Stories of Evolution

Panel Discussion

St Paul's Cathedral

Tuesday 21 October 2008

Transcript

Panellists:

Simon Conway Morris, Professor of Evolutionary Paleobiology, University of Cambridge

Steve Jones, Professor of Genetics, University College London

Alister McGrath, Professor of Theology, King's College London

Diana Lipon, Lecturer in Hebrew Bible and Jewish Studies. King's College London

Chair:

Canon Martin Warner, Treasurer, St. Paul's Cathedral

Martin Warner

Good evening to you, welcome to St. Paul's Cathedral and to this third public debate in our series entitled *Seeking Truth: Science, Mystery, and Human Identity*. These are sponsored by the St. Paul's Institute, and it's good to see so many people here again tonight. This year, St. Paul's celebrates the 300-year anniversary of the topping out of the building and, in addition to that anniversary and celebration, we are also completing a major cleaning and refurbishment of the cathedral. Throughout this year, there have been a series of celebrations which have directed our attention to what one might call 'the meaning' of the building. It has directed our attention towards the way in which science and faith interact in Wren's mind, and also among those with whom he was working on the design of this wonderful building built to the glory of God. It is in that context that this series of debates has been framed, to celebrate this year.

For those of you who have not been to one of our debates before, let me explain the format. In a moment, I am going to ask each of our speakers an opening questions; after which we will move into a panel discussion. Then, for the last part of the evening, we will take questions from the floor - from you. If you have a question, please write it on the back of your leaflet and hold it up to be collected. Could I ask you please that you do hold it and wave it so that the wandsmen - the men and women wearing the rather smart outfits with the red ribbons - so that they can see and they will collect the questions and then they will be brought to us up here on the dais. We will collect questions until about 7.20pm so if you could get your questions written down before that and collected that would be very helpful.

We shall end this evening promptly at 8.00pm, but before you leave do visit the bookstore which you may have noticed on the way in; it's at the back of the cathedral on the left-hand side as you go out. Could I ask you all also please to give generously to the retiring collection for our Education department, of which St. Paul's Institute is a part. You will have been given a gift-aid envelope on the way in, and if you are a British taxpayer please would you fill it in and put your donation in that.

There is other information about this evening and the whole programme in your white leaflets, including how you can hear a recording of it on Premier Radio this weekend and get a transcript from our website. If you would like to find out more about this series, which includes our final debate next week and our study days, then please fill in the form in the leaflet and hand it in at the retiring collection or when you submit a question. Perhaps I can also draw your attention to the fact that on Sunday evenings there has been a series of services connected with this series, and this Sunday the 26th of October the service will have the title 'The Botanist' and it will be a chance to interact with Gillian Prance; who was the Director of Kew Gardens and is now working down on the Earth Project in Cornwall.

I'd also like to take this opportunity to thank The Templeton Foundation for their generous sponsorship of this programme.

And now, it gives me great pleasure to introduce our panel. Starting at my far right, is Alister McGrath. A Professor of Theology at Kings College London; a *former* atheist; his background is in chemistry and molecular biophysics, and the interaction between Christian theology and the natural sciences has been a major theme in his work. Sitting next to him immediately on my right is Steve Jones, Professor of Genetics at University College London. Steve is a *current* atheist, he is one of the great communicators of science in this generation and is a prolific author and broadcaster - both on radio and television - with series including giving the Wreath Lectures on the language of the genes, and a six part television series on human genetics called *In the Blood*. Diana Lipton, on my left, is lecturer in Hebrew Bible and Jewish Studies at Kings College London where she teaches Hebrew texts and Jewish thought and practice. A former investment banker, she got out just in time, she has a book just published called *Longing for Egypt*. And on the far left of the dais here is Simon Conway Morris, Professor of Evolutionary Paleobiology in the Department of Earth Sciences at the University of Cambridge. Simon is a Christian, and another of the great communicators of science, and he gave the University of Edinburgh's prestigious Gifford Lectures last year - calling the series *Darwin's Compass: How Evolution Discovers the Song of Creation*.

Would you please welcome our panel.
(*Applause*)

Steve, perhaps we can begin with you; and we are going to start with just some introductory questions from which each member of the panel will give an answer. Steve, could you explain to us what evolution is?

Steve Jones
You're telling me I've got five whole minutes to do this? I can only speak in 55-minute chunks I'm afraid, as an academic but I'll do my best.

(*Microphone problems for a few minutes*)

(*Applause as sound issue is fixed*)

Is that better? Can you now hear me better? (*Applause*) All right, perhaps I should go back to the beginning and start again. Back to the first line of the book of Genesis according to Jones here. All right, I've been asked to define what evolution actually is. Evolution is overwhelmingly something which is simple. Darwin defined it in three words: 'Descent with modification'. Descent: the passage of information from one generation to the next. Modification: the fact that that passage is imperfect. Under those circumstances, evolution is inevitable; it is bound to happen. It is so simple in fact it can almost be physics. Evolution though is more than just the accumulation of error. Darwin had what's been described as the 'best idea any scientist has ever had', which is the notion of natural selection. That too is simple, natural selection is inherited differences in the ability to reproduce. If you carry a gene that makes it more like that you will stay alive and find a mate, that gene will become more common in the next generation and over the generations genes will build up and new forms of life will emerge.

Many people have drawn parallels between the evolution of life and the evolution of language, and I think that is to some degree fair. I often think that evolution is actually the grammar of biology. You can't understand a language, you can't learn a language, unless you understand the way it is put together. When we speak English, of course, that is just implicit. We understand without really understanding that we understand the grammar of the English language. When you learn French, you have to understand the grammar. I think it was Diderot who said that English was only French badly pronounced, and by saying that, actually, he was making an evolutionary statement. It's clearly the case that English and French were once almost the same language, but they have diverged from each through descent with modification. Evolution is the language of biology. Without evolution, you cannot be a

biologist. You can study some narrow aspect of it, but if you don't believe in evolution - and I say this to medical students, many of whom don't believe in the science - I say it's like being a chemist; in the sense of somebody who sells pills, rather than a pharmacologist; somebody who designs drugs. Anybody can sell pills over the counter, but if they don't understand how they work they are missing the joy of their own science. Anyone can deny the truth of evolution, but by doing that they are missing the joy of understanding the living world. Darwin was the first to point that out, and I can't think of a single biologist in the world you disagrees with me.

Martin Warner

Thankyou, Steve. Can I just say on a practical note, I've had a message to say that if you are sitting under the dome and still can't hear they can hear splendidly in the knave. So do please move, and we won't think you are walking out in disapproval.

Can I come on to Alister now? Alister, some Christians have a problem with evolution - why do you think that is? And what is Creationism, which is one of the ways of dealing with it?

Alister McGrath

Well there is no doubt that when Darwin published *The Origin of Species* this raised some questions for Christians, and I think it is good just to focus on two very briefly. One of them is the interpretation of the Book of Genesis, and for historical reasons British Christians - especially British Protestant Christians - had interpreted Genesis in a predominately literal way. In other words, seeing it as a historical account of what actually happened. Darwin's account of creation seemed to be in conflict with what Genesis said, so clearly this sparked off a debate on how that book was to be interpreted at the time. A second challenge which I want to focus on, is the big questions raised about the status of human nature. For Christians, as indeed for many other people, humanity is God's last word, so to speak. In other words, that humanity stands at the height of God's creation. In *The Origin of Species*, Darwin hints at this; and in *The Ascent of Man* he states this much more explicitly, that actually humanity is a late arrival on the scene and arrived on the scene by the same biological processes which gave rise to everything else. In other words, there was a very big challenge being posed to the idea of the uniqueness of humanity and, above all, the idea that it had some special place in the created order. So clearly that generated some discussion.

Now, of course, those discussions continue; and in the twentieth and early twenty-first century, the movement known as Creationism has begun to become quite significant. Creationism is defined in various ways, but the simplest way of understanding it is as a literal interpretation of the Genesis narrative to mean that humanity and everything else was brought into existence by God in a period of,

something like, six days, each of twenty four hours, about six thousand years ago. It's a very interesting position. Historically, Christianity has taken a number of positions on how Genesis should be interpreted and this is one of them; but it's not the only one. Again, interestingly, Creationism flared up very briefly in the aftermath of Darwin's publications and then died away. It resurged in North America during the 1920s, during the fundamentalist controversies, and then again it died away; after the Second World War it just seemed to have really fizzled out. Then, in the 1980s, it really began to resurge once more - and certainly the historical question that is really interesting to explore is, why has Creationism made such a big comeback?

So to summarise very briefly, what Darwin is saying is challenging; raising very deep questions that it is important to talk about. For me, he doesn't pose fundamental difficulties, for example, to the authority of the Bible; or indeed to what Christians believe. These can all be woven together, and that's why it is interesting historically to go back to the time of Darwin himself and to note that, actually, church people responded much more positively to what Darwin was saying than you might begin to think from reading some recent popular books on the subject.

Martin Warner

Thank you very much indeed. You've touched on the biblical texts, and Diana it is those that we have - if you like - borrowed from the tradition in which you stand. How should we interpret the creation narratives in Genesis, from your point of view?

Diana Lipton

Well, first of all, you should interpret them cautiously and with great humility. We are dealing with an ancient text; with a world-view which in some ways is very similar to ours but in other ways with extraordinary difference and it is sometimes difficult to know where are the parallels, where are the differences. Of course, it's also in Hebrew and anything we read that isn't in Hebrew is a translation - an interpretation - and that has to be taken on board also.

There are many ways, therefore, to read the Hebrew Bible and the creation narratives, and there are many ways that I could offer tonight. But, I'm going to assume that I was invited here primarily as a biblical scholar and say something about it from my point of view as a biblical scholar. I'm assuming as many biblical scholars do, that the creation - certainly the first creation narrative in Genesis - emerged in the sixth or fifth century BCE, probably sixth century, when the authors came into contact, in the Babylonian exile, for the first time with Babylonian creators Gods instead of with Canaanite nature Gods. The ones that they were more, at that point, familiar with. They also came into contact with something closer to what we would imagine or describe as science, people interested in calendars and

astronomy in ways that ancient Israelites were not at the time. So what I want to focus on is really with that in mind, and I want to ask the question whether the biblical creation account - especially Genesis 1 - bearing all of that in mind, is compatible with evolution.

I think there are two ways of thinking about what Genesis 1, especially, achieves and they both have to do with organisation. The first one, the more familiar one to us, is that Genesis 1 speaks about the organisation of the material world - the organisation of space. We hear in Genesis 1 how land is divided from water; how the sky is divided from the sea; how animals and plants are divided up by species according to their kind. All of these things must be then kept in place, and in many ways the perfect organism for doing that is the human being who then will, in some ways, tidy it all up and keep it organised as it was created. But in addition to that, we can read Genesis 1, the creation narrative, as dealing with the organisation of time - and I think that is where the Babylonian background is extremely important, because the idea of chaotic, uncreated, time was something of particular interest to the Babylonians. So there we have the day and night being created; the sun and the moon; the weeks; the months; the seasons, and all of this done in seven-day units. We hardly remember what was created on each day, but we do remember that creation took seven days. So, we have the organisation of space which doesn't necessarily involve much change. It could be a bit like cleaning up your house, you can more or less everyday get it back where it was; nothing much has to change. But then we have the organisation of time, and once these two things come together we have change on a much greater scale than we could imagine if we are just dealing with the organisation of space. There, I think, the equation - the conjunction - of space and time coming together means that not only is it possible to read these narratives as being compatible with ideas of evolution, but it's almost impossible to imagine that the authors of Genesis 1 - although I don't think for a moment they had evolution in mind - did not have a world-view which is consistent in some ways with ours when we are thinking of change in those respects.

Martin Warner

Thank you Diana. Finally, to Simon. The creation story gives humanity a divinely ordained place in creation. Could this actually square with the scientific understanding of evolution, so that in fact they are not incompatible?

Simon Conway Morris

Well thank you very much Martin, I hope first of all I am at least audible. Whether I will be understood is a slightly different point. The first point to make is that religion certainly needs evolution, and the reason for that is that, of course, it is a fundamental truth of the universe and that's something religions can never ignore. Actually, the other day I was re-reading cover to cover *The Origin of Species* by

Charles Darwin, and I was very struck in that book how much it is haunted by the ghost of William Paley; the person who stumbled across the watch on the heat. Of course, Darwin's attempt is wholly successful; he destroys this argument comprehensively and irrevocably. But I think it is also the case, and this may be a little bit more surprising, that I believe that evolution itself actually is necessary not only for religion, but also that religion requires evolution. They are mutually supporting each other, and I will try and briefly explain why that might be.

Effectively, a large part of the evolutionary synthesis insists that it is more or less random. That's of course most familiar perhaps for mutations, but also such things as giant rocks falling out of the sky; volcanoes blowing their heads off; and general mayhem ensuing which suggests that so dramatic are these catastrophes that there is no predictability in the process of evolution. Well that's rather strange, because all other sciences that I know about are predictable; and I think in fact there are now some strong arguments to suggest that, like other sciences, evolution is also much more predictable than is sometimes thought to be the case. Effectively, and I have to say this is an argument I have been pursuing not along but it's one which is deeply unpopular in some circles, I'm very struck by the fact that there are a remarkably limited number of solutions to which life can actually navigate. I can give you examples from viruses; all the way through from fungi; through to even ourselves in terms of the human condition. Again and again we find that actually the options available for evolution are far more restricted than we might actually expect, and oddly enough this applies most interestingly of all to the phenomena of intelligence. This is something which, famously like the camera-eye of the octopus and the camera-eye of the human is referred to as convergent, so to we have very good evidence that this is a convergent phenomena which has evolved more than once. So if it has evolved in our immediate ancestors, the great apes; but also independently has in the octopus and, for instance, some birds, then one suspects that in a funny sort of way we are predictable.

Now, why does all this matter? I think it matters for a number of reasons. To begin with, we can start to look at evolution more like a search engine; it has a way of discovering things which, if you like, have the potentiality from the beginning of creation. That's perfectly orthodox Christianity so far as I am aware. But more importantly, and again this might be something we can pick up in the conversations, both with you and between ourselves, is it seems to me frankly that we have no proper explanation for the nature of mind or the nature of consciousness. This, I must stress beyond all misapprehensions, is *not* the 'gaps' argument, it's not the finger of God coming in to do something specific, it is merely that we have not asked the right question, in the right place, in the appropriate context. Nor, by the way - and this is again familiar with Christian theology - do we have any explanation I think in a scientific context for the existence of what theologians refer to as 'radical evil'; and if you don't believe in radical evil I suggest that you go to your public library tomorrow and go to

history, any section will confirm that. So what does all this mean? Well, I think effectively, oddly enough, evolution at the moment is very analogous to nineteenth-century physics. Nineteenth-century physicists' thought they had it all sorted out, there was no remaining doubt; they effectively assumed that this was the end of the story. It seems to me that in fact that is the absolute reverse, and I think this will prove very much to be the case in evolution. I suspect very strongly indeed, that just as quantum mechanics completely overthrew physics, I strongly suspect that evolution in its own way is, dare I say, awaiting its second Einstein. Darwin's mechanisms entirely unexceptional, but quite frankly it is as interesting now as ionic bonding is to a chemist so I humbly suggest that we are very much on our first steps of understanding; and that, by the way, is why I am a scientist.

Martin Warner

Thank you Simon. Well, I wonder whether perhaps we might begin our panel discussion. But first, can I just remind you that if you have questions that you would like to ask please write them down on your papers and wave them in the air so that the wandsmen can see that you wish to ask a question. They will be collected and brought to us here on the dais. But Steve, can I perhaps give you an opportunity to respond to some of what you have heard from the other panellists; each of whom has a faith, either Jewish or Christian?

Steve Jones

Yeah. I mean I find that the arguments between science and religion are a bit like a battle, they're a battle. But they are a battle between two very different creatures, rather like a battle between a shark and a tiger. On their own territory, each of those beasts is a very fearsome opponent; but if you have a tiger in the sea, or even worse a shark on land, they are bound to lose. An awful lot of the discussion between evolutionists and believers in various faiths, I think just talked passed each other. It is interesting to me that we in the field of evolutionary biology, in my experience and I've been to many many dozens of extraordinarily boring scientific conferences, we never ever talk about the overlap between evolutionary biology and religious faith - because we don't see an overlap. I don't expect somebody who goes to a conference on the chemistry of chlorine to ask 'what would the book of Genesis make of this?' and I think the same is true of evolutionary biology. In the end it's just another science, it's just another way of understanding the world around us. The Book of Genesis actually, if you examine it, is very much a textbook. I often think of it as the first human genetics textbook of all, it asks very sensible questions and it comes up - for its day - with remarkably sensible answers. How did we all begin? What's the nature and origin of sex? Are we born with a predestined faith, good or evil? To what tribe do we belong? Who is related to whom? If we go all the way to the end, to the Book of Revelations, what will happen in the future? All these are really rather scientific questions, and they are questions which have been asked by many many faiths and they are very sensible questions to be asked.

When I start my introductory evolutionary lectures - perhaps I shouldn't do this - but I have a very beautiful painting of the Garden of Eden and I say what a beautiful image this is of human origins and everybody is of course very familiar with it. Then I show them a rather fearsome devil, a picture of a fearsome devil, and this fearsome devil is the central protagonist of the Chinese origin tale, his name was Pangu. Pangu, it was said in ancient China, was a giant God who hatched from an egg that floated in the cosmic void, appeared on Earth, grew rapidly for seventeen thousand years until his head hit the sky, which was a solid blue firmament. His head then exploded and he died, his eyes became the sun and the moon, his tears became the rivers of the Earth, and the lice and the fleas on his body became mean and women respectively. I say, well that too is a creation myth, and although it's not as beautiful as the biblical one but it was probably in its day believed by almost as many people.

How can you separate them? What evidence can you offer for one versus the other? The answer is, you cannot. You have only faith. Then I show them a picture of the title page of *The Origin of Species* and I say, here is another creation 'myth', you could call it, and in my view the evidence is absolutely overwhelming and I am astonished that people should deny it. I am often faced now at UCL, which is as you know frequently described as the Godless College of Gower Street. Specifically founded in order to put pay to the religious tests of Oxford and Cambridge, and then our corns were then stamped on by our friends at Kings College who were founded in opposition to us and not much has changed. But I'm often asked by Creationist students at UCL about evolution, and I say look if you insist on believing in Creationism in my view, and I am not at all religious, you are doing far more harm to your religion than you are to my science. Place yourself in the position of an intelligent Islamic young boy or girl, or from a Christian family, who is told with complete certainty at the age of eight or nine by his pastor or imam - who he greatly admires and listens to - he's told that humans and dinosaurs emerged on Earth, by mystical means, six thousand years ago and lived together; and he believes this. Then, he or she goes on to do A-level biology and it becomes completely crystal clear that that is babbling nonsense. What does he or she then think? Why should he or she believe anything else their pastors have been telling them? If they've been lying about that, why aren't they lying about the rest of it? That, to me, is where the interaction comes. We are both seeking truth in our own way, but I think they are different kinds of truths and an attempt to make them the same kind of truth I think, by its definition, is doomed.

Martin Warner

Thank you Steve. I'm going to ask Simon if he might like to respond to that, and perhaps Simon you might want to say something about where the overlap is which seems to be a very helpful observation.

Simon Conway Morris

Well, it's impossible to disagree with almost anything Steve says except everything. (*Laughter*) In as much as what we are talking about are entire world pictures about the way we see the universe around us, and I think possibly one way to try to begin to tease this apart - and I'm certainly not imagining that Steve himself would subscribe to these views, I rather doubt it in fact - is the general sort of view that Darwin becomes the encoding myth of our time, and that something I think Mary Midgley, amongst others, would regard as completely bogus. So there is no doubt at all about the realities around us, there is no doubt at all the scientific explanations. The question which really matters to begin with, is what is the world constructed and why is it constructed in such a way, and why to us does it have such things as meaning and purpose? These are metaphysical questions; they are not scientific questions. But again and again we see, effectively, a variety of scientistic argument where the entire explanation is universally hijacked in support of something which is solely reliant on scientific data.

Maybe two other very quick comments. The first is, again this may not ring with all ears in St. Pauls, that all of us live by myth. Myth, be it the Genesis narratives which I think are our foundational myth, are things which resonate with us at a level far deeper than the speculations which were carried out in Down House - they are very important but they are not the end of the story. Another aspect which I think is sometimes misunderstood by people who are not of faith - and I'm not in any way accusing them of anything, that is not my intention - is that I can assure you, and perhaps Alister and Diana will confirm that, the enterprise we are engaged on is extremely risky. All of us know that science may yet produce certain irrefutable facts which irrefutably destroy our world picture. But, from what I understand from the cosmology of the Big Bang; what I understand about the nature of the nervous system, what I understand about evolution, I, for the time being - and I don't mind taking a risk as I've often been wrong in the past -rather suspect, as I mentioned in my introductory remarks, is that we are very much dealing with unfinished business.

Martin Warner

Thank you. Diana, we have here a balance between the risk of scientific enquiry and our myths and texts - which Steve has already described as having a certain beauty to them. Would you like to comment on that response from Simon?

Diana Lipton

I agree with what Simon said, and also with what Steve said - there's a rabbinic story about that, they are both right. In that I also see the Genesis creation stories as an attempt by people in the ancient world to answer their own questions about their origins and about the world around them, many of which are similar to our questions; we haven't answered them to our satisfaction. As I indicated, I see

the particular text that we have, especially Genesis 1, as having a Babylonian context - a context which for its authors was exile. It seems to me, and this is where I would suggest that in some ways these biblical texts have almost anticipated some of the possible changes - the uncertainty - that Simon alluded to, in that it seems to me that part of what motivated the authors of Genesis 1 to write what they did is precisely encountering worlds they could not have anticipated. Changes that they didn't know how to accommodate. So, in describing the world the way they did, first of all they were trying to create security, order, and certainty where they found none. But secondly, I think they did it in such a way that they projected into future times the changes and the uncertainty that they themselves had encountered. So they didn't offer a version of creation which ties everything up, in which there is no future movement or change or developments. But rather, they combine an attempt to reassure themselves with an awareness that things could change again.

Martin Warner

Thank you. Alister, I wonder whether you might pick up on this business of risk and enquiry because I think what Diana has said about the impact of Babylonian exile on seeing God and creation differently may give us some indication as to how we read the scriptures; where they come from, and perhaps challenge some of the fundamentalist reading of them that you have described that Darwin was such a challenge for.

Alister McGrath

Well, I think that's a very important point to make and certainly, if we look at the history of how Christians interpret the Bible, we see many possible interpretations being debated. We need to get away from the idea that there was somehow some absolutely fixed Christian interpretation of Genesis which somehow more recent Christians have abandoned for perverted to try and bring Darwin into the picture. I think the key point to make is that every text needs to be interpreted, and there were at least three major lines of interpretation of Genesis there even by the fifth-century. One of them was due to Augustine. Let me tell you what Augustine said. Augustine said that God brought the world into being in an instant. That space and time are part of the created order and that God made the world in such a way that it had the potential to develop and to evolve. Now you can see immediately, that that is one way of reading Genesis which is going to move us in some very interesting directions. There's a real need for us to recalibrate how we read scripture. Realising that in the past perhaps some Christians have got some things wrong, some things right, and part of our continual duty as Christians is to keep interrogating the text; asking what does this really mean? Or, to take up a phrase from the New Testament from 1st Thessalonians Chapter 5: 'put everything to the test and hold on to what is good'. Certainly if we think, for example, of Charles Kingsley - a name known to some of you, he wrote *The Water Babies* and *Westward Ho*, he was also Canon of Westminster Abbey - and in 1871 commenting

on Darwin he said this: 'we knew of old that God made all things. Now we know he did even more than that, he made all things make themselves.' Kingsley saw this as an extension, an expansion, of traditional Christian thinking, not its contradiction. So the key point is, this is about the interaction, the dialogue, in which Christians can begin to challenge traditional interpretations; but also realising that there is gold in those hills, that some of those we have to set to one side, but others speak to us powerfully and have the capacity to illuminate and I think the challenge is to reach into our past and reappropriate those that make more sense today.

Martin Warner

Thank you Alister. Well I think from Charles Kingsley we get permission to read the scriptural texts in a very much more open way than perhaps some, from a fundamentalist point of view, have done. Steve, I wonder whether you might like to take us forward now to ask what implications that sort of reading might have for the difference between human beings and other creatures. Something that is clearly important in the Christian tradition.

Steve Jones

Yes, I think it's an interesting question. Actually, there is a quotation from Charles Kingsley - which perhaps isn't a very familiar one, and I probably haven't got it quite right - but Kingsley, who was a Darwinist and of course *The Water Babies* is in many ways a Darwinian parable, Charles Darwin appears in *The Water Babies* as Professor put-them-all-in-spirits; except you have to miss out the vowels. If you haven't read *The Water Babies*, or if you haven't read it since you were a child, read it again. It is one of the most terrifying pieces of intellectual pornography I have ever come across; it's quite astounding. Charles Kingsley had a strong tie with Ireland and he went to Ireland in about 1865 and he wrote to his wife, 'I'm here in Ireland and I see all around me human chimpanzees. It would not be so bad if they were black, but heavens above they are white and I cannot stand it.' That really is a classic misinterpretation of what evolution can tell you about what it means to be human. It has a mirror-image, I mean it's a disgusting thing in our twenty-first century eyes to say but in the nineteenth century, early twentieth century, it was common to draw evolutionary parallels or analogues for the levels of the various races. Frances Gardiner, who was Darwin's cousin, was very strong on that.

There is a modern analogy of it, which again I think takes me back to my strong feeling that these are two different fields, which is - one of its names is - the 'Great Ape Project'. Now, as many of you will know there is quite a remarkable sharing of the amount of DNA between ourselves and chimpanzees. There's arguments about the figures, the standard figure is about 98.8% sharing - the most recent stuff, a few months old, puts that down to about 95%. There's been a strong move, and the Spanish government for example has passed a law, to prevent animal experimentation upon chimpanzees on the grounds that

they are 98% human and therefore they deserve some version of human rights. Now the argument about animal experimentation is a separate one, but it seems to me a downright blasphemous statement that they are 98% human with 98% of our rights. However, they are not human at all. We aren't 98% chimpanzee; it's worth remembering that we share about 50% of our DNA with a banana. We're not 50% banana either above or below the waist right? (*Laughter*)

So, it seems to me a fundamental misunderstanding of the question. Many people in the nineteenth century felt...what frightened them about evolution was that it knocked them off their pinnacle of being special. Queen Victoria in 1842 went to London Zoo, and she saw the orang-utan whose name was Jenny; and she wrote in her diary, and I think I've got it right, 'I saw the orang-utan, she is frightfully and painfully and awfully human'. Painfully and awfully human, and Queen Victoria put her finger on what scared the Victorians; which was, my goodness we are just animals. Now, to me as an evolutionary biologist, the more I learn about evolution the more unique I feel as a human being. Because everything that makes us human rather than shaved monkeys - Darwinian man, though well behaved, is really but a monkey shaved to quote Gilbert & Sullivan - is unique to humans. Our sense of the past, our willingness to consider the future, our drive to help people who aren't our close relatives, the fact that men don't go out and rape. The biology is straightforward, male rapists have more children than male non-rapists; but we don't do it. All these things are unique to ourselves, and evolution is no good in understanding the unique because it is a comparative science.

I will shut up in a second, but I'll tell you a short joke which my father told me. He didn't realise that he was talking about this problem. I was talking about the parallel between evolution and language - I was brought up in West Wales in Aberist, which in my youth was a Welsh speaking town and still is as long as there are English people in the room (*Laughter*). The story goes that a local went into Aberist, into its only Chinese restaurant; was given a very good Chinese meal; was served by a very good Chinese waiter who spoke perfect Welsh. The local was amazed so he beckoned over the owner, and he said 'well boy where do you get this amazing fellow? A China-man who can speak Welsh.' The owner looked alarmed and said, 'Keep your voice down! He thinks he is fluent English!' (*Laughter*) That actually, illustrates my point. From a Chinese speakers point of view Welsh and English are dialects of the same language, which of course they are - the language of the Indo-European. We can only understand languages because there are many which we can compare with each other. If there was only one world language, let's say English, we wouldn't understand what it came from; we couldn't say how old it was; whether it evolved or had been created, we wouldn't know. It would be unique, and the same is true for everything that makes us human and not ape and not banana. It's unique and evolution has very little to do with it.

Martin Warner

Thank you. I don't know what that says about banana-eating Spaniards; it's an interesting thing to reflect on isn't it. Simon, I wonder whether you might like to respond to that?

Simon Conway Morris

Well, I almost feel Welsh. Very fair points of course and wonderfully told. I think one of the ironies with Darwinism is that so much of our commonality with the rest of life has somehow been ignored and lost, and in fact in many ways one would have thought this makes us more part of the biosphere rather than somehow being separate. But, I think as Steve alluded, there is a small problem. In my reading over the last few years what's fascinated me, and I think anybody would more or less agree with this, is how paper thin the differences are between ourselves and all other animals; and indeed the 50% of the banana which we so proudly share our heritage. So, what exactly is the difference? Well you can see a theological monster emerging straight away. Once again, I have to insist I am not dealing with 'gaps' arguments. But, as I think Steve mentioned in passing, there is a question of altruism or lack of altruism; helping people you've never met before, not raping people you have no affinity for. Those sorts of things we regards both as highly desirable or disastrously evil. Correspondingly language, it is vocalisations in animals yes - tweet, chirp, grunt - but no grammar.

So how might we approach this? Well I think there are two very interesting theological possibilities about this. One is, and this is something again of which I am afraid Darwinism is not well equipped to deal with, is that there are, and theologically this is a familiar argument, there are other realities. So the altruism we might see very vaguely reflected in some groups of animals, when it becomes fully fledged is not an emergence per se but, as I mentioned in my introductory remarks, is more of a discovery. Similarly language - perhaps some of you who are familiar with the work of Owen Barfield - have entrancing ideas about he nature of poetry, and thereby myth, rather than simply a series of formalised grunts. We can take this argument in the other direction as well, for I feel extremely seriously that with regard to our evolutionary ancestry which is stamped through us - the history in our bones as we say - that means that there is a fascinating set of links; and not least, of course people are considered about vivisection. Rightly so, it is an ethical problem. Should we experiment on chimps? Should we experiment on bananas? Well, you know there is some degree of uncertainty between one and the other. But at least so far as many animals go, and I myself would include insects, next time you swat that fly - is it conscious? Thank you.

Martin Warner

Thank you. I think one of the things that we might well want to pursue here and has been around and about in the background, is the question of Intelligent Design. I'm going to ask Alister if you might like

to comment on that, and then perhaps come to you Diana to talk about how that might feature from your perspective as well. Alister, to begin.

Alister McGrath

The phrase 'Intelligent Design' refers to a way of thinking about the biological process, and indeed the arrival of humanity on this planet, which argues that humanity and many other aspects of the biological order are so complex that they could not be accounted for by purely natural explanations. Therefore, the movement called 'Intelligent Design' - which is based in North America, especially at the Discover Institute in Seattle, Washington - argues that in some way the complexity of the natural order is such that one has to posit an intelligent designer to account for what you see. Now, I'm going to be critical of this movement in a moment, but I want to say; a) that it does actually make some good points, even though it takes them in some unhelpful directions; and b) that actually I could use the phrase 'intelligent design' quite happily, but I would mean something different by it. The Bible of this movement is a book by Michael Behe, published about 15 years ago, called *Darwin's Black Box*. A rather nice, catchy title. His argument is that there are many features of the biological world, which have what he calls 'irreducible complexity'. He gives examples; how is the blood able to clot? It's just so complex you can't really account for that on purely naturalist processes.

Now, here will be my concerns about Intelligent Design. First, Simon used the phrase 'the God of the Gaps' a moment ago and we might like to come back to that. 'God of the Gaps' basically means an approach which says science is unable to explain certain things therefore let us locate God in this explanatory gaps. The real problem with that is that as the gaps contract, God gets squeezed out. I really don't approve of this approach at all, it seems to me to be very seriously misguided; and I'm afraid Intelligent Design, or ID as its proponents call it, seems to me to fall into that category. It seems to me a much more helpful approach is to stand back and, not look at those things which cannot be explained, but rather ask why can we make sense of things at all? Albert Einstein's favourite phrase of 1936: 'the eternal mystery of the world is its intelligibility'. People like myself, John Polkinghorne, or Richard Swinbourne would say the really interesting thing is why can the human mind make so much sense of what we observe. So, for me, that is a completely different way of looking at things. Again, it just seems to me that Intelligent Design instinctively realises there is something that needs added levels of explanation but I don't think the approach they give is either necessary or appropriate; and in my view there are much more helpful Christian ways of beginning to engage with the evidence they bring forward.

Martin Warner

Thank you. Could we just stay with that for a moment and would you perhaps give us an indication of what the headlines might be of the more helpful Christian ways forward, before we go to look at how it might be seen from a Jewish perspective.

Alister McGrath

The more helpful headline, from a Christian perspective, would be; God creates a world which is meant to develop, and God continues to, in some way, be involved in that development. In other words, it's about a God who in some way meant this thing to happen. Obviously we would want to have a discussion about exactly how this guidance takes place. But I would want to say that actually one can begin to construct a theology of evolution which recognises it is happening, but also is saying that in some way this is leading us to intended outcomes.

Martin Warner

Thank you. Diana, would you like to come back on that from the perspective of your particular tradition?

Diana Lipton

First of all, I think that as I have already suggested the idea of development being built into creation is something that I think is very strongly present in Genesis 1 and 2 - but especially in Genesis 1 - and I think that is compatible with the Jewish way of reading the texts as well as with a Christian way. But what I would emphasise, in addition to what Alister said, is that development and change will bring, in their train, difficulties. So even as God created, according to Genesis 1, the world in the way he wanted it to be; he anticipated, according to the narrative of Genesis 1, that it wouldn't remain that way. I think what then emerges is the question of what will fix the problems? What mechanisms are offered within Genesis 1, within the Hebrew Bible Old Testament creation narratives, to deal with the negative consequences of change and developments? Here, I think, there is quite an interesting difference between the Christian view, as I would understand it, and the Jewish one. So, it seems to me that the Christian view of creation, as I understand it, much more emphasises what I began by characterising as the 'organisation of the material world'; the organisation of space. Therefore, as I indicated, it's not surprising that on many Christian accounts that I am familiar with the pinnacle of creation is Man. Because Man will be responsible for maintaining, for stewarding as the Christian term is, for stewarding the order of the world in future. For keeping it the way God, according to the creation narrative, intended it to be.

The very different emphasis, I think, in Jewish readings of these texts is to focus not so much on the material world - and maybe that is not so surprising if these texts originated in a context of exile where their authors had little control over their material, physical context. But rather, emphasised the organisation of time in the way that I mentioned at the beginning. There I think we see something very different. It is not Man that is the pinnacle of creation, on the sixth day, and Man therefore responsible for maintaining divine order; but rather the pinnacle of creation is Shabbat, the Sabbath. It is a temporal unit which, in its position at the end of the six day created world, will maintain that kind of order if observed in future times and at times when things go wrong. The kind of ironic part of this, is that whereas on the first model of creation as ordering the physical world - ordering space - Man must be in some ways interventionist to return the world to God's order or to keep it in God's order. On the second model, where the Sabbath and the observance of the Sabbath is actually a ceasing of activity, it's a withdrawal in a sense from the world; a withdrawal into time without process, without activity; with no work. It's really Man's withdrawal there that actually is the guarantor, is the fixing mechanism, and I think that is an interesting contrast between those two understandings as I would understand them.

Martin Warner

Thank you very much indeed. I hope we can come back to that, and I want to hold that for a time because it seems to that it resonates very powerfully with the statement by Jesus that the Son of Man is Lord of the Sabbath, and perhaps we might just tuck that away in the back of our minds to come back to and Alister I might come back to you on that in terms of what that might mean in terms of relationship to creation and something we haven't yet raised, which is the Christian understanding of the Trinity involved in the creation. But Steve, can we come back to you and ask whether all of this discussion that we have been having so far amounts to us being able to say that the atheism that has challenged some of the traditions of faith, is that a) rational and b) moral?

Steve Jones

Speaking as an atheist in St. Paul's I should probably take the Fifth Amendment here. (*Laughter*) Once again, I am going to go back to what I said before. Darwin became an atheist, as I'm sure everybody here knows, because he couldn't believe there was a God given the cruelty he saw in the world; particularly the death of his beloved daughter Annie. I am an atheist because, rather like Leibnitz' theory the mathematician, whenever people use arguments that say, as we heard a moment ago for example, that evolution was meant by God - that God put it all together so that it should happen - what Leibnitz said was 'I have no need for that hypothesis'. That hypothesis adds nothing to my understanding of the way the world works, and I have no way of disproving that hypothesis. Science is a profession for pessimists. We're in the business of trying to disprove our enemies first, with luck our friends, hypotheses and if we do disprove them we feel very very good. The statement that somehow

there is built in a designed end in view, either to culminate in Homo Sapiens or any other creature or in some special day, is just alien to the way we think.

Actually, this argument was familiar to Darwin. Many people have heard of the great French biologist Lamarck, Jean-Baptiste Lamarck. It's often said that Darwin disliked Lamarck, because he believed in what is called the 'inheritance of acquired characters'; the notion that the giraffe stretched its neck to get the high leaves, and that stretched neck was then passed on to the next generation. Well, that wasn't true. Darwin himself believed that, and as I often say to my religiously very mixed bunch of students that experiment has been tried for the last two thousand or more years since Jews and others started circumcising boys - it hasn't worked, they're still born with foreskins. The real reason that Darwin disliked Lamarck, and he really did dislike him, was just this argument. Lamarck had a view which he called the 'law of necessary progress' - that somehow, a bit like *Samuel Smiles: Self Help* (a book incidentally published on the same day as *The Origin of Species*), somehow every day in every way everything was going to get better and better. Lamarck felt that we were all progressing towards being, if not perfect, at least being French. (*Laughter*) Darwin, again and again, writes both in the Origin and in notebooks - in his notebooks somewhere he writes 'never say higher, nor lower'. To Darwin, a tapeworm is just as much evolved as is a human being. Each one traces its ancestry to an identical ancestor in the distant past, evolution has no direction; progress; or decay. It is entirely unpredictable; it arises from simple physical laws which at the moment we understand. Simon said that evolution is incomplete; of course it's incomplete, every science is incomplete. If the science was complete it wouldn't be a science. It's only theology which can define itself as being complete, and really that's why I remain an atheist because I am uncertain; I lack the certainty, and I somehow envy the certainty, of people who are religious.

Martin Warner

Alister, there's a challenge. Theology is complete. Does that do you out of a job?

Alister McGrath

That's a very interesting view of theology. As I see it, when I stopped being a scientist and became a theologian I was pursuing the same search for truth. I think both scientifically and theologically that quest continues, it is not ended - in fact I would say it is unending. In many ways in theology you keep coming back to these questions, you keep coming back to these texts, you are always checking them out - have I really got the best way of understanding these? Have I really appreciated the depth that's there? I would say that theology is really this unending task of trying to understand things correctly and also appreciate their greater depth. So, I would share Steve's concern about any science - any way of

thinking - which draws a line and says 'that's it!' I think these things are ongoing and that it's part of the discipleship of the mind to quest for these new depths and see where they take us.

Martin Warner

Thank you. Well I'm going to come now to our questions, and many of these will arise from what you've heard from the panel discussion and I think take us further along the lines of that discussion. One of the questions that we've got here, which I'm going to direct to Diana, is what is the intervention of God in creation? How would you respond to that question?

Diana Lipton

It's an excellent question, whoever asked, thank you very much. I would say that there's more than one account in the Bible of creation and of God's role in the continuation of the created order. On one model, we might think of the book of Job. Towards the end, chapters 34, 38, which describe God responding to Job's request to understand divine justice by saying 'where were you when the world was created?' where were you when the morning stars are woken up in the morning and when it's time for animals to breed and so on. It's very much an account of creation where God has to stay in it, day by day, to make it happen; and if God didn't wake up the morning stars and didn't encourage animals to mate nothing else would happen in the future. It seems to me that Genesis 1, which for us is a more influential account of creation in our own thinking, actually doesn't have such a strong role for God's continuing action in creation. That much more is put to nature itself, and I think Alister I can't remember whose view - I think it was Augustine's, the idea that God sets creation in motion and then it continues itself. That's a very strong element in Genesis 1, that everything is created with...that trees have fruit and plants have seeds; humans and animals are commanded to propagate, to be fruitful and multiply. So what happens in the future moves in to the ballpark of the order itself, so I would say according to Genesis 1 I don't see a great role for God's continuing intervention in creation - except as a role model, as I indicated, through his own willingness to rest and withdraw from it on the seventh day. In a sense that is what we are also being asked to do.

Martin Warner

Thank you. Alister, can I come back to you just very briefly on this to ask whether you've got a view; I think just bearing in mind what we said earlier about Jesus as Lord of the Sabbath and the intervention of God which is Trinitarian and Incarnational.

Alister McGrath

Well, I think Diana and I could have a very good discussion about this which would be a long discussion. But I think one point that would be very helpful to add to this discussion is that, from the

Christian perspective, the idea of incarnation does talk about a God who doesn't simply create but also inhabits and transforms the created order. So clearly that takes us in another very interesting direction. I think Diana and I would probably agree on another point, which is that in some way the imprint of God can be discerned in the work of creation and therefore that gives a motive for the study of nature, and indeed a motivation for the whole scientific enterprise. The basic idea is that by studying the created order, that enhances your appreciation of God. Indeed, in this cathedral tonight we might say 'look at this building, it helps you appreciate Christopher Wren'; likewise the creation.

Martin Warner

Thank you. It's sometimes been said that this is a building for Christopher Wren in which God is a lodger, so we do kind of want to see beyond that if we may. Thank you very much. Simon, the question for you I think, how do you distinguish between myth and scientific theory?

Simon Conway Morris

Rather simply I think. Scientific theories are refutable, and most scientific theories over the last three hundred years have been abandoned for the very simple reason that they have become part of a more complex story. Myth, on the other hand, is effectively the foundational sense of who we are and why we are here - and of course that can sound extremely airy-fairy, but you only have to scratch people very slightly and you'll find that some of the myths they begin to subscribe to, if they don't take some care, may actually go in some extraordinarily unhealthy directions. Of course, that sounds fearfully judgmental and I have to be careful about that naturally enough. But, the reality is that the reality we see may not be in any sense the entire reality; and again that sounds rather vague. In Christianity in particular the recurrent problem has been what we refer to as Gnosticism, which is a rather airy-fairy sort of 'my soul is a cosmic flower' etc. etc. and of course a good deal of New Age thinking - which in many ways has virtues because it is trying to reidentify itself with deeper realities - I have a feeling slips towards Gnosticism. So, in its own quiet way, science is painfully limited. It's wonderful to do, and I think Steve and I would agree about many things; but one of them would be that as and when we stumble on something new the excitement is overwhelming. It's not just 'I am the first person in the world to ever know this', it is that some part of the articulation of reality actually falls into a larger picture. But, that is not myth. Myth is something which transcends all that we do.

Martin Warner

Thank you. Well, that sense of things opening up in front of us I think Steve brings us back to you. There's a question here which I think is probably intended for you, and it's simply: Is evolution over? Or, if not, where will it lead?

Steve Jones

Oh my goodness. Yes, I rather foolishly gave a lecture on this at UCL two or three weeks ago. I didn't take it very seriously. It led the national newspaper of Brazil last week on the front page. (*Laughter*) I think we all know what evolution is - descent with modification. Perhaps I should say 'is natural selection over?' and I'm pretty sure that actually in the developed world, at least for the time being, it is. I often entertain my students when I am starting out a lecture by saying look to the person to your left and the person to your right - you may do that if you wish. Then, they look at each other blankly rather as we are here and then with some accuracy I say, two out of every three of you will die for reasons connected to the genes you carry. Their faces then fall. But then I say, cheer up, had I been speaking in Christopher Wren's time two out of every three of you would be dead already. (*Laughter*) That, of course, is true. We tend to forget what an extraordinary time we are living in. Even in the eighteenth and the seventeenth century, two-thirds of British babies were dead before they were twenty-one. So there were lots of differences; some people died, some people survived - and that was due to cholera, to starvation, to violence, to cold. Many of those lives and deaths were effected by genes, and we know that there are certainly genes that give you resistance or susceptibility to cholera and the Black Death. So there's plenty of raw material, or fuel, for natural selection. Now, in England last year and the year before last, 98.8% of all babies born lived until they were twenty-one. No differences, no fuel for natural selection. Okay? Natural selection turns on differences.

There's a second part to the natural selection exam. We've all passed the first paper by definition because we are all alive, okay? The second paper is somewhat more challenging, and there is a wider range of marks, because you have to have children. You find a mate and have children. From evolution's point of view, I might as well be dead because I have no children. If you look across the world, certainly into history, you find - certainly for men - enormous differences in the number of children they used to have. Even today, Mohammed Bin Laden - who was Osama's father - had twenty-two wives and sixty-five children. Osama himself, last time they were counted, had five wives and sixteen children. Now, if somebody has twenty-two wives there are twenty-one other rather gloomy men out there who are becoming Canons and Prelates and that kind of stuff and not having any wives at all. (*Laughter*) The one who I dug out as being the most lascivious of all, was a guy called Mulai Ismael the Cruel of Morocco. He had eight hundred and eighty-eight children. There was more than one Mrs. Mulai Ismael the Cruel, I can tell you. Hundreds of his fellow men had no children at all. Huge differences. That's gone away, now we have nought; one; two; three; or four children almost world wide outside of Africa. So no differences there, either, no fuel for natural selection. Evolution, for the time being, has stopped. If you are worried about what Utopia is going to be like, you shouldn't be because you are living in it now.

Martin Warner

Make the most of it. In that case I think Alister, the next question I'd like to direct to you. That is, did the soul evolve? And if so, how?

Alister McGrath

I have no idea how to answer that question. (*Laughter*) Partly because the word 'soul' is so defuse it is very difficult to say. What I think I would say is this, that for me I do not believe in a soul as a kind of elemental part of the human makeup. But rather, I would define the soul much more in terms of a human being's relationship to God; and I would pick up from Psalm 8, 'what is man that thou regardest him?' and actually that is a very powerful statement about a theology of the soul. We are who we are because we exist in relationship to God; who actually values us and sees us in a certain way. So I would certainly want to explore it in that way. But certainly, we could begin to answer this by making the point that the earliest cave pictures we know are widely interpreted to suggest that there is some sort of spiritual interest on the part of primitive man. I think that, if we are bound by the scientific evidence, we can't really answer that question. But I would say there seems to have been some sort of interest in what we might now call the transcendent, or the quest for the divine, right from the word go. Certainly you can see that in every historical culture we have. Augustine, who I mentioned earlier, would talk about almost like a spiritual homing instinct; that in some way there is something about us which makes us quest for something that is beyond us.

Martin Warner

Thank you. Well, Diana you took us back to the sixth century BCE and I wonder whether, with that sort of dimension of Alister's answer in mind, you might want to say something about the nature of morality in terms of how we've developed; and how that is characteristic in the Jewish tradition of what we've evolved into.

Diana Lipton

Gosh, that's a hard question to answer too. I think what I would say, to build on what Alister said and also to pursue this question that keeps coming back of the difference between us and animals, is the question of being relational. It seems to me that a difference in the biblical account, in the Genesis 1 and Genesis 2 accounts, of the creation of people versus the creation of animals is that, although both are commanded to be fruitful and multiply and therefore male and females must be intended to interact, a difference is that God says of people, and not of animals, that it's not good for Man to be alone. That, in the second creation account in Genesis 1, is the justification for the creation of women. I think that as a sort of basis, that idea that we as human beings are intended in someway to relate. Not just to propagate, because it would be possible as animals do to propagate without that kind of togetherness or

opposite of being alone. But, that we are intended to be relational; both to other people, and I think also given that Man is in God's image the intention there - as Alister also indicated - is that we are intended to relate to God in a different way from animals. I think that relational aspect, and the idea of empathy - that presumably when God says it's not good for Man to be alone, God is actually empathising in some ways with people. That, I would see, not as a particular change in morality but as a basis, a biblical basis, for morality that is very much context driven. An ideal is that we would be relational and empathic, and that our morality would emerge from that. A reality is that can easily be threatened, that there are things which stop us from thinking about other people and stop us from being empathic; stop us from acting, it seems, as this text would intend us to be. So, it's not so much that I think morality 'evolves' but that at different times different levels of morality are possible.

Martin Warner

Thank you very much indeed. I'd like to push that a little further and extend this idea of relational, empathic, identity into a Christian understanding, I think, of a sense that it is the whole creation that is redeemed by Jesus Christ - everything that God has made. I wonder, Simon, whether you might pick up a question we've had here. How far should the apparent suffering involved in the process of evolution count against the Christian assertion of the 'God of Love'?

Simon Conway Morris

Again, that's a *huge* question of course. I see my staff locking the doors at the back; we shall be leaving at ten o'clock sharp thank you very much. That is, I think if anything, the fault-line between modern day Darwinism and much of theology. In many respects, it is impossible to answer - how can you? Of course, the Newman fly of Darwin is translated into Belsen ultimately in some way. The whole thing, in many senses, is absolutely horrifying. There are many ways we can approach this, Steve mentioned in passing that Darwin was an atheist; well we can chew the cud on that. But I think also, slightly echoing maybe to begin with what Diana was saying, I think one of the dangers is how one loses trust in these things; and if you think this is a new invention then the few days around Easter in the New Testament one I think can inform you of what the loss of trust can actually involve, it was catastrophic. But with respect to the nature of evil that I mentioned in passing in my introductory remarks, the fashionable phrase 'radical evil', and indeed it is the case - and this has been argued by other people, and in indeed a forthcoming book by a colleague of mine - that it is not necessary to look to the foundational myths of Genesis, and it's very possible Diana would disagree with this - I am not a Jewish theologian, let alone a theologian of any sort.

But nevertheless, there is a deep seated sense - and this was articulated by people in the seventeenth century by Milton, by our generations by Tolkein as it so happens - that there is a radical fracture

through the world which, in the worlds of C.S. Lewis, is effectively an 'aboriginal disaster'. I suspect, but of course I'm not here to preach to you, that only through the incarnation - in fact through the Christian orthodoxy of the Resurrection as it happens, but I'm here to persuade you of those truths - that it seems to me that if those things are genuinely meaningless, the death of Darwin's daughter Annie, if these actually mean *nothing,* that, in my view, is far more terrible and far more catastrophic than the sense that however twisted and perverted, how malign, how so often one gets the sense of personal intervention - do you remember the way Jung spoke about the rise of the Nazis, as if Wotan had reawakened. Maybe we don't subscribe to Jung, but nevertheless I feel that is a powerful myth for something which pervades our world. In that sort of sense again, to emphasise what we've discussed briefly, there are of course elements at risk of this, but there is ultimately a future promise. Of course, the atheists say 'ah yes, airy-fairy stuff here we go again - off to North Oxford'; possibly so, but if we consider what some of the alternatives are this is not putting our heads in the sand. This is deciding what the foundation of the universe was, why it went wrong, and how - in Christian orthodoxy and I think also in Jewish orthodoxy, and indeed all monotheistic religions - we'll be looking towards a sense of completion.

Martin Warner

Thank you very much indeed. Well, I think with that foundational issue clearly on the table and very brilliantly opened up for us there are two rounds that I'm going to ask the panellists to do now. First of all, a quick answer to one final question from each of you before a moment for each of you just to sum up your comments and views from this debate. First of all, the question. What do the panellists say about the debate over Creationism being discussed in the classroom today? Steve...

Steve Jones

It's problematic. The difficulty is the Creationists in the United States have a thing they call the 'wedge strategy'. The wedge strategy - and as of course we all know in the US and in many other countries the constitution forbids the teaching of religion in state schools - the wedge strategy is that this is wrong, Christian religion should be taught in state schools, and the thin end of the wedge is Creationism. Now, in fact, I show pictures of the Garden of Eden in my lectures and you could say that I'm teaching Creationism; but I'm not. I'm very suspicious of this notion that we ought to have both views treated, even if not of equal weight. I sometimes say, it's like expecting me when I'm teaching genetics to give equal weight to the theory that babies are brought by storks. Babies, I fear, are not brought by storks, and there is no reason at all why I should bring that notion into my science classes. If you wish to discuss the baby stork theory in a theology class, or during a rugby match - do it! But don't do it when it's my subject, and that's really what I feel. I feel that Creationism should not be taught in science classes, if you want to teach in theology classes by all means do.

Martin Warner

Alister, a brief response to that - both views, or not?

Alister McGrath

I think these questions will naturally arise in science lessons, and I think it's appropriate to be able to say something in response. Not to take a religious view, but at least to indicate where this might take you. I think Dr. Reiss was treated abominably by the Royal Society, I think he got it *exactly* right. This is not a good day for the Royal Society, I think that that needs to be revisited.

Martin Warner

Thank you. Diana...

Diana Lipton

I think on the one hand I am very in favour of everything being discussed openly and children being educated by open-minded people but, on the other hand, I am very nervous about what is discussed in which context and how we then label that. So, by discussing Creationism in a science classroom, it might be because children have questions about Creationism, but we might end up against our own wishes and inclinations sending the message that we think Creationism is a science. Therefore, somehow I would want to now shut off a child who raised it but I would want to find a way to indicate that that is not the appropriate venue in which to discuss it in my opinion.

Martin Warner

Thank you. Simon, a brief word on this.

Simon Conway Morris

Very brief. Intelligent Design is rubbish, in as much as it's not science and in my view it's lousy theology. On the other hand; it is known, it has arguments - which I think are unsupportable, but if somebody in any class, be it the rugby field or biology, says 'Sir/Miss, what is this thing here?' then of course you do to the best of your ability explain its strengths. Because, after-all, there *are* arguments, we are intellectual people, and what I believe are its manifold and total weaknesses. But I would echo very strongly what Alister said with regard to the sacking of Michael Reiss by the Royal Society. I have to be slightly careful because I happen to be an FRS, but that's neither here nor there in this context. But I think it is not only disgraceful, but what is astonishing is the way in which it was organised by a group of people who are fundamentalists - oh yes! There they are, these ones happen to be *atheist* fundamentalists, they're all over the place. And, if we are going to have this sort of thing, one is on an extraordinarily slippery slope - so I think it is appalling.

Martin Warner

I think actually, those will perhaps form our last words. I see that the clock is moving very inexorably towards eight o'clock and this dais implodes at eight o'clock if we go on talking here. But before everybody leaves, first of all may I remind the audience that there is the possibility of giving to a retiring collection. Also, may I remind you of the bookstore, which is at the back of the cathedral, as you exit it is on the left-hand side. Can I thank all of you for coming, can I thank those of you who didn't hear anything to begin with for staying, and I hope you have been able to hear and have enjoyed this panel debate. Can I remind you about the debate which takes place here at the same time, same place, next week - 28th of October. Can I remind you also of the Sunday evening services as well, and any more information about the activities of the St. Paul's Institute which you have available and, of course, is all available on the cathedral website. But, most of all, may I on your behalf thank our speakers - Alister, Steve, Diana, and Simon - for the wonderful learning, insight, and humour with which they have led us and responded to our questions this evening. Thank you very much indeed.

(*Applause*)

END