

Discussion transcript: Science and the Bible: are they incompatible? Ernest Lucas

A lecture entitled 'Science and the Bible: are they incompatible? The creation story as a test case' was delivered by the Revd Dr Ernest Lucas on 13th May 2004 at the Winstanley Lecture Theatre, Trinity College. It was part of the Cambridge CiS-St Edmunds Public Lecture series on 'Science, Religion and Society' sponsored by the Templeton Foundation. A written version of the lecture can be found at the CiS-St Edmunds website (along with an archive of other series lectures):

<http://www.st-edmunds.cam.ac.uk/cis>

Subsequent to the lecture, a dinner/discussion with the speaker was held at St Edmunds College, Cambridge. An edited transcript of this discussion follows. It was chaired by Dr Denis Alexander (Babraham Institute) with introductory remarks from Professor Bob White (Earth Sciences). The other contributors are described at the end of the discussion.

Denis Alexander: Bob has agreed to start us off with a few reflections on the lecture and then we'll see where that takes us.

Bob White: I would like to thank Ernest very much for his lecture, and actually I am not going to reflect for too long on what he said because he said it so well!

What I thought we might do is to discuss some of the other issues surrounding the Biblical accounts of creation. So here are a couple of reflections which perhaps might start us off and lead us into other areas.

As many people here know, I'm a geologist and so I always have a timescale in my mind for the creation of the world and the universe. It runs something like this: the universe was created 14 thousand million years ago and the earth is a newcomer in that scheme – just the last third of it, some four and a half thousand million years. In this timescale humankind appeared

very, very late in the day, just in the last hundred thousand years or so – modern humans even less than that. We probably all have heard these analogies where you assume that the earth is one year old, and then work out what would have happened when. Well, the first known life on earth appeared around Valentine's Day, dinosaurs didn't go extinct till Christmas Day, humans wouldn't have appeared until a quarter to midnight on New Year's Eve at the end of that whole year, and Jesus didn't come until fifteen seconds before midnight. That puts an interesting perspective on things.

Secular books give a different slant – I'm just reviewing a book by Richard Forty called *The Earth, An Intimate History* and when talking about the rocks of the earth, he makes a comment that long after humans have gone from this planet the rocks will still be here.

Now, you see, that's a profoundly unchristian view of things because the Christian view is that this whole universe, this planet and everything in it, was created because God wanted to have a relationship with humankind, and that's why ultimately he created us at the pinnacle of his creation in his image. We know the story related in the Bible of how we broke that relationship, how Jesus had to come to restore that relationship and that in due course the world will be put back to rights when Jesus comes again. In contrast the secular view uses this long timescale to say that humankind is meaningless. Steven Jay Gould, a famous evolutionary biologist who died not so long ago, used to say that if you replayed the tape of life, things would come out differently – intelligence would reside in dolphins or some other organism, but probably not in humans.

Interestingly, a colleague from my own department, Professor Simon Conway Morris, has recently written a book called *Life's Solution*. The subtitle gives his thesis away: *Inevitable Humans in a Lonely Universe*, and his perspective is quite the opposite to Stephen Jay Gould's: once you've got life going – and that's quite hard – it's almost inevitable that something like humans will turn up at the end, however many times you replayed it. Now that, of course, fits in quite comfortably with a Judeo-Christian view of things. But I really wanted to raise that issue of the timescale because I sometimes wonder whether the difficulties that so-called Creationists have with macro-evolutionists (which I think most working scientists would consider themselves to be), is in the timescale. If the age scale of the earth was only ten thousand years, and that's only the bit that the Bible talks about, would they have less of a problem with evolution?

So that's one area to explore – what does the timescale say about God's interaction with the world, because it looks to be a very different timescale from what the Bible talks about?

The other area is to raise once again the issue that I think Zoë Lunnon asked in a question after the lecture. It's always a good thing when you're interpreting scripture not only to make sure it makes sense in your own experience of the world around you, but to look at how it fits in with the rest of scripture, because the whole of scripture is consonant, it is one. So if we think that one bit says something different from another, then we ought to be careful to check whether we are interpreting one of them wrongly. It does seem to me that Paul talks quite strongly, for instance, in Romans Chapter 5, that just as through one man sin came into the world, so through one man salvation was possible. From which I would cleave strongly to

the thought that there was one historic Adam through whom sin came into the world, since there undoubtedly was only one man, Jesus, through whom came salvation. There are other aspects of interpreting scripture, for example of how we interpret the creation stories in the light of the rest of scripture, that perhaps we could open up and talk about a little, which might shed more light onto how we view that creation story.

So that's a couple of things to keep us occupied. Timescales, as we see them today, and how creation is viewed not only in Genesis, but in the rest of the Bible.

Randall Richardson: It is interesting because the long timescale has never caused a particular problem to me, but it does a lot to students when I teach. What we end up having to do, I guess, is agree to disagree on a timescale because the argument that I use, which is similar to the point that Zoë was making on the interconnectedness of scripture, is that there's a real interconnectedness of different datasets that leads us to this estimate of the age of the earth. But if God wanted to fool us, which is the way I would see it from a pejorative sense from the scientist, as a test of our faith, there is nothing to say that you couldn't reset every clock, change every parameter, do it so that you could have the earth short and make it look long. Then we end up saying that's the end of our discussion because we both have said about what there is to say. The point I am trying to make is that it's not been a problem for me, but there doesn't seem to be a real reconciliation when I try to have discussions with students who are firmly committed to a young earth. From my perspective, there's not a way to reconcile the discussions that we have on the kinds of evidence when it gets down to what God could do if God wanted to.

Janet Tollington: Can I respond on that one? Coming from an Old Testament aspect of this, and thinking of what Ernest said about numbers and how numbers are used within scripture, there's a tendency for us to look at a number and say if it's twenty-three years it means twenty-three years, without stopping to think that it may very frequently be being used in a symbolic way. When you begin to look at the scriptures it's specific parts of scripture, what one might say are particular theological schools within the overall literature, who have got an interest in numbers. Often it's a priestly school of writing that is particularly concerned to show that there's no break in the continuity of a particular line of people who will put numbers in and will try to make a continuity within a particular story.

When you look at the Hebrew scriptures, the Greek version of the Christian Septuagint and then look at some Jewish writing, Josephus, you very often find that the numbers are different for different spans between different events. They are told in differing ways, and when you begin to look at it, you can discover that this person seems to be concerned in showing a continuity between entering into the land and building of the temple and getting to the exile, while another person is more concerned about a different set of connections in the story.

If you start seeing numbers as playing a different purpose within the telling of the story than trying to present chronology, then that takes a lot of these difficulties away. I have absolutely no problem in taking the Hebrew scriptures very seriously but seeing tens

of millions of years for the age of the whole created order. I don't see that there's a difficulty once you look at numbers, other than being precise, mathematical.

Bruce Winter: I have taken the question of the days as being an almost anthropomorphic lesson that you want to teach people so that, as Ernest very helpfully pointed out, you have got day 1 with the activities sort of filled in like a water colour, that is, you're putting detail in day 4, day 2 has detail in day 5, and day 3 is linked to day 6. It seems to me that if we're looking at what interpretation the author gives, then apart from some of the very illuminating comments that Ernest gave in terms of a polemic, you've also got what I mentioned previously in a question; you've got the reason why you keep Sabbath and why you should keep Sabbath, because God puts his tools down. So in both creation accounts there is a didactic, there is a message to Israel that is of fundamental importance, that the Sabbath was made for man and not man for the Sabbath. I see that that is the interpretation given at the end of Chapter II, verse 3, which says God blessed and God made it holy, because on it God rested from all his work which he had done in creation. As for the second creation narrative, we find a parallel in terms of how a man should enter marriage, and that's another very important thing.

I sometimes think we've asked the wrong questions of the passage – we wanted it to yield more than it's meant to, we don't listen first of all to the immediate text description in terms of what is unfolding, so days have meant nothing to me in this whole question. It's more what is it teaching Israel and what it teaches in the context the Christian church, i.e., the fact that there is a day made for us, that God has made for us for rest and for recuperation - to me that seems to be very important. If you live in a culture like Singapore, as I did, where people work seven days a week, you suddenly realize the great value of being in a context where there is rest to worship God and to gain perspective. Furthermore there's also in Genesis II, a statement of how people should enter marriage and the equality of men and women in a marriage context, which is also very significant. So that's where sometimes I think we're making Genesis I do far more work that was ever intended.

Denis Alexander: Just before bringing Ernest in on all these comments, I'm going to ask Paul for his perspective, because as a cosmologist his time-frame makes that of the geologists seem very short. As someone who studies the first femtoseconds of the universe and deep time, I'm sure you have a perspective on that, Paul, from a cosmological point of view.

Paul Shellard: Well, thanks Denis, I'll think of something to say for the transcript! Yes, I believe we are confronted with compelling evidence that the universe is about 13 to 14 billion years old. For example, you can trace back the history of the cosmic microwave background, the relic radiation left-over from the Big Bang fireball. It all fits together and you end up with a very coherent picture of the history of the universe from about a hundredth of a second after the Big Bang through to the present day. The speculation starts when discussing that first fraction of a second, but the rest I believe (and I teach in three lecture courses) is built on very solid scientific

and observational grounds; we have to accommodate that reality. Of course, in this regard all that cosmology has done is to note that the universe is itself a factor of three or so older than the geologists have told us that the earth is already. Nevertheless, the Big Bang model is a very coherent picture of the origin of our universe and it is yet another piece of evidence which points to great antiquity.

A possible response from a young earth proponent is that perhaps the universe were merely created with the appearance that it is very old. It is difficult to exclude this possibility except to argue that it is rather perverse. The standard response (as for example given by John Polkinghorne) is to ask whether this is the usual behaviour that can be expected of the God of the Bible? It seems rather deceptive and does not fit well with a self-consistent view of a truthful God.

Denis Alexander: Ernest, do you want to come back on any of that?

Ernest Lucas: Yes, I would like to come back on the timescale. I think – and Bob touched the nub of it when he used the phrase “significance of humans” – talking to sixth-formers or university students, they use this clock or whatever of humans coming along in the last few seconds, so may conclude therefore they are insignificant. I say, well look, how do you judge significance? When my first child was born and I took him in my arms, do I compare him with an elephant, which is so much bigger, do I compare him with what? I mean to me, the relationship is the important thing. Here is my child, a child who has only existed for a few minutes, I was there at the birth. So significance is about relationship and the point is the relationship with God, that’s what makes us significant.

Yes, the creation story in Genesis I and Genesis II is very anthropocentric, human-centred, because that’s the creature with which God has a special relationship and so the biblical story is only about the human significance and therefore that’s the timescale it’s concerned with. On the wider timescale, to me seeing Genesis I as a story about God as a worker has been quite illuminating, because in one sense for many of us the creative process is almost as important as the created product and we enjoy the process. Now why shouldn’t God enjoy thirteen thousand billion years of creative process, he was there to see it, we weren’t and it’s there for his enjoyment. I have no problem with that. If our creativity in some way reflects the nature of God, that fits in quite naturally to me. I have enjoyed making the Meccano models I used to make as a child and often think that the process of building a model is in many ways more enjoyable than having the model in the end!

Paul Shellard: Can I make a further comment on the timescale? At first glance 13.7 billion years looks like an unnecessarily long timescale if one argues that its primary purpose was the creation of human life, generally restricted to less than 100 years. But the history of the universe is a very intricate and interdependent tapestry. The very delicate balances and fine-tunings on which human existence depends has led to the formulation of the anthropic principle. It

appears that we live in a very special universe (an anthropocentric universe), one in which the tiniest changes to the fundamental physical laws or the initial conditions of the universe would prevent our emergence. Indeed, a sterile lifeless universe seems to be the generic outcome of an arbitrary Big Bang (if you are prepared to contemplate such wide-ranging possibilities). One consequence of this is the simple observation that a very old universe is a necessary requirement for our existence. Stars need to synthesise the heavy elements needed for life through nuclear reactions in their interiors. Only after these elements are spread throughout the universe by supernova explosions, at the end of a typical stellar lifetime of several billion years, do the building blocks for life first become available. And of course a long timescale is necessarily closely related to a very large universe. In the standard Big Bang model, the size of the observable universe is simply the distance light can travel since its beginning - in fact in an expanding universe we need another factor of three, making the universe about 40 billion light years across (i.e. almost unimaginably huge). So with the known physical laws as they are given, it seems that any intelligent being can expect to gaze at a vast universe of a great age and, thus, naturally to ponder their own insignificance!

The only other comment was that St. Augustine seemed to have the anthropic principle in mind when he was talking about a seed. What was the quotation you gave? "In the seed, then, there was invisibly present all that would develop in time into a tree ... and in the same way we must picture the world". We now know that within the physical structure of the created world all the potentiality existed already for the nuclear, chemical and organic complexity which we observe today - it was there even before the universe was a nanosecond old.

Patrick Richmond: The anthropic principle was important for me in seeing that there might be some reason why we need such a big and old universe to produce us. However, I also want to say, assuming playing devil's advocate is part of my ministry, that if we are to understand the problem of the large timescale and size of the universe and our apparent insignificance, it's not going to be good enough to draw an analogy that's too anthropomorphic and likens God merely to a human being. This is because I think people at some level can see that God is omnipotent and therefore significantly unlike one of us. Now I have just recently, praise the Lord, had a young baby son and can relate to Ernest's illustration, but we had to go through nine months of waiting for that. I therefore think that to try and give some mileage to the objection, we've got to ask, if God is omnipotent, would he have the same experience of enjoying putting Meccano together as we have? That enjoyment may seem to fit better with a limited being who has various skills, automotive skills, the skills of putting things together that mere physical creatures need. In other words, that sort of pleasure in manual skill and construction all seems to presuppose a limited, non-omnipotent, non-omniscient being who can't get just what he wants immediately, simply by willing it to be so. A straightforward appeal to what we enjoy may seem unpersuasive in the face of the disanalogies between God and us.

I also think that there can still seem to be a problem of efficiency if we appeal to the importance of our relationship with God. If humanity is the pinnacle of creation, as Genesis

seems to teach, creation may seem too big and to have been around too long for that relationship to be the key thing. If God's so interested in the relationship then ought he not to have had more of it than just fifteen seconds right at the very end of the day? That seems to be a lot of play and a lot of Meccano going on for someone who can speak and call things into being and who loves us like a father loves his child. No doubt Augustine would not have been too bothered by the huge length of time because he thought God was beyond time. However, a lot of modern theology is abandoning the classical view that God is timeless as an alien import from Platonism, so I think there may yet be more to this problem than meets the baby's eye. Humanity seems far more significant and valuable than most of creation but at first glance, God seems to have chosen an extremely inefficient way of producing us, and that can seem problematic.

Bob White: I was just going to say, there is all eternity, isn't there?

Janet Tollington: That's the point I was going to make, that that's *presuming* that God is working within history and that – I can't use the right language, I'm not a scientist but I think you know what I mean – we are going chronologically and that God's had to wait whereas if God is eternal, outside time, is beginning and end all at the same time, then God isn't experiencing a long, long, long, long wait like your nine months wait to have the relationship because God's there at the end as well as at the beginning, outside of time.

Bob White: I was making just the same point, that we're going to be around for all eternity, so what's thirty million years compared to eternity?

Denis Alexander: Does anyone else want to come in on this theme of time?

Jim Sweeney: I don't see the emergence of the human person at the very end of this as sort of calling in question their significance. I don't see why we should read it that way. If we have had a long pre-history for a start, it seems to me to increase our significance rather than to diminish our significance. And there are also other values – there's no reason to think that we are the only significance of the universe, that the universe in itself and its evolution over a long period of time has its own significance as well.

There's also another question that I think came up at the very end of the lecture, which I enjoyed very much, in talking about the value of the biblical perspective to enable us, even in scientific and modern terms, to look at the realities and that is it seems to me that some ecological theology moves in the direction of a theological reading of this long 13.75 million years, whatever figure it is, a theological reading of this length of time. I remember being very much impressed by an ecological theologian many years ago who was talking precisely in these terms. He was saying that if, in a previous generation or era, we would be founding a new religion precisely on this science of this length of time, then this is an amusing story of mystery, a theological reading of the thirteen billion years and different stages of it is precisely what we should create.

Denis Alexander: Has anyone else got comments on time before we move the discussion on a bit?

Ernest Lucas: Patrick used the term efficiency and in fact that's an interesting word to use. We are in a society where efficiency is very important and maybe that's not the way God thinks. The point you made about the other creatures in the universe, God may enjoy red giant stars or something and so he wanted to produce human beings through a route which involved red giant stars, or whatever. So I suppose what I'm really saying is we just don't know the mind of God. I just reflected on the fact that if in some way human creativity reflects something about the nature of God, our enjoyment in created process as well as created product to me is a way of grappling with this issue.

Gareth Jones: Can I just come back to things that interest me, that is more individual development, the picking up on efficiency or inefficiency, as you come back to Patrick's nine months of wait sort of thing. When you look at individual development you can say it's appallingly inefficient and then you get this little thing, that's incapable of talking to you and utterly uninteresting in the first ?hungry month. You can look at it and then you look at the wastage, it's incredible. But on the other hand you can look at it in different terms and you can actually see, in a sense, that although at one level they may look inefficient, at another level all these various facets are absolutely essential for what we are going to emerge at the end, so you have to have this time. I'm not saying that the sort of processes you've got in the development we're looking at are the same but I think there are elements there once you get to understand the processes you see that lengths of time except? are actually very important.

Randall Richardson: I can make it quick, but Bob raised an issue of not just a long time up to now, but a long time into the future and humankind's role. From an evolutionary biology perspective there are a thousand species extinct for every species in existence today and it's hard for me to imagine in this system that we will be around for a very long time geologically. I guess I struggle with that as a process – or, if you want to get even worse than that, the sun will run out of energy eventually and we had better be some place else when that happens or there won't be a habitat, no matter how good we are about taking care of our planet. But that's so far in the future I'm not even worried about that. Unless you're going to restrict that relationship till after you're dead as a relationship to God eternally and forever. But for those future humans that come after us, I worry about having any confidence that we could have that same kind of timescale that led up to this point to have any kind of a future for that.

Denis Alexander: Well, without eschatology I think we're all pretty hopeless – without a firm faith in the coming again of Christ and the hope of a new heavens and a new earth, nothing really makes much sense, does it?

Ernest Lucas: I think there's an important apologetic admission of a point here. I have seen a shift reading the semi-popular science literature over the last ten years. Quite a lot of scientists have in a sense shifted their interests from human origins to human destiny and so you are getting secular eschatologies arising. The church hasn't been good at catching up

on that. What do we say as the answers to these sorts of questions? John Polkinghorne is one person who has tried to grapple with this in his last two or three books but I think there's an important area there for Christians to engage with the scientific community, particularly the cosmologists perhaps, who are raising these questions. What do we have to say about the inevitable incineration of planet earth by the sun as it goes into the next stage of its evolutionary development as a star.

Denis Alexander: Well, without eschatology I think we're all pretty hopeless – without a firm faith in the coming again of Christ and the hope of a new heavens and a new earth, nothing really makes much sense, does it?

Bob White: No, it was using scriptural evidence as a whole to look back on that creation story. What else do we learn from the rest, looking holistically at the whole of scripture.

Denis Alexander: I think I'm going to move us on. Not that I don't want to get us into eschatology, but I want to stay reasonably focused because there's a second whole area that Bob raised at the beginning which I think we need to discuss: what do we learn from the rest of Scripture as it looks back and reflects on the creation story? Does anyone who hasn't spoken yet want to add any comments on that?

Bill Broadhurst: I have a couple of tangentially related questions about this. How do we think Jesus and Paul actually used scripture themselves? Did they use it in a literalistic way or in a metaphorical way? I'm prompted to ask these questions because in the New Testament I occasionally find Old Testament passages that appear to be misquoted. For example, in Luke 3:4 we find John the Baptist being described as a "voice crying in the wilderness" which is not quite what we read in the English NIV translation of Isaiah 40:3-5. Another example would be when the apostle Paul is talking about spiritual gifts in Ephesians 4:8. When describing a triumphant procession, he quotes from Psalm 68:18, saying that the victor ascended on high, led captives in his train and "gave gifts to men". By contrast, the NIV text of the psalm says that the victor "received gifts from men". This could simply be attributed to the authors misquoting the Old Testament because they have fallible memories. However, I suspect that more is going on in these passages. Perhaps the sense of these scripture quotations is being deliberately changed to make a point in a new context. If so, this might imply that Jesus and Paul had a rather more flexible attitude to the Old Testament documents than would commonly be imagined.

Philip Luscombe: Can I also come into that at a tangent because I'm not a biblical scholar but I take lots of the points because it is very interesting to look at the way the New Testament uses the Old Testament and the freedom with which it uses it, but also I think it's freedom within a certain framework, so I think there are rules to be derived from that.

But if I could jump off somewhere slightly different, if you'll forgive me, which is going back to the lecture and the way in which it seems to me particular passages from Galileo that you were quoting may or may not be true of Augustine, that there's a sense that scripture and

a body of knowledge are in a sense opposed to each other or there are two separate things. Certainly Galileo, and I think perhaps Augustine, are saying here is a certain bit of knowledge, we know this, this is given, and therefore we'll interpret scripture and I'm slightly worried about that, not least in terms of my current interests which are the sociology of science. Is science a given any more? How much ought we to be interpreting science? I know the wilder literary people who've looked at science tend to say well, science is just another text to be read like everything else, and OK most of us who have got a scientific background wince when people say that; and yet, there is something, isn't there, about the way science is placed within culture and about the way in which the science that we have is the science that we have because it's come out of this culture. I'm just wondering whether there's not more creativity, more flexibility: it's not simply here is a given deposit of knowledge and here is scripture which has to be interpreted in order to make sense of that, it's rather here are two deposits of knowledge both of which have to be understood in their contexts.

Ernest Lucas: I think what you say in a sense is a just criticism of Galileo. I hesitate to speak too much about Galileo because I wouldn't claim to be a Galileo scholar, but from what I've read of Galileo I think he was arrogant and I hear an arrogance about science. I think what you said would be a fair criticism of Galileo – he did seem to be saying well, I know I'm right as an astronomer or physicist. I think it's different with Augustine. There was a quote from Augustine I originally intended putting in that I cut out for lack of time, where he very carefully raises this issue and says, now watch it! Now after the quote I gave about we shouldn't call the bible into disrepute by our ignorance, by people who don't know anything about science all I'm saying this is what the bible says therefore is It goes on to say, and this is my paraphrase, you mustn't tie every Greek interpretation to the latest scientific theory because the scientific theory might change and there's always a negotiation. We can't avoid that; we've got to be people of our generation and we've got to relate our biblical interpretation to the known knowledge of our generation. I would also like to say that at any one time there is a fair core of reasonably established scientific knowledge and we just have to work with that, all the time being humble enough to know that the core can sometimes radically change, as has happened occasionally. But there's always a knife edge here of negotiation and one mustn't be arrogant as a scientist or as a biblical scholar.

Janet Tollington: If I can go back to Bill's comment about the scriptures and the quoting of the Old Testament in the New, one thing we need to remember is that some of the use of the Old Testament would not be the Hebrew Old Testament but the Greek translation which is itself an interpretation in places rather than a straight translation so there are places where, in the Pauline writings, it is much more closely related to the Septuagint than it is to the Hebrew. Also, at the time of the New Testament events and people, the Old Testament wasn't canonized in the sense of being absolutely fixed of what it is and the order in which it is, so the sense of which bits of material you regarded as scripture and whether there was just one fixed version of it or,

dependent on which community of Jewish belief they were with they may have had a subtly different version. It was only at a later stage that it was finally decided this is the one that we're going to hand on and transmit within that sort of corporate tradition of handing on.

It may be that they did think they were using exact words in some instances where we now say that it doesn't seem to be the same. In other instances they may quite genuinely have been saying that I want to put a slant on that because that's what's relevant for the community that I'm talking to now, and it's this aspect that I want to draw attention to. I don't suppose we will ever get certainty on that as to whether they thought they were quoting precisely or using it in a more loose way, that this is the nub of what was being said there.

Paul Mills: Correct me if I'm wrong, but I think apart from the references of Christ and Paul to Adam, the only other New Testament reference directly to this is an event in Genesis I when Paul describes God as creating light out of darkness, the allusion to that in 2 Corinthians. Most of us, well you can regard the references to Adam as possibly being as your King Lear reference was, although if you do that it weakens the force of how Jesus and Paul refer to Adam but it's difficult to see what Paul was doing alluding to the third day of creation, if he was saying other than God could, God did, create light without a light source, in a sense that is magnifying God's creative ability in so doing. Therefore, he's regarding it as not just an account to give a spiritual lesson but as something that in a sense this is how God acted and therefore this is a lesson for his action in the church. That's more of an observation than a question, but does Paul's use of that text cast any light on this?

Zoë Lunnon: One point that Paul makes, and I think one of the strongest references to science in the New Testament is in Romans I where it says that even those who haven't had direct revelation or read the bible have revelation from God through creation; but we all have the bible available to us so surely one question is how can we inter-relate what creation tells us about God's character because Romans I is directly saying the bible tells us of God's character, how can we lead that in to what we know the bible tells us about God's character, how do the two link together?

Denis Alexander: So still it's a New Testament view of the Old Testament, in general?

Bruce Winter: Just very briefly, I think to follow up Bob's question when looking at the New Testament, what Genesis I and II says about man that says some tremendously important things. I think one shouldn't move beyond that as a starting point to see in terms of when man appears in the whole created order the world is very good; and Genesis II, the world is built around man so man becomes very much the centre of what's happening. You've got two separate accounts, both of which are saying tremendously important things about the question of anthropology, a question of who we are and that, to my thinking, is at least one of the starting points – that'll be taken up elsewhere - but there is sufficient in those two accounts to say something in which

man is different from the rest of creation for very good reasons.

Janet Tollington: Yes, I would agree, Bruce, that it is saying that humankind is different from creation but the very fact that Adam (Adam) is created out of Adaama' which is the substance of the earth, is also showing the very close relationship between humankind and the substance of the earth, that there's a distinction but not something that is so totally different. It is the breath or the ruah which comes out of spirit in other places that God breathes in, that actually separates out humankind from the rest of the created order. In the New Testament, when they are using Adam, the fact that that word itself in both Hebrew and in Aramaic means humankind as a generic kind of being rather than being a personal name, would resonate with whoever was hearing the conversation and its link with the material substance of the earth. We see it as a name rather than being a descriptor of a kind of being sometimes.

I was talking with Patrick over the meal of how a lot of the people who were hearing Jesus and hearing Paul were so steeped in the Jewish scriptures and the Hebrew thought and the culture of that time, that the meaning of what words would signify things in their understanding are completely lost on us. They would be much more aware at some level but they wouldn't have the same scientific questions that we have, so they're less knowledgeable - but more knowledgeable of what the significance of some of these things are.

John Bryon: Can I just say something regarding that particularly. The passage I'm thinking about is Romans V, I think, with the direct comparison between sin coming through Adam, one man, and then redemption coming through Christ, one man, and the parallel seems to be both one man. When I read the bible, what it says to me is the parallel seems to be both being one man. Is that something that we just read into it or is that actually meant to be there as well, is that a parallel which Paul is saying through his passage or through his writing?

Chiranjib Mitra: What I want to say is related to the interpretation of the bible. Now the Old Testament, as we know, is the same for the Jewish people as for us but they don't have the basis of the New Testament interpreting the Old Testament which is part of the original biblical material which we have. So quite often in the Old Testament things are meant in a symbolic way, like for instance entering God's eternal rest and that is only in the Book of Revelations .. these concepts. So is it quite different, like the Jewish people and us Christians, we have interpretations that may turn out to be quite different.

Ernest Lucas: Can I pick up another point on interpretation first and then we might move on to other points. Coming to one or two of the things that have been said about the New Testament use of the Old, and I speak with some hesitation here knowing that there are some New Testament scholars in the room – I'm an Old Testament scholar – already Janet's made the point that the New Testament writers sometimes seemed to be quoting the Green translation and I think that's the case with the Ephesians III quotation of the psalm you mentioned. I think, if I remember rightly, Paul is in fact following the Septuagint translation of the psalm which says

giving gifts rather than receiving and that raises some questions for us because they use the Septuagint as their bible.

Secondly, there is something in the point that Janet again was saying. I think it was C.H. Dodd who wrote the book something like *The Apostolic Preaching of the Gospel*, where he makes the point that maybe sometimes when the New Testament writers quote a verse, we think how on earth did they make that sense out of it? What Dodd does very powerfully in his book is to show that what they are doing is using that verse, if you like, as a way of saying not that we might quote, shall we say Isaiah 14 v 25, in its context and they would assume the hearers would know the context. What they are doing is using that verse as a key into the theology of a passage. We think the verse has been mishandled but if you look at the verse in its Old Testament context, they have rightly understood the theology of the passage. Our problem is that we don't know our Old Testament well enough and we say they are mishandling the Old Testament: that's a key point that Dodd made that many key people still haven't picked up on fifty years later, which is very important.

The third thing I wanted to say is again perhaps as scientists we are very used to being very careful to quote somebody and then we put the footnotes in and all the rest of it. That's not the way they did it in the ancient world, whether they were Jews or Greeks or whatever. They did their interpretation by altering the quotation and they weren't considered to be misusing the quotation. They did not say this is what so and so wrote, they said this is how I understand what so and so wrote. Of course in Judaism that develops into midrash, where sometimes the quotation is totally changed, but what you are doing is interpreting it. It's because of our understanding of authorial responsibility and author's rights and copyright and so on that we think they are mishandling the text. They are not, that's just their way of interpreting the text by not giving you the quote straight, but the quote with their spin on it. No-one would have said they were misusing it, so there's a cultural difference here that we have to be aware of.

Now finally may I make the point that what is different about, shall we say, orthodox Judaism and Christianity is we read the Old Testament through the eyes of European christianity, they read it through the eyes of the Talmud and their scholars. We have the same base but, because we read it through a different trajectory of interpretation, we read it differently and sometimes we Christians can learn a lot by listening to what Judaic scholars say. I am not a Judaic scholar so I can't comment a lot on it but I did spend some time in my last sabbatical, which was five years ago, reading some of the Judaic interpretations and found some of them very illuminating. Some of it I would have to say, as a Christian, I just did not agree with. But we have to realize they have got a trajectory of interpretations that is now two thousand years developed, we've got a trajectory of interpretation that is two thousand years developed and we have to be aware of that and try and understand one another with regard to the Hebrew scriptures as we've got these different terms of interpretations. We are saying that the Old Testament is to be read through the lens of Christ and they are saying it is to be read through the lens of the Talmud scholars of the first four centuries of what we would

call the Common Era.

Denis Alexander: There is just one point which Jon made that takes us right into a central question which I'm going to throw at you, because I think it's been floating around in the background but not yet tackled directly. Within your interpretive framework of Genesis, where and when do you see humanity made in the image of God beginning? Homo sapiens sapiens appears to have emerged in Africa around 150 thousand years B.C. or thereabouts, and our genomes are, as far as we know, are pretty much the same as those individuals, so within that kind of biological framework and within the biblical framework, where does humanity begin? That's just an easy question for you to pick up after all the other difficult ones!

Ernest Lucas: I always get asked this in the local churches and so it's not only a group of Cambridge scholars who raise the question. My response in the church is always how do you define humanness? For me, as a biblical scholar and I think as a theologian, I'd say humanness is defined by a creature that bears the image and likeness of God – and what does that mean? Well, theologians have spilt a lot of ink on that but in part to me it means a being whose personality can reflect something of the nature and qualities of God and aims to have a conscious relationship with their creator. Now, how does a scientist define humanness? You, as a molecular biologist, find it in terms of a genome. A palaeontologist would define it in terms of cultural assemblies and bone structures and so on. I honestly in one sense don't know quite where you would put the theological definition together with either of those. I'm sure that you can't say that once you get a certain distance from the chimpanzee's genome, you have got a being in the image of God. You've got a homo sapiens sapiens.

I suppose cultural assembly might be a way into it, when do we first get the evidence of humans worshipping and I find that a very difficult one to answer because some of the evidence that anthropologists put to me of human worship I want to say well, maybe that was, I mean burying their dead, was that worship or was that public hygiene? They buried their dead with rose petals – was that public worship or was that hygiene?

Ellen Nisbet: Can I interrupt? Elephants – do they bury their dead? I don't think that anyone here would actually say that an elephant is actually worshipping God but that would be a counter-argument.

Ernest Lucas: As far as I can see, what convinces me of the earliest evidence of worship is probably Chatalhyuk? in Turkey, buildings with what seem to be niches for what we might call idols. That may be the first, and there you are, what, seven or eight thousand BC? Once someone can say to me that they've got clear evidence of humans who worship beings I would say you have got something that I would regard as a human being in the image and likeness of God.

Bob White: Another classic determinant is that there was agriculture, because they left the Garden of Eden and had to till the ground and that's a similar time, eight-ten thousand B.C. Ernest Lucas: Peter Pierce? quite rightly pointed out on that one that the picture of – again this is cultural assemblage – the picture of the culture, certainly of Cain and Abel, (but I don't know about Cain), certainly some sort of agricultural citydom which again puts us into that sort of era.

I have to come back to my example of Revelations 13. I find it very difficult to get back behind a symbolic narrative to a date. I can say of a symbolic narrative like Revelations 13, it's about a historic individual and I'm quite happy to say that the story in Genesis 2 and 3 is about historic, individual couple, but I find it very difficult to give you any historical dating.

Jo Richardson: Do you think that there was a man created by God called Adam and he was the first man because it seems to me the point Jon brought up was that Paul is talking about one man and that all mankind has come from him, that we're part of the fullness and simpleness of human nature and that's why we need Jesus as our saviour and so if there wasn't one man, then how does that fit? But I would like to know what you think.

Ernest Lucas: Well, here I'm very tentative and this is attempting to make some sense which is speculative. I would accept an evolutionary origin of humankind and I would see that as the way in which God chose to use to bring into being homo sapiens sapiens, if you want to use the scientific definition of us, but within homo sapient sapiens you would get to the point where it is possible for that being to have a conscious relationship with their creator. At that point I would say you have a biblical man and woman, in biblical terms, and I'm quite happy to speculate that that would mean you would in fact have individuals. In that sense you have the individual Adam and Eve – just one? – I don't know, I'm happy to have that as a possibility

Chiraijb Mitra: In Genesis Chapter 1 it says that God created man in his image and then in Chapter 2 again it says that God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being. Quite often in the New Testament, life can mean spiritual life, becoming a living thing, so maybe he chose that person and breathed into him the holy spirit or whatever which he took away after the fall. That man would have been Adam.

Ernest Lucas: This is all possible, I just don't know. In one sense I am trying to avoid being pushed to give a literal interpretation to what I see as a symbolic story and I find that very difficult.

Randall Richardson: This may be taking the conversation somewhere else and you're obviously a biblical scholar of the Old Testament, but as my voice gives me away I'm from that place that had the biblical scholars, creation scientists, I come from that very same country. It

seems a slippery slope to start saying that everything has to be understood in its context and the language that they used which is for me, perhaps acceptable for the Genesis story but then when you get into the actual life of Christ in the New Testament, it gets a lot more difficult if you start saying well, of course he lived at a particular time, he was a particular human being, in a particular culture – use the language that Tesco participants would understand – and yet when does it become a story that informs us about the right way to have a relationship with God and when does it become it's written and therefore it happened and if I don't accept that, I fall out of favour with this group in the states that says I'm no longer a Christian even if I question something about it. I guess I'm trying to take you out of the Old Testament or at least bring the discussion out of the Old Testament into the New Testament to have that discussion of how slippery is the slope, to talk about interpreting a story versus the literal, historical truth of it.

Brian Stanley: I've been listening to the discussion with interest as I'm neither a scientist nor a theologian, but a historian who deals with the last few milliseconds in terms of geological time. It seems to me that, behind a lot of the discussion that we've had recently, and particularly over the Adam question, is the broader question of how far we make theological truth dependent on historical veracity and what the connection is between historical evidence and theological meaning, which is essentially a post-Enlightenment question.

I found it very interesting that in your lecture, Ernest, all your examples were pre-Enlightenment (Ernest Lucas: deliberately so). After the Enlightenment you still get the same attempts to reconcile the Genesis creation account and science, all of them on a certain level more or less successful, but I think there is a difference that comes in once people no longer speak with such confidence, as Calvin and Augustine, and Origen before them, did, about scripture simply as revelation. Scripture begins to be seen much more as the product itself of a human historical process and that's why I think we're beginning to wrestle with these questions of how far we can begin to distance the theological truth of at least certain parts of scripture from their historical or scientific underpinning. Now I want to go a certain way down that road, but not too far, because the centre of Christian faith is history, it is the incarnation and the crucifixion and the resurrection, which are datable, contingent events dependent on history. One of the reasons we're having problems with Adam is because perhaps we are slightly afraid of the slippery slope – that if we let history go for Adam then we're going to let history go for Jesus as well, to put it to its logical conclusion.

The Oxford theologian, Benjamin Jowett, in his famous essay 'On the interpretation of Scripture', published in the controversial volume, *Essays and Reviews*, in 1860, affirmed (p. 375) that 'When interpreted like any other book, by the same rules of evidence and the same canons of criticism, the Bible will still remain unlike any other book ... it will create a new interest and make for itself a new kind of authority by the life which is in it.' That is a classic post-Enlightenment attempt to restate the authority of Scripture in ways that preserve it from the inroads of modern science and critical historical method. Jowett was, to an extent, right. We should not be afraid to submit Genesis, or any other part of Scripture, to the scrutiny of

contemporary scientific knowledge and therefore also critical textual analysis (which is the result of the application of modern 'scientific' principles to the biblical text). But we should beware of the inference widely drawn today that history therefore does not matter at all, that we can simply affirm the theological truths of the Genesis accounts and dismiss as irrelevant the question whether there was ever an Adam, or ever a Fall. The Christian story is essentially about what happened to humankind in history, and what God in history has done about it. While fully acknowledging that the early chapters of Genesis are not 'history' in the sense that the Enlightenment has taught us to accept, we need to preserve that central truth.

Ernest Lucas: Well, that's the key point. What the Creation Research Society people say to Randall means they are assuming that if they bring their literal interpretation of the text, they are not interpreting it. Of course they are – that's a form of interpretation. You can't avoid interpreting – it's just that a literalistic approach seems to be validated by the enlightenment because that was a scientific model of how you read text. Over the meal Denis made the point that as a scientist he never has handled ancient text so he always assumed – and it's easy for a scientist to assume – that you read all texts as if they were scientific texts, but that's a form of interpretation if you read the bible as a scientific text. Over the meal Denis made the point that scientists have never generally had to handle ancient texts, so they tend to assume that you read all texts as if they were scientific texts, but that's a form of interpretation if you read the bible as a scientific text.

With the gospels, yes, I still have to ask the question what sort of literature is it? Well, it's not modern biography. It also captures the modern biography after the gospels, I don't think they're even quite Hellenistic biography if you compare them with the biographies that we know from ..they are, I would say, a form of preaching the gospel but preaching the gospel about a real person who read and did real things. Luke in particular claims this and so I read them in that light, as bringing out the theological significance of this person, his life, his sayings, his death, his resurrection. But the importance of that is that it was a real person who really did die and really was raised from the dead and therefore that's part of the gospels. I take that seriously so I have to be able to debate it and talk about a real person and so on.

Denis Alexander: I would just like to bring in people who haven't had a chance to speak. Ellen, what about you?

Ellen Nisbet: We've made a basic assumption that science and Christianity are going to be against each other and that everybody assumes that they are. When someone asks me what I do, I say I work on algae. I don't say I work on evolution because I don't want to have an argument as, whether they're Christian or not, they are going to say "How on earth can you do those two things together?" It wasn't until I was about fifteen that I realized that there was a problem with being a Christian and being a scientist. Before then it hadn't ever occurred to me that there was this issue and suddenly I moved to Britain and it was. My church had a problem with it and I remember talking to my youth group leader and saying that we did this or that in

school and he said “How did you believe that?” and I was like – what’s the problem? So I think underlying an awful lot of people is the belief that there is a problem with the two. Perhaps if you started at the opposite point saying there isn’t a problem, would some of these issues actually not be issues?

Gareth Jones: One of the points you made, Ernest, was that with some of these theologians, Calvin etc, they accommodated the language to ordinary people, language of the unlearned etc., something that I’ve always found extremely helpful. The problem as I see it is that when you translate that into today you are dealing with ordinary people today, more numbers of ordinary people look at Genesis and they come up with this literalistic interpretation. They haven’t got all these Old Testament scholars to help them and they probably wouldn’t understand them anyway. Now, aren’t these the ordinary people, you could say that we are the very unordinary people, and I’ve got absolutely no problem with the sort of things that you were saying but when you come to Adam, Adam’s a person – that’s what it says in scripture. Now OK we know there are interpretations involved but how do you get this over to the ordinary people today? Is there any way of getting it over or will we go on having these problems of the one group up there with their heads somewhere in the states etc., or some youth group. We all know because we have encountered them. And then other people who are having these interpretations which perhaps make sense but is there any way around this because those are the ordinary people out there.

Ernest Lucas: What I find, going round talking to church groups quite a bit, is that in fact I get a very positive reception. I say the sorts of things I’ve said tonight only on a simpler, lower level but when you’re faced with someone, that quote from Origen, just rings bells with all sorts of people. “Of course “, they say, “why haven’t we ever seen that before?” It’s plainly obvious; it’s not meant to be literal. It’s because they come at it with a modern scientific mindset, you must read it as science, that they have problems, like people say. The Origen quote I find is one that unlocks the problem for lots of people. They say of course it’s not to be read literally, read it as a symbolic story and it’s less of a problem.

The problem is I think that there is an emotional problem, the slippery slope argument – if you read Genesis that way why don’t you read the gospels that way. All I answer is you read the Gospels as what they claim to be, you don’t read them as what I’ve said Genesis is. Once you say you read Genesis like that people say do you read the whole of the Bible like that? Of course you don’t mean that, I’m not saying that, I’m saying you read each bit of scripture as the sort of scripture it is. That’s one thing and the other is the emotional attachment to a traditional interpretation which we all have problems with.

Denis Alexander: I was going to ask Yin Ling whether in Malaysia people come to ancient texts in a very literal way or whether they have a completely different handling such texts, because we tend to have a culturally very local way of looking at things.

Yin Ling Woo: What Ellen says brings to mind what I have been thinking all evening. This is such a special group of people whereas in Malaysia it wouldn't be a problem at all. Most people I grew up with, and churchgoers, would see the Adam as a man and wouldn't have a problem with it. They would also take sides and they don't see a conflict with science and the bible. Also they don't question interpretation as much as what we're doing here and when Marvin and I discuss theology, or whatever he learnt in college, he comes back and tells me all these things and I think gosh, we never thought of that before. It's never been an issue in a country like Malaysia, at least not for 90% of the people you meet or talk to – the problem of interpretation is never there.

I don't know whether it's dangerous or it's a very simplistic way of looking at the bible but I'm glad that the holy spirit works in different individuals and it's alive, even if interpretation is not a problem for them.

Denis Alexander: Heather, what's your background in that sense? Have you also come from a situation where there was conflict in this arena or was it more a question of reconciliation?

Heather Poore: I grew up in a Christian home so I've always had a belief in the bible and my father is a physicist and he's never really had a problem with it. I guess neither have I but I meet some of my students who I supervise and for them it is a real issue and it is slippery slope for them. They think that if they interpret Genesis I culturally then they are questioning the authority of the bible and it's an issue for them so they don't go anywhere near it. I think that creates a stumbling block for the people that we have conversations with, I think that's very important.

Denis Alexander: We're going to wind up now and I'm going to take chairman's prerogative, because I haven't contributed very much, and just say a few sentences. Then I'm going to let Ernest have the last word.

The only thing I would like to reflect on, as someone who is quite involved in evolutionary biology, is the immense particularity that is involved in the whole process. Evolutionary history is a very particular history. There were small communities of homo sapiens becoming homo sapiens sapiens in Africa between one and two hundred thousand years ago, perhaps very small populations. There's a fascinating history of that of which we only know part, and so I have no problem in thinking that there's a focused particularity also in the first two chapters of Genesis about Adam and Eve who became what Professor Sam Berry (following John Stott) has dubbed homo divinus, those first spiritual beings who had fellowship with God and who then fell away from that fellowship. So just as there is a particularity in evolutionary history, involving a small group of early modern humans from whom we have inherited our genomes, so also in God's purposes there can be a particularity in the spiritual history of humankind, referring to those who first walked with God but whose sin then broke that special relationship. In this view the possession of a homo sapiens sapiens genome is necessary but not sufficient for spiritual life.

But now I'd like to thank Ernest very much for triggering such a stimulating discussion

and I'd also like him to have the final word.

Ernest Lucas: You sparked another memory which has suddenly come back to me and this take me back thirty years when I was a post-doctoral fellow in the Biochemistry Department of the Medical School at North Carolina. I went to a seminar on population genetics, about which I knew very little, (and still don't know a lot) given by a Jewish scientist and he drew an egg-timer shape on the board and said that it was quite clear from the genome that the human species went through a bottleneck where there was a very small population, otherwise we wouldn't have the genetic uniformity that we have. He said the size of that bottleneck could have been one or two. And he said it all depends on what you put in the population equations, depending on what period it was you put in. Then he drew a picture of Noah's Ark and that was the end of the seminar!

The last thing I want to say is thank you very much for a very stimulating discussion this evening. I came in some ways with a mixture of dread and expectation but I have enjoyed it tremendously, so thank you very much indeed.

Discussion participants

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