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Editorial Address

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Faith and Thought

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of the Christian revelation and modern research

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EDITORIAL

This Number of *Faith and Thought* incorporates three of the addresses delivered at a Symposium on Evolution held in January, 1970, under the Chairmanship of Professor Robert Boyd. It was a happy occasion which brought together a number of speakers holding different views on the matter and in such a way that their differences provided a wealth of discussion, all of which was conducted in a spirit of christian friendship. The fourth contribution on that occasion by Mr Gordon Barnes will be published in a subsequent Number of this Journal.

Some time after this Meeting we received a short paper by Mr George S. Cansdale which addresses itself to some of the more important questions that were raised in discussion concerning the Biblical account of the Flood and its interpretation. We are therefore pleased to include this paper in the present issue. Mr Cansdale has been associated with the work of the *Victoria Institute* for many years, and his immense experience in the field of animal life coupled with his interest in the evidence of animal distribution in the Bible has won him the admiration of many over the years. Readers may care to note that his recent book, *Animals of Bible Lands* (Paternoster Press) will shortly be reviewed in *Faith and Thought*.

With this issue of the Journal the present Editor hands over the task to Dr Robert E. D. Clark, M.A., Ph.D. of Cambridge. This will not be the first occasion upon which Dr Clark has

undertaken the editing of the Institute's publications, and those of us who know him and can recall his long-standing association with the *Victoria Institute* are happy in the knowledge that the *Journal* will be expertly supervised and the readers of *Faith and Thought* will be generously served under his editorship. Dr Clark retires from his teaching post in the Cambridgeshire College of Arts and Technology this Summer, and it is fitting, therefore, that in this *Journal* the good wishes of his many friends should be recorded.

D.J.E., May, 1971

RICHARD J. P. ACWORTH, M.A., D.-in-L.

Creation and Evolution

Before we begin to discuss the subject that we have come together to consider, I should like to say, very briefly, what a joy it is for me to speak before this meeting of the Victoria Institute, a body before which my late father, Captain Bernard Acworth, lectured on aspects of this very subject during the 1930's. And I should like to express my gratitude, *our* gratitude, I am sure, to Dr. Spanner and Mr. Barnes, who suggested that this discussion should take place when they were present at a lecture which I gave in Westminster Chapel, with Dr. Lloyd-Jones in the Chair, on the subject of *Creation, Evolution and the Christian Faith*. (This lecture has now been published as a booklet by the Evangelical Press, under the same title, price 12p). The subject that we are to discuss is one that is of vital concern to every Christian, I believe; and I therefore welcome this opportunity of discussing it with fellow-Christians, not all of whom see eye to eye about it. I hope that it will be axiomatic during this discussion that everyone involved is presumed to be in good faith, and genuinely concerned for the cause of Truth. So far as we are concerned, no personal attack on anyone is intended, even when the ideas of some are subjected to strong criticism. I am sure that you all understand that. But it is most important that we should discuss this matter thoroughly. For evolution has become the most widely accepted philosophy of the modern world. In an age which is marked by widespread and far-reaching scepticism, when previously accepted values and beliefs are almost universally under attack, belief in evolution and progress is probably the nearest thing that can be found to a generally held presupposition of thought – a presupposition that is held by many with an almost religious fervour. And there can be little doubt, I suggest, that this general acceptance of the theory of evolution has been the chief factor which, during the past century, has undermined popular

belief in Christianity, and, amongst those who have remained Christians, belief in the reliability and strict truth of the Scriptures as the Word of God.

In this discussion of the theory of evolution, it has fallen to me to examine the theory of evolution from the biblical and religious point of view, and in particular to examine some of the attempts that have been made to reconcile the theory of evolution with biblical Christianity. I shall not in this paper be entering into the scientific evidence for or against the theory of organic evolution, but shall confine myself to suggesting that this theory is not reconcilable with the biblical account of origins. Mr. Arthur Jones and others will be approaching the question from the scientific side. Nevertheless I feel that I ought to make it clear that my own rejection of the theory of evolution was not in the first instance based on its incompatibility with the scriptural evidence. It was based on the lack of convincing scientific evidence for the truth of the theory, and on the strength of the scientific and philosophical arguments against it. I have never actually believed in evolution, but I long thought it a matter of only secondary importance, hardly relevant from a religious point of view. In the course of time, however, I came to see to what a large extent 'progressive humanism' both inside and outside the Christian Church was based on the premiss of evolution; this renewed my interest in the subject, and I turned to the scientific evidence with a new realisation of its importance. It was then that I came to see once again, for myself, how weak the scientific evidence for evolution is, and how unreasonable are the arguments which are advanced to support the theory that higher and more complicated organisms (including man) have evolved gradually, over a period of many millions of years, by a process of descent with modification, by means of natural selection, from lower and simpler ancestors. It was this realisation of the unreasonableness of the evolutionary theory that enabled me to return to a much stricter view of the authority and inerrancy of the Bible than I had previously held.

But the subject that I want to consider with you now is that of the relationship between the theory of evolution and the

Bible. *Prima facie* at least, it seems to me, it is evident that there is a sharp contrast between the Genesis account and the evolutionary theory of origins. Where the theory of evolution teaches that the world began in an unorganised form, and that life has gradually evolved, over a period of hundreds of millions of years, by means of struggle and death (natural selection) acting on random variations (or mutations), through which higher forms of life have appeared only gradually, the Bible tells us that the whole world of living things was created within a week, according to all their various kinds, at no very remote period in time. It is indeed possible to dispute whether the 'days' mentioned in Genesis i were literal days of 24 hours each, but Genesis ii. 4, seems to make it plain that the creation did not take any great period of time (compare the same usage of *beyom* – in the day that – in Numbers vii. 84, where it is also used comprehensively to sum up what was done at one time – i.e. in a succession of natural days), while Exodus xx. 11, seems to suggest that the days of creation were indeed days in the ordinary sense. Be that as it may, however, there can be no possible doubt that Genesis i. repeats ten times that the different 'kinds' of creatures were created separately, to reproduce 'after their kinds'. This may not indeed mean every precise species as it exists today, for the Bible, teaching that all races of men now alive are descended from Noah, implies that species are variable within quite wide limits; but it does exclude any transformation of one basic kind of creatures into another. This teaching of Genesis on the fixity and permanence of the basic kinds of creatures is confirmed in the New Testament, where St. Paul tells us that 'All flesh is not the same flesh: but there is one kind of flesh of men, another flesh of beasts, another of fishes and another of birds' (I Cor. xv. 39), thus reminding us that man differs from the animals, not only in respect of his immortal soul or spirit, but also in respect of his body, and that animals, birds and fishes are essentially different amongst themselves.

These are far from being the only points on which the Bible appears to contradict the theory of evolution. The creation of Eve from Adam seems irreconcilable with an evolutionary

view, since it seems difficult to suppose that, while man evolved, woman was produced directly by God. The biblical account of the Flood, too, tells of a world-wide catastrophe which, if it truly happened, must have accounted for many of those features of the physical world, and of fossil distribution, which evolutionists interpret in terms of gradual processes operating over long millennia. But the most fundamental contrast between the biblical and the evolutionary accounts of origins does not depend on a literal interpretation of the first chapters of Genesis; rather does it concern the whole tenor of the scriptural teaching on the relations between God, man and the world, and on the origin of evil. For the Bible everywhere supposes that the world and man were created good, and that all the disorder that we now find in the world is a result of human (and angelic) sin. On an evolutionist view, however, disorder and conflict are necessary features of the world that God has made, and of the means that He has chosen to bring it to perfection; they must thus be attributed to God Himself as their cause, and not to any sin on man's part. As a result, consistent Christian evolutionists play down the seriousness of Original Sin, since it is difficult to see how creatures that had only just evolved into human beings could be capable of committing a sin of such absolute gravity as to involve all their descendents. But in fact evolutionism undermines our whole realisation of our own and mankind's sinfulness, since it leads us to think of our present condition as normal in a being who is only gradually on his way up from the beast, instead of seeing it as terrible in someone whom God created in His own image and likeness. All the evil and selfish tendencies which the Bible regards as the effects of sin are, on an evolutionary view, entirely natural, as animal instincts not yet wholly overcome in man. The theory of evolution tends to minimise, it would seem, human freedom and moral responsibility; more seriously still, it seems to compromise the moral nature and character of God Himself. However, we shall return to these points when we consider some of the attempts that are made to reconcile the theory of evolution with Christianity.

There is one further point which, I think, needs to be mentioned while we are considering the *prima facie* opposition between the theory of evolution and biblical Christianity. And that is this. If the theory of evolution is adopted in a consistent way, it seems that one must allow that man is continuing to evolve. If this is so, it seems that Christ Himself cannot have been a perfect man. Christian evolutionists, it is true, do not generally accept this conclusion, and many of them believe that the upward movement of evolution ended with the appearance of man; but it is possible to regard this as a lack of consistency in their acceptance of evolution.

Further aspects of the contrast – which I believe to amount to a contradiction – between biblical Christianity and the theory of evolution, will come to light in the course of the rest of this paper; but it is hoped that what has been said will have been sufficient to show that anyone who attempts to reconcile the two has undertaken a most difficult task. And it is important to notice that, contrary to what some writers say (cf. L. Gilkey in *Science and Religion*, ed. I. G. Barbour), Christian opposition to the theory of evolution is not due to any objection to the general scientific conception of a world governed by uniform natural laws; on the contrary, there is nothing in the concept of unchanging natural law which, properly understood, is contrary to the teaching of the Bible. No; it is the actual contents of the theory of evolution to which exception is taken, as being both unsound from a scientific and philosophical point of view, and contrary on many points to the specific teaching of Scripture.

We have seen, then, that there is a very wide divergence between the biblical and evolutionary accounts of origins. Nevertheless, there are many Christians who manage to reconcile the two accounts in their own minds. The main object of this paper is to examine some of the attempts that have been made to reconcile the theory of evolution with the Christian faith. It is not my purpose to examine the views of those who, while making some concessions to the evolutionary outlook, nevertheless continue to believe that God created the main orders of animals, and in particular man, by His own

direct action. I shall confine my attention to those who consider that man is derived from sub-human ancestors, by a process of descent with modification, but who think that this view can be reconciled with the biblical account of Creation.

Many people, first of all, have tried to reconcile the biblical doctrine of creation with the theory of evolution by accepting evolution as the source of the human body, but attributing the origin of the soul to special creation. On such a view, God waited for the evolutionary process to produce – or, if you like, guided this process to the production of – a body fit to be united to a spiritual soul; and then He created human souls, made in His own image, to inhabit the body that had been evolved. People who hold this sort of view think of the soul as what makes a man a man, and they tend to think that, in this way, they can accept the evolution of the human body without having to modify the rest of Christian doctrine to any serious extent. In my view, this theory would represent the most hopeful way of reconciling creation and evolution, if one was prepared to accept a strict dualism of body and mind, and thus to attribute man's entire conscious life to the specially created soul, and to deny that animals have a consciousness at all similar to that of human beings. In a strictly Cartesian framework, evolution would not raise most of the difficulties for a Christian that it raises once one accepts psychological evolution; though even then it would remain contrary to the teaching of Genesis that God created the different kinds of creatures separately. But in fact no evolutionist whom I have met or read accepts such a dualism; evolutionists uniformly regard psychological evolution as inseparable from the evolution of the bodily structures of the various species. On a view such as this, it is not possible to separate the creation of the soul from the evolution of the body in a meaningful or helpful way.

Despite these and other difficulties, a view such as that which has been outlined was until recently the most widely held one among people who thought that evolution had been proved, but who nevertheless wanted to retain their Christian belief. It is a view, for instance, that has been very commonly held by Roman Catholics. But in recent years this compromise solution

has been breaking down, not least under the influence of Teilhard de Chardin. Thoughtful people have realised more and more that evolutionism claims to give an overall picture of the development of the world and of man, and that, if it is to be taken seriously, it demands the complete rethinking of Christianity in evolutionary terms. And this is precisely what Teilhard de Chardin tried to do: to reformulate Christianity in terms of evolution. In doing this, I consider, Teilhard turned Christianity completely upside down (cf. my chapter in the 2nd edition of Philip E. Hughes's *Creative Minds in Contemporary Theology*, published by Eerdmans, of Grand Rapids, Michigan); the resultant 'neo-Christianity' (Teilhard's own term) reverses the biblical picture of man's relations with God and the world, and regards a movement of mankind towards conscious and organised unity as the culmination of the evolutionary process and the ultimate standard of value, thus overthrowing the supremacy both of the Bible and of the individual conscience. As Teilhard did not claim to base his system in any fundamental sense on the Bible, it is not necessary for us to discuss it here today; but the eagerness with which his ideas have been accepted by so many people shows, I think, that Christians who have accepted evolution are not in general satisfied for long with a compromise solution such as the one which we considered before, but realise that a consistent evolutionism requires a complete rethinking of Christianity.

There are, however, many people who hold that a view of this kind, an integral adaptation of Christianity to evolutionism, rests on a misunderstanding. In particular, many Evangelicals who believe in evolution make a sharp distinction between the scientific theory of evolution, on the one hand, and the evolutionary philosophy on the other, and, in contrast to Teilhard de Chardin and those who think like him, they accept the former, at least as a working hypothesis, but reject the latter. This distinction has been strongly urged by Professor Jeeves (*The Scientific Enterprise and Christian Faith*), and is also accepted by Dr. Spanner and, it seems, by Gareth Jones. According to these writers, the theory of evolution is a purely scientific theory, with no necessary repercussions on one's general view

of the world. Evolutionary ethics, in particular, they would say, rests on what is known as 'the naturalistic fallacy', the fallacy of arguing from what is the case to what ought to be done. Moral imperatives, they hold, are known either intuitively or by revelation from God (cf. Jeeves, *op. cit.*, p. 3); they do not depend on what one may think about the nature of the world. Most of those who hold this view also regard the biblical teaching on creation and the scientific theory of evolution as complementary accounts of the origin of the world and of man. This question of complementarity we shall be examining in some detail in a minute; but may I just say in passing that the theory of evolution cannot be separated from 'evolutionism' as easily as they think? For although it is true that 'ought' cannot literally be deduced from 'is' (i.e. from two premises neither of which contains an 'ought'), yet it is also true that moral imperatives are not unrelated to matters of fact. The moral judgements that we make are necessarily judgements about the world as we think it to be; and the acceptance of the theory of evolution cannot fail to affect our whole understanding of man, and hence our views about how he ought to behave and to be treated. We shall have to return to this point again in due course.

We must now examine the claim made by many today, including Dr. Spanner and, I am sure, others who are with us today, that the evolutionary account of origins and that contained in the Bible, though they seem contradictory, are really complementary. When the two accounts are described as complementary, what is meant is that they can both be true, because they refer to different levels or different types of explanation. The concept of complementarity, in this sense, is one that has arisen in the recent history of science. In the past, scientists usually advanced their theories as 'really true', as giving, that is to say, a picture of the world as it really is. But today they tend to see them rather as descriptions of only one level of reality, to which other explanations – perhaps even seemingly contradictory ones – need to be added. Which answer or explanation is to be given will depend on what question is being asked. The classic example of two apparently

contradictory theories which are today taken as complementary is that of the two theories of light. In the past, these two theories, one regarding light as a stream of particles emitted by a source, the other thinking of it in terms of waves spreading through space, were regarded as mutually exclusive. More recently, however, it was discovered that, while light behaves in some situations like waves, it behaves in others like a hail of tiny particles. Eventually the viewpoint has been widely accepted that despite the appearance of contradiction between them, both theories (or pictures) could be valid, because they represent answers to different questions. Neither picture, it is said, gives us a literal picture of the objective world, but both are true at their own level. And now – and here is what we are coming to – it is suggested that, just as the wave and corpuscular theories of light are apparently opposed to each-other, but are really complementary, so too the biblical and evolutionary accounts of origins are seemingly opposed, but really complementary.

What we might call this Complementarity Model, this suggestion that the biblical and scientific accounts of origins are really complementary and are therefore both true at their own levels, has been developed by Dr. Spanner in his little book *Creation and Evolution*. He likens the complementarity of Genesis and evolution to that of two accounts of the origin of a book – one in terms of printing techniques, paper and ink, the other in terms of the inspiration, intentions and meaning of the author. In this sort of way, two seemingly complete but quite different accounts of the origin of a book could be given. And so too, Spanner suggests, two different accounts of the origin of the world and man can be given – one in terms of divine creation, the other in terms of evolutionary development. This analogy, however, it seems to me, with all due respect to Dr. Spanner, is not really an adequate one; for in his example there is no real contradiction between the two origins of books, whereas there is between the Genesis and evolutionary accounts of human origins. To this he would reply, however, that there is an apparent contradiction between the wave and corpuscular theories of light, and yet both accounts are accepted

as true and complementary to each other. Why not creation and evolution?

We come here to a most important point. I am no physicist; but the question at issue is really one of philosophy rather than of physics. We must say, I believe, that, to the extent that the wave and corpuscular theories of light truly contradict each other, they *cannot* both be true, whatever may be *said* about their complementarity. I do not for a moment dispute that light behaves in some contexts like particles and in others like waves, but I contend that, in this case, neither theory can be regarded as giving a true account of the nature of light. Rather we must say that the ultimate nature of light is *unknown* to us, but that, if we wish to foresee its behaviour, in some contexts a 'wave model' is helpful, in others a 'particle model'. Probably neither model is really *true*, in the sense of representing what light is really like, but in different contexts both models are *useful*. This type of view, of course, is by no means peculiar to me; it is widespread among philosophers of science. But it is important in this context because it enables us to say clearly that two explanations which contradict each other cannot both be true; at most they may be useful fictions which enable us to correlate or foretell certain aspects of the behaviour of the objects in question. But the Bible certainly claims more for itself than this: it claims to give an account of what really happened; and so too, if I am not mistaken, does the theory of evolution. If this is so, the biblical and evolutionary accounts of origins, insofar as they contradict each other, cannot both be true, unless we are willing to throw over our whole concept of truth and of rational argument.

In view, then, of the *prima facie* opposition between the Bible and the theory of evolution, the claim that the two accounts of origins are complementary cannot be convincing unless we are given some idea of how they can be combined into a single, more complete account. Otherwise the claim to complementarity is purely gratuitous, if indeed it does not imply an abandonment of the principle of contradiction itself. In *Creation and Evolution*, Spanner does indeed tentatively suggest a possible reconciliation of Genesis with the theory of evolution,

a reconciliation which is based on the analogy of regeneration, of what happens when a man is 'born again' or converted to Christ. Man's immediate ancestor, Spanner suggests, who arose by evolution, was similar to an unregenerate man today. Such a being might be cultured and artistic and even religious, but his life would still be, in biblical terms, 'of the flesh'. Only when God breathed something of His Spirit into him did he acquire a potentiality of responding to God; only then was he transformed from a superior sort of animal into a man made in the image of God. Just as a man today can be educated, artistic and religious, and yet not born again, so, according to Spanner, even highly developed cave-art and evidence of religious burial doesn't prove that a creature was a man, in the biblical sense of someone made in the image of God. According to this suggestion, then, Adam differed from the man-like creatures that preceded him (and from which he was descended) only in having received a capacity to respond to God; all his natural make-up, both bodily and psychological, had arisen through evolution from sub-human ancestors.

To me at least it is plain that no reconciliation of the Bible with evolution along these lines is possible. For Spanner's suggestion rests on the presupposition that the Bible is concerned only with man's relationship to God, with what we might call a new, supernatural dimension in man, whereas the whole of ordinary human life – bodily, psychological, intellectual and cultural – is purely the affair of science and history. And Spanner also considers that the image of God in man consists purely in this new capacity for entering into a personal relationship with God; a man, he thinks, can be cultured and intelligent without being made in the image of God. In this way, Spanner attempts entirely to separate man's spiritual relationship with God from his understanding of the rest of his nature. But this dichotomy is really an impossible one, since man's relationship with God is rooted in the natural order. If it is not rooted in the natural order, if man's relationship with God depends on a 'special creation' but every other aspect of his life is simply the product of evolution, then, it seems, religion and spiritual life become a sort of optional extra, irrelevant to the rest of human life.

In truth, however, the Christian revelation concerns the whole of human life. God is not the creator of our spiritual life only, but also of our bodily and mental life, and indeed of the whole world. It is man as a whole who is made in the image of God, in that he can love and know, and can aspire towards beauty, freedom, truth and justice. The tragedy of fallen man is that, though he remains in God's image, that image has become twisted and corrupted through sin. It is because man, as man, is made in the image of God that he always has an inkling of the reality of God and of his own moral responsibility (cf. Romans i. and ii.). But it is also because man has this basic and indelible knowledge that fallen man is without excuse before God. Man as a whole is made in the image of God: that is why man's life as a whole stands under the righteous judgement of God.

A view such as that of Spanner, then, attempts to separate man's spiritual understanding of his relationship with God and his natural understanding of the human situation into entirely watertight compartments. And this is even more true of those who assert that the biblical and evolutionary accounts of origins are complementary, without attempting to show in any detail how they can in fact be reconciled. One of the chief roots of these theories seems to be the desire to remove Christianity from the realms where empirical facts have any relevance to its truth or falsity. Those who try to do this, it seems to me, are doing little more than repeating, in more sophisticated terms, the attempt of older liberals and modernists to separate spiritual truth from historical fact. In so doing, they cut the ground from under the relevance and importance of the Christian revelation for ordinary life. In the Preface to his book, Spanner explicitly writes, 'This book is not concerned to discuss scientific evidence, but rather to establish, on the basis of evidence of a different sort, a position for faith which no amount of scientific discovery will ever overrun'. In saying this, he is (no doubt unconsciously) echoing T. H. Huxley, who is quoted by Dr. Schaeffer (*Escape from Reason*, p. 75) as prophesying in 1890 that the time would come when, having removed all empirically verifiable content from religion, people would

say that, 'No longer in contact with fact of any kind, Faith stands now and forever proudly inaccessible to the attacks of the infidel'. But though such faith may be 'inaccessible to the attacks of the infidel', the infidel really no longer has any reason to attack it, because it has given up contradicting his view of the world at any point. A statement that is reconcilable with any conceivable observation or theory, however seemingly contradictory, is devoid of rational meaning. This is a fact that is well known to modern agnostic philosophers, who are much more clear-sighted in this matter than are those Christians who try to retain the meaning of Christianity while abandoning its claim to factual truth. If we remove Christianity, or if we remove the doctrine of creation, from the realms where empirical facts have any relevance to its truth or falsehood, then at the same time we give up their claim to say anything meaningful or relevant about the real world. Nothing is then relevant to the acceptance or rejection of Christianity except a purely esoteric 'religious experience', and the Christian revelation has no contribution to make to the rational understanding of the world. In Dr. Schaeffer's phrase, we retreat to a non-rational position, 'above the line', where what we say can very reasonably be ignored by the rest of mankind. And this, I consider, is tragic, because the world needs the Christian understanding of its dilemma, the Christian answer to its needs.

It seems to me, then, that what those Evangelicals who consider that the Genesis and evolutionary accounts of origins are complementary have done, is to divorce faith, in this respect at least, entirely from reason. I have sometimes heard it suggested that we creationists exalt faith and denigrate reason, but this is not so; we insist that reality as a whole is understandable in biblical terms, whereas those who believe in complementarity deny in practice that any overall view of reality is possible. In a book such as Jeeves's *The Scientific Enterprise and Christian Faith*, this distrust of reason is expressed on several occasions. It is expressed in his assertion that moral imperatives depend on revelation alone or on intuition, without reason having any part to play; it is expressed, too, in his regarding man as an integral part of nature, not only necessarily

subject to error in his thinking, but also ruled by the same determinism that characterises the behaviour of animals and purely material beings. Jeeves regards this low view of man as a biblical one, but he seems to forget that, according to the Bible, man is made in the image of God and is also, unlike animals, a sinner, and therefore free and responsible to God. Most important of all, however, for our purposes, this distrust of reason is seen in the way in which these writers seek to separate the meaning of Scripture from the facts of history and science. And this separation of spiritual truth from historical fact is contrary to the whole nature of the biblical revelation. For in the Bible God reveals Himself as much through what He does as through what He says. Jeeves contains a classic example (*op. cit.*, p. 108) of trying to keep the meaning of Genesis i.-ii. while abandoning its claim to literal historical truth, rather in the way in which some modernists try to retain the meaning of the resurrection while denying that Jesus actually rose from the dead. But in reality, if the historical facts had been different, so would have been the meaning which they contained.

Thus, for instance, Genesis teaches that God is both transcendent and immanent, omnipotent yet interested in man; in common with the whole of Scripture it teaches that He is both just and righteous. And it teaches these things largely by reporting how God has acted. If however God had produced the world by means of evolution, then we should have a God who used evil as a means of creating, without any prior sin on the part of creatures. For on an evolutionary view animals share human feelings to a greater or less extent, and they must have been fighting, suffering and dying for millions of years before man appeared. And this suffering would not be something incidental to God's manner of evolving the world; it would be the very means that He used to achieve His purposes. But a God who used such methods would not be a just God, still less a God of mercy and love. God reveals Himself in the Bible as a God of justice, mercy and love, whereas a God whose method was evolution would show Himself indifferent to all moral considerations. God also reveals Himself as a God of infinite

wisdom, knowledge and power, attributes which hardly seem consistent with the hit and miss fashion in which he allegedly evolved the world. For if man brings his inventions to perfection only gradually, the reason is that he lacks the knowledge and control of natural forces to make (for example) a perfect machine at his first attempt. A literal understanding of God's creative act, on the other hand, harmonises perfectly both with what reason and the analogy of man at his best would lead one to expect, and also with what God reveals of Himself and His character throughout the Bible.

When I on one occasion suggested to a distinguished evangelical believer in evolution that the evolutionary process was not a means of creation that could be used by a just and righteous God, he replied that I was wrong to attribute to God a justice or a goodness like that which we know. In truth, he said, 'God's ways are not our ways' (Isaiah lv. 8), and it is mere rationalism to affirm the contrary. In my opinion, this is another example of that exaggerated distrust of reason on which I have already commented. For though 'God's thoughts are not our thoughts', His thoughts are *above*, not below ours: God is *more* just, more righteous than we are, not less so. But if God's attributes have nothing in common with what we know of justice, mercy and the rest, then His call to us to be 'followers of God, as dear children' is nonsense, and the Bible's descriptions of God as 'a God of truth and without iniquity, just and right' (Deut. xxxii. 4), 'merciful and gracious, long-suffering and abundant in goodness and truth' (Ex. xxxiv. 6), have no descriptive meaning for us but only an emotive one. Such descriptions would make one think of God as just and merciful; they would make one think of Him as more just and merciful than any human being can be; they would thus tend to colour our attitude to God, but they would not in fact tell us anything about Him or His way of acting towards us. In truth, I suggest, a God who produced the world by an evolutionary process such as that envisaged by Darwinists and neo-darwinians would be a God who was entirely indifferent to morality, a God whose character bore no resemblance to what the Bible leads one to think about Him. Alternatively, if the God who

'evolved' the world were indeed good, then one would have to see Him as lacking either power or knowledge in the face of disorder and evil. In neither case, however, would He be the just, holy and almighty God of the Bible, whose work is perfect. For God's character is known by what He does, as much as by what He says; and, we may add, He can be known by what He says only if the words through which He reveals Himself have the same meaning for Him as they have for us.

Meaning, then, cannot be divorced from facts. The early chapters of Genesis cannot be a parable in which God reveals the meaning of what He did when He 'evolved' the world, for the evolutionary process is the reverse of that described in the Bible. In Genesis, God reveals that He made the world good, and that the only disorder in it results from human sin; if evolution is true, however, He made it disorganised and imperfect, and it is only by a labouring process that it begins to approach to goodness. Genesis cannot give the meaning of evolution; the meaning which it contains is the reverse of the evolutionary perspective, and is inseparable from its account of how God actually created the world. But if in this case the theory of evolution necessarily leaves us with a concept of God that differs radically from the biblical one, it also leaves us with a widely different view of man. For the Bible tells us of the greatness, the nobility of man, made in the image of God, only 'a little lower than the angels' and having dominion over the works of God's hands (Psa. viii.). So far from presenting man as a part of nature, as Darwin does, the Bible shows him to be uniquely related to the God in whose image he is made. But at the same time the Bible gives a very realistic picture of the lostness of man, of the evil and sin that is in his heart, and of his alienation from God; and it traces this lostness, the abject failure of man, back to its source in human sin, beginning with that of our first parents. The Bible teaches that man is truly sinful; it thus insists that he is *responsible* before God for all that he does, a truly moral being who is accountable to God, and ultimately to God alone, for all his actions. The Bible thus sets forth the tragedy of man in all its contrast: it shows us both the nobility and the failure of man, and tells us of the gracious way

in which God has intervened to make possible the restoration of man to his true relationship with Himself. From an evolutionary standpoint, on the other hand, man cannot but see himself as essentially an animal; he is to be understood in terms rather of his relationship with his sub-human ancestors than of his relationship with God. In this context it seems natural that man should be dominated by 'animal' drives; human freedom and responsibility is minimised, and man is assumed to be subject to the same determinism as the rest of nature. Such a change in one's understanding of man cannot fail to have effects in every department of life and thought – in political and economic thinking, for instance, and in one's views on the administration of justice; but above all it will have an effect on one's attitude to religion. For on an evolutionary view man is not responsible for the state in which he finds himself; his condition is perfectly natural, and he cannot see that he stands in need of God's forgiveness. This, it seems to me, is the attitude which naturally follows from acceptance of the theory of evolution; the attempt to keep the Christian understanding of man while accepting the evolutionary account of his origin is doomed to failure. The world in general has already adopted the evolutionary understanding of man, with the disastrous effects (from the Christian point of view) that we can see all around us. And, we may add, it is difficult not to see, in the low view of man propounded even by an Evangelical such as Professor Jeeves, a reflection of his acceptance of the theory of evolution as applied to man.

And so we see that the theory which regards the biblical and evolutionary accounts of human origins as complementary presents us with no merely academic issue. It undermines the whole relevance, and indeed the truth, of the Christian message. In the long run one cannot give up the facts and keep the meaning, because the facts (for example the supposed facts of evolution) themselves imply a meaning. We cannot, therefore, accept the Bible as our final authority and at the same time accept the truth of the theory of evolution; or at least, we cannot accept these two at once and be consistent. If we believe the theory of evolution to be true, then our attitude to

the Bible cannot help changing. Either we must allow it to be interpreted in terms of passing human philosophies and theories, or else we must seek to divorce its spiritual meaning from its historical truth. The former is the path chosen by people such as Teilhard de Chardin; the latter, as we have seen, is that taken by Evangelical believers in 'complementarity'. But if the Bible is God's own revelation of His truth, then neither of these attitudes is satisfactory. The Bible, it is true, is not a scientific textbook; but if it is true, it is true on every level, authoritative in all that it teaches. If we accept the Bible as God's Word, then we must allow it to judge human theories, and not be judged by them. Otherwise we are not regarding it as finally authoritative.

It may help to clarify this point about our attitude to the Bible if we turn our attention briefly to the New Testament. If we approach the New Testament with the same attitude with which believers in complementarity approach Genesis, we shall have no difficulty in explaining away the Virgin Birth, the miracles of Jesus, His resurrection and His ascension into heaven. We shall think it possible to retain the meaning of these events while doubting or denying that they occurred in history. In fact there is a startling similarity between the way in which Evangelical believers in evolution approach the Old Testament and the 'demythologising' programme with which Bultmann and others approach the New. This approach, however, cannot be reconciled with the acceptance of the final authority of Jesus and of His apostles, and of the New Testament as an authentic record of their teaching. According to the Gospels, Jesus had no hesitation in referring to the opening chapters of Genesis as being factually true (cf. Matt. xix. 4-6; xxiii. 35; xxiv. 37-39), and the Apostles also did so in the most explicit terms (cf. Romans v. 12ff.; I Cor. xi. 8; xv. 21ff.; II Peter iii. 3ff.; I John iii. 12). If the theory of evolution is true, and if the New Testament is substantially authentic, then either Jesus was mistaken, or else He accommodated His teaching to what His hearers expected Him to say. In either case, it seems, we shall be unable to take His teaching at its face value.

I should like to take one of these passages from the New

Testament as the starting point of the last reflection that I shall be putting before you this morning. In II Peter iii. verses 3-7, St. Peter tells us that in 'the last days' many will deny the prophecies of the Lord's return, on the ground that 'all things continue as they were from the beginning'. They are willingly ignorant of the fact that the heavens and the earth were formed by the word of God, that furthermore the old world perished, overflowed with the waters of the Flood, and that this present world will one day perish by fire. In these ways, St. Peter seems almost to be warning us in advance against that philosophy of uniformitarianism which is one of the chief roots of evolutionism. For, philosophically speaking, the theory of evolution is rooted in the attempt to explain the present state of the world entirely in terms of processes that can still be observed in operation. It does not fall to my part today to examine the scientific evidence for or against the theory of evolution, but I will just say that no scientific evidence has been discovered which would force one to accept it as true. Evolutionists have been unable to find any processes now operating which would be able to account for the origin of life and the progressive development of more complex and really different organisms. But the attempt to find such an explanation continues, because evolutionists are imbued with the uniformitarian ideal. If the Christian revelation is true, however, this attempt is doomed to failure: as St. Peter reminds us in the passage to which I alluded, the world was made by God's word, by His externalized thought and creative *fiat*; it has moreover a cataclysmic history, and will have a catastrophic end. A uniformitarian explanation of its history is therefore impossible. Since a scientific explanation is necessarily in terms of processes which can still be observed, this means that a scientific account of origins is impossible. But this, in truth, it seems to me, is no more than the nature of the case would lead one to expect. Scientific observation and experiment enable us to get to know the regular working of natural processes, and these we are able to formulate into scientific laws. These laws explain or express the regularity of nature, the fact that each type of material being always acts in a particular way; but they do not

at all explain how these beings came to be what they are. From a Christian point of view, the natural processes that we observe and the laws that we formulate to describe them represent the orderly way in which God conserves and administers the world; they do not explain how He created it. In terms of the often derided analogy proposed by Paley, scientific laws describe the functioning of the mechanism of the world, just as one could describe the functioning of the mechanism of a watch or a machine. But the laws which explain the functioning of a watch are not adequate to explain how it came to be. No more are the observable forces of nature adequate to explain the origin of the world, with all the varied organisms that we find within it.

To conclude: the scientific facts, I suggest, do not warrant our accepting the theory of evolution as proved. The impulse behind the continued attempt to establish the truth of evolution is the uniformitarian ideal, an ideal which is neither compelling from an intellectual point of view nor compatible with Christianity. But if we do accept the theory of evolution, and if we are consistent and realise its implications, then we can accept neither the final authority of Scripture nor the biblical teaching on the creation, fall and redemption of man. The attempts that have been made to reconcile these two accounts of origins are, as I have tried to show, unsatisfactory. Has not the time come, therefore, for a return to a straightforward acceptance of the biblical account of origins, and thus to a Christianity which can give an answer to the crying needs of mankind?

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The Dogma of Evolution

The subject of evolution has been discussed at the Victoria Institute for more than one hundred years. In a letter to Wallace in 1867, Darwin mentioned that his theory had been ably defended before the Victoria Institute ('a most orthodox body'), but he commented that the ensuing discussion was 'very rich from the nonsense talked!' What is remarkable is that we are still arguing today in 1970. It is a simple fact that arguments dealing with the scientific data rarely seem to be coercive and opinion has consequently generally followed the pronouncements of the latest evangelical bishops of science. It is this that I want to investigate. I shall argue that the scientific data occupies a very secondary place; that the conflict is rather philosophical and religious; and that for us it really is a matter of what the scriptures say. The aim of this paper is thus to demonstrate why we cannot appeal to science for help on this issue.

I would begin by suggesting that we have been so busy looking at the trees that we have failed to see the wood, that if we wish to see evolution in a true perspective we must first have a look at the structure and strategy of science as a whole.

The basic method of science is simple enough. As every schoolboy knows, the sciences are entirely empirical and thus philosophically neutral. The scientist begins by collecting facts in as unbiased a manner as possible. The inspection of these facts will reveal some features of order, allowing the scientist to formulate an hypothesis which relates them. If after further collecting the features of order are sufficiently clear-cut, the scientist will announce the discovery of a law of nature. This is the procedure which is our culture's messiah. *But every schoolboy is wrong!* However small the area of study may be, the scientist always faces a veritable avalanche of facts. If he ever tried to collect them as they presented themselves, he would be crushed.

The scientist is always biased; he must come to his work

with a theory which will enable him to *select* the *relevant* facts. He has, as it were, a net with a certain size of mesh and what his net doesn't catch isn't fact. This alone undermines the belief in the neutrality of science, because we cannot separate fact and interpretation in the way the positivist would require. We only know facts as we place them in the context of a theory, that is, as we interpret them. This in very brief outline is what has become known as the hypothetico-deductive method – you invent an hypothesis, you deduce what would follow from it, and then you make observations in order to see whether the facts are what your hypothesis predicts. Unfortunately this is as far as many authors take it; but it is clearly unsatisfactory as it stands. As Medawar has put it: 'If it is a formal objection to classical inductivism that it sets no upper limit to the amount of factual information we should assemble, so also it is a defect of the hypothetico-deductive scheme that it sets no upper limit to the number of hypotheses we might propound to account for our observations. To exchange Whewell's system for Mill's, on the face of it, is to trade in an infinitude of irrelevant facts for an infinitude of inane hypotheses.' (1969 pp. 52–3). 'Any fact', wrote Poincaré, 'can be generalised in an infinite number of ways, and it is a question of choice.' (1905 p. 146). There is not, I suspect, any formal solution to this problem for although many criteria, such as simplicity, have been put forward to restrict our choice, they cannot make it unique. There is, however, one very important restricting factor which is often overlooked. Just as we select the facts by means of a theory, so we select the theories by means of a paradigm, a theoretical framework – a framework not now for facts but for theories. As examples of such paradigms we have logicism and formalism in mathematics; atomic and thermodynamic theory in physics-chemistry; uniformitarianism in geology; and mechanism and organicism in biology.

Before we penetrate deeper into science we need to consider the question of scientific status – how do we determine whether a theory is scientific? By what standard do we distinguish between the propositions of chemistry and alchemy or between those of astronomy and astrology? Again there is no simple or

formal answer to this question because many factors are involved and not all of these are specifiable. However there is one factor of immediate relevance – Popper's demarcation principle (see Popper 1963). To be accepted as scientific, a theory must be so structured that we can indicate some critical observation which would refute it. The reason for this perhaps unexpected criterion is the logic of the situation: a theory can never be conclusively verified whereas it can be logically proven false. In this respect, science is the search not for truth, but for error.

But how do we criticize paradigms? Since they govern not facts but theories, no observation can refute them. Paradigms have a largely programmatic function (Kuhn 1962; Wisdom 1963) – they tell us what paths of research to follow and they prescribe limits to the kind of theory we should construct. As an example we can consider thermodynamic theory and in particular the principle of the conservation of energy. A specific form of this principle can be refuted, but faced by such an apparent discrepancy the unspecific form simply directs us to look for a new specific form possibly dealing with previously unknown forms of energy. To understand this situation we must delve into the structure of paradigms. The laws associated with *theories* are generally straightforward and observational, and the concepts employed are *instantiative* (cf. Wisdom 1957). As an example we can take Boyle's law that the pressure and volume of a gas vary inversely at a given temperature. The concepts employed, 'pressure', 'volume', 'gas', have instances – they refer to concrete things we can observe or experience. To test this law we make a deduction which takes the form of a simple syllogism, e.g.

- 1) All gases obey Boyle's law.
- 2) This object is a gas.
- 3) Therefore this object obeys Boyle's law.

The laws associated with paradigms, by contrast, are theory-laden and the concepts involved are non-instantiative. As an example we can consider the principle that if two animal species coexist in a particular region, they must be ecologically different. This principle involves the concept of environment – a concept which is non-instantiative in that an environment is

not something we can observe or experience. As it stands, the principle is irrefutable. But a specific form, such as the principle that two species cannot coexist if they compete for the same limited food resource, is falsifiable. It should be noted, however, that the specific form has *specified* a concrete aspect of the environment and thus contains only instantiative concepts.

So how can a paradigm be refuted? The answer to this question is really quite simple. Theories deal with facts and are consequently refuted by facts; paradigms deal with theories and are consequently refuted by theories. As an example (after Wisdom 1963, 1968) we can consider the principle that energy is continuous. This principle of classical physics is clearly irrefutable. If, like Planck, we discover phenomena of radiation which seem to be due to discontinuous processes (quanta of action), we cannot at all rule out the possibility that other quantities of action (to be discovered) might restore continuity. But Schrödinger's formulation of the wave-equation provided a theory with the deductive consequence that energy levels are discontinuous. Since this theory was independently tested (e.g. by the emission spectrum of the hydrogen atom), it refuted the assumption that energy is continuous. Similarly a theory with perpetual motion as a consequence would, if confirmed, refute the principle of the conservation of energy. However there is a snag here: refutation does not necessarily lead to *rejection*. All that a refutation does is to enhance the problematical tension of a paradigm and indicate the need of revising it. The refutation only has the necessary power to eliminate when it has the support of an alternative and better paradigm.

We are now back with a familiar problem – how do we select an alternative paradigm? Only in this case the problem is considerably more intractable. Theories are generally being compared with respect to a single paradigm which provides a stable meaning for the terms employed. Alternative paradigms, in contrast, may not have a single statement in common. This is because the facts to be explained will be so permeated by the conceptual structure of the paradigms, that these paradigms will never explain the 'same' thing. Consider, for example, the radically different meanings given to the terms

'space', 'time' and 'force' in Newtonian and modern physics. Kuhn has argued that the proponents of different paradigms 'practice their trades in different worlds'. They confront the same reality and know that they do so 'but in some areas they see different things and they see them in different relations one to the other.' (1962 p. 149). Thus when the protagonists argue they are bound to be fundamentally at cross-purposes because neither side will grant the non-empirical assumptions the other needs to make his case.

Now if 'competition between paradigms is not the sort of battle that can be resolved by proofs' (Kuhn p. 147) how do we select an alternative and how does this become accepted by the scientific community? The answer, I would suggest, is that there must be a philosophical conversion first. A paradigm always entails some fairly general assumptions about which nothing can be proved scientifically. These assumptions arise in the context of a new philosophy which helps to redetermine the problems which are to be tackled in our science and the types of answer which are to be admitted. This leads to a further question: *How* does a philosophy structure our scientific beliefs? I would suggest that it does so through being informed by the answers we give to three questions – questions which each practising scientist must answer even though he may not do so either explicitly or consciously:

- 1) What is the origin of all things?
- 2) What coheres and interrelates all the aspects of our experience? – whence the lawfulness of the universe?
- 3) What is the vantage point from which we can meaningfully view each individual fact and the integral totality of creation?

It is the answers to these questions that structure a scientist's philosophy and his philosophy, in its turn, directs his choice of a paradigm. The thing to notice, however, is that these are religious questions for the answers we accept determine the direction of the *whole* of our life. *Our ultimate directive in science comes from our religious commitment.* If we confine our attention to our western culture, we find that there are basically two commitments – the humanist and the christian. The Christian

receives his answers from the Word of God – that the origin of all things is the God who is really there; that this God has created a lawful universe and that the vantage point is the regenerated believer whose sinful heart has been cleansed by God, reattuned to the lawful structure of his creation and confirmed in obedience to his Word and Will – at least that’s how it should be! The humanist, however, can only plead that the facts are ‘brute’ – they are ‘just there’; that the lawfulness in some sense relates to man and that the vantage point is the autonomous reason of the scientific man. Blackham writes that ‘The faith of the humanist is first of all in reason. . . . The rationalism of the humanist is . . . a reliance on science’ (1968 pp. 28, 32).

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All this may seem a rather long preamble, but it enables us to place evolution in a true perspective. Consider: if the aim of science is to know reality, to find unity in the multiplicity of phenomena, then how can this be achieved in line with the humanist commitment? What, in other words, can a humanist believe about reality which is consistent both with his humanism and with his belief in the attainability of unity in science? There would seem to be only one answer. Unity will only be possible if reality is a continuum, whereby each aspect is related with the others by evolution. Thus the Dutch philosopher Delfgaauw argues that ‘The idea of evolution as such is . . . only a direct inference from the notion that observable reality is a unity. . . . There is the elementary unity that connects the sum of what is observable with the (potential) observing. It is in consequence of this that modern science bases itself on the postulate of the unity of observable reality.’ (1969 p. 105). However he can only argue thus because he puts up a man of straw as the alternative – ‘that observable reality divides off into a number of unities or “spheres” which have no reciprocal relation at all.’ (ibid. my emphasis). Clearly he has no intention of believing in anything else.

Evolution is neither a scientific theory nor a paradigm, but a metaphysical dogma of continuity – a dogma which is a basic

tenet of the humanist faith. Humanist scientists always, of course, mask the religious status of this dogma by referring to it as a 'law' or 'principle':

'Though no evidence worth anything has as yet, in my opinion, been advanced in favour of a living being, being developed from inorganic matter, yet I cannot avoid believing the possibility of this will be proved some day in accordance with the *law of continuity*.' (Darwin, 1903, ii, 171, my emphasis.)

'In any endeavour to trace the evolution of a highly specialized organ, a difficulty arises in the application of what may be called the *principle of continuity*. It is repugnant to reason to suppose that eye or ear appeared suddenly in evolutionary history. Their evolution *must* have been a continuous process . . . ' (Pumphrey 1950 p. 5. my emphasis). The Dutch zoologist de Wit gives us the truer judgment: 'Although the doctrine of evolution presents itself as a pre-eminently scientific theory, it is not a scientific theory at all. Rather it expresses a specific *philosophical view* regarding the genesis and the structure, in space and time, of the living world. The basic element of the doctrine is the principle of *Transformation* and the theories of mutation and selection are superimposed on it in an attempt to give scientific status to a speculative metaphysical principle.' (1965 p. 405.) It isn't fashionable to admit this today, but the older scientists were more honest. The zoologist Watson said to the British Association in 1929 that 'Evolution itself is accepted by zoologists not because it has been observed to occur or is supported by logically coherent arguments, but because it does fit all the facts . . . and because no alternative explanation is credible.' (1929 p. 88.) Similarly the physicist More wrote in 1925 'The evidence for the evolution of plants and animals is commonly said to be derived from many sources. When, however, we examine these causes for our belief we find that . . . most of them can be considered only as secondary reasons to confirm a theory already advanced. . . . Our faith in the idea of evolution depends on our reluctance to accept the antagonistic doctrine of special creation, because this view of creation is foreign to our belief in the continuity of law and order.' (pp. 117, 304.)

We now come to the paradigms which have been articulated within evolutionary philosophy. Essentially there are three alternatives: Lamarckism, Darwinism and Macro-mutationism. These are *not* scientific theories, but *frameworks for theories*. As such they are all factually irrefutable. This needs to be stressed as it has long been fashionable for evolutionists to say that they reject creationism as unscientific, because it cannot be tested. Thus the geneticist Bruce Wallace has written: 'we reject special creation as an adequate explanation because we can think of no means by which we can put it to a valid test, because we can imagine no observation falling outside the capabilities of a Creator possessing unlimited ability.' (1967 p. 5.) It is really quite ironical that we can rewrite this statement: 'we reject Darwinism as an adequate explanation because we can think of no means by which we can put it to a valid test, because we can imagine no observation falling outside the capabilities of natural selection!' Fortunately this has now become widely recognized. Amongst scientists one can mention von Bertalanffy (1952 p. 89); Birch and Ehrlich (1967); Murray Eden; Ernst Mayr; Alex Fraser and Marcel Schutzenberger (in Moorhead and Kaplan Eds. 1967) and amongst philosophers Sir Karl Popper (1963); A. R. Manser (1965) and A. D. Barker (1969).

Leaving aside, for the moment, the question of evolution itself, we can now ask whether the evolutionist can choose between these paradigms by means of their theories. The answer is in the negative because there neither are nor can be evolutionary *theories*. All the paradigms we dealt with before were concerned with the way things *are*, but evolutionary paradigms are historical interpretations – they deal with the way in which things *became as they are*. Evolution provides two types of historical explanation which Goudge (1961) has called 'integrating' and 'narrative'. Integrating explanations integrate the various biological disciplines by showing that the phenomena (homologies, vestigial organs, geographical distribution etc.) can be explained as the outcome of an historical process having continuity and direction. Narrative explanations analyse the continuity into an intelligible sequence of occur-

rences so as to produce a coherent narrative, a 'likely story'. Now these are valid forms of scientific explanation but they do their job without the aid of any general laws. The events are not deduced from a law or set of laws as instances of a kind; they are individual phenomena between which individual relations hold and they will not recur. *After they have taken place* events are explained by showing them to be the outcome of postsequences of events but nothing is deducible about phenomena yet to come. Our various paradigms can, of course, systematize these historical interpretations by rewriting them in terms of the categories provided (mutation, natural selection etc.), but this tells us more about the nature of the paradigms than about the phenomena.

We are now left with a puzzle. If evolutionary paradigms are both in observation – and theory – irrefutable, then why is it that, in Britain and America, Darwinism is accepted almost to the exclusion of the alternatives?

The answer, I would suggest, is to be found in the twin metaphysics on which Darwinism is based:

- 1) The atomist thesis that wholes are explicable by analysis into their parts – namely organisms into their genes.
- 2) The thesis that events are always explicable by preceding events which are their causes.

This ties in with what we were saying about the unity of science. Oppenheim and Putnam write that as far as they can see, 'the only method of attaining unitary science that appears to be seriously available at present is micro-reduction' (1958 p. 8). In connection with evolution they wrote: 'The reason for our regarding evolution and ontogenesis as providing indirect factual support for the unity of scientific hypothesis may be formulated as follows:

'Let us, as is customary in science, assume causal determination as a guiding principle; i.e., let us assume that things that appear later in time can be accounted for in terms of things and processes at earlier times. Then, if we find that there was a time when a certain whole did not exist, and that things on a lower level came together to form that whole, it is very natural to suppose that the characteristics of the whole can be causally

explained by reference to these earlier events and parts; and that the theory of these characteristics can be micro-reduced by a theory involving only characteristics of the parts' (p. 15). It is this attitude which draws from Marjorie Greer the just charge that Neo-Darwinism is 'a theory deeply embedded in a metaphysical faith; in the faith that science can and must explain all the phenomena of nature in terms of one hypothesis, and that an hypothesis of maximum simplicity, of maximum impersonality and objectivity' (1966 p. 199). Greer notes that the basic explanatory concepts of Darwinism are *chance* (random variation) and *necessity* (external compulsion of natural selection) which 'from Democritus through Hobbes to modern physicalism (are) the sole permitted instruments of reductivist explanation' (p. 191).

How else can the Humanist explain? Let us imagine that the universe comprised but four elements, A B C D, together with all their interrelationships as expressed in general laws. Now a humanist can clearly 'explain' this universe by micro-reduction, by analyzing it into its elements. But this explanation is inherently unsatisfying because it provides no answer to the questions: 'Why A B C and D and not any other elements?' and 'why these particular laws and not any of the multiplicity of other laws which could, without any violation of logic, be equally easily imagined?' The only 'way out' of this predicament is to defer the problem i.e. to explain the present situation in terms of the (assumed) simpler situation X years ago. But this is all that can be done because even an infinite regress will not allow a scientific explanation of the whole. But what it does do is serve as a palliative, because the scientist can forever immerse himself in reductivist investigations. I would suggest that these are the reasons why Darwinism is so much more popular than its less reductive rivals.

Now let us consider evolution itself. Evolutionary paradigms are irrefutable – irrefutable, that is, if we grant two assumptions:

- 1) That evolution has occurred, and
- 2) That scientific methods are applicable to the study of origins.

The second assumption is theologically unacceptable because

the applicability of scientific methods boils down to the assertion that the creative past can be explained in terms of present-day (scientifically-analyzable) phenomena. The German biologist Mainx puts it like this: 'The fundamental assumption of the doctrine of descent presupposes that all those processes which have led during evolution to change in the organic multiplicity in principle also takes place today.' (1955 p. 49.) This, of course, is the old heresy of explaining creation in terms of providence. But this is really a digression because we are primarily concerned with the first assumption.

We can draw together the threads of our discussion in the form of three statements:

- 1) The only way in which one can effectively criticize any evolutionary paradigm is by criticizing the whole philosophy of evolution.
- 2) The only way in which one can effectively criticize evolutionary philosophy is by confronting it with an alternative which can also provide paradigms.
- 3) You can only engage in such criticism if you are prepared to entertain the philosophical and religious beliefs entailed by such an alternative. If you are not so prepared then for you evolutionary science will become a dogmatic and completely petrified metaphysic. (Dare one suggest that for many scientists that is already the situation?)

I would suggest that, as Christians, we can draw the following lessons:

Firstly that the issue for us is primarily a Biblical one. We cannot allow science to control our exegesis of Genesis not only because that is a denial of the authority of scripture but because science is, in any case, inherently incapable of helping us. We could only so use science if the humanist's beliefs were true.

Secondly that the only alternative is to follow scholars like Dooyeweerd and Mackay and argue that the early chapters of Genesis do not belong to our time scale and thus contain no data which is relevant to our scientific studies. But if you do this

you must remember that, in the absence of revelation, the only way in which one can scientifically evaluate and criticize palaeontological paradigms is by comparison with alternatives – in this case, creationistic alternatives.

Thirdly that the setting up of alternatives entails the consideration of an alternative philosophy. This is imperative in this case because we certainly cannot accept the currently-accepted philosophical and religious basis of evolution. In fact from our standpoint we can riddle it with holes!

Fourthly that we must be very careful as we compare paradigms. Since opposing paradigms cannot be compared in a directly refuting way, we will be comparing them primarily for consistency i.e., demonstrating that the creationist explanation of a phenomenon is consistent whereas the evolutionary one is not. We must also remember that opposing paradigms will be using terms such as ‘evolution’; ‘creation’; ‘species’; ‘variation’ and ‘mutation’ in radically different ways. If these points had been recognized in the past, a great deal of futile argument might have been avoided. In some cases, for example, the evolutionist and the creationist will give what appears to be an identical explanation of a phenomenon. The actual differences will only become clear when the explanations are seen in the different conceptual frameworks. The moral, I think, is that if we are going to contribute usefully to the scientific argument then we are going to have to do a great deal of homework.

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The last thing I wish to do now is briefly to compare a creationistic and an evolutionary paradigm as regards the explanation of firstly the mechanism of evolution and secondly homologies.

A. The Mechanism of Evolution

a) *Darwinism*. Darwinists argue that all existing and extinct creatures have evolved from primitive unicellular forms by a process of natural selection acting on random mutations.

But this dogma is in conflict with another dogma of modern biology, namely, that the gene (and its consequent enzyme) is highly specific, and different from virtually all other genes. But if the gene is really so unique then it is too unique to be produced by a Darwinian mechanism because these specific nucleotide sequences will not be produced rapidly enough. The discrepancy here amounts to tens or hundreds of *powers of magnitude*. I won't say more here as this issue has recently been well analyzed by Frank Salisbury (1969) and Murray Eden (in Moorhead and Kaplan 1967). What I will say more about, however, is mutation itself. With the elimination of other possibilities, the Darwinist now relies on mutation to provide the variation for natural selection to utilize. This is a problem because the one thing that the paradigms have to account for is progressive evolution, whereas mutations seem to be anything but progressive. They seem to be a biological analogy of noise in a physical system – they occur spontaneously and randomly as the result of accidents in cellular or nuclear metabolism; they have no known cause and they decrease the integration and order of the system. There is no known mutation which can claim to be beneficial and also survive criticism.

b) Creationism. The creationist, of course, doesn't have the same problem. He asserts that an horizon is provided for our investigations by the fact that there are irreducibly different kinds of animal and plant. As to variation within these kinds the creationist can explain this according to normal genetic processes. In normal animal populations today there are about fifty independently segregating genes and most of these have five or six alleles. By recombination you can produce some 1,060 different forms. When you take into account the amount of hidden variation which can be released by breaking linkage groups etc., there is clearly more than enough potential (!) to account for the trivia which the evolutionist calls 'evolution in action' – the relevant variation was all there to start with.

B. Homology

a) Darwinism. Here the argument is that if we compare, say,

the forelimb of a crocodile, the paddle of a whale, the wing of a bird, the wing of a bat, the forelimb of a mole and the arm of a man, we find that although they perform different functions they nevertheless have a similar arrangement of bones, nerves and muscles. This the evolutionist explains by arguing that they all evolved from a common ancestor with this same basic structure. This is, of course, a very crucial argument for as de Beer puts it: 'This concept is at the root of all phylogenetic schemes, for it is by means of their homologous structures and the modifications which they have undergone that the ancestry and affinity of organisms are determined.' (1958 p. 146.) There are many criticisms of this so I can only give a few. Firstly the argument makes a very questionable assumption, namely, that whereas the particular features of any animal are adaptive to its particular mode of life, its general plan is not. What is amusing here is that this assumption conflicts with Darwinism itself. As a result several evolutionists have given it up. The zoologist Arthur Cain writes that: 'everything that is known of the power of natural selection and the nature of evolution strongly suggests that there has been ample time for the complete reconstruction of the older groups to make them better adapted to their modes of life if this had been necessary; their remarkable constancy of plan combined with plasticity in pretty well every detail of that plan over hundreds of millions of years almost forces us to the conclusion that they are as they are because that is what, in competition with all the other great groups, they need to be.' It is really quite entertaining for a creationist to watch all this – the evolutionists are continually putting up arguments and then later – without publicity – so toning them down that the creationist, after the necessary conceptual adjustment, can give the same explanation.

My second criticism of the evolutionary argument is more serious. The evolutionary explanation of homology has met a snag in the fact that homologous structures reveal no unity in production. At first it was thought that homologous organs would have a common embryological origin – but there are too many exceptions. So after the rise of genetics various attempts were made to explain homology in terms of common genetic

determination, but this, too, has failed as indeed have all other attempted explanations. By 1930 several biologists had given up trying. Writing in 1958, Sir Gavin de Beer refers to the 'interesting paradox' that 'while continuity of homologous structures implies affinity between organisms in phylogeny, it does not necessarily imply similarity of genetic factors or of ontogenetic processes in the production of homologous structures' (p. 153). He goes on to comment that, 'Since the developmental mechanisms of homologous structures can become changed, the wonder is not that morphological relations sometimes may vary, but that they are usually so remarkably constant'. The only possibility would seem to be that the plan of an animal body is entirely the product of the environment. But Alister Hardy argues that this is 'remembering the great variety of environments which a single species may encounter and the variety of different kinds of animals which may live in the same habitat . . . almost a *reductio ad absurdum*' (1965 p. 214). Stalemate!

b) Creationism. The creationist might expect similarities because since the animals were created for man, it is reasonable to expect that they should be classifiable. But the creationist might also expect that each animal would be structured the way it is because that is the best for it in relation to its way of life. Cain has shown that there is a substantial body of evidence to support this view.

These are just two brief illustrations of the way in which we can analyze the respective paradigms of evolution and creation. All that remains for me to do is to reassert the primacy of scripture. And I can do no better here than to quote some words of Calvin:

'It is vain for any to reason as philosophers on the workmanship of the world, except those who, having been first humbled by the preaching of the Gospel, have learned to submit the whole of their intellectual wisdom (as Paul expresses it) to the foolishness of the Cross (I Cor. i. 21)' (1965 p. 63).

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D. C. SPANNER

Creation, Science and Scripture

As one of those responsible for this meeting I would like to say that I could have wished that it had taken a different form. Serious questions like the bearing of Holy Scripture on the scientific theory of evolution are rarely decided by public debate; the matter is too emotive, and many of the arguments too technical for headway to be made that way. I would far rather the subject had been discussed in an unhurried way in a limited group, where numbers were small enough for those taking part to get to know and respect each other. We are, after all, christian brethren, concerned for the 'defence and confirmation of the gospel'; and we all recognize that much of the teaching abroad today which bases itself on the biological theory is for many destructive of belief in the inspiration of Scripture and a stumbling block to faith in Jesus Christ. 'The Naked Ape' by Desmond Morris is just one instance of the form which the popular modern evolutionary understanding of man can take; and we are all agreed that somewhere here is an enemy and we must fight it. Where we differ is in the strategy and tactics which we judge to be the right ones to employ, and I imagine that most of us look upon this meeting as an opportunity to help one another to discover them.

What exactly is the enemy that confronts us? We need to be clear about this or we shall find ourselves at cross purposes. I shall argue that it is not the scientific theory of evolution (for I do not personally believe that Holy Scripture forecloses the issue of biological evolution) but rather the idea of evolution raised to the status of a philosophy and even of a religion. We might call it in fact 'Evolutionism'. This outlook commonly regards the scientific theory as providing the necessary and sufficient clue to an understanding of man and all that concerns him including his ethics and religion. Accordingly it has no place for a Personal Creator; no valid questions remain to be

asked beyond the level of mechanism – how did life originate and what course has it followed? Beyond this, however, Evolutionism has become a religion as well as a philosophy. It has pantheistic and mystical connotations, and may even borrow extensively from Christianity. The influential ideas of Teilhard de Chardin fall into this category. Between these two extremes, the atheistic and the pantheistic, lies a whole spectrum of outlooks; but all of them are characterized by denying in one way or another the biblical God of Creation and Providence, the God ‘with whom we have to do’. Evolutionism then, and not the theory of natural descent, is the target at which I shall direct my remarks.

Must we reject the biological theory?

To reinforce the distinction between the scientific theory of evolution and the religio-philosophy of Evolutionism I should like to draw a parallel. One of the curses of present-day thought is relativism, the idea that, for all practical purposes, all the knowledge that is accessible to man and that has a bearing on his existence is relative. Absolute statements about God, about human nature, about ethics and so on cannot be made. All truth is relative, and changes with time and situation. Thus modern man loses contact with the solid ground that gave his forefathers conviction and steadfastness; and just when the exponentially mounting pressures of his plight call for firm directives all he has is ‘situation ethics’ or a religion with no absolutes. All of us would agree that it is this relativism in morals and religion that has as much as anything else landed us in such a sorry mess. Now it may be a subjective judgement, but I cannot help feeling that the present mood draws some support, at least, from the triumph of relativity in physics. For what Einstein’s insight did was to detach us from the conviction that in space and time we have contact with an absolute frame of reference, and to convince us that every observer has a view of things peculiar to himself but of equal validity to everyone else’s. Almost all observations in other words, became relative. Of course a few invariants remained,

common to all observers, and chief among these was the velocity of light. But relativistic ethics can, after all, boast the same: it has love as the invariant, the common quality of all right moral decisions. Thus the parallel between relativity (in physics) and relativism (in religious morals) is fairly close; it is only their spheres which are different, and it is reasonable to maintain that the one bolsters the other. But no one, I imagine, would go on to argue that because relativism is abhorrent to the Christian therefore he must oppose Einstein. On the level of physical mechanism relativity is entirely appropriate. But in religion and morals men come face to face with God; and at least if God is the God of the Bible this means they meet the Absolute and Final, and to advocate relativism, of any sort, in connection with Him is to become futile in one's thinking.

It is in this way that I view the distinction that has been drawn between evolution, the scientific theory, and Evolutionism, the religio-philosophy. One is a theory of mechanism; the other, taking it for granted that the theory is true, proceeds to make an entirely unwarranted extrapolation into the realms of philosophy and religion. It is unwarranted because while it usually poses as a logical consequence of the theory it is in fact nothing of the kind. It is merely one of a number of possible interpretations of it; and any fair-minded person would admit that there are other equally possible interpretations, such as the view often and inadequately called Theistic Evolution. I would therefore seek to emphasize the point that rejection of Evolutionism does not *ipso facto* mean rejection of the scientific theory, any more than rejection of relativism in ethics means rejection of relativity in physics.

Where then does this leave us? Rejecting Evolutionism in all its forms, where do we stand with regard to the theory of descent? I think it leaves us with an important preliminary decision to make. Before we proceed to evaluate the theory of descent we must first decide the *grounds* on which we are going to make our evaluation. There would, for most of us, seem to be two possible grounds. Firstly there is an examination of the scientific evidence; secondly, there is an appeal to revelation. This question, of the direction in which we are to look for our

answer, is not perhaps quite so clear-cut as it appears at first sight. It would be easy if scripture only made pronouncements where the avenues of scientific and historical enquiry clearly had nothing to offer, and vice versa. But this is not always so, a case in point being the Resurrection. Why do we believe in the Resurrection? Is it because the Bible asserts it authoritatively as revelation, or because 'it is one of the best-attested events of history'? No doubt this is more a theoretical problem than a practical one, and no doubt belief in the Resurrection comes in point of time in the first place to different people through different channels, i.e. firstly through the impress of authority or firstly through examination of the evidence. What matters is that ultimately both testimonies converge to the same point. But we need to remember that the New Testament writers don't belittle the visible, tangible, public evidence of this great event; they insist on it, and do not just fall back on a word of revelation. The purpose of the latter is not primarily the declaration of the physical event (for which 'ordinary' evidence is available) but *the proclamation of its significance in ultimate terms*. With this analogy in mind therefore we may turn to the question we have just raised, namely on what grounds we are to assess the biological theory of origins. Certainly, on the face of it, evidence of a visible, tangible, public nature (that is, scientific evidence) does exist to be consulted, and the believer is bound to regard this as God-given. On the other hand Scripture is not silent either on the matter of origins. Clearly, we need further light on the relationship between Nature (which furnishes the tangible evidence) and Scripture in order to come to a decision as to the right basic approach. This light the Bible itself may be expected to give us.

The beginning of wisdom

The Bible makes it abundantly plain that all true understanding begins with God and a right attitude to Him. 'The fear of the Lord is the beginning of wisdom' (Prov. ix. 10) knowledge (Prov. i. 7) understanding (Psa. cxi. 10) and insight (Prov. ix. 10 R.S.V.). The man without it is wrong from the start, and

hasn't really a clue to the final meaning of things. It is no accident therefore that the Bible opens with the phrase 'In the beginning, God'. John takes this up at the opening of his gospel with the same emphasis, and the Psalmist adds his own testimony, 'With Thee is the fountain of life; *in Thy light* do we see light' (Psa. xxxvi. 9). To the Bible God is One to whom the true seeker first directs his attention. He is not the end of a philosophical argument; He is the starting point. It is wrong therefore to come to the God who reveals Himself with a preformed philosophy of our own, into which we expect His revelation to fit. The Bible teaches us rather to come to Him as little children (Mark x. 15, Matt. xi. 25), whose thoughts are to be moulded and informed by the light He delights to give. We ought not to come to Him determined beforehand, for reasons of our own, to hold to a philosophy of Evolutionism; equally, we ought not to come having decided in advance on a philosophy of Non-Evolutionism. It is here that it is so easy to fail. What the Bible insists on is not at first a correct conceptual framework, but a correct spiritual attitude. Where the fear of the Lord is present, truth can find an entry; no preconceived philosophy of one's own stands in the way. Surely this is what the Bible means when it speaks of the man 'who is humble and contrite in spirit, and *trembles* at my Word' (Isaiah lxvi. 2). Such a man isn't commended for his correct ideas, but for his childlike spirit, and this spirit God promises to enlighten (Psa. cxix. 130).

Coming to God

Coming to God for instruction implies submission to revelation; for revelation is God's systematic instruction of men. It is of more than one kind, and Scripture itself directs us to several modes which God uses. Nature in all her manifestations is divine revelation (Rom. i. 19, 20; Psa. xix. 1-4), and God teaches men through her (Job xii. 7; Matt. vi. 26ff.; Gal. vi. 7). God uses history also (II Kings xvii. 7, 19; Luke xiii. 1-5); and inner experience (Prov. xx. 27; Isaiah xxx. 20; II Cor. xii. 7-9). However, verbal revelation has a unique and pre-eminent place

among all these different modes. This may be the meaning of Psa. cxxxviii. 2 and it may reasonably be read into such passages as Psa. ciii. 7 and I Kings xix. 11-12 where history and nature respectively are also in view. However that may be, this conclusion is evident when we consider the enormous emphasis placed in the Bible on the medium of words, from the burden of the prophet (Exod. iv. 11, 12) to the teaching of Jesus Christ (John xiv. 24). Compared with words, Nature and history are equivocal indeed. The sunset says one thing, the earthquake another, and history too can very easily be read in quite contradictory ways (Jer. xlv. 1-3, 15-18, 20-23). Language however has a power, a range and a precision that are unequalled among modes of communication; it is one of the principal symbols of man's superiority to the animals and distinguished him from the first (Gen. i. 28, 'said to them'). Thus the conclusion that of all God's methods of communicating His thoughts to man publicly and permanently the written word stands supreme is inevitable if only in terms of our ability to understand.

Nature and Scripture

It is because of this pre-eminence of the written word that it is proper to turn to the Bible to find our right attitude to Nature, just as we turn to it for an ultimate understanding of history. When we do so we find not only that the Bible attributes theological meaning to natural happenings (e.g. Matt. v. 45), and gathers from them precepts for the practical conduct of life (e.g. Prov. vi. 6) but also that it regards knowledge gained from Nature by the methods of scientific enquiry (i.e. observation and experiment) as also God-given. This surely is the implication of Isaiah xxviii. 23-29 with its insistence that the agricultural expertise of the farmer exists because 'his God teaches him'. The Bible would seem to suggest that knowledge on this level (i.e. the scientific and technological) is open to men irrespective of their spirituality or otherwise; indeed the ungodly may even excel in it, as the narrative of Gen. iv. 17-25 indicates. But it is still the result of divine instruction. If this is so then it has an obvious bearing on our theme.

To sum up, we may say that these various aspects of the biblical testimony to Nature justify us in believing that Nature has many different things to teach us from God, and these things are not all on the same logical level. At what may be called the scientific or phenomenal level we learn techniques and the relation of physical cause and effect; at the behavioural level how to relate our daily conduct to the constitution of things; and at the theological level how to grasp God's purposes in what we observe. At this last level Scripture has to interpret things for us (and it clearly takes this role on itself) for nature's meaning is not self-evident. But on the purely scientific level nature is largely an autonomous revelation and capable of self-interpretation. 'The earth bringeth forth fruit *of itself*' (Mark iv. 28) seems to add point to this conclusion; nature appears to have built-in laws which suffice to govern her development, and we do not have to look outside her for explanations of why one phenomenon follows another. She is a closed system of cause and effect this verse seems to say, explicable within her own terms. The biblical miracles of course place a limit on Nature's autonomy; but in doing so they in fact establish the very point we are making, for the miracles are recognised by Scripture as 'wonders' i.e. events to understand which we feel impelled to invoke some special action of God. Nature therefore has a proper pattern of her own, or no event could be a 'wonder'.

However, outside her own terms Nature is not self-explanatory; she has to be understood as a continuing manifestation of the divine activity (Psa. cxlviii.; Col. i. 16, 17; Heb. i. 3). It is most important therefore that we don't stop at Nature, lest we worship and serve the creature rather than the Creator (Rom. i. 25).

These principles enable us to form a conclusion as to the relative dominions of the two revelations, the book of Nature and the book of Scripture. Inevitably there will be occasions when they treat of the same subject. When they do so, what course are we to take when they do not seem to agree? Which is then to be attributed the decisive word? Here we may invoke the Reformer's great principle (itself biblical): that since God

chooses to make Himself comprehensible to the 'plain man' (the man with an 'honest and good heart', Luke viii. 15) we should interpret revelation in the 'plain sense', i.e. in a way which will commend itself to men of good will who have no particular axe of self-interest to grind. In accordance with this principle it would therefore seem right to decide our question as follows: Nature is to have the decisive word when the interpretation in question is on the phenomenological (i.e. scientific) level; and Scripture when it is on the theological level (i.e. the level of the unseen). This will mean that natural observations, or scientific conclusions fairly based on them, must be allowed to 'warn us off' certain interpretations of Scripture when these fall within the provinces of science, and of course vice versa. This may not be a conclusion that immediately commends itself to all Christians; but for the reasons we have given it would seem to be a biblical one. Further, it is one which almost all Christians do in fact in particular cases subscribe to. As an example such passages as *Psa. xciii. 1, xcvi. 10*, are informative. The medieval church interpreted these in a mechanical sense: the earth was a fixture. Today all of us accept it as a matter of course that scientific observations have made this interpretation untenable. Nor do we feel that we are 'giving in' to science when we do this. It was plainly never the intention of the Bible to assert this. We do in fact allow science the last word because the interpretation displaced was on the scientific level, which Scripture nowhere claims to be within its own domain. As a result we have the positive gain that we are led to seek a more significant meaning to this verse which we might otherwise have lost: the world is established because God's throne is established, and cannot be moved any more than the righteous man can (*Psa. xv. 5. Jeremiah v. 22*, i.e. on the level of the unseen). If this principle is accepted it will prevent many incursions of science into theological matters; equally it will prevent many incursions of theology into scientific ones. This may not be a conclusion which immediately commends itself to all Christians. However it would seem to be a biblical one, and one to which nearly all Christians do in fact conform on occasion; for instance, over the interpretation of

Psa. xciii. 1, or of Jer. v. 22. The first passage we now no longer insist (as the Church one did) implies the mechanical fixity of the earth; as for the second – none of us imagines it to be a denial of the erosive power of the sea, or of its ability to encroach. God has taught us otherwise, through observational science, and we recognise that the passage must have a less superficial meaning. Thus again we are led to seek an interpretation more relevant to the sphere which Scripture claims as its own, viz. God's moral government of men and nations.

It is similar in the complementary situation. Many birds can be observed to die in hard winters, and the superficial may conclude from this that either they have no watchful Provider or that He is callous. But Scripture assures us that this is not so (Matt. x. 29). Its testimony is to be given precedence, because this is a sphere in which it *claims* to speak with authority.

This question of the sphere in which we are to recognize that the written Word has final authority is often obscured by posing it in a tendentious manner. 'Science versus Scripture' is the form in which we often meet it; and in this form the verdict, for the sincere Christian, is almost inevitable. But the anti-thesis is unfair; the question should be stated in terms of two sources of revelatory instruction, not in terms of one, and a human construct based on the other. It is a decision which in fairness concerns the book of Scripture and the book of Nature; or if one prefers it, one which must be settled between our systematisations from these, namely Theology and Science. Further, it should not be posed in terms of an animosity, a 'versus'. It should be the Christian's conviction that both books, as instruction manuals of the God of Truth, are harmoniously related, and our proper enquiry is when to turn to one and when to the other. That each has its own sovereign sphere, and that Scripture is not intended to cover the whole range of human interests, has always been the conviction of great men of God and one which is in fact implied in many of the great confessions (e.g. Art. VI of the Anglican articles) and fairly explicitly stated in the Bible (2 Tim. iii. 16, 17).

The biblical basis of Science

As a further help in getting our ideas straight it is useful to consider the biblical basis of science, or whether indeed it has any. The biblical teaching about the life of man in the world is not by any means a thing capable of a snap statement. In their eagerness to do justice to the Bible's doctrine of a world in the power of the evil one (I John v. 19), with him as its ruler (John iv. 30) and god (II Cor. iv. 4), and with its wisdom impotent to find out God (Matt. xi. 25, I Cor. i. 21), many earnest Christians have belittled, and continue to belittle, the whole scientific enterprise. This is surely a damaging mistake. In the first place it forgets such scriptures as Psa. xxiv. 1, Psa. civ. 24; Isaiah vi. 3; in the second misses the fact that Scripture underwrites the scientific and technological enterprise in a fundamental way. It records God's mandate to Adam to 'have dominion' over every living thing', and to 'fill the earth and subdue it' (Gen. i. 28). In illustration of what was intended by this we have man's technological use of natural resources (Deut. viii. 9) and of animals (Deut. xxviii. 4); his systematic gathering of knowledge (I Kings iv. 33); his interest in the mysteries of the creation (Psa. civ. 24; Psa. xix.; Psa. cxi. 2) resulting in knowledge commended in general terms as God-given (Deut. viii. 18; Isaiah xxviii. 23-29).

In the third place the anti-scientific emphasis misses the point that what has made the enterprise so often seem wrong is much more likely to be not its essential character but its motivation (cf. Gen. xi. 4). It is because science is an enterprise which gives man such power (cf. Gen. xi. 6) that it is peculiarly liable to be exhibited in a bad light. In this however, man's scientific capabilities are like his artistic ones, a gift from God (cf. Gen. ii. 9, 12; Exod. xxxi. 1-4) though very liable to be misused (Acts xvii. 29; Rev. xviii. 11, 12) so however are many of God's other gifts. Technological advances have, as a matter of history, often been prompted by a spirit of arrogance and self-assertiveness (Isaiah ix. 10) especially when military objectives have been concerned (Isaiah xxxvii. 24). All this must be recognized, but the lesson to be learned is surely not that science (and art)

should be belittled, but that they should be prosecuted in a spirit of thanksgiving and answerability – in the spirit of faith evinced by the centurion (Luke vii. 8) to whom the power he possessed spoke most loudly of the Authority to which he was responsible. Science carried on in this spirit has a divine mandate. It is a reading of God's book of Nature with wonder and profit. But even when the spirit of its enquiry falls short of what it should be, science still has about it many qualities which should commend it to the Christian. For one thing, it is in principle committed to an objective reality, the created order. It is never primarily speculation. For another, it does in practice return again and again to this reality to be reformed by it. It is rare indeed for its theories to be regarded as exempt from correction by new observational data; few scientists reject data merely because they don't like them. Compare theology! It is in rather a different case. It has often been far less committed to Holy Scripture, far less ready to be reformed by it, and far more prone to pick and choose. The difference between science and theology is no doubt one of degree in this respect, but it is hardly in question which of the two has been truer to its real self, at least within our present century.

What we must insist on in science therefore is a spirit of reverence towards its subject matter and responsibility towards God; but granted these, we must allow that science has divine backing and within its limits embodies Divine instruction. Such would seem to be the teaching of Scripture.

The Biblical idea of Creation

A clear appreciation of the biblical mandate for science and technology is one element which must enter into an informed judgement about the question we set out to discuss. Another, entering in a different way, is an appreciation of the various aspects of the biblical doctrine of Creation. The Bible's doctrine is hardly the simple, unsophisticated conception that it is often made out to be. We have only to look at the Hebrew word for 'create' (*bara*) to realise this. This word is frequently taken with clear justification to signify the production of something

from nothing (*creatio ex nihilo*). In the biblical record Man is said to have been 'created' (Gen. i. 27). However he is also said to have been 'formed from the dust of the ground' (Gen. ii. 7). Whether these two statements come from different sources is a matter I am neither competent nor concerned to discuss; it is enough for me that they have come to men woven into Holy Scripture as the gift of the all-seeing and all-disposing providence of God. To me therefore they represent 'data', to be received and not argued with. But clearly they present a problem as they stand, just as the dual nature of the electron presents us with a problem. There is evidently more to the biblical notion of creation than at first appears.

It was an insight of Augustine that creation involved not just material objects, but also the space-time framework (to anticipate a little) in which they exist: Creation to him was *non in tempore sed cum tempore*, time itself belonging to the created order. This idea is not therefore a modern one. Augustine's conception is certainly in harmony with Gen. i. 1 and with Heb. xi. 3 (where the Greek for 'world' is a temporal one, 'ages'); and that space too must be similarly comprehended would seem to be agreeable to the thought of Psa. civ. 2 and Isaiah xl. 22. These considerations lead us to the conclusion that the springs of creation arise not within our space-time framework (even at ultimate distances in space or time) but outside it in the eternity where God dwells (Isaiah lvii. 15). If that is the true implication of biblical thought then it follows that in the final analysis God's creative activity cannot be spoken of adequately in spatio-temporal terms at all, and the attempt to do so (to bring home to men the great lessons it is essential for them to learn) is bound to present us with an account which must not be probed too far or too unimaginatively. In its twin theme of Redemption the Bible expresses itself in temporal language of which the same might be said. It speaks about 'the Lamb slain from the foundation of the world' (Rev. xiii. 8) or the saints as 'chosen in Him before the foundation of the world' (Eph. i. 4), and it would seem beside the point to ask to what instant on our physical time scale these verses refer. The answer might well be, to none,

and this may be the correct reply to similar questions in our present context of Creation; for example, to what physical time intervals do the six days of Genesis refer?

But the Bible also speaks of creation as a process within our setting of space-time. If its springs are in eternity the stream nevertheless flows within our continuum. Man *created* in God's image, was 'formed from the dust of the ground' (Gen. ii. 7) and the word used (*yatsar*), in its 'plain sense', indicates not instantaneity, but process (compare Isaiah xlv. 10; xlv. 9). Further, the word *bara* itself, to which appeal is so often made by those who insist on the suddenness of creation and its character as the antithesis of process, is itself applied by Scripture to situations where the processes of God's continuing providence are the very things being spoken about. This application of the idea of creation is very wide; it embraces the cycles of Nature in which one generation or turn of the year follows another (Psa. civ. 29, 30), the Divine sovereignty in history (Isaiah liv. 16), and the inner experience of the restored sinner (Psa. li. 10). With all this in mind, it is very difficult to see on what grounds some have maintained that process is the very opposite of creation, or that to ask how God created is to deny that He created at all. Rather, these instances justify us in maintaining that the spatio-temporal sequence in which God has brought His created works into being may well form the reverent object of study of the embryologist, the historian or the psychologist in the examples quoted. Their findings will not disclose the Creator: but to those who 'understand by faith' that there is a Creator they will provide cause for thanksgiving and worship. In fact, the understanding of creation as an aspect of God's continuing providence gives point and emphasis to the Bible's call for a life of early devotion; God is *my* Creator not merely because He once formed Adam (and has now turned things over to natural processes) but because He is the One to whom, in an immediate sense, I owe the fact of my existence (Eccles. xii. 1).

In seeking for human analogies to help us to understand the Divine activity – and we have clear biblical authority for seeking such help not only in its revelation that we are made in

the image of God but also in the Bible's very frequent use of such analogies itself – we come across one which because it sets out to deal with human life in its many-sidedness goes as far perhaps as any in throwing light on the problem. This analogy, due I believe to Dorothy Sayers, concerns the human writer and the character he creates. The characters originate in the living and thinking of the author, within the space-time in which *he* exists, so to speak. But they also originate in the events described in the narrative, in the space-time within which *it* moves. The two space-times have no necessary connection; the author's may be London in the Victorian era, the narrative's, Mars in the year 2001. Nor is the order of appearance of the *dramatis personae* necessarily the same in the two settings, for the author may have worked out his last chapter before he plans the first, though perhaps some rough correspondence in order is more likely. What we must emphasize however is that it can be said of *any* character, at *any* stage of the narrative, 'this person is the creation of the author' without denying that *within* the narrative such a character has grown naturally from a young man or a family circle. The ageing David Copperfield was a creation of Charles Dickens; notwithstanding, he developed within the story from the young David Copperfield and still earlier from his parents. The older man therefore does not have to appear fully grown without antecedents; he can develop quite naturally within the narrative *without losing his created status*. Thus we if ask, how has the mature David Copperfield come-to-be? we can answer in two ways: he is the creation of the author, who thought him out and determined his nature; and, he is the outcome of the events of the narrative. Both answers are true, though the first is the more final. It is this first aspect that corresponds most closely to the biblical idea of creation; the second answers rather to its doctrine of providence, though the distinction must not be pressed. What we are suggesting is that in the human analogy there are two logically quite distinct space-time frameworks: the human author's, in which he eats, sleeps, shaves or travels to his office; and the narrative's, in which the same things are true of his creatures. Similarly, in the divine reality we meet

two frameworks; the eternity which God inhabits, and historical time in which his creatures live out their little days. Accounts of God's handiwork referred to these two frameworks, may properly be spoken of as complementary.

'God finished His Work'

One aspect of creation needs to be returned to in view of the Bible's regard for creation as a continuing feature of God's world. In what sense is it true to say that God 'finished' His work if it is apparently still going on? This is not perhaps such a difficult problem as might at first appear. The completion of God's work is signaled by the creation of man. He is the crown of the created order, and nothing higher is contemplated or perhaps in the circumstances possible. Now this can easily be reconciled with the facts of Nature. In many respects material systems are clearly limited by their physical properties. Land animals have an upper limit of weight, animals with an exoskeleton an upper limit of size. The limitation arises from such physical characteristics as strength-weight ratios, or the diffusion coefficients of oxygen and carbon dioxide. There is every reason to believe that such limitations, which seem to be inherent in the very constitution of material systems apply also to intelligence and mental powers. Granted therefore that the created order has attained this limit in man the language of finality and completion used by Genesis appears quite natural. God had no further advance to make; His work was finished.

Drawing together the threads

It is now necessary to draw together the rather diverse threads of the arguments and show how they bear on the attitude of the believer to the biological theory of evolution. This will be our concluding task.

In the first place we recognized that God instructs man through various avenues of revelation, in particular the Bible, Nature, history and inner experience. Firstly because of its own claim and secondly because of the nature of the case we recog-

nised Scripture as having the precedence among all these avenues in the sense that it is interpretative of the others on the ultimate, theological level. Nevertheless this does not mean that the others are superfluous, thrown in for good measure but if need be dispensable. They have things to tell us which Scripture nowhere claims to tell, and *on their own level* have every right to be given the last word. Especially is this true of Nature, whose fixed order (Jer. xxxi. 36 R.S.V.) exists independently of Man. Scripture claims as its own sphere what pertains to 'instruction in righteousness' (II Tim. iii. 16); methods of good farming must be learned elsewhere (Isaiah xxviii. 23-29). This naturally leads us to ask how we can decide whether a point is to be settled by appeal to Scripture or to one of God's other books, such as Nature. This may require some consideration; and it is probably true to say that sometimes the growing experience of the whole church is needed to come to a right conclusion. It would be foolish to ridicule our medieval forebears for what we now believe was a false exegesis of the verses which speak of the earth's fixity; a new perspective had to be achieved to see this. However two principles can, on biblical authority, be accepted; nothing that God has revealed anywhere is to be despised, and everything that He has revealed belongs to His one self-consistent truth. Thus the fossil record of early man-like creatures is not something to be disparaged for it is part of God's book of Nature. Nor can it, in the long run, prove to be inconsistent with the Genesis account. This, at least, is the conviction of the author.

This question of 'proper understanding' throws into prominence another, that of proper attitude. God requires of us that we receive His instruction as little children. First of all it is 'data', something given and to be accepted on Authority (not of course *human* authority) even if not understood. Second, it is to be pondered over, though never questioned. The pattern is the same whether the data are from the Bible and addressed to the theologian in us, or from Nature and addressed to the scientist in us. This attitude implies that the data are to be our starting point, our touchstone, and our anchor. The test of truth is not to be conformity with our philosophy, but

with what is 'given'; our speculations (and we must all needs be speculative to some extent) are to be firmly attached at this point. Third, it is to be taken in its entirety (Luke xxiv. 25). We are not to pick and choose, either on the irrelevant grounds of our preconceived ideas, or because certain elements of the 'given' seem irreconcilable with others. As particular examples of this we saw that according to Scripture God's creative activity is associated with the present as well as the past, and we are not free to deny this to save our system; nor on the other hand are we free to deny unwelcome evidence from the fossil record. Fourthly, we are to recognise that, conformably to our position as little children, some elements of God's instruction will be for the moment incomprehensible (John xiii. 7; Dan. xii. 8). We are to expect this, and not to be stumbled by it. To be offended on this score is to think more highly of ourselves than we ought to think, and to forget the Psalmists injunction given in a very relevant context (Psa. cxxxi. 3) to 'hope in the Lord' i.e. to look confidently for Him to resolve our difficulty in His own time. We need to take to heart the lesson of the Crucifixion. *With a wealth of Old Testament revelation* and with no personal doubts as to whether it was to be received or not as the Word of God the early disciples yet misunderstood completely (until after the event) the nature of the Messianic mission, and the misunderstanding was profound. Is it inconceivable that our understanding of the Creation narrative might not be similarly at fault until corrected by the march of events and renewed attention to *all* God's avenues of instruction?

We need to remember that the Christian life is a life of faith. If hope has not yet attained its object (Rom. viii. 24, 25) neither has faith (I Cor. xiii. 12); and this means that we must expect life to be beset with problems, including intellectual ones. It is part of the exhilaration of the life of faith to see how God will overcome our problems, whether they are the material ones of making ends meet, or the intellectual ones of harmonising apparent irreconcilables. To shirk the discipline of living with a problem till God is pleased to resolve it is to opt out, to this extent, of the life of faith. It is my belief that the constant invoking of the miraculous, without adequate reason,

is just this. No evangelical Christian doubts that the Creator could, if He wished, call the entire cosmos into being, fully formed and operative, in six literal days or even in six literal seconds. What the Christian has to ask himself however is whether *all that God has been pleased to reveal to him*, through the Bible, through Nature (Gal. vi. 7), through history (Psa. cvii. 43), and through inner discipline (Psa. xvi. 7) compels him to take this view. One of the great lessons of the Bible is that God works more often in ways we describe as ordinary than in ways we regard as miraculous (Matt. xvi. 4); its miracles are often all relatively rare events, and (performed before their eyes) designed to arrest the attention of weak and sinful men. There seems therefore no *biblical* *raison d'être* for the Creation to have involved such 'miraculous' elements as have just been mentioned, i.e. six literal days and the instantaneous appearance of adult forms. To maintain that *we cannot accept that the Creator was at work* unless it be conceded that the events were outside the scope of a principle of uniformity may be a sign, not of faith but of unbelief (John iv. 48).

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 grounds¹. Where they are biological and phenomenal they must be answered on scientific grounds². 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 both³. 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.

1. e.g. whether man was made in the image of God.

2. e.g. whether man has genetic continuity with the animal creation.

3. e.g. in what sense man is made of the 'dust of the ground', or creation was accomplished in six days.

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A Universal Flood: Some Practical Difficulties

For over a century parts of Genesis have been the subject of recurrent and bitter debate. Now, at a time when many conservative evangelicals find that the traditionally opposed views are not irreconcilable, more young Christians seem to be holding extreme literalist opinions and to be unable even to consider any other possibility. In this they are encouraged by several books and popular teachers.

The Flood, by Dr. A. M. Rehwinkel, reached its 11th printing in 1967 (Concordia) and is now being widely advertised in Britain. Morris and Whitcomb's *The Genesis Flood*, published in America in 1961, appeared in an English edition in 1969 (The Evangelical Press). Professor Enoch's little book *Evolution or Creation* (The Union of Evangelical Students of India, 1966) has been widely recommended; this is rather sketchy and in a more popular form, but it has the same literalist approach as the others, and all are based on the thesis that most of the earth's geology resulted from a universal flood. This was apparently first published in detail in books by G. McCready Price; viz., *The New Geology* (1923) and *Evolutionary Geology and the New Catastrophism* (1926).

The two latest books have been reviewed very fairly by A. N. Triton in the *Christian Graduate* (xx. 2. 1967 and xxii. 4. 1969), but I have seen no other reviews. It is probable that this thesis is accepted by virtually no Christian trained in any of the disciplines involved, for such find it rich in inconsistencies and special pleading. These 'Flood Geology' books all cover largely the same ground, with much theorising and speculation about conditions before, during and after the flood. Perhaps it would be helpful to look at this general problem from a more practical angle, and here I write in two different capacities: as

a former Forest Officer very interested in ecology and, currently, as a Zoo Director. This line of thought was prompted by a request to consider the logistics of the Ark, assuming that all non-aquatic forms of life must be saved. (In fact the aquatic species pose a major problem and this is discussed below.)

All schools believing in a Flood, whether universal or limited, are agreed that it was recent, i.e. within the last 10,000 years or so. Such a period has certainly seen development of forms, but hardly the multiplication of species called for by the theory, advanced by Rehwinkel, that massive 'evolution' subsequent to release from the ark greatly reduced the numbers that Noah had to house. He suggests (p. 70) that a single pair of cattle may have represented the entire bovine family, or a pair of large cats the whole of the felines. Research done while working on my book *Animals of Bible Lands* (1970) has produced only evidence to the contrary. Vertebrate land species known today, in round figures, are 2,000 amphibians, 4,000 reptiles, 8,000 birds and 15,000 mammals; even allowing that these had multiplied four times since the Flood, Noah would have had some 7,000 species to care for.

Most of the small kinds would have started off in pairs but some 40 genera of the larger mammals – the ruminants – and all the game birds, pigeons, and perhaps other orders also are 'clean', so these were admitted not in pairs but in sevens, which some commentators read as seven pairs. The endo- and ectoparasites would be included in the cargo willy nilly – but what about other land invertebrates, mostly insects, and amounting to perhaps half a million species? They could not have survived the conditions which these writers describe.

The technical problems that faced Noah were immense. As regards space the cubit is a well attested unit and a literal reading must give the size as c. 450 x 75 x 45 feet, which is a fraction of what would be needed, while the task of feeding, cleaning etc. would be far beyond the powers of the eight men and women forming the crew, a number which is not questioned. Food, much of it bulky, would fill as much space as the animals; Noah was specifically told to provide food for both man and beast (Gen. vi: 21) and this fact alone seems to make untenable

the hibernation theory that is noted below. Unless one accepts the suggestion of a world uniform climate (and presumably uniform habitat) there is the need to provide for a range of temperature and humidity, as well as special foods. Further consideration reveals several major difficulties.

1. *The Assembly of the cargo*

If the flood laid, or relaid, all the strata the antediluvian land shapes were quite different from those we know and there may have been no oceans to cross; but can one claim that the physical problem of assembly was minimised by there being no arctic regions and no deserts, with the whole world enjoying a uniform climate which allowed all animals to be evenly distributed? There are said to have been no mountain barriers – yet the ark came to rest on one. (Rehwinkel p. 74) The theory seems to claim that all extinct species, now known from fossils, were also living in that world, but for such a complex fauna to find room all available areas and a wealth of habitats must have been filled.

With modern materials and techniques, aided by air transport and skilled staff, moving wild animals is still a big task involving losses. Can we truly envisage Noah bringing samples of the total fauna into this one vessel? Rehwinkel sees no difficulty, for when the animals ‘came’ he sees them reporting to Noah of their own accord, brought by an instinct implanted in them by God for this occasion. However, in the previous verse (Gen. vi: 19) Noah was instructed ‘and of every living thing of all flesh, two of every sort shalt thou *bring* into the ark.’ A few pages later he mentions the theory that the task was eased by widespread hibernation, only to reject it on the grounds that it implies a miraculous interference with the life of most of the animals; he also notes, but calls fantastic, another idea that Noah had a mysterious oil of which one drop per day sufficed for both food and water.

2. *The Problem of Aquatic Species*

We know, particularly from aquarium work, that many

species of all classes are highly sensitive to salinity, hardness, aeration, temperature and other factors. How did these species survive? How did the marine and freshwater forms sort themselves out again and find their niches? Or has specialisation occurred only in the last 6,000 years or so? The conditions obtaining during the flood, according to Rehwinkel, were catastrophic: the sea mammals and fish could not possibly have survived them. This is how he describes it. 'There were probably 10,000 or more Krakatoas and Vesuviases shaking and tearing at the foundations of the earth. . . . This is not a fantastic assumption or a mere figment of the imagination.' And much more besides, though he gives no evidence for this. The survival of any form of life, including the ark itself, seems impossible.

3. *The Extinct 'Prehistoric' Reptiles*

To assume that these were all buried by the flood raises problems of spatial distribution and also of ethics. Why and how did Noah select only some groups for saving while whole orders of the giant reptiles, and many others, just disappeared? To suggest that they were all part of the cargo but then failed to adapt to postflood conditions is no more helpful.

4. *Re-distribution of Animal Life after the Flood*

For the ecologist this is perhaps the biggest snag of all. A universal flood involves disturbance on a scale beyond our imagination. It is unsafe to claim that the properties of inert matter have changed, and even the opponents of uniformity agree that the following principle has applied since the flood; waterborne material settles out according to its size, the fine particles last of all, so that most of the earth's surface must have been left covered with a uniform soft mud, forming a nearly sterile habitat useless to most animal life. Experience with the Kariba and other dams making lakes of only a few thousand square miles shows how these sediments form and also how vegetation is killed by comparatively shallow immersion. To this must be added intense turbulence for months on end and

water that before long would be uniformly brackish, and therefore lethal to most plant life and invertebrates.

In what form had the vegetation survived? How was this mud colonized with flora appropriate to the infinitely varied soil and climate zones that we know today? How did the animals retrace their steps, or spread into new lands? How, for instance, did the flying squirrel, of hamster size, reach North America? How did the order of marsupials alone get to Australia, and yet are hardly known elsewhere? What did the specialized tree animals do while their forests were growing? Most of these are severely practical questions such as field naturalists would ask in the knowledge of what floods, cloudbursts and tidal waves etc. can do over relatively small areas. A world-wide flood lasting for upwards of six months would mean universal devastation, whether or not it involved laying down all the strata in a series of huge tidal waves. These and many other difficulties seem quite insoluble in ordinary terms.

To be more constructive, I have no doubt about the flood's historic nature, which is plainly attested by our Lord. There is widespread mention of such an event in other ancient records, and there are many signs of flood remains in parts of the Fertile Crescent, though it is hard to date and correlate these, which is true also of some other early Biblical happenings. Further, the men of that early period were able to catch, train and domesticate a range of large wild animals. It was they who brought the Nubian Wild Ass and the Aurochs, or Wild Ox, into human service. Two Hebrew words for cattle are found in the early chapters of Genesis. *Behema* is a general term for animals but in such contexts usually refers to domestic stock; *miqneh* corresponds rather closely to the OE *chattels*, or movable possessions, and often means, or includes, stock. Noah must have had domestic animals, which were necessary to make possible such settlements as are described in Gen. iv: 17, while v. 20 'Jubal . . . the father of such as . . . have cattle' is hard to interpret otherwise.

We shall never know just how the formidable task of domestication was approached but the late Professor Zeuner, by far the greatest authority in this field recently, has recorded most

of the known facts in his *History of Domesticated Animals* (Hutchinson, 1963). For many centuries after the earliest period, especially in Ancient Egypt, men were masters at taming large and unlikely animals, showing an expertise that has long since been lost.

The Biblical record gives precise dimensions for a craft in which Noah and his family were to live with the animals. A wholly literal application of the English text demands sundry adjustments and raises the difficulties already discussed, so it seems right to ask ourselves whether this line is correct. There is no question about the flood's miraculous nature, seen clearly in the precise foretelling of beginning and ending, as God causes the forces which He has created to do His will, and then in the preservation of Noah and his family. There is wide agreement among conservative scholars that the flood's extent was limited, an interpretation that removes most of these difficulties. Perhaps Noah's main job was to save the breeding stock of the domesticated animals closely associated with man and largely dependent on him, thus allowing a quick start in occupying the ground which had been severely damaged, but not all entirely ruined, by the deluge. This suggestion certainly has its difficulties, especially in the words 'all' and 'whole' etc., but it has a pattern which seems to correspond much more closely with the way in which God is revealed as dealing with man and beast throughout the Scriptures.

Our Lord's reference to the flood was as a type (Matt. xxiv: 38 ff) and this is perhaps more important than the physical details – just as I regard the lesson in Jonah's incarceration as being more valuable than the exact identification of the 'great fish'. The incident of the fiery serpent in Numbers xxi has a bearing on this. There is nothing miraculous about the actual serpent, for several striking details fit *Echis*, the Saw-scaled Viper; this is known to become very numerous locally in some parts of East Africa and India, and one species is found in the Desert of Sin. The hand of God is seen in the timing, and above all in the healing which came by faith and obedience. It is interesting to know the identity of the fiery serpent but this seems less vital than the truth it teaches (John iii: 14).

When we approach such incidents intent on fitting them into a theory we have formed or adopted we may need to invoke the miraculous to an ever-increasing degree; in particular, a succession of widespread and long-continuing miracles would be needed to solve the complex of problems raised by the flood geology theory. Such certainly are not beyond the power of the God who created the universe but they would form a pattern quite foreign to what is revealed in the rest of Scriptures. This desire to buttress one's faith on literal foundations, which is true of at least some students taking this line, is the aspect of this approach that worries me. If some of these rigid props collapse, as they may well do, the result is unsettling or even disastrous.

No method of interpreting these early chapters is without some apparent contradictions. What, for instance, do we make of Abel's description as a shepherd (Gen. iv: 2)? The Hebrew word for 'sheep' and 'flock' in these verses means 'a member of a flock (of sheep or goats)'; in many cases, though not here, it is qualified to show which is meant. The plain meaning is that the animals were domesticated, for in about 260 other usages it never refers to wild animals. There is good archaeological evidence that the goat was in use at least 1,000 years before the sheep, but assuming that Abel kept goats we may ask who had domesticated them, a task that is not done overnight. This question still stands if all datings for sheep and goats are taken as post-flood. After many years of study I do not know how to reconcile these facts, but I do not let this worry me or undermine my faith. Similarly the Fall poses a problem for me; I have no doubt about its tragic truth, for it offers the only explanation of the mess this world is now in, but I would not be dogmatic about details, nor would I dare to comment biologically on the serpent in this passage. In this connection Mark Twain had a helpful comment. The portions of the Bible that worried him were not those he could not understand but those that were crystal clear, where man's position and condition are plainly stated.

The form of the biblical documents is such that we cannot regard them as a precise source of scientific facts, for many

are in obviously poetic form, while others are hard to classify, and their purpose is primarily moral and religious. I find this emphasis helpful when speaking on this general subject to student and other groups. It is more profitable to discuss man's purpose, present condition and destiny, about which the Scriptures are precise, than his physical origin, on which various views are held, by Christians and others. So I seek to make three main points: that man is unique because of his spiritual nature; that the fall alone explains his present plight; that his only hope is in accepting the finished work of Christ. This makes it possible to differ amicably in the more controversial areas, which I feel to be of less doctrinal significance, while concentrating on these basic points which man's pride hates to accept. Taking this line is not just avoiding the issue; it goes to the heart of the matter while keeping off what can so often be sterile argument adorned with a box full of red herrings.