universe was therefore gravitational and in the case of the sun this apparently allowed for an age of about 20 million years, increased to 100 million if the original atoms or particles were supposed to have been hot or moving with high velocities. This doctrine of the origin of the universe: known as the nebula hypothesis, was accepted by all at the time as by far the most probable of any proposals which had been made. It seemed, therefore, that the higher estimates of the earth's age obtained from the cooling of the planet were too high. Once again it seemed to confirm 100 million years as a reasonable figure.

Kelvin investigated two other methods of dating. Assuming the earth is solid, its shape, with bulges at the poles, made a calculation of the length of the day at the time of solidification possible. Knowing the rate at which the length of the day changes, calculation gave the time of solidification. The other estimate was based on the energy lost in friction as a result of the tides, this causing a slowing down of the earth. Neither of these methods were so reliable as the first two, but they could be made to give figures in conformity with the 100 million estimate.

Looking back today it seems that Kelvin was wrong. But this is a hard judgment. More reliable estimates of the age of the

earth as based on radioactive methods, gives a time scale more like what the biologists and geologists had wanted — Darwin, for example, was much criticised for suggesting as much as 300 million years as the time taken for the erosion of the Weald. But in fact many of the estimates had been vastly too large: not thousands of millions of years, but millions of millions. If Kelvin erred on the low side, they too erred on the high side. Quite apart from this, it was the simplicity of Kelvin's faith, his perseverance, and his unflagging interest which in effect created the science of geophysics. No one before his time had seriously wanted to collect earth data and subject it to mathematical analysis. In many other ways too he did more for science and technology than perhaps any other man who has ever lived.

Kelvin with Clausius was the first man to formulate the second law of thermodynamics: the law dating from 1850 which sees the perpetual motion machine as a violation of science. Yet believe it or not, although for many decades before the second law had been formulated, perpetual motion machines had been considered unscientific (the French Academy, for instance, in 1775, refused to consider further papers on them), Lyell invented one to keep the earth's heat from flagging. For edition after edition, right on to the 1880's, of his great work, *The Principles of Geology*, he described how pockets of hydrogen in the earth's interior reacted with the oxides of metals producing water and metals; whereupon the water reacted with the metals belching fire and smoke in such activities as volcanos, and producing the hydrogen once more which then repeated the merry-go-round. It is hardly a wonder that Kelvin became impatient in the end and launched a determined attack on the crude geology of the time. Finally in the 10th edition Lyell at last admitted the point, but far from recanting he then suggested that perhaps the Deity intervened to keep the perpetual machine at work. For why, he asked, should science "despair of detecting proofs of such a regenerating and self-sustaining power in the works of the Divine Artificer?" With this he suggested that if the perpetual motion machine was not in operation on earth, perhaps it was situated in the sun. "It is ironic, therefore" says Birchfield, "that in order to counter Kelvin's objections to uniformitarianism, Lyell found it necessary to invoke the possibility of divine laws at variance with the discovered laws of nature". (p.70)

All in all the story is a remarkable one, and it is well and very fully told by Birchfield. Looking back on the history of the controversy from this vantage of time the Christian will see a moral in the words of James Croll (1877). In writing of the source of the sun's energy he says, "The utmost that any physicist was warranted in affirming is simply that it is impossible for him to *conceive* of any other source of energy [than that of gravitation].

His *inability*, however, to conceive of another source cannot be accepted as a proof that there is no other source" (p.125). We may rightly apply this to the materialistic philosophy of today. The inability of the materialist to conceive of any principles operating in the universe other than those of laws studied by science, "cannot be accepted as a proof that there is no other source".

REDC

Malcolm Jeeves, *Psychology & Christianity: the view both ways*, Inter-Varsity Press, 1976, 184pp. £1.85

Professor Jeeves is talking as much to nonspecialists as to perplexed students of the behavioural sciences. After introducing them to the psychology of today, he sets down succinctly both the biblical and current psychological 'views' of the nature of man. These two 'views' of man are then compared and various mistakes of interpretation are cleared away to lead to the author's major contention: No necessary conflict exists between them.

The author considers four issues, each notorious for catching Christians unawares: extrapolating to human from animal behaviour; relegating human responsibility to determinism; the psychology of salvation; and, where the labels are identical, confusing lay vocabulary with psychological jargon. All of it is excellent vaccination material for Christian students.

The book concludes with the chapter we were all nervously awaiting - Jeeves may pass off the Bible's *man* as compatible with psychology, but what about the Bible's *God*? Again, the author rides the storm masterfully, and reaffirms his conviction that the great majority of psychology/Christianity problems are nothing but the logical end-product of misinterpretations.

It was in fact Jeeves' own 'nothing-buttery' (as he puts it) that gave me vague discomfort for much of my reading. While this book is a very helpful inoculation for many ill-informed Christian students of all ages, and while its message of 'Beware the nothing-buttery of misinterpreted psychology' was never more urgently needed, there is a certain belittling of Christianity, I felt, on the author's part. For example, take the title: "The View Both Ways" - the implication is of *Truth* existing somewhere, both extra-biblical and extra-psychological, on which Christianity and Psychology are acceptable but not final perspectives. Or take "the biblical model of man" (p 19, also similarly on p 80) - what is a 'model' if not a knockdownable? Again, especially in Chapter 4 but also generally,

the emphasis on God's Diagnosis of the human condition virtually precludes Jeeves' mentioning God's Judgment as an integral part of the nature of man, which not only comes from the past and is in the present, but which also anticipates the future. Or again, on p 131, the essence of being a Christian is the exercise of a capacity that 'all' have grown up with (ie, that of "responding as one person to another"): yet this emphasis somewhat hides the quality of the exercise man has made of this capacity, namely, his rebellion against God.

However, this implicit nothing-buttery in Jeeves' albeit excellent book is one particular instance of a more general problem that permeates the chapters, unresolved though not unmentioned. On p.170, the author complains of "the failure to distinguish between, on the one hand, the reasonably well-assured findings of scientific psychology and, on the other hand, the speculations and claims of pre-scientific psychology". Is this complaint justified, I wonder? Certainly, it is a succumbing to the latter half of the dichotomy which has given rise to deeply-upset Christian students. But does this mean that we have to brand pre-scientific conclusion-drawing (what I call "logic by innuendo") as Bad, and scientific conclusion-drawing ("logical logic") as Good? Is it really sufficient to say to such Christians that they have employed the wrong sort of logic, and that if only they will back-track and start again with the right sort of logic, their problems will clear up?

I think not. Logic by innuendo bites deeper than that. And my bet is that logic by innuendo is *not* a mistake to be eradicated, but is actually the way that people (*qua* people as opposed to *qua* scientists) think; and so what Jeeves is requiring of them is an unnatural transformation of thought into the mode of the scientists' published papers (see Medawar, 1962).

Suppose we make a fanciful attempt to plot the natural history of an 'Idea'. It gets mooted and despite popular rejection is finally 'demonstrated' as so, and is gradually accepted. Then it becomes a background factor in people's thinking, an *a priori* which goes unchallenged, as part of the Establishment. The radicals then move in and challenge it, and it is eventually ousted as old-fashioned, then as unscientific and disproven. Now, imagine Skinner's, Sargent's and Freud's views on Christianity as having ousted various 'Christian' *a priori*'s from people's mental Establishments, into being old-fashioned and now unscientific. And in the merry-go-round of Ideas, Skinner's, Sargent's and Freud's views now enjoy the '*a priori*' position. What is required to oust Skinner, Sargent and Freud? If I weren't a firm believer in the sovereignty of God, I know where I'd put my money. Not on the logical logic of Lloyd-Jones (1959) and Jeeves (1967, 1976); but on the logic by innuendo that has ever been employed to popularise

the notion that today's 'a priori's' are old-fashioned (exemplified perhaps by Baker 1974 and by Schaeffer 1973). After this, enter "logical logic" to tidy up the spadework.

But, you protest, that wasn't the purpose of this book. And of course you are probably correct. In all, it is, I believe, a very useful publication indeed, though my greatest hopes for it are more as a preventative than as a curative measure.

Martyn C. Baker

References

- Medawar P. 1962 "Is the scientific Paper a Fraud?" Radio talk reprinted in *The Listener*
- Lloyd-Jones M. 1959 *Conversions: Psychological and Spiritual - A critique of the book, Battle for the Mind* IVP
- Jeeves M.A. 1967 *Scientific Psychology and Christian Belief* IVP
- Jeeves M.A. 1976 *Psychology and Christianity: The view both ways* IVP
- Baker M.C. 1974 "The Psychology of Conversion" *Faith and Thought* 101 127-140
- Schaeffer F.A. 1973 *Back to Freedom and Dignity* Hodder and Stroughton

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Added in proof . As we go to press we have received vol. 2 (G to Pre) of the New International Dictionary of New Testament Theology (edited by Colin Brown, Paternoster Press, 1023 pp., £18 or £14 if ordered before 30 Ap. 1977). Publication of Vol.3, the final volume, is expected at the end of 1977. This beautifully produced and scholarly work, which can be used without a knowledge of Greek and Hebrew, discusses the major theological terms of the Bible against their background and use in their original languages. In the present volume there are many fascinating and thought-provoking entries such as God, Guilt, Heaven, Hell, Israel, Judgment, Kingdom, Laugh (with discussion of humour in the NT), Law, Lord's Supper, Love, Magic, Miracle, Nature, Parousia, etc. The indexing (66 pages) and cross-referencing are very thorough.

ESSAY REVIEW

UFOs: DEVILS AT LARGE?

That fear is an unworthy motive for doing right or turning to God will be agreed by all; but is it not a better motive than none at all?

Aldous Huxley (*Grey Eminence* 1941, p.122) cites the case of the wicked and selfish woman, Maria de Medici who ordered her soldiers to sack Angers. Father Joseph (François Leclerc du Tremblay 1577-1638) warned her that if the order stood she would suffer the torments of hell fire. She gave way and the city was saved. What a pity, reflected Huxley, that there is no threat that you can hold over the heads of wicked people today.

Perhaps there is. For a recent book¹ contains a threat almost as terrible as the threat of hell, though this time it is a hell on earth. It is blood curdling stuff and obviously intended to be. The UFOs are appearing in their thousands and in every country. No two are quite alike. They have murdered 1,000 people already including 50 or more pilots, some after unprovoked attacks. Russian but not American astronauts have suffered though most of the latter have seen them right enough; one space ship was followed right round the globe.

Terrribly mutilated bodies of men and animals have been found after UFO visitations, "hypnotic rays" have enveloped and stunned observers. Mysterious abductions, teleportations, sexual assaults and rape with both sexes are reported. A phantom UFO descended over an airfield and just lifted up and removed an aircraft which was never seen again. After sightings, horrible mysterious "men in black" - thin, pale and bloodless - sometimes appear, attempting to destroy UFO evidence by frightening observers into silence. Sometimes great giants, up to 19 feet high, appear, immobilizing observers with paralysing rays and attempting kidnappings. All of which, of course, is supported by many witnesses, the very best available evidence and authoritative books, not excluding the multi-million selling books of von Däniken.

Then again, there is an almost equally frightening geophysical story. The molten magma beneath the earth's crust (sounds a century out of date?) is in fearful turmoil; climates are changing drastically (too true) and the antics of the sun (too many sunspots; its radiation storms 100 times as violent as they ought to be) give cause for alarm - "This worrisome activity is similar to the signs a star gives off before it 'explodes' (or actually implodes)".

(In support of this the reference given is to a newspaper interview.)

Then back to the UFOs again. They are not a new phenomenon. The trouble is that they now come thick and fast whereas before they were quite rare. For example (p.28) Columbus saw one on "October 11, 1492" just four hours before sighting land. With another sailor he saw a light moving up and down: several times "it vanished and reappeared. No satisfactory explanation of the mystery has ever been offered". (R. Blum, *Beyond Earth: Man's Contact with UFOs* p.44 is cited as the authority. This book is mentioned repeatedly). The land-fall of Columbus has been discussed so often that such a remark seems inexcusable! The flickering lights appeared at just the hour and phase of the moon at which the Bermuda fireworm discharges gametes in luminous streams. (See R. Crawshaw, *Nature* 1935, 136, 559; R. Ward, *The Living Clocks* 1972 and review in *Nature*, 240, 493. Also R.G.D. Wolper, *A New Theory...* Smithsonian Misc. Coll. 1964, 148 etc.)

What, then, *are* UFOs? The authors argue like this. If UFOs are a materialistic phenomenon they cannot come from the solar system for on no other planet can a technological society exist. Other planets in the galaxy (if there are any) are too far away and the probability of man-like creatures on them seems indefinitely remote. In addition, no two UFOs are exactly alike which argues that they cannot be technological products turned out in factories. Nor do the UFOs give the impression that they are investigating us seriously - instead they play games with and baffle us. Also they never crash, or make a mistake, or land for refueling. They travel with speeds vastly in excess of possible aircraft and even at 16,000 mph can perform sudden right-angled turns - far more than enough to tear bones and flesh asunder! Generally they travel silently, too, without sonic booms! Nothing fits a physical picture - a point on which all investigators seem agreed.

Are they *psychic* then? Occasionally encounters are recorded as seen by some but invisible to others. Yet often there are physical effects - interference with electrical equipment including ignition in cars, burnt circles on grass left after they have landed and taken off again, mutilation of bodies (though UFOs are not always overtly hostile). Apart from men, animals too are terrified.

Point by point every rationalistic theory breaks down. So where do we turn next? Perhaps it's all rubbish - there *are* no flying saucers! Dismiss it that way if you can, but it's odd that belief in them is now so widespread and that many highly critical minds (like J.A. Hynek - *The UFO Experience*, 1972) have ceased to be sceptical.

The authors of this book escape from the dilemma by fearlessly

invoking the supernatural. UFOs are demonic. They are one of the early signs that the last days are now upon us. One day, perhaps, the sinister figure of Antichrist will step out of a flying saucer and proclaim that he can sort out the muddles in which governments are entangled. Reference is made to many parts of the Bible including Lk. 21:11 ("There will be terrors and great signs from heaven"), the mysterious creatures described in Revelation 9, and the passages which promise that Christian believers will be saved from the terrors that are to come.

If the facts are right (what a pity that the book often invites disbelief by the uncritical presentation — not that it is easy to be rationally critical in such matters!) and *if* the reader believes in demons, the argument makes good sense: indeed with these provisos it is fairly convincing and ought to be considered seriously by Christians. But of course many Christians do not believe in demons, which are too easily dismissed as a superstition of past ages. On this the authors quote (as usual, with no proper reference) words ascribed to William James.

The refusal of modern enlightenment to treat possession as a hypothesis to be spoken of as even possible, in spite of the massive human tradition based on concrete experience in its favor, has always seemed to me a curious example of the power of fashion in things scientific. That the demon theory (not necessarily a devil theory), will have its innings again is to my mind absolutely certain. One has to be 'scientific' indeed to be blind and ignorant enough not to suspect any such possibility.

One may add that to some of us at least it seems passing strange that people who believe in an after-life, who even think (as so many do) that discarnate spirits (Mother Mary or saints, dead friends and relatives) can be talked to, prayed to, or for, and may even occasionally make their presence felt, that *these* earthly people (whether Christian or not) find it impossible to envisage discarnate spirits, good and bad, who do not happen to have lived in a body, seems the height of irrationality. One can understand such dis-belief, only, on the part of those, the sceptics, who think that death is the end of all.

But we have said enough. This book is well worth reading, but it needs to be read in conjunction with such a book as Hynek's, otherwise its sheer apparent credulity may well create reaction! Perhaps the fear motive will sometimes prove effective in a Christian cause where more desirable motives have proved ineffective.

1. John Weldon and Zola Levitt, UFOs: *What on Earth is Happening, The Coming Invasion*. Bantam Book, 1976, 176pp. PB. £0.60.

Essay Review

ON REDATING THE NEW TESTAMENT

It is very difficult to predict what will be the prevailing reaction to Bishop Robinson's latest book.¹ It would be a pity if it were either dismissed as a nine days' wonder or simply used piecemeal as a quarry for details by those who have other axes to grind. It presents a thesis which merits dispassionate assessment. The author has long been convinced that the Gospel of John contains primitive and reliable historical tradition. This led him to question the lateness of the traditional (and generally accepted) dating (p.9). This in turn reopens the whole question of its place in the development of New Testament Christianity and so of the dating of other books.

In fact Robinson leaves the Johannine dating to the end of his book, not to let a personal impression on this point colour his argument on other books. He was confronted with one striking phenomenon, the ostensible absence from the New Testament of any reference to the fall of Jerusalem in A.D.70 as a past fact. This event must inevitably have been a focal turning-point in the whole history of primitive Christianity. S.G.F. Brandon recognised this, and explained the odd silence of the Christian writings as a studied rewriting of history, to suppress a supposed Christian involvement in the Jewish movement against Rome. Robinson offers a simpler explanation of this silence, that the New Testament writings were already complete before 70. This amounts to a fundamental challenge to many of the positions of the current "critical orthodoxy".

It is on this level that the book deserves to be discussed. The author points out that little thorough work has been done by recent scholarship on the internal and external evidences for the absolute datings of New Testament books. The processes of source, form and redaction criticism have progressively built up an assumed history of Christian development, but this is not securely anchored by the rigorous determination of absolute dates. The span of the process of composition has tended to expand or contract according to academic fashion or personal viewpoint.

Robinson challenges a whole current synthesis, but he justifies his case in detail as it applies to each part of the literature. He does this in vigorously independent terms, without undue deference to the "current state" of any question. The result is a book with which nobody is likely to agree *in toto*, which contains many novel and surprising suggestions, which reopens questions which ought not to have been closed, and is an abundant stimulus to fresh thinking. This is eminently a discussable book, which sets out its reasons frankly, and invites reasons in answer to reasons, evidence in answer to evidence. All this is admirably done. The discussion

of detail takes full account of wide reading in diverse schools of thought.

The crucial point of departure is the ostensible lack of reference to the Fall of Jerusalem anywhere in the New Testament. Robinson discusses this with great thoroughness, and decides against the common view which would find such reference in *vaticinia post eventum* placed in the mouth of Jesus. He finds no compelling reason to believe even that any of Jesus' prophecies were written down in the light of 70.

I agree in principle here, but I think Robinson may be pressing the logic of his argument too far. He does not convince me on certain books where I still think a later date is valid. A pre-70 dating is in fact no more to be made a straitjacket than the critical orthodoxy should be. My guess is that *no* New Testament book was written in the immediate aftermath of 70, but that a very few were written at a date sufficiently remote to reflect a substantially different situation which represents the more distant outworkings of the catastrophe. The prospect of establishing any such dating securely hinges, it seems to me, on the possibility of establishing clear and objective criteria from a broadly based historical study.

Another general comment is in order here. The book is often more persuasive in its cautions than in some of its positive solutions. And Robinson himself fully recognises the point. He reiterates his insistence that his statements should be taken as questions. He urges his answers with fairness and caution, and recognises the strength of alternatives. His bold hypotheses are thought-provoking, but may not command assent, even though he repeatedly draws upon rich veins of well-worked material from older and neglected scholars. But his concluding observations are very important. He stresses that there is remarkably little hard evidence, internal or external, for the dating of the writings. Assumptions about literary dependence or prophecy after the event can be dangerously subjective, and strict criteria are needed. Currently accepted dates rest on remarkably slight foundation, determined only by elimination or by conjectural intervals required for development or diffusion. They "coexist rather than cohere" (p.343). There is neglect of the obvious, and there is "the manifold tyranny of unexamined assumptions" (p.345).

We should not be despondent about finding answers in the face of these salutary doubts, and certainly Robinson himself is not deterred from the attempt. But the important thing is his reopening of questions, his call to reconsideration. His answers are better taken as propositions for debate, as illustrations of the possibilities opened by the argument for an earlier synthesis. The layman should not be induced to mistake a new hypothetical structure for an accomplished revolution in Biblical scholarship.

In fact many of Robinson's positive arguments are of very uncertain value. I am very doubtful about some of his inferences from affinities of language or theology. The parallels between Phil. and 2 Tim. (p.80) do not prove a close sequence of relationship between them. Doctrinal affinities between Paul and Matthew (pp.97, 105) make a hazardous basis for the early dating of Matthew. And an early date for 2 Pet. is made to hinge in part on an even earlier placing of the Pastorals (p.198). In some of these cases the argument has to depend on the combination of hypotheses.

Another problem is involved in the very limitation of the discussion to the narrow, if crucial, focus of the dating. Robinson is understandably reluctant to get too far embroiled in questions of authorship and authenticity unless these are directly relevant. This is inevitable in a book already packed with close argument, and he still strives to tackle these questions wherever they impinge. But the different books pose different problems, and the dating issue sometimes becomes divorced from other facets which may need prior treatment. The tentative ascription of 2 Pet. to Jude is a case in point: the idea is so ingenious that we may neglect to ask whether an aberration of method supplies the only occasion for it.

Let us then survey the work in a little more detail.

The Pauline epistles are relatively the easiest ground. Robinson accepts the essential authenticity of the whole Pauline Corpus, and places the whole within the span of Paul's life as contained in Acts. On Galatians he essentially follows Lightfoot, while inclining to the South Galatian option, the definitive statement of which postdated Lightfoot. This actually leads him to a later dating than the pre-Jerusalem Council setting which is now often held in conjunction with the South Galatian view, but he gives a full and fair consideration to the alternatives. He places *all* the imprisonment epistles in Caesarea (c. A.D.58), going beyond Reicke's recent renewal of the Caesarean hypothesis for some of them. Most problematic of his treatment of the Pastorals: 2 Tim.1:17 seems very difficult to explain unless Paul had at least reached Rome. Robinson puts 1 Tim. very tentatively at about the time of the Corinthian correspondence, late in 55, and follows another suggestion of Reicke that Paul wrote to Titus while *en route* for Jerusalem in 57. But these hypotheses seem to me to stem from an unnecessary effort to link the essential authenticity of the Pastorals with the possibility of fitting them into Acts. (There are, ironically enough, those who are quite prepared to reject the evidence of Acts where such a correlation ostensibly exists.) But Acts is not to be another straitjacket, and I see no acute difficulty or artificiality in supposing that Paul obtained the acquittal he was entitled to expect and that the Pastorals may plausibly be set in a Pauline context later than the abrupt close of the narrative of Acts. I think it actually remains the most likely solution.

Robinson rightly starts with Luke-Acts as the key to the Synoptic area. Acts gives the best prospect of correlation with external data. Luke writes primarily as a historian, rather than as the "theologian's theologian" which recent study tends to make him. Opinion is of course much divided here, but I believe the evidence for the early date of Acts is unusually strong and diverse. This is also crucial as being necessarily a central plank of any synthesis. The implications of an early dating are as far-reaching as were those of a late dating in the Tübingen period. On a traditional "linear" view of Marcan priority, the sequence Mark - Luke - Acts looks assured. I should then see no objection to supposing the series complete by the date of the abrupt ending of Acts (c.62). Then Matthew is the uncertain quantity. But opinion on the Synoptic problem is now unusually fluid, and perhaps a different sequence may yet be established. There are clearly difficulties here, but Robinson's thesis rests on essentially firm ground in a central area.

Robinson argues that an extended period was needed for the formation and accretion of Gospel traditions in the Christian community before the emergence of the canonical form, particularly of Matthew. The processes of composition and literary relationship were, he thinks, more complex than traditional source criticism would suggest. But the final stage is still to be placed very early. The situation presupposed by Matthew, according to Robinson, again following Reicke, fits what is known about Christianity in Palestine between A.D. 50 and ca. 64. I find myself very doubtful here, for we really know too little from external sources to establish this kind of judgment. I should be content with saying that the pre-70 option seems an open one. Matthew is in fact an instructive case, for the same evidence is freely used to place the Gospel both before and after the watershed. Does the tribute-money incident (Matt. 17:24-27), for instance, reflect a problem of the church before or after 70, or one operative in the lifetime of Jesus? The Temple tax no longer existed in that form when there was no more Temple. But the argument for the editing of tradition in this early period is as uncertain - and as plausible - as for its editing later.

The General Epistles are a more difficult matter. They are in a sense less crucial to the central issue of the early synthesis, for they stand somewhat apart from the intricate interlocking of persons and events in the Synoptic and Pauline areas. Robinson seeks in general to place them by the indications of their setting in the church. His arguments for the primitive character of James are impressive, but many of the criteria he uses elsewhere strike me as uncertain. The comment about the precision of certain absolute dates in the period under discussion (p.140) helps only if we have strong grounds for relating our data to them. I think we have to reckon more directly with the problems of authorship and authenticity. The apostolic name should surely carry some

presumption of essential authenticity unless there is reason to challenge it. The onus surely lies upon the attempt to prove pseudonymity. In 2 Peter there are evident difficulties which raise the question, but it is disquieting to see how F.W. Beare on 1 Peter, for instance, proceeds to assume pseudonymity upon the briefest and most perfunctory assessment of the historical situation. Robinson is fully aware of the point, and indeed expresses himself strongly about the facile invocation of the concept of pseudonymity (pp.347-8). But his method and purpose preclude him from invoking prematurely any contrary presumption of authenticity. His conclusions are certainly very interesting: Jude and 2 Peter are the products of the same mind, antedating the death of James and the outbreak of official persecution, and for that matter antedating 1 Peter. He finds support from seeing a double allusion, to 2 Peter in Jude 3 and to Jude in 2 Pet.3:1.

Hebrews poses most acutely the question of relationship with the events of 70. No other book focuses upon the discussion of the Jewish sacrificial system, yet opinion of its date remains deeply divided. Robinson makes a forceful case at least for the earlier option. He ascribes the book tentatively to Barnabas.

The Revelation is something of a test case here. It is unique among New Testament books in being dated in early tradition. Yet Robinson gives reasons for rejecting the weight of external testimony to a Domitianic dating, following in this respect the distinguished precedent of Lightfoot, Westcott and Hort. His arguments are most interesting and stimulating, and will repay some discussion. He takes the book to presuppose a situation where the Temple still stood and the decisive separation of Jew and Christian had not yet taken place. He finds remarkable parallels with Jude and 2 Peter, and relates the situation of impending persecution more particularly to that of 1 Peter. The main body of both books, he argues, reflects the development of events in Rome. The crisis, on his view of the Seven Letters, has not yet matured in Asia. He sees no clear reference in them to the imperial cult. He questions the supposition that their setting demands so lengthy a lapse of time since Paul, and illustrates the subjective and contradictory use often made of debatable details. He argues that a straightforward reading of Rev.17:9-11 points to a placing under Galba (68-9), with reminiscence of recent events in Rome, in a sequence linked with his dates for the General Epistles.

One important side-issue here is the question of a Domitianic persecution. What do we mean by persecution? I believe there was a policy which Domitian enforced rigorously and which put intense pressure on Christians. They were just in an anomalous position with regard to Judaism as recognised by the state. There may have been no self-conscious attack upon Christians as such.

Their sufferings were a by-product, but they suffered none the less for their faith. Now none of this proves the Domitianic setting against Robinson, but I think he disposes of the possibility too easily. There is need for a study in depth of the externally documented situation. Domitian's moves against a few prominent people who may have been Christians is not the whole story, nor, I think, the most relevant part of it. There is still a lot more to be said here. I think there *is* reference to imperial cult in the letters. I should attach some weight to the local reaction to Domitian's decree against vines (cf. Rev. 6:6), or to a reconstruction of the background of the Nicolaitans or the "synagogues of Satan", or even to the rebuilding of Laodicea after an earthquake (cf. Rev. 3:17), precisely because I think these references may be integrated in principle with a pattern of "hard" evidence which suits Domitianic Asia. The question is whether either case is established. It is an instructive instance of the need for the rigorous study of criteria, and it is the constant merit of Robinson's own work to call for this. Again, his whole chapter is a spur to fruitful discussion. His insistence on a straightforward interpretation of the reference of Rev. 17:9-11 is much in point: any solution is debatable, but the problem is an acute one for the Domitianic viewpoint.

To affirm a later date for the Revelation need not call in question the substantial correctness of an early synthesis. I suspect that Robinson's scheme is a little too neat. The development of events and movements is often complex and repetitive, and there are indications that that was so here. Jewish-Christian relations were a problem in the nineties, and it is, I think, an oversimplification to close a chapter of history at 70. Robinson tends in practice still to assume a more linear process of historical development than the facts seem quite to warrant. He may have compressed what others have expanded, and he often surpasses them in his carefully and thoroughly discussed correlations with external events, but the argument from development remains uncertain, as indeed he recognises. Perhaps he could hardly do otherwise: it is easy for the critic to demand standards of proof which the evidence does not permit. Yet one may recognise the force and ability of an argument without being fully persuaded.

On the treatment of the Fourth Gospel, the focus and starting-point of the work, there is perhaps less to be said. Robinson makes a convincing case at least for the primitive setting of the material in the ministry of Jesus. He finds a striking absence of evidence for editing in the later church. How does Dodd, for instance, combine a traditional late dating with his sense of the crystallised primitiveness of so much of it? There is a gap here which strains credibility. So Robinson effectively reopens another question. The answer to the date of composition is perhaps not yet at all clear:

might one even suggest that a late date is *only* plausible on the assumption of apostolic authorship, for only thus might one perhaps explain the preservation of such primitive perspectives? Robinson however would see no occasion for this. He argues both for apostolic authorship and an early date. The least convincing part of his discussion is his treatment of the Johannine Epistles and the stages and sequences of composition. The evidence here seems too slight to sustain the weight he is forced to put on it. But I am not sure that we are well placed to give any easy answers here.

The dating of New Testament books is of course only part of a more extensive complex of problems, which includes the study of extra-canonical literature. The obscure period after 70 is a challenge to historical criticism. If we follow Robinson in his rejection of "the peopling of the sub-apostolic era with a penumbra of pseudo-Pauls, pseudo-Johns (and even pseudo-Judes!) on no evidence which is not drawn out of the documents themselves" (p.348), we need to look afresh at this period. He proposes early dates for the Didache, 1 Clement, the Epistle of Barnabas and the Shepherd of Hermas, arguing that a natural placing of most of them after 70 has been precluded by the insistence of making the New Testament books usurp their place and force them later. He makes some telling points. Even Lightfoot, for instance, fails to do justice to the ostensible reference in 1 Clement 41 to the Temple sacrifices in the present tense. But this is another difficult area. Robinson persuades us at least that we have no ground for objecting to the reconsideration of some old solutions. The Didache is the most contentious case. In setting it extremely early he finds in it "valuable evidence for the prehistory of the synoptic tradition" (p.324). But the criteria for dating this work are particularly elusive.

Altogether then, this is an important book which merits much high praise. It offers some solid gains and much food for thought. In some areas modern criticism has never effectively challenged the assumptions on which rejected conclusions have been built, but has even built in its own share of dogmas upon the debris of exploded hypotheses. So this kind of clearing of the ground is salutary. The general (and largely cautionary) conclusions on pp.336-351 are more significant to my mind than many of the positive hypotheses. Indeed Robinson tends to overplay a case which I take to be strong in some of its essentials. He tries to prove too much, to press an idea to its logical limit. (Again, we must remember his insistence that we treat his statements as questions for debate.)

One area is, I think, crucial to the essentially early synthesis. I have had little occasion to discuss the Luke-Acts question here, for Robinson seems to be on very solid ground, and I readily concur with him. This double work links with the primary writings of

Paul on one hand, and with the Synoptic relationships on the other. The early date here runs counter to much current critical opinion, but is supported by a wide diversity of evidence, at least for Acts. And the consequences are far-reaching.

But we must look hard at the arguments from development, not least at those of Robinson himself. His account of the period between 62 and 70 is most problematic, precisely because of the large part he requires the interdependence of developmental uncertainties to play. It is probable enough that the early synthesis applies more widely, but I doubt some of his positions, and some of his reasons for positions I might accept, and I take some of his probabilities for possibilities, and others as proving less than he might wish to maintain.

COLIN J. HEMER

1. J.A.T. Robinson, *Redating the New Testament*, SCM London, 1976. £8.50.

MARTYN BAKER

Advertising

This is the fourth paper given at the recent VI Symposium on Communicating the Christian Faith Today (22 May, 1976). The author, viewing the matter from his own psychological slant, analyses the development of advertising in recent decades. He draws attention to the parallel with preaching; both approaches calling for some sort of an action on the part of those addressed. He concludes that Christians have often tended to appeal to the same motives as advertisers, forgetting that in the NT God positively commands repentance.

Historically, this change in behaviour used to be brought about by advertising that was *proclamation*. It was born with the invention of print — print being, as McLuhan and Fiore (1965) say, "a ditto device", a method of taking the old word-of-mouth village-wide gossip and transforming it into new print-bound nationwide communications. Such mass-produced proclamations gave the impression of manufacturers 'blowing their own trumpets', and led to advertisements being called 'puffs'. Thomas Carlyle (1843) referred to them as "that all-deafening blast of puffery" when he commented as follows:-

We take it for granted, the most rigorous of us, that all men who have made anything are expected and entitled to make the loudest possible proclamation of it, and call upon a discerning public to reward them for it" — "Nature requires no man to make proclamation of his doings and hat-makings; Nature forbids all men to make such. There is not a man or hat-maker born into the world but feels, or has felt, that he is degrading himself if he speak of his excellences and prowesses, and supremacy in his craft; his inmost heart says to him, 'Leave thy friends to speak of these; if possible thy enemies to speak of these; but at all events, thy friends!' He feels that he is already a poor braggart; fast hastening to be a falsity and speaker of the Untruth.

Bragging it may have been, but 'puffery' made products well-known and brought in better sales. ("Good morning. Have you used Pears' Soap?" became such a habit of speech that Stock Exchange men of the 1890's are reported to have refused to greet each other for fear of arousing the complementary question — see Turner, 1952).

As proclamation-advertising increased in volume, with different brands of similar products engaging in competition, moves were made 'to distinguish one's own product from one's competitors'. Into advertisements, therefore, came claims to indicate difference from, superiority over, other like goods (as witness the fantastic claims made on behalf of quack medicines, increasingly from the Great Plague until the nineteenth century when legislative curbs were introduced). Proclamation was superseded by *persuasion*.

As persuasion-advertising grew more and yet more in volume, consumer attitudes hardened to the point of cynicism towards almost all claims made for products. A method was required to break through this self-protective cynicism; a way of advertising was needed which was actually persuasion, but had the innocuous appearance of proclamation; — the *ambiguous* advertisement. It is this sort of thing that Dichter (1964) has in mind:—

We have a mental habit of seeing an advertisement as a kind of bulletin, a statement to the public ... about a product and its various characteristics. In reality, tests show that consumers tend to respond to advertisements as if they were a form of word-of-mouth communication. Because of their deep need for sincere and reliable human guidance, they cannot help seeing an advertisement as an interpersonal communication from the people who make a product to the people who buy it.

In a sense, the desire is for re-creating a past situation, where the shoemaker, the tailor, the grocer-around-the-corner gave information and friendly advice based upon personal knowledge of the consumer and his or her family and their needs and means. Such an intimate relationship created a feeling of trust and security, and reduced the confusions of 'cold commercialism'.

It is when the consumer feels that an advertisement is intended more as a sales tool than as information and guidance that he feels threatened, that he rejects the advertising claim, that he turns for a solution of his buying problem to word-of-mouth. It is when he feels that an advertiser speaks to him as a friend, an unbiased authority, or uses other positive psychological approaches in creating the atmosphere of word-of-mouth, that he will relax and tend to accept the recommendation.

Such ambiguous advertisements — persuasion successfully masquerading as proclamation — have been generated from at least two mainstream influences in twentieth century psychology: the Psychoanalytic and the Pavlovian approaches. An advertisement based on psychoanalytic thinking will most likely present an innocent view of the product concerned, with some slight twist that satisfies hypothesised hidden needs of the consumer, that supplies a goal for motivation of which the owner is unaware. For example, the long-standing Embassy cigarettes poster is often described by smokers as honest publicity — it simply portrays a pack and a cigarette, plus caption. However, the blueish smoke haze in which they are enveloped fits exactly the basic tenets of Marcovitz' (1969) theory that heavy smoking is a respiratory addiction to consumption, resurrection and powerful visualisation of the smoke itself.

This in-depth 'motivational research' approach is less popular today (Collins & Montgomery, 1969; Cannon, 1973), and has given way to an increase in the less mysterious advertising based on Pavlovian psychology. This attempts to transfer the already-formed response to a particular stimulus onto a new stimulus — the advertised product. Just as dogs can be trained to salivate at the sound of a bell rather than to the expectancy of food, so young men may be taught to give the disarming response, 'Mmmmmmmmmmm....', not to the young lady but to the product beside her.

Such an approach can also be used in reverse. A dog will respond to electric shock by the self-preservative, anxiety-reducing action of breaking the circuit. (Solomon and Brush, 1956, taught dogs to jump a barrier into the nonelectrified part of their cage.) This action can then be conditioned onto a signal preceding the electric shock rather than the shock itself. Similarly, smokers may be urged to avoid contracting lung cancer by quitting smoking, the signal for cancer of the lung being (the thought of) cigarettes.

The course of the antismoking campaign publicity illustrates fairly accurately, much of the above described development of advertising; but it also mirrors somewhat uncannily the trend of Christian evangelism to the present time. The antismoking message in the UK started in the late 1950's as a proclamation of Early Death through Smoking. This statement of statistical association was then followed up by various attempts at persuasion. (Don't waste your life, What about those you leave behind?, You can't scrub your lungs clean, and so on) away from future disaster. The negative consequences (of which cigarettes are the signal and to the threat of which quitting is the response) were then altered from the long-term future to those of the present-day: coughing, phlegm, festering impurities in the lungs. Then they became less medical, more down-to-earth (bad breath, odourous clothes, and other social unacceptabilities). Presently, the campaign focusses on what smokers

miss by not quitting, and the good things gained by stopping ("The moment you stop smoking, your lungs begin to heal", backed by a glorious photograph of bounding dog and joyful family charging through a meadow is a recent Scottish example). Thus, proclamation was succeeded by persuasion, which was firstly 'in reverse' about the future, then about the present, and finally we have a positive Pavlovian approach.

Similarly the message presented as 'the gospel' once consisted of a proclamation of facts. Efforts to persuade unbelievers of its truth then shifted in the direction of stressing the unpleasant consequences of unbelief, sometimes improving on the Scriptural account of them (for instance, in the awful paintings of Bosch). In the twentieth century, the emphasis shifted to the negative consequences experienced in the present (boredom, existential uncertainty, loneliness, immediate evil results of sinning); and thence further, to the positive things of the Christian life as incentives to receive the gospel (purpose in life, the love of God, heaven, peace, happiness, gain a Friend).

Hazards involved in 'advertising' the Gospel

The inherent danger of all persuasive advertising, whether blatant or ambiguous, is that consumers will become rapidly disillusioned with the product if its advertised claims are not authenticated in practice. In our example above, this is certainly the single biggest problem of the antismoking campaign. A smoker on first exposure to its publicity may well attempt to quit, hoping to avoid the consequences of continuing or gain the incentives to stop. Then he fails to give up, and into the bargain experiences both private and public humiliation in finding cigarettes his master, with consequent drop in self-esteem. His personal prediction in committing himself to giving up was of success: it has been disconfirmed. These factors lead him increasingly to disillusionment, such that the campaign publicity loses all credibility for him. Subsequent exposures to its advertisements find him well and truly conditioned not to notice them, not to take action; and in this he is reinforced by the maintenance of his dignity and self-esteem. Nonresponse is rewarded proportionally to the amount of antismoking publicity thrust upon him - and just as with the avoidance response of Solomon & Brush's dogs (above), this avoidance response is extremely resistant to extinction.

In tragically similar manner, disillusioned people who responded initially to claims made on behalf of the gospel rather than to the gospel itself (which is a command, not an optional recommendation; imperative rather than incentive - Acts 17:30; for example) are reinforced in their present non-response proportionally to their subsequent re-exposure to such gospel 'advertising'.

In conclusion

Does an examination of the development of advertising afford useful lessons for communicating the Christian faith today? As a cautionary tale, yes it does. If nothing else, it counsels one back to the exhortation of Jeremiah 6:16, to "ask for the old paths, where is the good way, and walk therein". But let us heed the sequel — "They said, we will not walk therein". Applying this to ourselves; if we insist on following the technique of the advertiser, may we not expect an increasingly disillusioned public for each new evangelistic campaign?

REFERENCES

- Cannon, T. (1973), *Advertising Research*. Intertext.
 Carlyle, T. (1843), *Past and Present*, cited by Turner (below)
 Collins, L. and C. Montgomery (1970), "Whatever happened to motivational research? end of the messianic hope", *J. Market Res. Soc.*, 12, 1.
 Dichter, E. (1964), *Handbook of Consumer Motivations; the Psychology of the World of Objects*.^{*}
 McLuhan, M. and Q. Fiore (1965), *The Medium is the Massage*.
 Marcovitz, E. (1969), *J. Amer. Psychoanal. Soc.* 17, 1074.
 Solomon, R.L. and E.S. Brush (1956). In M.R. Jones (Ed.) *Nebraska Symposium on Motivation*, Lincoln, pp.212-305.
 Turner, E.S. (1952), *The Shocking History of Advertising!* Michael Joseph.

*The quotation from Dichter (1964) is used with the permission of the publishers, Messrs. McGraw-Hill Book Co. NY.

JOHN BYRT

The Roles of the Bible and of Science in
Understanding Creation

Many mutually inconsistent views on the subject of creation have gained acceptance among Christians. In this paper Mr Byrt outlines their strengths and weaknesses and examines the status of creation in Christian faith.

Since the creation-evolution controversy erupted about a century ago following the publication of Charles Darwin's *Origin of Species*, there have been significant contributions to the evidence available. It might have been expected that this would have clarified the main issues and led to some clear-cut answers; but this has not been the case. The subject is so inextricably linked with philosophical issues that it is virtually impossible to separate established facts from the predispositions and prejudices of the individuals contributing to the discussion. Nevertheless, every thinking person feels a need to fit 'the facts' - at a level appropriate to his depth of study - into a self-consistent picture. It will therefore be our aim to formulate a positive view of creation rather than content ourselves with pointing to weaknesses in the generally accepted theories of evolution.

Defining Evolution

The word '*evolution*' of itself signifies merely an unrolling or unfolding. The aspect with which we are concerned is designated '*organic evolution*' or '*biological evolution*'. This is the theory that all existing forms of plant and animal life have arisen by natural descent from one or more simple forms. That the topic is philosophically '*loaded*' is indicated by the definition of evolution included with others in the Shorter Oxford Dictionary: "The origination of species conceived as a process of development from earlier forms and not as due to '*special creation*'."

Micro-evolution. Almost all higher forms of life show some potentiality for variation, and in response to changes in environment (either in different places or at different times), one variant may be selectively favoured with respect to another variant of the same species. Many evolutionists argue that these small changes, allowed

to accumulate over many generations, will produce new species, and then new families, and finally all the changes from single celled ancestors through invertebrates, fishes, reptiles and mammals to man. They therefore feel justified in including these supposed changes in their definition of evolution.

Many small evolutionary changes have been observed either in nature or in the laboratory. One that is frequently quoted is 'industrial melanism' in certain moths. Before the advent of industrialization, light coloured moths were 'normal', and darker ones were seen only occasionally. As the trunks of trees in industrial areas became blackened with soot, the predominant variety became the darker one, and the light variant became 'abnormal'. (H.B.D. Kettlewell, 1959) This is readily explained by the vulnerability of moths of dissimilar colouring to predation by their natural enemies, the birds. In fact, all such cases can be viewed by the creationist as demonstrations of the wisdom of the Creator in equipping living things with an inbuilt protection against limited fluctuations in their environment. There is *no* experimental evidence that such changes can accumulate indefinitely; to believe that elephants and men have arisen in this way from the same parent stock represents an act of faith on the part of the evolutionist. It is therefore a source of confusion that the same term 'evolution' is applied both to these small, demonstrable changes (sometimes termed *micro-evolution*) and also to those large changes necessary to the doctrine of transformism resulting in new families, classes and phyla (sometimes termed *macro-evolution*). Dr. G.A. Kerkut of the University of Southampton comments:

There is a theory which states that many living animals can be observed over the course of time to undergo changes so that new species are formed. This can be called the 'Special Theory of Evolution' and can be demonstrated in certain cases by experiments. On the other hand there is the theory that all the living forms in the world have arisen from a single source which itself came from an inorganic form. This theory can be called the 'General Theory of Evolution' and the evidence that supports it is not sufficiently strong to allow us to consider it as anything more than a working hypothesis. It is not clear whether the changes that bring about speciation are of the same nature as those that brought about the development of new phyla. The answer will be found by future experimental work and not by dogmatic assertions that the General Theory of Evolution must be correct because there is nothing else that will satisfactorily take its place.

The Origin of Life. When Prof. J.B.S. Haldane (1949 p.8) represented the Rationalist Press Association in a debate against spokesmen of the Evolution Protest Movement, he agreed to do so "provided that the question of the origin of life be excluded and that the discussion

should be limited to organic evolution — the theory that existing animals and plants, and also mankind, are descended from simple forms of life." Since that time there has been much speculation on the stages by which life might have been generated by purely 'natural' means, and most evolutionists would now include the spontaneous generation of life as an essential part of their theory.

Life is often pictured as arising by steps something like the following:

1. The earth's primeval atmosphere is supposed to have consisted of reducing gases such as hydrogen, methane and ammonia with water vapour and nitrogen.
2. Radiation or electric discharges acting on this mixture produced simple organic compounds such as amino acids, containing carbon, oxygen, hydrogen and nitrogen.
3. These simple molecules combined to form very large molecules such as proteins, which are necessary for even the lowliest forms of life.
4. It chanced that one or more of these molecules possessed the ability — in the presence of a suitable nutrient medium — to replicate itself, and so many similar molecules were produced.
5. Details like the formation of a containing membrane and the presence within this membrane of the other molecules necessary to catalyse the replication reaction being conveniently assumed, life followed automatically under the influence of physical and chemical forces.

The part of this chain supported by experiment is that if the right gas mixture is carefully chosen in the laboratory, simple compounds can be produced by repeated electric discharges; and even somewhat larger molecules may accumulate, provided steps are taken to remove them from the destructive environment of the experiment as soon as they are formed. All the other links rest largely on faith, as the following points show:

1. There is no evidence that the earth's atmosphere ever consisted of the gases demanded by the theory and much evidence that it did not. "The composition of sea water and atmosphere have varied somewhat during the past; but the geologic record indicates that these variations have probably been within relatively narrow limits." (Rubey, 1951) "Sedimentary rocks exhibit much the same characteristics [especially as regards the ratio of ferrous to ferric iron] throughout

geological time. This would be unlikely were the composition of the atmosphere at some earlier date radically different from what it is now." (Mason, 1952, p.183). There is no evidence that the nutrient nitrogen-containing medium ("soup") ever existed, especially as the earliest rocks are not associated with high N-containing deposits (Brooks and Shaw, 1973). Dissociation of water vapour by the sun's actinic rays (see Cloud 1968f) would leave oxygen in excess, the hydrogen escaping into space. This makes intelligible the fact that Martian soil evolves oxygen when moistened. Methane and ammonia are not found on the moon, Venus or Mars and both are absent in volcanic gases (for analyses of these, see Rubey, 1951; Fridriksson, 1975, p.48 gives analysis for Surtisi). Hydrocyanic acid which could give organic compounds, has often been postulated (Raff and Meaburn, 1969) but the absence of Prussian blue as a mineral seems to rule it out. According to Brinkmann (1969) oxygen build-up in the atmosphere must have been rapid from the start which "precludes biological evolution as presently understood".

2. Before the oxygen in the atmosphere had produced a protective ozone layer, life could not have existed on earth unless protected, either by a considerable depth (estimated at 10 metres) of water, or in some other way.

3. Coppedge (1973) applies probability theory to the formation of the types of molecule necessary for life. He concludes that there is about one chance in 10^{161} that a single usable protein would have been produced by chance during the time claimed as the age of the earth.

4. Even if a 'soup' of protein molecules were produced in some warm pool, there is no good reason to suppose that life would appear. No one understands just what physical and chemical factors distinguish a living amoeba from one that has just died; and no one has ever succeeded in bringing lifeless matter to life in the laboratory.

"Genesis" and Theories of Creation

Genesis 1 teaches that God created the heavens and the earth. As soon as we venture beyond this basic statement, however, we encounter among Christians a bewildering collection of theories purporting to explain or interpret the Genesis account. Most of these theories have been tabulated by Donald England (1972, p.116), and we here present his list in note form to illustrate the range of theories put forward, all by scholars anxious to do justice to the words of Genesis:

1. Literal days, young earth... Fossils mostly due to global Flood.
2. Young earth, but series of catastrophes including Flood.
3. Gap or restitution theory; earth became void.
4. Multiple gap; 24-hour creation days separated by long ages.
5. 'Days' of Gen.1 equated with geological ages.
6. Days of revelation in which God revealed creative acts.
7. Poetic presentation; futile to attempt correlation with science.
8. Theistic evolution: God created matter and laws, evolution followed.

To every one of these interpretations some objection has been raised on either biblical or scientific grounds. Some of these objections we shall be considering in greater detail; for the moment it suffices to note very briefly the general grounds of objection:

1. Not only light but "evening and morning" exist before sun, moon and stars. Temperature too is 'normal', since water exists in both liquid and vapour forms. Vegetation (and presumably photosynthesis) appears before the sun. The work of the Flood in creating several km of sedimentary rocks with many millions of fossils appears excessive.
2. Like the first interpretation, this is confronted by many indications of earth's antiquity — radioactivity and associated dating methods, continental drift, ice ages, coal formation, etc.
3. The rendering "became" has been opposed by a number of scholars. See this JOURNAL, 72, 207. E.J. Young (1964, p.9) goes further in insisting that, quite apart from any catastrophe, "the chapter is not concerned merely with the reformation of already existing material. Its theme is far grander than that." However, the thesis is defended on linguistic grounds by A.C. Custance (1970). On the scientific side, one might expect a global catastrophe such as to necessitate the re-creation of all life forms, and even of the sun, to present an obvious feature of the geological record.

4. This is a "hybrid" theory lacking the appeal of simplicity -- a feature the more desirable because of the extreme brevity of the Genesis record.

5. The Hebrew *yom* is often used of an indefinite period -- even in Gen. 2:4, "In the day that the Lord God made the earth and the heavens." It has been claimed, e.g. by J.C. Whitcomb (1972), p.27 that "in historical narratives the numerical adjective *always* limits the word to a twenty-four hour period." However, the whole contention of some of the other interpretations is that the Genesis account is *not* an historical narrative; and for some expositors Whitcomb's appeal to the evenings and mornings of Dan. 8:26 as 2300 literal days would weaken rather than strengthen his case. However, even with "days" involving millions of years (as in W.J. Beasley, 1955), exact correlation between Genesis and geology is difficult; e.g. the appearance of trees bearing "fruit" before land animals or even aquatic life.

6. This thesis is argued cogently by P.J. Wiseman (1949). It has the advantage that the order of revelation need not follow rigidly the actual order of appearance. The background of the sabbath law given in Exod. 20:11 presents an exegetical problem; "for in six days the Lord made heaven and earth, the sea, and all that is in them, and rested the seventh day." However, the point here made about the Sabbath is that man is to imitate God by ceasing to work on the seventh day, and on this view Adam must have noted that this is just what God did. But the impact would surely have been greater if the devout Israelite had himself been the witness of the creation plus resting, rather than merely the recipient of some form of message about how Adam had witnessed it.

7. M.G. Kline (1970, p.81) states that "the prologue's literary character ... is that of simple observation, and a poetic quality, reflected in the strophic structure, permeates its style." As against this, E.J. Young (1964, p.105) says: "The characteristics of Hebrew poetry are lacking. There are poetic accounts of the creation and these form a striking contrast to Genesis one."

8. Some writers see incompatibility with particular biblical phrases such as "according to its kind". However, this is to place rather heavy weight on a few words. More important are the scientific problems such as the origin of life and the discontinuities in the fossil record -- perhaps the more telling because the theistic evolutionist is not under the same philosophical compulsion to believe as is the atheist.

Hermeneutics

It is evident that most of the above interpretations are mutually contradictory, and we must ask: On what grounds is one interpretation to be rejected, and another accepted?

When we look at the range of the objections listed, it becomes evident that the answer to this question will depend not on clear-cut evidence but on *hermeneutics*: the general principles of interpretation we apply in our study of the Bible. Many variants can be detected in this area, but for simplicity we shall distinguish three main approaches.

Literalist. Some would use the word 'Fundamentalist' here. However, this word is ambiguous. As John Stott (1970, p.43) reminds us, "The Oxford English Dictionary has preserved the early meaning of 'fundamentalism' as 'strict adherence to traditional or orthodox tenets ... held to be fundamental to the Christian faith' and mentions biblical inerrancy only as an example." The attitude to which we refer here claims not only that the Bible is inerrant but that its language must be taken literally when ever possible. It sees the Bible as authoritative for every field on which it touches, however incidentally; any conflict with, say, geology means that the geologists must be wrong.

Liberal. For this group, the Bible reflects a progression in man's understanding of God and his universe, penned by men living lives enlightened by his Spirit. Views on scientific themes are likely to be those current at the time of writing, and are frequently erroneous; but this does not diminish the Bible's value on spiritual matters.

Moderate. While the original documents are accepted as divinely inspired, the wording is accommodated to the social and cultural environment at the time of writing and the need to be meaningful to readers of widely differing background over many centuries. Numerous figures of speech, types and allegories are used, and the 'true' meaning will not always be self-evident. When, e.g., the Bible attributes psychic properties to bowels, kidneys, heart, liver and bones, this neither proves the Bible "unscientific" nor disproves its inspiration, but "the divine revelation came in and through these modes of expression and the infallible truth shines *through* them" (Ramm, 1970, p.211).

In some areas these different approaches yield only marginally different conclusions, and it might be thought that they are of interest only to the academics. Applied to the age of the earth, however, they make the difference between a few thousand and a few

thousand million years. Further study in such areas thus becomes virtually impossible until some decision is made on the general approach to Bible interpretation.

It is important to realize that there is no single answer which is self-evidently *the correct* one. Interpretation of a particular passage, or of a whole theme, inevitably has some subjective element. There is one NT passage (2 Pet. 1:20) which deals with the interpretation of Scripture, and significantly that passage has itself been the subject of different interpretations. "First of all you must understand this, that no prophecy of scripture is a matter of one's own interpretation..." Peter precedes this by a reference to the fact that he and the associated apostles, as eye-witnesses of the majesty of Jesus, had "the prophetic word made more sure." (The RSV, used in most places throughout this essay, gives a different slant from AV in this passage.) He follows it by noting that the *giving* of scripture was a work of the Holy Spirit: "men moved by the Holy Spirit spoke from God." These and other NT passages suggest that our spiritual vision in the understanding of scripture is at its keenest, when

- (i) we relate all that has been written, whether in OT or NT, to the work of our Lord, past, present and future;
- (ii) we acknowledge the utter inability of a human being, using simply his own intellectual prowess, to understand correctly the words of scripture; and
- (iii) we seek the help of God's Spirit in this task. (See Rom. 10:5-9).

It is likewise important to note that to interpret language literally is *one type of interpretation*. In a particular passage it may be right, or it may be wrong. In dealing with a Book which abounds in figures of speech (it is instructive to look even at the Table of Contents in Bullinger's 1100-page "Figures of Speech Used in the Bible"), there is nothing inherently more reverent in a literal interpretation than in one which detects metaphor or allegory. Very frequently there is room for both literal and figurative applications of the same passage. (See Gal.4:21-31)

While the last word has not been spoken on this subject (and will not be, in this life), a useful approach has been suggested by Dr. D.C. Spanner (1970): "My conclusion therefore to the question of how we are to decide the issue of the origin of Man is this. Where the points at issue are theological and ultimate they must be answered on biblical grounds. Where they are biological and phenomenal they must be answered on scientific grounds. Where there seems to be a double reference, i.e. an issue which touches

both the theological and the scientific, care must be taken to do justice to both. Sometimes, indeed the way to do this may not be at all clear. In such a case we must be willing to live with the problem, until the God of all Truth is pleased to bring us to a right understanding, and to a grateful appreciation of the consistency of all His avenues of instruction."

The basic premise underlying this attitude is that the Bible is — for want of a better word — a *theological* or *religious* book; one which makes no claim to instruct its readers on cosmology, geology or any branch of natural science beyond the stage they might reach by natural studies. This is *not* to assert (as has sometimes been urged) that the Bible must be full of technical errors. Rather does it maintain that the Bible is not full of technical *statements*, erroneous or otherwise; where it makes statements that appear *to us* to have technical content, these should be regarded as couched in language chosen for intelligibility, without any implication as to the correctness of the 'science' that gave rise to that language. And we must have sufficient technical humility to realize that if ever there is a 21st century, some of the science of the 20th century will appear as a very childish approximation to truth. Why then should the divine Author make special provision to satisfy the technical consciousness of our particular era?

We should learn from the mistakes of an earlier generation who insisted on interpreting expressions like "the four corners of the earth" literally or "scientifically". Those who delight in the "scientific accuracy" of Job 26:7, "... and hangs the earth upon nothing", should be aware that they use a different basis of interpretation in v.11, "The pillars of heaven tremble". A similar willingness to vary our 'feel' for a passage will be detectable in many other instances — usually without any formulation of a definite policy. Given enough perversity or lack of knowledge it is possible to build a quite fantastic scientific picture of the structure of the universe, as was done, in fact, by the sixth century monk Cosmas Indicopleustes (McCrindle 1897).

Identifying the Questions. When this principle is applied to the study of origins, it becomes possible to consider two questions on their respective merits:

1. How much can we determine as to the mode of creation, its date and its duration? The answer to these problems should be sought from natural science, with the possibility that the Bible might contribute marginally in areas of overlap or 'interface'.
2. How does the Bible describe God's creative work? For what purpose is the topic of origins introduced in certain contexts? These problems can be answered — if at all — only from the Bible, which is the ultimate and sole authority within this realm.

This separation of scientific and theological aspects enables us to examine specific problems in an objective way, without restraints imposed before the investigation begins. We shall not have time in this essay to examine every one of the problems that are commonly encountered. Instead we shall deal with a few typical examples, in the hope that the interested reader will then be in a position to apply the same techniques to other examples as they arise.

Evidence claimed to support evolution.

Various books propounding evolution deal with certain lines of evidence that are supposed to support the theory; the books opposing the theory are commonly subdivided in a similar way. For instance, a debate between H.S. Sheldon (for) and D. Dewar (against) (1947) has the following chapter headings:

Causes of Evolution
 The Geological Record
 Geographical Distribution
 Morphology (i.e. physical form) and Classification
 Experimental Evidence (i.e. breeding and genetics)
 Embryology
 Nascent and vestigial organs
 Some Instincts and Habits of Animals
 The Origin of Man

Somewhat similar groupings of topics are adopted by Davidheiser (1969), Heinze (1973) and Carron (1957, 1973). Of these various lines, we shall confine our attention to the geological aspects: the dating of earth and its rocks, and the fossils found in sedimentary deposits.

Age of the earth and rocks

While the mechanism by which evolution is supposed to have occurred is still a matter for debate, on one point evolutionists agree: the changes involved must take place very slowly over millions of years. It is not surprising, then, that Charles Darwin's *Origin of Species* appeared somewhat after the uniformitarian understanding of geology was propounded by Sir Charles Lyell about 1830.

Dating methods other than by radioactivity measurements — e.g. the concentrations of salts in the ocean, the rates of deposition of sedimentary rocks — are quite unreliable, and virtually all dating of rocks is nowadays by radiometric methods. Various elements (or

more accurately the isotopes of those elements that undergo radioactive decay) undergo spontaneous disintegration to produce different elements. The relative amounts of mother and daughter elements *at the present time* can be determined by analysis whilst the Geiger counter enables the present rate of radioactive decay to be measured. This can be compared against the known present rates of decay for many isotopes.

Quite apart from attempts to date rocks more or less accurately, the elements found on earth suggest that a few thousand million years must have elapsed since the oldest rocks solidified. This follows because all of the nearly 300 non-radioactive isotopes of the elements are found in nature but none of those with half lives of a few hundred million years or less. Isotopes with half lives in the thousand-million year range (U-238; 4.5 thousand million years; Th-232, 13.9) are found in fair quantity, but at the lower range (U-235, 0.7; K-40, 1.0) only traces remain, or even none (e.g. Pu-244; 82 million years; I-129, 17 million years).

It is urged by some that radio dating for a rock is only possible if the following conditions hold:

1. None of the daughter element was present in the rock when it was formed;
2. The rate of decay of the element has remained constant since the time the rock was formed;
3. All of the daughter element in the rock was derived from the parent element that was previously in the rock." (Moore and Slusher, 1974 p.425)

It is true that these conditions are beyond rigorous proof and that the results obtained by radioactive dating are dependent to this extent on the assumptions made. On the other hand there are limits also to the extent to which the conditions are likely to be *untrue*. It is worth while considering each in further detail.

1. Gish (1972 p.42) writes: "While very accurate methods are available for determining the *present* ratios of uranium-lead, potassium-argon, and other isotope ratios in mineral-bearing rocks, there is, of course, no direct method for estimating the *initial* ratios of these isotopes in the rocks when the rocks were first formed." However, there are many cases where isotopes occur apart from any present evidence of radioactive systems and these permit meaningful calculation of original or apart-from-radioactivity ratios. Thus all lead found in minerals lacking in uranium contains 23.6% of Pb-206. But this isotope of lead is the final product formed in the U-238 series. It is reasonable therefore to suppose

that in uranium minerals, Pb-206 over the 23.6% level has been formed radioactively and it is from this excess that ages are calculated by the so-called method. Similarly in the rubidium/strontium isochron procedure the natural ratio Sr-87/Sr-86 is 0.71 but if Rb-87 (which gives Sr-87) is present, the ratio is larger and from the difference the age is calculable. (For details, see for e.g. Yorke and Farquhar, 1972)

2. There is a limit to the error in radioactivity methods that can be attributed to greater decay rates in the past. Radioactive processes result in heat generation of sufficient magnitude to contribute appreciably to the warming of the earth's surface today. An attempt to compress, say, an age of 5000 million years to 10,000 years on the basis of this factor alone would be likely not only to subject any living creatures to a lethal barrage of radiation, but to convert the whole planet to a boiling inferno.

The suggestion is often made that although rates of decay are found to be constant over a considerable range of laboratory conditions, other factors such as cosmic ray intensity might influence them profoundly. Nevertheless rates of radioactive decomposition are the same in high flying balloons where cosmic rays are plentiful, as in mine shafts where the latter are almost completely cut off.

It is urged that the discordant results sometimes obtained, especially in the earlier days when techniques were poorly developed, lead many to suspect that all is not well. Among the most widely used of the radiometric methods are those based on the decay of uranium isotopes, in several stages, to yield an isotope of lead. Geological time scales reproduced in countless books are based ultimately on a few measurements of this sort. Knoph (1957, p.227) states: "Ultimately, however, they are tied to three dates based on atomic disintegration: 60 million years, the age of the pitchblende at Central City, Colorado; 220 million years, the age of the pitchblende at St. Joachimstal, Bohemia; and 440 million years, the age of the uranium-bearing shale at Gullhogan, Sweden ... All other absolute ages have been derived from the three radio-active tie points by interpolation based on thickness of strata or by 'reasoned guesses'." If this 1957 claim is still true, it is fascinating to compare this high level of confidence with the words of Henry Faul (1966, p.61): "Uraniferous shale is another unreliable system ... Uranium and lead both migrate in them in geologic time, and detailed analyses have shown that useful ages cannot be obtained from them. Similar difficulties prevail in attempts to date pitchblende veins." (But see whole

rock method below)

For himself, Paul (1966, p.53) feels that "volcanic-ash falls and lava flows are now probably the best reference points for the time scale. They were deposited quickly - instantly in geologic time - and many of them are interstratified with fossiliferous sediments without any significant break in sedimentation ... Layered volcanics are the mainstay of the geologic time scale."

In contrast we may compare the frequently made claim (Clementson 1970, p.237 etc.) that volcanic deposits known to be very recent may give ages anywhere from 180 to 10,000 million years. The difficulty here is that when volcanoes erupt, stones and small particles which do not become molten at the time of the eruption are mixed with lavas. These (xenoliths) often give great and probably genuine ages whereas if determinations are made on the recently molten magma, low ages are obtained. (Thus Funkhouser and Naughton, 1968 used the K-Ar method to date lava from a Hawaiian volcano which erupted in 1800-1. The xenoliths gave large and variable ages, but the recently molten magma gave figures no higher than the lower limits possible by this method of dating. The xenoliths in this case contained high pressure gas and even liquid CO₂, proving that they could not have melted near the earth's surface.)

3. This has been largely covered under (1) above. A somewhat related problem is the possible leaving or diffusion of products of radioactive decay leading to high estimates of age.

Leach of constituents, or diffusion of gaseous elements such as helium and argon might be quite considerable, if ages are great. Loss of intermediate elements in the uranium series is also possible (notably Rn-222 in U-238 series). Such leaching would normally have the effect of diminishing the estimates of age. Rather discordant results are obtained therefore, as expected, when specks of mineral are analysed, though age estimates are unlikely to vary by more than ±50%. In the Rb-Sr isochron entirely consistent results were obtained when the 'whole rock' was examined, since this contains the leached Sr. It appears that in the uranium method, lead can leach out and that the 'whole rock' technique will remove discrepancies.

The "Young Earth" School

Despite sources of error, we should probably decide that many of the fossiliferous rocks have ages of millions rather than thousands of years, if we accepted the principle that the answer should be sought by purely scientific studies. However, IF Genesis is taken as the overriding authority on this matter, and IF its language must be interpreted literally, then an age of 10,000 years or less is demanded. This idea has enjoyed a considerable revival during recent years, especially in USA. In practice the "young earth" is usually linked with a "Flood geology" which attributes almost all the fossiliferous strata to the Noachian deluge. Several organizations make this a definite part of their platform:

(a) *Creation Research Society*, for which full members (now numbering about 500) must have at least a Master of Science degree. A quarterly journal of high standard is produced, and two volumes of collected papers from the years 1964 to 1968 ("Why Not Creation?", and "Scientific Studies in Special Creation") have appeared. Each copy of the Quarterly carries the Haec credimus: "For in six days the Lord made heaven and earth, the sea, and all that in them is and rested on the seventh. — Exodus 20:11."

(b) *Institute for Creation Research*, headed by Dr. Henry M. Morris, co-author of "The Genesis Flood", a major work putting forward the "young earth" approach.

(c) *Bible-Science Association*, headed by Rev. Walter Lang. A substantial News-Letter is produced, dedicated to:

Special Creation
 Literal Bible Interpretation
 Divine Design and Purpose in Nature
 A Young Earth
 A Universal Noachian Flood
 Christ as God and Man — Our Savior
 Christ-Centered Scientific Research

A perplexing feature of the "young earth" approach is that two arguments have been advanced, largely incompatible with one another. On the one hand, the "Principle of Apparent Age" admits that good scientific work yields results pointing to an earth of vast antiquity but attributes these 'incorrect' results to a built-in appearance of age; on the other hand, evidences of earth's youthfulness are sought along purely scientific lines.

Principle of Apparent Age. When Whitcomb and Morris published "The Genesis Flood" in 1961, they not only listed the objections given above to the use of radiometric age determinations but also introduced the idea of a "grown" creation having an "apparent age". All aspects of creation were said to exhibit this apparent age, "analogous to the 'apparent age' of a mature Adam at the first instant of his existence." As applied to radioactivity, they suggest that "all the elements of the chain were also created simultaneously, most likely in a state of radioactive equilibrium." They maintain that "it is eminently reasonable and consistent with the basically efficient and beneficent character of God, as well as with His revelation concerning the fact, that He would have created the entire universe as a complete, operational, functional mechanism" (p. 345). They acknowledge the existence of critics who feel that it would be deceptive of God to "cause things to look as though they were old and had come into their present form by a long process of growth when actually they had just been created"; but they respond that "there could be no *genuine* creation of any kind, without an initial appearance of age inherent in it."

The word "genuine" in this connection appears to mean 'de novo', 'ex nihilo', with no 'process' and no intermediate stages. Elsewhere (1972, p. 29), Whitcomb states, "The supernaturalism and suddenness of creation provide a necessary background for the concept of creation with a superficial appearance of history or age." However — for the present writer, at least — his case is not helped by the claim (p. 33) that "the proper context for understanding the events of creation week is ... the person and work of the Lord Jesus Christ as unveiled in the New Testament. If nearly every miracle performed by our Lord on earth involved the creation of built-in history, should we expect anything less during that unique period when He brought the world into existence?"

But the creation narrative of Genesis does *not* suggest that living things appeared out of nothing. If we are to insist on language being taken literally, we must give due weight to expressions such as "The earth brought forth vegetation"; "Let the waters bring forth swarms of living creatures"; "Let the earth bring forth ... cattle and creeping things." It is, moreover, very doubtful whether a concept of instantaneous creation was envisaged by any of the Bible writers.

Evidence of Youth. In the Institute for Creation Research's *Acts and Facts* for Sept. 1974, Dr. Morris gives a list of 76 estimates of the age of the earth based on standard uniformitarian assumptions. Many of these concern the influx of salts into the ocean via rivers; and even within this single method, the application to different elements yields a not unexpected diversity of results — from 100 years for aluminium to 164 million years for chlorine. Dr. Morris's

conclusion is that "those ages on the low end of the spectrum are likely to be more accurate than those on the high end". An equally valid conclusion — to say the least — is that the figures point not to the youthfulness of the earth but to the uselessness of the methods of dating.

Other lines of evidence said to point to a young earth include: the low helium content of the atmosphere compared with what we would expect from production by radioactive decay (though helium would easily escape from the earth's gravitation field); the low nickel of the earth's crust compared with the rate of addition in the form of meteoric dust; the retention of relatively high pressures in oil/gas deposits; and even the decline in the earth's magnetic field which, it is argued (apparently without any knowledge of magnetic reversals) cannot have preceded for millions of years.

Apart from the technical problems involved in these lines of evidence, a serious source of perplexity is that *if* God did in fact build an apparent age into the whole creation, one would expect that he would do it *consistently*. One would not expect evidences of youth to pop up here and there, as if God had forgotten to "artificially age" these few aspects of his work.

Historical Geology versus Flood Geology

Even if no attempt is made to place absolute ages on the rocks, collision between the rival interpretations of geology is inevitable. Proponents of a young earth point to fossils whose position in the strata is anomalous as judged by the composite sequence of sedimentary strata on which historical geology is based. Three examples are quoted in the C.R.S. text book, (Moore and Slucher 1970, p.417):

1. Fossil pollen grains of the pine family have been found at the bottom of the Grand Canyon, in rocks supposed to be Precambrian, and therefore more than 600 million years old. Only very primitive plant life, if any at all, would be expected at this level.
2. Footprints of dinosaurs are found in the bed of the Paluxy River, Texas, in rock classed as Cretaceous and dated at about 100 million years. But the same bed contains also undoubted human footprints (some 15 in. long see also Morris and Whitcomb, 1961, pp. 166-175 and A.E.W. Smith, 1968, pp. 293f etc.).
3. In 1968, fossil trilobites (associated with Cambrian deposits, dated at the order of 500 million years) were found

embedded in the print of what looks remarkably like a human sandal, near Delta, Utah. If both the trilobites and the sandal are genuine, this one find would of itself be sufficient to annihilate the science of historical geology; for they link the very first of the definite fossil groups with the very last — man.

The question is whether these problems represent the norm, and show historical geology as an edifice built on imagination, or whether there is some very abnormal explanation for findings of this type. Again, if the alternative explanation is that all the world's fossils were the result of a single, global flood, are we left with problems of greater magnitude than those we solve? We must ask, for instance:

1. Could a single Flood really be of such a magnitude as to produce all the sedimentary — or at least all the fossiliferous — rocks, which in some places measure several km in thickness? If this is the thickness after consolidation into rock, what must have been the thickness of mud swirling around the earth?
2. If rocks were formed by the deposition of vast quantities of sand, clay boulders and debris, would we obtain the stratified effect, often with sharply defined boundaries, that in fact we observe?
3. Why do volcanic intrusions into fossiliferous strata, which must then be only a few thousand years old and which should not be part of the original creation covered by an "apparent age", often yield ages of millions of years?
4. If the earth's surface was at the time of the Flood covered by a vast depth of mud in which were distributed the remains of all the plants and animals that perished in that Flood, would the depths at which fossils formed have any consistency at all, such as to give rise to the science of palaeontology? Do differential settling rates really offer a sufficient explanation, as Morris claims, of the generally well-defined zones in which different fossils appear?
5. Could the earth have supported at any one time a sufficient population of living things to account for even the many millions of fossils that have already been unearthed? For instance, Alan Hayward (1973, p.211) notes: "Although only a small part of the earth's crust has been explored, a million million tons of coal have already been discovered ... Coal is almost pure carbon, whilst vegetation contains only a small proportion of carbon. Consequently it must have taken something like a ton of vegetation to produce a hundredweight

of coal. Even if Noah had lived when the earth was completely covered with dense jungle, there would still not have been nearly enough vegetation in his world to produce all the coal that exists today."

Questions such as these have provoked rebuttal of the Flood geology not only from atheists but from Christian geologists. One such is Dr. van der Fliert of the Netherlands, who draws attention, for example, to the Paris Basin, a system of rocks covering a large part of France. Here, he says, "we have a huge bowl-shaped structure, consisting of strata dipping gently towards the centre, which implies of course that the younger strata are exposed in the central, the older in the peripheral, parts of the basin." When we move to the American continent we find "in the Gulf Coast Area of Mexico, Texas, Louisiana and Florida ... a huge structure of low-dipping strata very well known as a result of thousands of bore holes drilled in the search for oil." He claims "that surface and subsurface data permit an unquestionable correlation, layer by layer, and thus the establishment of the sequence of normally superimposed strata attaining a thickness of many thousands of meters."

A rejoinder is given by Clifford L. Burdick, (1970, p.142) a consulting geologist of the catastrophist school, who notes that "in numerous places in the world a reversed order exists, as in Glacier National Park, Montana; in Banff, Canada; Wyoming, Arizona; and the Alps." However, while this poses problems for the historical geologist, it hardly disposes of the many instances where a predictable order *is* maintained. One may be excused for wondering whether the "highly selective sorting action" claimed by Whitcomb and Morris (1961, p.274) on the basis that "the organisms found in the lowest strata, such as the trilobites, brachiopods, etc. ... are very 'streamlined' and quite dense" is really adequate to explain the spread of fossilized structures over depths of thousands of metres.

The Origin of Man

Again the dating of fossil remains is a major area of controversy, and again it is not possible to provide, on purely technical grounds, answers that are beyond dispute.

Radio-carbon Dating. Most atoms of carbon have a mass of 12 units. Atoms of mass 14 units, designated C-14, are formed by the reaction of cosmic rays with nitrogen atoms in the upper atmosphere. These radioactive carbon atoms are incorporated in molecules of carbon dioxide, and diffuse into the lower atmosphere. They thus form a normal part of the "carbon dioxide cycle", and come to form a definite

proportion of the carbon dioxide circulating in this fashion. Living things continually renew their stock of C-14 through the food chain, so that a sample of carbon dioxide produced by oxidation of the organic matter of any creature immediately after its death will always yield the same result for radioactive emission. As the years go by, radioactive carbon atoms disintegrate and are not replaced, so the radioactivity steadily diminishes. The number of disintegrating atoms drops to half its initial value in about 5700 years, and then to half of this value in another 5700; after about 50,000 years the residual radioactivity is so low that the method is no longer useful.

Even values of this order are too high for acceptance by proponents of the 'young earth' interpretation, and weaknesses of the method have frequently been noted. It relies on several basic assumptions:

1. That the rate of *formation* of C-14 atoms, and hence the intensity of cosmic rays controlling that rate, has remained constant during the 50,000 years for which the test is applied.
2. That this rate and various factors were stabilized well *before* 50,000 years ago, so that the loss of C-14 atoms by disintegration and the formation of fresh C-14 atoms in the atmosphere had led to an equilibrium state.
3. That the carbon contents of reservoirs (atmosphere, ocean) containing cosmic ray produced C-14 on which living matter draws for its supply of carbon have remained steady. (See Suess, 1965)

These assumptions are not exactly correct. Suess (1965) gives a calibration curve connecting apparent C-14 dates with actual time elapsed. Clark (1975, 1976) has attempted to correct the Suess corrections but Suess is unconvinced. (See also Watkins, 1976)

Much of the C-14 dating has been carried out on samples cut from sections of very old trees - in particular the bristlecone pine in parts of USA - so as to include only a narrow band of tree rings. The growth rings themselves can be dated by a tedious counting of thousands of rings whose varying widths reflect changes in climate from year to year. When a tree died many years ago its ring pattern must be linked with a pattern known to extend to the present time, and since this may prove tedious it is usual to locate the position of overlap roughly by means of radio-C dating, so some measure of circular reasoning is (or used to be) involved (Sorensen, 1973). As a result of such work corrections are applied to old radio-C dates. Ferguson claims that by piecing together the results of many different trees it becomes possible to obtain "a continuous

tree-ring chronology of 7117 years". A repetition of his work, (La Marche and Harlan, 1973) using different trees confirmed his findings with a maximum error of at most two years back to 3535 BC at least. Baxter (1974), points out that although individual corrected datings on trees are doubtless correct, variations in C-14 content of carbon dioxide depending on locality and altitude are likely: a 2% margin of error may be allowed when applying the C-14 correction curve to a different locality.

On the basis of the published work it seems that radio-carbon dates of around 2500 BC must be increased by about 700 years (to 3200 BC) and 3000 BC by about 1000 years (to 4000 BC).

There have been several instances where the effect of checking by the C-14 method has been to reduce drastically the dates assigned by other methods. There was, for instance, the Keilor Skull, found in 1940 in a river terrace about 15 km. from Melbourne. Initial estimates, based on the assumption that the terrace was formed by the silting up of a tidal lake during a warm period between Ice Ages, were in the vicinity of 130,000 years (Brunton, 1961). Other geologists decided the terraces were laid down by river floods, and the age tumbled to 25,000 years (Tugby, 1952). After radio-C fluorine determinations it was revised to 8500 years.

African Ape-Men. It is not possible here to give even passing attention to each of the fossils which have been included from time to time in the supposed chain of man's ancestry from some common link with the apes. Those most in the news at present are the *Australopithecines*, which means 'southern apes'. The first of this group was described by R.A. Dart in 1924; he gave it the name *Australopithecus africanus*. More recently Dr. Louis Leakey made the headlines with his *Zinjanthropus boisei*, now classified as an australopithecine; this was followed by "Handy Man", *Homo habilis*; the work has been carried on by Richard Leakey with the discovery at Lake Rudolf of finds such as Skull 1470. Two things contributed to the excitement surrounding these skulls: their supposed human characteristics and their vast age.

The ages attributed to the Leakey finds are of the order of 2-3 million years. This is on the basis of the potassium-40 to argon method, the estimates being made on volcanic tuff at approximately the same level as the sedimentary deposits. This particular method is subject to all the limitations listed above for radioactivity methods in general; it is all the more doubtful because the half-life of potassium-40 (some of which disintegrates to an isotope of calcium) is about 1000 million years, so that a mere 2-3 million years is right at the bottom end of the range for which reliability can be claimed. William Straus and Charles Hunt (1962) of Johns Hopkins University comment: "Until the contradictory dates and the existence and duration of the unconformities are resolved, the dates

are of doubtful value in formulating hypotheses about the rates of evolution of man and his culture, rates of other vertebrate evolution and migration, rates of accumulation of volcanic ash, and the persistence of ancient lakes. Whatever the hypothesis, it must be frankly admitted to be speculative".

As to the human characteristics, these have varied in a rather mysterious way. The cranial capacity has been typical of that for apes, 400-600 cm³, as compared with a capacity of 1200-1400 cm³ for man. The australopithecines had been divided into two species: *afriicanus* with smaller jaws and teeth, and *robustus* with heavy eye-brow ridges. But Richard Leakey says they represent the female and male forms of the same species. On the basis of fragments of pelvis, limb and foot bones it was claimed that they walked upright. But Richard Leakey (1971) says they (not including *Homo habilis*) were long-armed, short-legged knuckle-walkers, similar to extant African apes.

That man has evolved from an ape-like ancestor therefore remains very much an act of faith. The lack of clear lines of development is witnessed by the variety and complexity of theories attempting to fit the fossil finds into a single scheme. For instance, the Melbourne *Age* of 13.7.74 features an article headed "These Skulls Tell Different Tales". Four skulls all found near Lake Rudolf in Kenya between 1969 and 1973 are consigned to *four different branches* of hominid evolution, separating about 5 million years ago. The branch containing Skull 1470 leads on to *Homo sapiens*, and the other three to extinction. Even in 1953, Douglas Dewar was able to distinguish 12 theories advanced at that time, all to some extent mutually contradictory. A more up-to-date account is given by Frank Cousins (1971). The words of W. Straus, quoted by Dewar are still relevant: "I wish to emphasize that I am under no illusion that the theory of man's ancestry which I favour at the present time can in any way be regarded as proven ... One cannot assume that man is a made-over anthropoid of any sort, for much of the available evidence is against that assumption."

Where Does Adam Fit

When we turn from the purely scientific evidence and the problems of the evolutionist and attempt a positive view of creation, we find that the Bible student too has his problems; and again they involve hermeneutic principles. We may summarize them in the form of the question: In what sense was Adam the first man?

In an age when anthropology, archaeology and geology were practically non-existent, one would probably never ask such a question;

or if it were asked it would be answered, "In every sense, of course; why try to complicate things?" There are many today who, ignorant of the problems arising from the increasing knowledge in these areas, echo a similar sentiment. One would not wish to create problems where none exist, or to disturb in any way the peace of mind of sincere folk who wish only to be left in that peace. But for the sake of those who do see a problem and whose minds are greatly exercised by it, some answer must be attempted, even if it can at best be extremely tentative.

One answer is to deny the problem by denying Adam. It is of course a fact that the Hebrew noun '*adam*' (or *ha'adam* with the definite article) means 'man', and is so translated throughout the O.T. except for the early chapters of Genesis. Alison M. Grant, (1973) suggests: "A story about 'Adam' (= mankind) suggests that the writer's intention was to get across a message about 'Everyman' (you and me and everyone else), not something about a particular man who lived a long time ago." Our only real guidance here comes from the way in which the OT was understood by the inspired writers of the NT. Although direct references are few, they are (to the present writer at least) conclusive; e.g.,

Rom. 5:14: "Yet death reigned from Adam to Moses, even over those whose sins were not like the transgression of Adam, who was a type of the one who was to come."

1 Cor. 15:45: "Thus it is written, 'The first man Adam became a living being'; the last Adam became a life-giving spirit."

Of those who accept that Adam was the first man in some meaningful sense, some understand that he was the first to have a physical form essentially similar to modern man. This implies that all fossils showing this form (especially as regards the skull) must be more recent than Adam, and must be his direct descendants. This creates a problem with dating, and in an attempt to reconcile the Bible and archaeology, dates have been 'pushed' from both directions. Dates obtained by radiometric methods have been either rejected as worthless, or a 'correction' has been applied on the basis of severe interference to dates at the time of the Flood. On the Biblical side, it has been noted that Hebrew genealogies can often skip over one or more generations; and that versions other than the text used for the AV yield different ages for Adam. One of the attempts to reconcile Biblical and archaeological dates is by Patrick O'Connell (1969); who states (p.111), that the time from Adam to the call of Abraham is 2032 years in the Hebrew text, 2324 years in the Samaritan, and 3389 in the Septuagint. He concludes that "8000 or 10,000 years at most is more than sufficient to account for the development of the human race between the time of the earliest fixed settlement in Mesopotamia and the creation of Adam and Eve", and that the maximum estimate of

the time before the Deluge need not exceed 15,000 years.

If we follow the hermeneutic principle of looking at the major purpose of the Bible records, we shall probably place less emphasis on the physical form of Adam. There have been many explanations of the "image and likeness" of Gen. 1:26; the true interpretation must be sought by noting the direction of emphasis in the NT. This leads us unmistakably to our Lord: to those qualities of worship, spiritual discernment and subjugation of will which were present in potential form in Adam and manifested in all their beauty in this "last Adam". "He reflects the glory of God and bears the very stamp of his nature" (Heb. 1:3).

It is idle to speculate on the extent to which these capacities are a function of physical brain size and form, and the extent to which they require a special, divine implantation. But *if* there did exist at one time a race of beings more man-like than any of the existing apes — with larger brains and higher intelligence — but without the spiritual potential of Adam, then we can conceive that they would not be classed as 'men' in this Biblical usage of that term. A specific example of a possible 'near-man' is the Neanderthal race, of which quite a number of skeletons have been unearthed. At one time this race was pictured as brutish, stooped, and with a shambling gait, and was given the status of a separate species within the genus Homo. But at least two features create problems for this view. One is that when the fossils are placed in chronological sequence (insofar as this is possible) the *earlier* ones appear closer to Homo sapiens than the later specimens. The other is that finds in Palestine (at Magharet-et-Tabun and Mugharet-es-Skuhl) show a mixture of Neanderthal and Cromagnon (modern) types strongly suggesting interbreeding of the two races (Le Gros Clark, 1967, p.302; see Custance, 1968, pp. 30,34).

A different approach is taken by Victor Pearce (1969). Looking at the cultural setting presented in the early chapters of Genesis, he notes that Adam evidently lived before the Bronze Age, since Tubalcain rates special mention in this connection in Gen. 4:22. On the other hand, Adam's family did cultivate crops and breed animals: this provides "a clear and unmistakable guide, as man had never practised farming before 10,000 B.C. or thereabouts." It is hard to share the confidence in dating methods reflected in Pearce's statement, "For 500,000 years it had never occurred to man to grow his own food. Then comparatively suddenly he became a farmer ... During that half million years or more, we have a worldwide record of stone tool-making." But the direct appeal to Scripture is appealing in his conclusion (p.21) that "in Genesis 1, Old Stone Age man is described, the Hebrew collective noun *adam* meaning mankind as a whole;" whereas the account commencing at Gen. 2:4 using the noun "The Adam" relates to a special individual, "a New Stone Age farmer of about 10,000 to 12,000 years ago."

Creation in the Framework of Genesis

Recent expositions of Genesis by professional theologians have tended to view the first 11 chapters as a unity, rather than to dissociate creation from the rest of the book. This 'unity' is often attributed to the work of redactors living many centuries after Moses but we can welcome the tracing of unifying themes without at all embracing these theories of the development of the O.T. In particular one notes the works of the German scholars Gerhard von Rad and Claus Westermann, summarized for example by J.J. Scullion (1974).

In particular, four stories are seen to illustrate the theme that man oversteps God's limits: God punishes man's wilfulness, and at the same time God offers a way of protection. The creation story finds its place as the first of these: the initial and typical transgression of God's law, the resulting alienation from God, and the protection symbolized by the coats of skin. In the next episode, man rises up against his brother, "he takes life which belongs to and comes from God." God "steps in with punishment, and drives Cain from his presence. But as he punishes, God puts a mark on Cain so that no one can take it upon himself to avenge himself on Cain." In Gen. 6, man's rebellion is illustrated in the strange story of the sons of God: "man sought to rise above himself by union with the divine ... God steps in and throws man back within his limits—120 years ... The punishment is the flood ... God saves through Noah and the ark."

Finally in Gen 11 we have the story of Babel, where man strives to "use technology to make himself like the gods." God's punishment in this case is to scatter man over the face of the earth. But if this is to follow the pattern, "where is God's gracious intervention?", the answer suggested is one which identifies Gen. 1-11 as a prologue to the whole of the Bible: "In the very land of the ziggurats, where the story of the tower would have arisen, God chose ... Abraham ... and formed the beginnings of the people through which he was to bring salvation to mankind."

There remain one or two aspects of the creation account which find specific reference later in the Bible, and which could therefore suggest that the *details* are relevant to our understanding of the *meaning* of creation. We should therefore examine the *way* in which these aspects are used in Scripture.

Six Days. The fact that creation in Gen.1 occupied six days is used in Ex. 20 in connection with the fourth commandment: "Six days you shall labour ... for in six days the Lord made heaven and earth, the sea and all that is in them, and rested the seventh day; therefore the Lord blessed the sabbath day and hallowed it." The questions

this usually evokes are whether this usage proves that the days of Gen. 1 were literal, "24-hour", days; and if so whether they were days of creation, or of re-creation, or of revelation to man; and if of creation, how they could be described in terms of "evening and morning" before the creation of sun, moon and stars. But are these the questions of greatest relevance? Suppose we ask instead how the reference to God's *creative* work might be expected to reinforce the command for the special observance of one day in seven. Here we note that the parallel account in Deut. 5 does not use the "creation week" as the basis for the commandment, but rather: "You shall remember that you were a servant in the land of Egypt, and the Lord your God brought you out thence with a mighty hand and an outstretched arm; *therefore* the Lord your God commanded you to keep the sabbath day."

Putting these two bases together, we see how the seventh day was not intended merely as a refraining *from* toil, but was to be "a holy sabbath of solemn rest to the Lord" (Ex. 35:2). It was a token offering to God of the energies of *every* day, a recognition that as both Maker and Redeemer he was entitled to their total and wholehearted response in service. It was *God's* sabbath not because the almighty Lord of the universe *needed* to rest in any real sense; but because in the final analysis any hope of release from toil and bondage must lie in a sharing of *His* sabbath. This is precisely the emphasis of Heb. 4:9f: "So, then, there remains a sabbath rest for the people of God; for whoever enters God's rest also ceases from his labors as God did from his."

The Image of God. "God created man in his own image ... male and female he created them," we are told in Gen. 1:27. In chap. 2 we are told of the creation of a particular man and woman; the man is pictured as formed "of dust from the ground", and the woman from "the rib which the Lord God had taken from the man."

Here it would be an extreme literalist who would find the major significance of these verses in the mode of creation. The lessons drawn in the references in other parts of Scripture are of a different type, viz:

1. The sanctity of marriage. Gen.2 itself adds the note: "Therefore a man leaves his father and his mother and cleaves to his wife, and they become one flesh." Even here, it would be possible to read more into the words than could possibly have been intended, and see some reason why the newlyweds might live with her parents but not with his. But the more general application to the status of the newlyweds as a unit gains confirmation not only from the general practice under the Mosaic law but from the lips of Jesus (Matt. 19:5) and Paul (Eph. 5:31).

2. The household hierarchy. Paul uses the fact that Eve was created after Adam to reinforce his dictum that a woman — evidently a *married* woman — should "learn in silence with all submissiveness" (1 Tim. 2:11; see also 1 Cor. 11:8f).

3. Conduct and ethics. Because man is a direct creation of God, he is responsible to God. In particular, he must accept the moral dictates of his Creator. As God says through Isaiah (45:9): "Woe to him who strives with is Maker, an earthen vessel with the potter!"

4. The status of man. The Psalmist sees man (8:5) as made little less than Elohim ("God" in RSV). This is not a cause for glorifying man; rather (v. 9), "O Lord, our Lord, how majestic is *thy* name in all the earth!" Again it is in the Letter to the Hebrews that we find the implications of this passage particularly traced; and characteristically we find it leading us directly to the Lord Jesus. We do not yet see a complete fulfilment of God's intention in Gen. 1:26 to "let them have dominion over the fish of the sea, and over the birds of the air, and over cattle, and over all the earth ..." But we do see the vital step towards the goal: "we see Jesus ... crowned with glory and honor" (Heb. 2:9).

5. The new nature. Because Jesus has blazed the trail and brought many sons to his Father, these begin — even in this mortal life — to partake in that new nature which is in a real sense the image of their Creator. They are urged: "be renewed in the spirit of your minds, and put on the new nature, created after the likeness of God in true righteousness and holiness" (Eph. 4:23f; so also Col. 3:9f).

The General Message of Creation

Leaving now these rather specific aspects of the usage of creation in later sections of the Bible, we ask: In what more general ways do we find creation used as the basis for moral or theological teaching? And perhaps of almost equal significance, in what ways is it *not* used? For if details such as the time of creation, or the order of creation, or the mode of creation have interest only as history, then they seem to miss the mark of the real subject matter of the Book, which is man: his plight and his hope through the grace of God.

The first thing that strikes us when we undertake this study is the *very large number* of passages in which reference is made back to the first few chapters of Genesis. The subject in fact becomes

a vast one, and we shall be able to do little more than list the major types of usage.

1. God is the Creator, and his creation demonstrates his power and wisdom. Prov. 3:19, "The Lord by wisdom founded the earth; by understanding he established the heavens." Prov. 8:22;31.
2. While God did cease from his creative work in one sense, it is also true that he has a continuing role as creator-sustainer of his works. Psa. 104:30, "When thou sendest forth thy Spirit, they are created; and thou renewest the face of the ground." Job 33:4.
3. The whole physical creation was an integral part of a Plan embracing both man's origin and his destiny. Isa. 45:18, "For thus says the Lord, who created the heavens (he is God!), who formed the earth and made it (he established it; he did not create it a chaos, he formed it to be inhabited!): 'I am the Lord, and there is no other'." Num. 14:21; Hab. 2:14; Rom. 8:18-23.
4. The God who made man understands man, his weaknesses and his needs, and has provided accordingly. Isa. 63:16, "Thou, O Lord, art our Father, our Redeemer from of old is thy name." Ex. 4:11f; Psa. 94:9-11; Psa. 119:73.
5. This provision leads directly to our Lord, who is so central to the whole Plan as to be described not only as the firstborn of all creation but even as Creator. Col. 1:15f: "He is the image of the invisible God, the first-born of all creation; for in him all things were created, in heaven and on earth, visible and invisible, whether thrones or dominions or principalities or authorities — all things were created through him and for him." Heb. 1:10.
6. Many aspects of creation were completed only in a very limited sense in Adam and the Adamic environment. All such will find fulfilment in and through Jesus, who now exemplifies the glory which he had in God's firm purpose before the world was created, and to which his brothers and sisters are called. Phil. 3:20f: "But our commonwealth is in heaven, and from it we await a Saviour, the Lord Jesus Christ, who will change our lowly body to be like his glorious body, by the power which enables him even to subject all things to himself." Rom. 1:4-6; Rom. 8:23.

Summary

Any attempt to summarize what is so sketchy an outline of an enormous subject must necessarily be inadequate. Rather we shall try and indicate the principles we have used in attempting to form a coordinated thesis.

1. Gen. chap. 1 (and/or chap. 2) is commonly regarded as presenting a *narrative of events*, in more or less chronological sequence. While various interpretations of the account have been put forward, they have almost invariably been within this basic framework, usually without any realization that the framework could be different. So long as this framework is present, there is an expectation that some correlation with the scientific "facts" of creation should be possible — even when it is acknowledged that science is constantly changing, and many of today's 'facts' are certain to be modified tomorrow. No one interpretation of the first chapters of Genesis is self-evidently correct, and in fact every one of the interpretations advanced to date has been subject to criticism on either biblical or scientific grounds.
2. The Bible does not claim to be an encyclopaedia, and there is no good reason for expecting it to offer guidance — let alone infallible guidance — in any scientific discipline, except insofar as a particular point has a necessary association with the theological purpose of the book — man's need of redemption and God's provision for this need through his Son.
3. The study of the usage of the first few chapters of Genesis in the remainder of the Bible suggests that the mode of creation plays very little part in the importance and significance of the record, and throws doubt on the need to regard the account as an ordered or chronological setting out of a series of events. Rather do we find the chapters used to illuminate the character and purpose of God with men and women both during their moral lives and in future consummation.
4. This does not solve — and may in fact rob us of some 'solutions' we thought we had — problems as to the time, duration or mode of creation. It does, however, give us that peace of mind that comes from the realization that these things are not central to the real message of the Bible, are not essential for our comprehension, and may be allowed to wait on the accumulation of further scientific evidence, and on our own spiritual growth.

We may, for example, consider on its merits the question of whether the creation narrative is so basic as to stamp on the number seven a significance which it retains through the remainder of the Bible; or whether some more basic significance attaching to the number (as also to 10, 12, 40 and others) dictates the framework within which creation is cast.

6. This does not mean that evolutionary theories of origins are to be welcomed. However, it may modify the grounds on which they are to be rejected. Rather than because of incompatibility with some few verses of the creation narrative — or with a particular interpretation of these verses — these notions become suspect because:

(a) The history of their development, and the impetus for their promulgation, can be traced to a spirit of naturalism and materialism, a frequently conscious desire to eliminate God from his universe.

(b) The facts of science, insofar as it is possible to extricate these from the mass of accompanying theories, do not support the idea of continuous and purposeless development, but rather of discontinuity, of limited catastrophism, and of an overruling wisdom vastly greater than man's.

(c) While the tendency to exalt human reason and the invincibility of 'science' is reduced, it is not eliminated in the idea of 'theistic evolution'. While it is acknowledged that such ideas are held by many sincere students of the Bible, it cannot but render more difficult the humble acceptance of that book as authoritative in the areas for which it is authoritative: the status of man, his moral responsibility, the fact that his hope is based not on human effort but on divine grace.

REFERENCES

- Baxter, M.S., 1974; *Nature*, 249, 93.
 Beasley, W.J., 1955; *Creation's Amazing Architect*.
 Brinkmann, R.T., 1969; *Jour. of Geophysical Res.* 74, 5355.
 Quotation is from *New Scientist* 19 Feb. 1970, p.344.
 Brooks, J. and G. Shaw, 1973; *Origin and Development of Living Systems*.
 Brunton, A.A., 1961; *The Vic. Naturalist*, Aug.
 Burdick, C.L., 1970; *Creation Res. Soc. Qtly.* [Dec]7, 142.
 Carron, T.W., 1957, *Evolution — the Unproven Hypothesis*; 1973 (19th ed.), *Science Falsely So Called*.
 Clark, R.M., 1975; *Antiquity* 49, 251f; 1976, 50, 61f.
 Clark, W. Le Gros, 1967; *Human Evolution: Readings in Physical Anthropology*.
 Clementson, S.P., 1970; *Creation Res. Soc. Qtly.* [Dec]7, 137.
 Cloud, P.E., 1968; *Science*, 160, 729; 1969, *Proc. Nat. Acad. Sci.*, 53, 1169 and later papers.

- Coppedge, J.F., 1973; *Evolution; Possible or Impossible?*
- Cousins, F. 1971; *Fossil Man* 2nd ed.
- Custance, A.C., 1968; *Fossil Man and Genesis*.
- Custance, A.C., 1970; *Without Form and Void*.
- Dewar, D. 1953; This JOURNAL 1954, 86, 1. See also J.B.S. Haldane, H.S. Sheldon.
- Davidheiser, B., 1969; *Evolution and Christian Faith*.
- England, D., 1971; *A Christian View of Origins*, 1972.
- Faul, H., 1966; *Ages of Rocks, Planets and Stars*.
- Ferguson, C.W., 1968, *Science*, 159, 839.
- Fliert, van der, 1970; This JOURNAL 98(1), 1 and *J. Amer. Sci. Affil.* 1969 (Sept).
- Fridriksson, S., 1975; *Evolution of Life on a Volcanic Island*.
- Funkeouser, J.C., and J.J. Naughton, 1968; *Jour. Geophysical Res.*, 73 (14), 4601.
- Gish, D.T., 1972; *Evolution — the Fossils say No!*
- Grant, A.M., 1973; *Adam and Eve and 'All That'* (Joint Board of Christian Education of Australia and New Zealand).
- Haldane, J.B.S., and D. Dewar, 1949; *Is Evolution a Myth?*
- Hayward, A, 1973; *God's Truth*.
- Heinze, T.F., 1973; *Creation vs Evolution*.
- Kerkut, G.A., 1960; *Implications of Evolution*.
- Kettlewell, H.B.D., 1959; *Scientific American*, March, p. 48.
- Kline, M.G., 1970; *The New Bible Commentary*, Article 'Genesis'.
- Knopf, A., 1957; *Sci. Monthly*, Nov.
- La Marche, V.C., and T.P. Harlan, 1973; *Jour. Geophysical Res.*, 78, (36), 8849.
- Mason, B., 1952; *Principles of Geochemistry*.
- Leakey, R., 1971; *Nature*, 231 241.
- McCrintle, J.W., 1897; *The Christian Topography of Cosmas an Egyptian Monk*.
- Moore, J.N., and H.S. Slucher, (eds.) 1974; *A Search for Order in Complexity*.
- Morris, H.M., and J.C. Whitcomb, 1961; and many later printings; *The Genesis Flood*.
- O'Connell, P., 1969; *Science of Today and the Problems of Genesis*.
- Pearce, E.K.V., 1969; *Who was Adam?*
- Raff, R.A. and G.M. Meaburn, 1969; *Nature*, 221, 459.
- Ramm, B., 1970; *Protestant Biblical Interpretation*.
- Rubey, W.W., 1951; *Bull. Geol. Soc. Amer.* 62, 111 (Reprinted in P.J. Brancazio and A.G.W. Cameron, editors, *The Origin and Evolution of Atmospheres and Oceans*, 1964).
- Scullion, J.J., 1974; *Austr. Bib. Rev.*, 1.
- Sheldon, H.S., and D. Dewar, 1947; *Is Evolution Proved?*
- Smith, A.E. Wilder, 1968; *Man's Origin, Man's Destiny*.
- Sorensen, H., 1973; *Pensee*, 3, (2), 18.
- Spanner, D.C., 1970; this JOURNAL, 98, (2-3), 43.
- Stott, J., 1970; *Christ the Controversialist*.
- Straus, W., and C. Hunt, 1962; *Science*, 27 Ap. p. 293.

- Suess, H.E., 1965; *Jour. Geophys. Res.* 70 (23), 5937.
- Suess, H.E., 1970; In I.U. Olsson (Ed), *Radiocarbon Variation and Absolute Chronology*.
- Tugby, D.J., 1952; *Wild Life*, Aug.
- Watkins, T., 1976; *Radiocarbon Calibrations and Prehistory*.
- Whitcomb, J.C., 1972; *The Early Earth* see also H.M. Morris.
- Wiseman, P.J., 1949; *Creation Revealed in Six Days*.
- Yorke, D. and R.M. Farquhar, 1972; *The Earth's Age and Geochronology*.
- Young, E.J., 1964; *Studies in Genesis 1*.

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