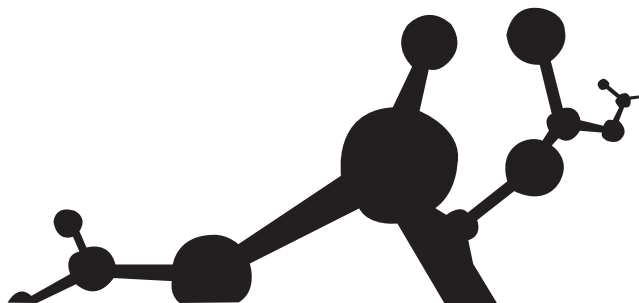


# Science & Belief The Big Issues

Notes for Church Discussion Groups  
Written by Russell Stannard



Learning activities to accompany  
Professor Russell Stannard's series  
of video discussions on the major  
questions and controversies  
concerning science and belief.



## **Acknowledgements**

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# Introduction: for the course organiser

## The problem

*The Times* newspaper recently carried a front page story announcing that cosmologist Stephen Hawking had a theory that does away with the need for a Creator God. At the same time, topping the bestselling book list was biologist Richard Dawkins' attack on religion entitled *The God Delusion*, based on his Channel 4 TV series *The Root of All Evil*.

Such biased media coverage is understandable. A banner headline 'God is Dead' boosts circulation and viewing figures in a way that 'God is Alive and Well, and Still in Charge' would not. But it does pose a problem: Where does one turn if one wishes to assess the relationships between science and religious belief in a sensible, balanced and well-informed manner?

## The solution?

This course might be the answer. The overall aim is to provide the essential background information needed for making up one's own mind on the various important issues raised. Various kinds of believer, together with atheists and agnostics, offer a wide range of viewpoints. The course is intended for use by church discussion groups, by youth groups, and in school Religious Studies lessons (for which there is a separate set of Teacher's Notes, including follow-up activities suitable for young people, elsewhere on the disc and also available from RE Today Services).

In the church context, we envisage the course could have a number of uses. It could be the basis of a Lenten course. It could be a component in confirmation classes. Because of its even-handed approach it is ideal for attracting into dialogue those on the fringes of church life.



## The resources

The course consists of a set of videos with accompanying guidance for group leaders. The presenter, Professor Russell Stannard, OBE, is a leading figure in the ongoing science–religion debate. Emeritus Professor of Physics at the Open University, he is also a licensed lay minister in the Church of England, and a Member of the Center of Theological Inquiry, Princeton, USA. He has written and broadcast extensively on both science and religion, most notably in BBC Radio 4's *Thought for the Day*. The producer, Tony Coe, was formerly a BBC TV producer before setting up his own TV and video-making company, Two Cats Can Ltd. Besides Russell Stannard, the videos feature young people speaking from their own convictions; they are not actors. The whole project has been made possible by a generous grant from the John Templeton Foundation.

Both the videos and these notes are available via the internet at <http://tinyurl.com/6kkqs4n>. Discussion groups might like to view the videos online from this website. Some groups may prefer to have the material as a DVD, copies of which are available from: Christian Education, 1020 Bristol Road, Selly Oak, Birmingham, West Midlands, B29 6LB, at a cost price of £5.00 inc.VAT. Orders can be placed by writing to that address, or via email at [sales@christianeducation.org.uk](mailto:sales@christianeducation.org.uk), by telephoning 0121 472 4242, or online at <http://shop.christianeducation.org.uk>

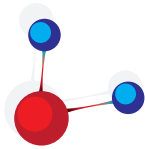
## Getting started

We suggest that, having appointed the group leaders, each of them is issued with their own copy of the DVD and a printout of the discussion group leader's notes commencing on the next page. We further suggest that you call them together for a preliminary briefing session at which you introduce them to the nature of the course and take them through the first part of the discussion group leader's notes – that part giving general guidance. You might then have a showing of one of the programmes, so demonstrating how to find them on the DVD, and how to pause the video at a point indicated in the Notes for that episode. Such a meeting provides an opportunity for the leaders to voice any questions and concerns they might have.





# Discussion group leader's notes



## Introduction

Religious belief has recently come under attack by certain prominent scientists such as Stephen Hawking and Richard Dawkins. The impression is given that science and religion are locked in conflict. But is that a fair judgement? This course is aimed at providing the kind of information needed to make up one's own mind on the various issues in a sensible, balanced, and well-informed manner.

## The resources

The course is based around twelve 10-minute programmes:

- 1 Evolution and Genesis
- 2 Intelligent design
- 3 Morality
- 4 Round table 1
- 5 Creation
- 6 The anthropic principle
- 7 Extra-terrestrial intelligence
- 8 Round table 2
- 9 Psychology
- 10 Miracles and the laws of nature
- 11 The relationships between science and belief
- 12 Round table 3

As you will see from the list, there are nine *information programmes*, each of which deals with a specific topic. These programmes follow a common format. They open with a series of rapid-fire statements by young people aged 15 to 18 years, expressing their opinions on the said topic. These serve to illustrate the commonly held, differing viewpoints, and also the confusion surrounding the subject. This leads into the main part of the programme: Professor Russell Stannard examining the opinions expressed, and providing insights and relevant background information needed for establishing a reasonable assessment of the issues being considered. Each programme then concludes with a display panel listing two or three crucial questions for you to put to your group for discussion.



The remaining three programmes (numbered 4, 8, and 12) are *round table sessions*. These each consist of extracts taken from a discussion of the issues raised in the previous three information programmes. They feature Russell in conversation with the young people who made the initial opening statements, the latter now having had the chance to view the information programmes and hear what he and the others had to say.

## How to structure your course

You should use the video resource in whatever way you consider best suits the needs of your particular group.

If the group meets on a regular weekly or monthly basis, you have the freedom to use the video material flexibly. As a general rule you might plan on using two information programmes per session. But if you find the discussion is going really well on a particular topic, it might be more appropriate on that occasion to use just the one programme. The discussion programmes are rather different. They could be used as a useful reminder of the issues raised in the three previous information programmes, and thereby serve as a stimulus for a recap of earlier themes. Or you might prefer to end your course by showing all three discussion programmes together at a single session as a summary of the entire course. Or, of course, you might decide to ignore them completely as being not especially helpful to your particular group, and concentrate solely on the information programmes.

In the event that your discussion group is meeting for a limited period – as a Lenten or Advent course, say – then you might need to decide which programmes to use. A six-week course is no problem: you can just show two programmes per session in the order in which they appear, numbered 1 to 12. In the case of a five-week course you might like to consider the following selection: 1 + 2, 3 + 5, 6 + 7, 9 + 10, and 11 + 12. But do not feel tied down by any such plan. If you find in practice that one programme per session is more than enough to fill the time available, then go with that format. There is no requirement for you to use all the videos. In consultation with the other members of the group you might like to choose, from the list given above, just those that cover the topics of greatest interest to you.

## The book of the series

There is a book of the series, with the same title, written by Russell Stannard and published by Lion Hudson. It covers the same ground, but in greater depth. As discussion group leader, you might find it useful to consult it prior to the course, or alternatively to read the relevant two chapters before each particular session. At the end of the course, members of the group might like to regard the book as a useful reminder of your sessions together.



## Leading the discussion group

Prepare for each session by viewing the relevant video(s), and reading their accompanying notes beforehand.

Each programme's notes start with the key questions that appear on screen at the end of each programme. There follows a brief summary of the contents of the video.

Under the heading **Supplementary questions** are suggestions for questions and discussion points you can feed into the group at your discretion. With some of the programmes there are natural breakpoints, where, if you wish, you can pause the play in order to discuss the topic so far while it is still fresh in the mind. The timings of where this would be convenient are indicated in this section, along with the closing words of that section. Following such a prompt, you will find questions related specifically to the extract you have just viewed. If however, you prefer to have an uninterrupted viewing of the whole programme, that's fine; just ignore these prompts.

You are not, of course, restricted to asking these questions. You or your group might bring up other related issues and questions, in addition to those suggested here. Not only that, but the separate Teacher's Notes accompanying the series, mainly intended for use in schools, include some active ways of drawing out and comparing thinking. You may want to 'borrow' one or two of these activities to give some of your group sessions a different character. (These Teacher's Notes are to be found on the DVD, or alternatively at the website associated with this course: <http://tinyurl.com/6kkqs4n>)

Work out how you want to help the discussion group feel relaxed. Do you start with drinks and chat, to tune in to each other, or would you prefer to finish with drinks and social time? Decide what is best for your group and the premises. If some of the participants don't know each other well, start the first session with introductions all round the circle. Ask them to give their names and say a sentence – perhaps about what they want to get out of this course. You should then agree the contract about format for each session, start and finish time, and how you expect to shape the session. Decide whether it is appropriate to begin or end each session with a brief prayer.

Tell them about how the programmes are shaped. You can then show the first piece of video and move off into discussion. On completing the viewing of a programme, it might be a good idea to pause it at the screen displaying the major questions. To have this permanently up on the screen might help to keep the ensuing discussion on track.

You might like to begin the discussion with a go-round question: What was your view of this issue, aged seventeen? What was most surprising for you in the video? Have you heard opposing arguments on this material in other quarters – what were they?

Keep an eye on the clock so you view any further planned video material at an appropriate interval. Just before the planned ending of the discussion, draw the group into some sort of concluding round. What will they take away from this session? Is there anything they would like to come back to for further discussion? What was most challenging to them? At the end remind them about the time and place of the next session and any change of format.



At one of the later sessions, you might tell them what the topic is to be, but *before* showing the video, ask them to state their opinions on the subject. At the end of the session this can lead into an interesting exploration as to whether their views have been modified in the light of what they have learned from the video and the ensuing discussion with other members of the group.

**General rules for running any discussion group include:**

- Ensure *all* members of the group participate. You might, for instance, ask whether ‘someone who has not yet spoken’ would like to add something. Wherever possible, frame your questions as open questions with no right or wrong answer, to draw out the more tentative. What is your experience? As a seventeen-year-old, how would you have dealt with these issues? What has made you change your views over time? What do you find most persuasive? What would you want to ask about this of your priest/minister or Professor Stannard? Often it is the quiet, thoughtful participants who have the most interesting contributions to make.
- Try to contain the more talkative members so they don’t monopolise the proceedings. You might choose to respond to questions, taking it in turns round the circle. Some groups use the discipline of a talking stick. You have to pick up the stick (or other token) from the centre table before speaking. If the pace of discussion is too quick or combative then the quieter members are less likely to participate actively – the speaking stick mechanism can give a steadier pace to a discussion.
- If the discussion goes unhelpfully off subject, remind the group of the key question they are meant to be addressing.
- Periods of silence can be a good thing; they might indicate that members are quietly considering what has been said. If you feel the discussion is flagging, introduce one of the back-up supplementary questions.
- You might like to end the session by asking members whether there is any particular thought they will be taking home with them – perhaps something new they have learned, a change of opinion, a greater appreciation of a different viewpoint, and so on.

Finally we point out that at the end of the programme notes you will find a helpful word list, giving brief descriptions of the terms used in the videos. This is in case anyone wishes to remind themselves of their meaning. You might like to print it out and have it handily available on a central table for anyone to consult during the course of the discussion session.







# Programme 1

## Evolution and Genesis

### Summary of the video

This opening programme equips us to consider and respond to these questions:

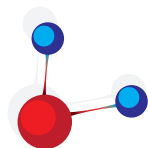
- **How would you describe the relationship between evolution and Genesis?**
- **Are they in conflict with each other?**
- **Are they seeking different kinds of truth?**

The programme presents information about the varied history of biblical interpretation, from St Augustine, via the Council of Trent and Vatican II, to an example of a modern-day creationist – the Argentinian evangelist Luis Palau. This account of the history of debates about creation raises a question about the nature of biblical revelation for Christians: Are certain parts of it, like Genesis, more like poetry than scientific writing?

The argument avoids the simplistic opposition between science and theology – depicted as analogous to two boxers fighting each other. There is much to be said for the idea that science is about 'how' questions and religion about 'why' questions.

However, the relationship might be more subtle than that. Perhaps they are from time to time looking at the same problem but from different perspectives, in rather the same way as 3D spectacles at the cinema can give rise to a more comprehensive view than either one on its own. Maybe both disciplines have something worth hearing.





## Supplementary questions

In addition to the main questions posed at the end of the video, you might like to introduce into the discussion a selection of the following. There are no natural pauses with this opening programme.

- Do any members of your group subscribe to a literal interpretation of the Adam and Eve account to be found in Genesis? If so, how do they regard the evidence biologists advance in favour of evolution?
- Why do you think the creationist movement is so strong in the USA?
- Are they justified in campaigning to have the Genesis account taught in school biology lessons as an alternative to evolutionary theory?
- Were you surprised to hear of St Augustine's non-literal approach to Genesis as long ago as the fourth century, with its overtones of evolution?
- Would you agree there are ways of conveying truth other than in a straightforward scientific manner? Could we regard George Orwell's *Animal Farm* and William Golding's *The Lord of the Flies* as examples of our modern-day equivalent of the ancient myths? Can you think of further books and films that carry an underlying message? Do today's TV soaps sometimes convey valuable lessons for us in story form?
- What would you say are the important underlying messages in the Adam and Eve story? Do they still have validity for us today?
- What do you think of the suggestion that science and religion might at times be looking at the same problem but from different angles (recall the 3D spectacles analogy)?
- What do you think of the declaration of the Council of Trent that the Bible was written 'at the *dictation* of the Holy Spirit', and how this was amended at Vatican II to be 'at the *inspiration* of the Holy Spirit'?





# Programme 2

## Intelligent design

### Summary of the video

This programme equips us to consider and respond to these questions:

- **Is evolution on its own able to account for the development of intelligent life?**
- **If so, does that get rid of God, or might we see God working through evolution?**

The theologian William Paley argued that since everything about the human body is so beautifully fitted to fulfil its function, it must have been designed that way, and the designer was God.

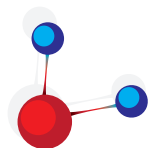
Darwin's theory of evolution by natural selection provided an alternative explanation. The evidence for evolution is diverse and very strong. Nevertheless, going from inanimate chemicals (primordial mud) to us involves some very difficult steps: the formation of the first cell, the eye, the ear, and so on. Might not God have had to have intervened in order to negotiate these hurdles? Adherents to 'intelligent design' claim this to be the case. However, it has to be noted that this is essentially a 'God-of-the-gaps' type of argument. As science progresses, gaps in knowledge tend to get filled up, leaving such a supposed type of God with less and less to do.

Is such an intervening type of God necessary? An account is given of how the intricate structure of the eye might have evolved in gradual stages, each of which would have conferred some small incremental survival advantage and could therefore have been preserved and subsequently built upon.

If we were to accept that evolution was God's way of making us, how would God know what this process would eventually produce, given that it depends in large measure on random chance? The notion of convergence is introduced. This holds that certain characteristics, such as the ability to see, intelligence, and so on, were bound to evolve.

Finally, if we are evolved animals, with much in common with the other animals, how come we are supposed to possess an immortal spirit and not they? Does it make sense to think that the spirit evolved in parallel with our bodies?





## Supplementary questions

In addition to the main questions posed at end of the video, you might like to introduce into the discussion a selection of the following. In this programme there are two places where you might want to pause the play.

*Pause at (6.11) '...how we end up in God's hands' and ask:*

- Recalling William Paley's argument about the watch, is it still possible to advance the apparent design of the human body as *proof* of God's existence – or has the theory of evolution changed all that?
- Is the evidence for evolution convincing?
- Do you support the idea of intelligent design, i.e. that there were steps along the way from primordial mud to ourselves that could not have been negotiated by evolution alone, but must have involved the direct intervention of God?
- Did you find the suggestion as to how the eye might have developed in a number of small stages a plausible account of what might have happened?

*Pause at (8.31) '...the Divine Bookmaker' and ask:*

- If God chose evolution by natural selection as the means to produce human beings, does the fact that the process involves a strong element of random chance mean that God could not have known what the end product would be?
- What do you think of the idea that God might be regarded as the Divine Bookmaker?

*At the conclusion ask:*

- If we are products of evolution, how come we are supposed to have an immortal spirit, but the other animals not?
- Is the spirit something that might have evolved over time in our ancestors along with the evolutionary changes to the physical body?
- Do you see any clear-cut dividing line between human beings and the other animals, or is it all a matter of degree?





# Programme 3

## Morality

### Summary of the video

This programme equips us to consider and respond to these questions:

- **Where does the moral sense come from? Is it God-given? Is it something manmade?**
- **How far might evolution play a part in understanding at least some aspects of morality through them having survival value?**

Certain types of behaviour are universally condemned as being morally wrong: murder, robbery, bullying, and so on. Others, such as giving to charity, are held to be good. Some say that this sense of right and wrong comes from God.

But what about the grey areas: abortion, contraception, stem cell research, and so on? The fact that there is no agreement over these issues leads some to conclude that morality is nothing more than a set of rules devised by society.

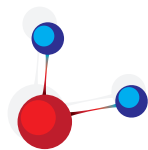
Science is often said to be 'value free'. In other words it has nothing to contribute to the debate. But is this true? We know that the behaviour of animals is to a large extent genetically controlled – the manner in which a cat, for instance, will instinctively kill a bird even when it is not hungry. Such behaviour patterns are encoded in the cat's DNA, having been formed through conferring onto the cat's ancestors a certain survival advantage. As an evolved animal ourselves we must expect to be similarly subject to inherited behaviour traits.

These will include an element of selfishness (in the past, our ancestors grabbing what food was available) and possibly aggression. But there is also expected to be survival advantage in adopting an element of co-operation in situations where both benefit from the arrangement. This is called *reciprocal altruism* (you scratch my back and I'll scratch yours). In this manner a consensus could arise that one should mutually agree not to kill, steal, or commit adultery. It is to everyone's benefit. But these are three of the Ten Commandments.

One would also expect that there would be sacrifice on behalf of close kin, i.e. on behalf of those sharing to a large extent the same genetic material. Such *altruism on behalf of close kin* is associated with the idea of *the selfish gene*. It could explain why a mother is prepared to sacrifice her own interests, and if necessary her life, on behalf of her children.

But is that the whole story? What about acts of sacrifice on behalf of those who can never pay you back, and for those who are not closely related to you? Is this where God comes in – with what we might call the higher forms of altruism?





## Supplementary questions

In addition to the main questions posed at the end of the programme, you might like to introduce into the discussion a selection of the following. In this programme there are two places where you might want to pause the play.

*Pause at (2.24) '...is it right to abort a foetus' and ask:*

- Where do you think the moral code comes from: God or society? Or is it a mixture of the two?
- Given that religion has been inextricably bound up with society from time immemorial, is it possible for society to produce a purely secular moral code that has not been influenced in some way by religious attitudes?
- Is it possible to have a moral sense without being religious?
- If morality stems from God, why are there grey areas, such as stem cell research, abortion, contraception, and so on, where devout religious believers can disagree as to what God requires of us?

*Pause at (8.31) '...because it has evolutionary advantage' and ask:*

- Is science 'value free', or might it have something to contribute to our discussion of the source of morality?
- Do you agree that certain of the Ten Commandments (do not kill, steal, commit adultery) could have arisen as genetically influenced behaviour patterns through such co-operation having conferred on our ancestors some survival value?

*At the conclusion ask:*

- Would it be helpful to draw a distinction between, on the one hand, moral codes that could be explained in terms of reciprocal altruism or altruism on behalf of close kin, and on the other, those codes that might be called the higher forms of altruism, i.e. where there is no reciprocal benefit, or the acts of sacrifice have been made on behalf of those who are not closely related?
- Is it likely that an ancestor acquiring a gene mutation that said in effect 'Love your enemies' would have survived to pass on that gene to us?





# Programme 4

## Round table 1

### Summary of the video

This programme consists of extracts taken from a round table discussion in which those interviewees appearing in Programmes 1 to 3, having now heard what Russell Stannard and the others have had to say on the subject, have a chance to exchange views.

The programme is very different from the earlier programmes. How you choose to use it, and the other round table discussions (Programmes 8 and 12), is up to you. It could serve as a useful recap of the themes dealt with in those three previous programmes. Your group might find it of interest to compare how these young people, taking A levels in Religious Studies or Philosophy, have gone about discussing the issues. Their exchanges might provoke your group into further consideration of some of the issues. Or, having had a preliminary viewing of the programme yourself, as chairperson, you might prefer to direct your group straight on to Programme 5.

## Points arising out of the discussion

Here is a selection of points made by the participants in the round table discussion. They might serve as a useful stimulus for further debate in your group:

*'Many creationists fear that if they don't claim hard facts then religion will be undermined.'*

*'There are many ways people attempt to prove or justify religious belief – these are not empirical in the same way as science.'*

*'A child brought up without society and relationships might give evidence of whether the moral sense is innate, or constructed by society – but most of society would say such an experiment was immoral!'*

*'Religions add weight and authority to the moral sense that we have from our evolved nature.'*

*'In secularising societies, religion declines and immorality increases – so even though it is perfectly possible to be a good and altruistic human being without religious belief, it does seem that religious authority buttresses moral behaviour for many of us human animals. Is this a good thing about a more religious society?'*

*'On the subject of Adam and Eve and evolution, different times need different kinds of explanation.'*

*'Is there a tendency to think that people long ago were stupid and ignorant, or did they have different ways of getting at the truth and passing it on?'*

*'It is not true to say that people long ago did not think scientifically like us. They were inquisitive, which comes to the same thing.'*

*'Are humans special? If not, what's the point?'*

*'Evolution makes you depressed.'*

*'There's a missing link in the evolutionary chain. That's where I think God got involved.'*

*'You say evolution was God's way of making us. But what about all the suffering that went on? Is that not a problem?'*

*'Does everyone have an innate sense of God from the moment they are born?'*

*'The moral sense comes from our parents. But where did they get it from?'*

*'Morality might come from religion. But who is to say religion came from a god?'*

*'As religion declines, crime rises. In a society without religion, there are no limits.'*







# Programme 5

## Creation

### Summary of the video

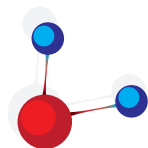
This programme equips us to consider and respond to these questions:

- **In the light of our modern understanding of cosmology, is it still possible to think of a Creator God?**
- **If not, then what else could be the answer to the question: 'Why is there something rather than nothing?'**

The sun and the other stars are gathered together into galaxies, which themselves form clusters of galaxies. These clusters are all retreating from each other in the aftermath of the Big Bang which occurred 13.7 billion years ago. This is nothing like the six-days creation story we find in Genesis. Although modern-day evangelists like Luis Palau insist on a literal interpretation of the Genesis account, this was not shared by early church leaders such as Gregory of Nyssa.

So are we to regard God as the cause of the Big Bang? As Stephen Hawking points out, cause must come before effect and where the Big Bang was concerned there probably was no time beforehand; both space and time came into existence at the Big Bang. But such an eventuality had already been foreseen by St Augustine 1600 years ago. He recognised that time was a property of the world and would therefore have to have been created along with everything else. We must not think of the Creator God as an initial cause. Instead, God is the reason why there is something rather than nothing. God's input is to be found throughout time, not simply at the first instant. As the German theologian Paul Tillich put it 'God is the Ground of All Being'.

Hawking has responded by proposing that there is a law of nature, called M theory, the function of which is to produce universes spontaneously out of nothing. Accordingly, it produced this universe and many others. Even if there is such a theory (and at present there is no evidence for it, and the theory itself has not even been formulated) that merely shifts the question. Rather than ask 'Why the universe?' we would have to ask 'Why M theory? What is responsible for *its* existence?' Are we to think of God's input being at the level of creating the law, the law then bringing the world into existence on God's behalf?



## Supplementary questions

In addition to the main questions posed at the end the video, you might like to introduce into the discussion a selection of the following. In this programme there is one place where you might want to pause the play.

*Pause at (3.15) '...it doesn't necessarily have to be literally true' and ask:*

- There were obviously no witnesses to the Big Bang, so can scientists be reasonably certain that it occurred?
- If one accepts the Big Bang theory, does the six-days creation story in Genesis still have value today?
- There are people (perhaps you are one of them) who continue to accept the literal interpretation of the Genesis creation accounts. They believe that they are defending the original interpretation. But can this be sustained in the light of the views expressed by the early church leaders such as St Gregory of Nyssa, and St Augustine, who clearly did not accept such a way of interpreting Genesis?

*At the conclusion ask:*

- If there was no time before the Big Bang, there could have been no 'cause' of the Big Bang. Does that affect the way you see God as Creator of the world?
- If there is such a theory as M theory, and our universe, along with other universes, owe their existence to its operation, how does that affect our understanding of God as Creator?
- It takes intelligence for scientists to investigate the laws of nature, such as M theory. Might it therefore require an Intelligence (with a capital I) to set up the laws in the first place?
- 'The universe is beautified by rainbows, sunsets, poetry and symphonies, energised by the awesome violence of the Big Bang, mountains, and deep space, tingling with love, sexuality, courage, and discovery. All this from the operation of blind forces of nature alone?'
- We owe everything – our very existence – to the Creator God. How should that affect our relationship to God, and the perspective that we have on life in general?





# Programme 6

## The anthropic principle

### Summary of the video

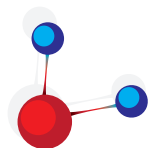
This programme equips us to consider and respond to these questions:

- **Why is the universe friendly to life?**
- **Was it deliberately designed like that, or is it just part of a much larger multiverse picture?**

The Nobel Prize winning physicist Steven Weinberg once dismissed life as 'a more or less farcical outcome of a chain of accidents'. And it is not difficult to see how he arrived at the view that the universe is hostile to life: the vast numbers of stars (suns), the seemingly limitless depths of space, the freezing temperatures, voracious black holes, and so on.

However, first impressions can be misleading. It took a long time, 13.7 billion years, for evolution to produce us human beings. During all that time the universe had to continue expanding, so it *had* to end up big. Moreover, it has come to be recognised that if the violence of the Big Bang had been different from what it was, or the strength of the electrical force, the nuclear force, or the gravitational force had been different, or if the fundamental sub-atomic particles had had different masses, or there had been 2, 4, 5 etc. spatial dimensions rather than the familiar 3, there could have been no life anywhere in the cosmos. The universe is actually life-friendly. It has seemingly bent over backwards to accommodate us and the other life forms. It appears to have been fine-tuned for life. This observation goes under the name 'the anthropic principle'.

How do we account for this? Was it in fact fine-tuned – the Designer being God? An alternative is to postulate that our universe is not alone. There are other universes all run on different lines. The majority have no life in them because one or other of the conditions for life were not met. The whole ensemble of universes is called the *multiverse*. It is difficult to see how any proof could be obtained for demonstrating the existence of these supposed other universes. Nevertheless, the multiverse must presumably be the solution adopted by atheists. However, the multiverse idea is not in itself necessarily atheistic. One could well imagine that the God who created many interesting life forms in addition to us human beings might also delight in creating a wide variety of universes.



## Supplementary questions

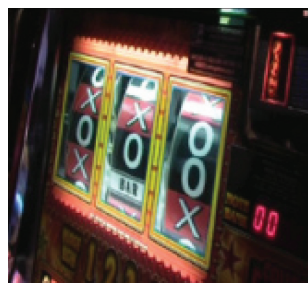
In addition to the main questions posed at the end of the video, you might like to introduce into the discussion a selection of the following. In this programme there is one place where you might want to pause the play.

*Pause at (5.12) '...the name of the anthropic principle' and ask:*

- How did you first react to those opening statements by Weinberg: 'The more the universe iscomprehensible, the more it also seems pointless', and how he dismissed life as 'a more or less farcical outcome of a chain of accidents'?
- How do you react to the sheer vastness of space? What does it tell you about yourself? What does it tell you about God?
- The chance of getting a life-friendly universe by simply throwing together laws of nature atrandom, and setting the values of the physical constants governing the strengths of the forces and so on at random, are virtually zero – less than winning first prize in the Lottery week after week after week. Do you nevertheless think that it could have happened purely by chance?

*At the conclusion ask:*

- Do you favour a single universe especially designed for the purpose by God, or the multiverseidea? If the latter, was that God's way of working, or did it happen of its own accord?
- If among all the different life-forms, God takes a *special* interest in us human beings (because we uniquely can enter into a loving relationship with him), does it make sense to think that, on the assumption that the multiverse hypothesis is correct, he would take a special interest in our universe (as being the home of intelligent life)?
- It takes faith on the part of a religious believer to accept that there is life in a heavenly realm beyond this mortal earthly life. Does it take the same kind of faith for a scientist to believe in the existence of other universes which also cannot be contacted from this universe?
- Has what you might have learned from this programme changed the way you see the universe?





# Programme 7

## Extraterrestrial intelligence

Before your group views this video, it might make for an interesting change if you were to ask them for their preliminary views on the topic. Do they believe there is extraterrestrial intelligence out there? If so, how would that impact on religion?

### Summary of the video

This programme equips us to consider and respond to these questions:

- **What impact would the discovery of extraterrestrial intelligence have on religion?**
- **How would such a discovery alter your assessment of the importance, or otherwise, of humans?**

Though some primitive forms of life might one day be found on other planets of the solar system, we would have to look beyond, to planets orbiting other suns (i.e. stars), to find life forms with an intelligence equal to, or superior to, ours.

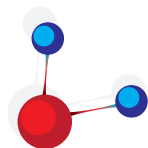
There is no shortage of extra-solar planets, or *exoplanets*, where extra-terrestrial intelligence (ETI) could have flourished – which is not to say that it necessarily has. If ETI does exist, how does that affect the way we view ourselves in relation to them?

If they reached our level a long time ago, they might be vastly more intelligent than us by now. But that assumes species like ours become ever more intelligent. Is that so? Do our more intelligent human beings today have more children than the less intelligent? Unlikely.

ETI might be using genetic engineering to produce designer babies – designed to be more intelligent. That assumes they have not meanwhile blown themselves up in a nuclear holocaust!

How can we make contact with any ETI that might be out there? Given the vast distances involved, travelling to visit them is hardly practicable. No, we must rely on detecting any signals ETI might be sending us. The Search for Extra-Terrestrial Intelligence programme (SETI) has long made searches for such signals but so far has drawn a blank.

How would the discovery of ETI change things? Should we feel overwhelmed by the sheer numbers of creatures that might be out there? Would God value a highly intelligent ETI more than us? Could they be *spiritually* superior to us? Would they need their own Saviour?



## Supplementary questions

In addition to the main questions posed at the end of the video, you might like to introduce into the discussion a selection of the following. In this programme there are two places where you might want to pause the play.

*Pause at (5.37) '...the Search for Extraterrestrial Intelligence' and ask:*

- What do you reckon to be the chances of there being ETI out there?
- Are those who discount the possibility of there being ETI simply being arrogant about the human race, and self-centred?
- Thinking in terms of an evolutionary timescale, measured in millions of years, do you think that we, and other possible intelligent species elsewhere, are capable of avoiding a nuclear holocaust before we progress significantly further in intelligence?
- Do you think the human race is still increasing in intelligence with each successive generation?
- Thanks to the Human Genome Project (i.e. the mapping out of our human genes) we are in a position to go in for directed evolution rather than continuing to rely on evolution by natural selection. We could greatly enhance the overall intelligence of our race by putting budding Einsteins into stud farms, while sterilising the less intelligent. Is this acceptable, and if not, why not?
- Do you think it possible that ETI has no such scruples about adopting that kind of programme for improving the overall intelligence of their race?

*Pause at (8.59) '...spirituality be like' and ask:*

- Might God value a highly intelligent ETI more than ourselves?
- Could ETI be more developed than us in a spiritual sense? If so, how might that superiority manifest itself?

*At the conclusion ask:*

- What significance, if any, could the life of Jesus here on earth have for ETI elsewhere?
- Would ETI require the Eternal Son of God to take on their own form? In other words are there likely to be further incarnations throughout the cosmos?
- Could ETI have developed in such a way as not to require a Saviour at all?





# Programme 8

## Round table 2

### Summary of the video

As with Programme 4, this programme consists of extracts taken from a round table discussion in which those interviewees appearing in previous programmes, having now heard what Russell Stannard and the others have had to say on the subject, have a chance to exchange views. This discussion centres on the topics discussed in Programmes 5, 6 and 7.

This type of round table discussion programme, as pointed out earlier, is very different from the other programmes, and how you choose to use it is largely up to you. It could serve as a useful recap of the themes dealt with in those three previous programmes. Your group might find it of interest to compare how these young people, taking A levels in Religious Studies or Philosophy, have gone about discussing the issues. Their exchanges might provoke your group into further consideration of some of the issues. Or, having had a preliminary viewing of the programme yourself, as chairperson, you might prefer to direct your group straight on to Programme 9.

## Points arising out of the discussion

Here is a selection of points made by the participants in the round table discussion. They might serve as a useful stimulus for further debate in your group:

*'I just accept that there is a universe. I don't see any need to ask why it is there.'*

*'Does M theory (the spontaneous creation of universes) alter things in any significant way?'*

*'Doesn't it make better sense to think of God creating M theory, which then goes ahead and produces universes for him, rather than him having to sit down and design each one individually and then create them himself in a hands-on manner?'*

*'Stephen Hawking must be right, because he is a scientist.'*

*'There's no getting away from the fact that there are hostile elements in the universe, like Weinberg says, and I believe these outweigh the life-friendly ones.'*

*'Belief in a Heavenly world depends on indirect hints we have in this earthly existence (answer to prayer, religious experience, the resurrection of Jesus, etc). If it turns out that scientists discover indirect hints of other universes in our universe, would that alter things?'*

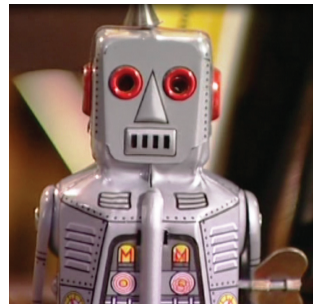
*'Scientists don't have any preconceived ideas. They are wholly objective.'*

*'You're more likely to find something if you already believe something first because you're looking to prove or disprove something.'*

*'We don't want to believe in ETI because it downgrades us humans.'*

*'Is ETI likely to be religious?'*

*'ETI could never come here with proof that there is no God. Nothing could ever prove there is no God.'*







# Programme 9

## Psychology

### Summary of the video

This programme equips us to consider and respond to these questions:

- **Who do you think provided the more accurate assessment of religion: Freud or Jung?**
- **Is it helpful to regard either religion or atheism as a mental virus?**
- **Do we have free will?**

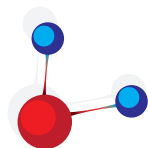
The idea of religious belief arising from wish fulfilment is attributed to Sigmund Freud, the father of psychology. He claimed that the notion of a heavenly father stems from the desire to prolong the protection we had from our earthly father when young. He describes religion as an infantile delusion. Religion is a comfort. This view may be partial. For instance, it does not take into account the challenges posed to the religious believer.

Another founding figure of psychology, Carl Jung, saw things differently. For him the image of God is at the very core of the healthy personality. Asked in an interview whether he believed in God, he replied that he did not *believe*: he *knew*.

Richard Dawkins describes religion as a harmful mental virus, transmitted from parents to children, infecting generations. It should be eliminated. But might not the argument be turned on its head? All cultures and societies have been found to be religious. Religion appears to be an integral feature of the normal state of the mind. It is atheism that is new and spreading. Would not atheism be a better candidate for being the virus?

The possibility that free will is illusory is also explored in the programme. Are our choices real? Has not the deterministic workings of the brain already laid down what the so-called 'choice' is to be?

The free will/determinism dilemma seems to be paralleled in the religious sphere by the religious question as to what extent, on the one hand, we freely choose to enter into a loving relationship with God, and on the other, we find our future has been predestined by God. For example, Jesus did say, 'You did not choose me, but I chose you'.



## Supplementary questions

In addition to the main questions posed at the end of the video, you might like to introduce into the discussion a selection of the following. In this programme there are two places where you might want to pause the play.

*Pause at (5.37) '...in the life of the mature person' and ask:*

- Does wish fulfilment play some part in your religion?
- To what extent do you think your understanding of God might be coloured by the relationship you had with your own father when young?
- Do you see your religion as primarily a comfort, or is it more like a challenge that can on occasion lead to difficult, uncomfortable decisions?
- To what extent, if at all, do you think Freud might have been right?
- Jung claimed that he did not need to *believe* in God; he *knew* God. How would you describe your own attitude to God? Is it based on belief, or knowledge?
- Jung once declared 'Among all my patients in the second half of life ... there has not been one whose problem in the last resort was not that of finding a religious outlook on life'. To what extent would you say the problems facing society today are due to a lack of a religious dimension to many people's lives?

*Pause at (7.20) '...religion or atheism' and ask:*

- According to Richard Dawkins' meme idea, which do you think is the better candidate for being the mental virus: religion or atheism?

*At the conclusion ask:*

- If one accepts that our minds are controlled by the deterministic workings of the physical brain, then we have no choices to make. So does that not mean we no longer have to make any decisions: what will be, will be? Or is the decision not to make any more decisions, itself a decision?!
- Is our relationship with God dependent on our free choice as to whether to follow Christ or not, or are we conforming to a destiny that has already been mapped out for us by God? Recall how God told Jeremiah 'Before you were born, I set you apart. I appointed you a prophet', and how Jesus said 'You did not choose me, but I chose you'.
- Could it be that God has a planned destiny in mind for us, but it is still up to us to decide whether to go along with his plan? Or might God know us so well that his plan for us exactly fits in with what we would have chosen to do anyway?





# Programme 10

## Miracles and the laws of nature

*Before your group views this video, you might like to ask them to have a guess at the sort of things they expect Russell Stannard to be saying about miracles. They can then see whether they were right!*

### Summary of the video

This programme equips us to consider and respond to these questions:

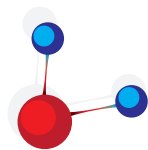
- **According to the scientific outlook, are miracles possible?**
- **Do they actually happen, or are they just superstitious fairy tales?**
- **Are they stories illustrating spiritual truths?**

Strictly speaking, a miracle is any event that can be interpreted as God being revealed in a special way. The contentious ones are those that would require a law of nature to be broken. These are the ones we shall concentrate on.

Science shows that nature very consistently follows the laws. But that does not mean science is able to rule out the possible occurrence of miracles in exceptional circumstances – like for example, those accompanying the coming of the Eternal Son of God to earth as Jesus.

Which is not to say that one can now go ahead and accept *all* the miracle accounts in the Bible, together with those reported as happening today. Some such stories might have naturalistic explanations, or could have been generated by some misunderstanding – a loss in translation, possibly. Also one must take note that ancient peoples took a positive delight in tales of wondrous happenings, so some accounts might have arisen through exaggerated claims.

One thing, however, is clear. The biblical miracle stories nearly all have spiritual meanings behind them. The miracle is a concrete analogy for the deep underlying truth. Perhaps it is to these truths we should pay most attention, they having the most relevance for us today. Perhaps we should not worry too much over whether, in addition, the account refers to an actual law-breaking miracle.



## Supplementary questions

In addition to the main questions posed at the end of the video, you might like to introduce into the discussion a selection of the following. In this programme there is one place where you might want to pause the play.

*Pause at (3.58) '...not all that surprising' and ask:*

- 'The laws of nature are God's laws, so he can do what he likes with them.' Do you agree?
- If God is prepared, on certain occasions, to perform a miracle in answer to prayer, why does he not similarly act in other cases?
- During Jesus' temptations in the wilderness, he deliberately turned his back on the performance of miraculous signs, such as throwing himself off a high building. Why?
- Occasionally, having performed a miracle, Jesus instructed his followers not to tell anyone about it. Why do you think he gave this instruction?

*At the conclusion ask:*

- In view of what was said in the video, how do you now regard the following miracle accounts: (i) The parting of the Red Sea; (ii) Jesus casting out devils; (iii) Jesus walking on water; (iv) The healing of the ear of the servant of the High Priest.
- In Mark's gospel we read that Jesus called the fishermen, Simon and Andrew, to follow him and they straightaway did so. In Luke's gospel, written later, they follow him only after there has been a miraculous haul of fish. Why do you think in Mark's account of the incident he makes no mention of the miracle?
- We are told that Jesus' miracles, unlike the silly ones recounted in the Apocryphal writings, carried within them deep spiritual messages. What do you think were the spiritual messages underlying (i) the turning of water into wine, and (ii) the raising from the dead of Lazarus?
- Has any member of the group had a personal experience of a miracle, or knows someone who claims that a miracle has taken place in their lives?
- What was your attitude towards miracles at the start of this session? Has the video and the subsequent group discussion modified your views in any way?





# Programme 11

## The relationships between science and belief

Before your group views this video, you might like to ask them, in the light of what they have learned from the series, to try to sum up how science and religion, in general, relate to each other.

### Summary of the video

This programme equips us to consider and respond to these questions:

- **Are science and religion in conflict with each other?**
- **Are they separate and independent enterprises?**
- **Do they have something useful to contribute to each other in an interactive way?**
- **Are they engaged in a common search for understanding and are potentially integrated?**

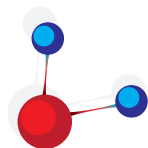
Many people believe that the persecution of Galileo, over his defence of the idea that it was the Earth that went round the Sun rather than the reverse, is typical of the Church's reactionary opposition to the progress of science. Closer examination, however, reveals that the real motive behind the trial was very different. And yet the notion that science and religion are at loggerheads with each other – the so-called *conflict model* – persists. Is there an alternative way of viewing the relationship?

Some see the two enterprises as dealing with different questions: 'how-questions' and 'why-questions'. This is the *independence model*.

Others see them as often addressing the same sort of problem, but coming at it from different angles. Each has something to offer the other. Occasionally a theologian will be the first to gain an insight into a topic (St Augustine's early ideas about evolution and the beginning of time, for example); sometimes it is science that points to the need for further theological thought (medical ethical questions, and the possibility of extraterrestrial intelligence elsewhere). This is the *interaction model*.

Finally, there are those who subscribe to the *integration model*, whereby a study of God, the Creator of the world, leads naturally into a study of God's creation through science, and vice versa: a study of creation leading to an interest in the Creator.

Which of these models is to be preferred? Or is there some truth in all of them?



## Supplementary questions

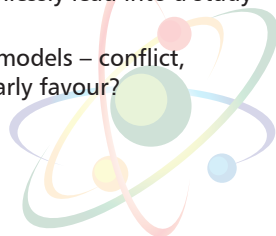
In addition to the main questions posed at the end of the video, you might like to introduce into the discussion a selection of the following. In this programme there is one place where you might want to pause the play.

*Pause at (5.39) '...collision course with science' and ask:*

- In the light of what you might have learned from the video, was the Galileo trial really a case of science versus religion?
- Setting aside the Galileo affair, are there, nevertheless, instances today of conflict between science, on the one hand, and at least certain forms of religious belief on the other (creationism, for example)?

*At the conclusion ask:*

- How would you respond to Jonathan's comment: 'Science is willing to change its views based on observations, faith requires you to ignore these observations to preserve tradition'?
- According to the independence model, science deals with how-type questions, whereas religion is concerned with why-type questions. Can you give examples of both?
- Again according to the independence model, science and religion have their own methods for arriving at conclusions. Science engages in the performance of physical experiments, often in a laboratory. What kinds of evidence do religious people seek in order to arrive at *their* conclusions?
- The interaction model holds that science and religion each have something to offer the other. Looking back over the series, can you give examples? (The group might mention Augustine's views on evolution and the beginning of time; three of the Ten Commandments – to do with killing, stealing, and adultery – might arise out of genetically influenced behaviour patterns; the impact of ETI on religious thought; ethical questions raised by modern medicine; the possible need for an evolution of the spirit in parallel with the evolution of the body; etc.)
- It is thought that one can often learn much about the character of an artist through the study of his or her paintings. For example, those of Francis Bacon are violent and tortured, while those of the monk Fra Angelico are calm, gentle, and serene. The integration model holds that a study of creation can lead one in a natural way to contemplate its Creator. Do you think one can learn anything about God through the study of nature?
- If you love someone, then you are interested in what they do. The integration model makes the claim that if you love God, you will take a natural interest in what *God* has done and is doing. Knowledge of God, should therefore seamlessly lead into a study of creation – through science. Do you agree?
- Time to vote! Let's have a show of hands. Which of the four models – conflict, independence, interaction, and integration – do you particularly favour?





# Programme 12

## Round table 3

### Summary of the video

As with Programmes 4 and 8, this programme consists of extracts taken from a round table discussion in which those interviewees appearing in previous programmes, having now heard what Russell Stannard and the others have had to say on the subject, have a chance to exchange views. This discussion centres on the topics discussed in Programmes 9, 10 and 11.

This type of round table discussion programme, as pointed out earlier, is very different from the other programmes, and how you choose to use it is largely up to you. It could serve as a useful recap of the themes dealt with in those three previous programmes. Alternatively, you could use it as a jumping-off point for a discussion of the whole series.

## Points arising out of the discussion

Here is a selection of points made by the participants in the round table discussion. They might serve as a useful stimulus for further debate in your group:

*'Just because our activities are predictable, doesn't mean we didn't choose them.'*

*'Neuroscientists claim to be able to detect the brain activity associated with the making of a 'decision' some time before the subject is consciously aware that they have indeed made the decision. Does that not disprove free will?'*

*'If the future is already determined, why would God write a bad part for me?'*

*'I think God is being unfair. Why should he choose one person to be a prophet and not another?'*

*'Just because God knows, outside of time, what your choice will be, doesn't mean you haven't made a choice.'*

*'So-called miracle cures from incurable disease might simply be because of a misdiagnosis.'*

*'Scientists want to be their own kind of God.'*

*'Has Richard Dawkins raised science to be his own religion? Does he exercise faith in science? Does he preach?'*

*'Science changes. Religion is stuck in its way.'*

*'Science doesn't come with an agenda.'*

## Concluding discussion

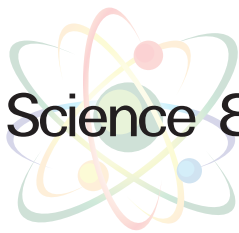
You might like to ask each member of the group in turn to say what they will remember most about this course.

- **Did they find any particular programme especially interesting?**
- **What might they have learned from the course that they didn't know before?**
- **Have their views altered as a result of what they have heard?**

Finally you might like to point out, for anyone wishing to follow up the discussion in greater depth, that there is a book of the series: *Science and Belief: The Big Issues*, by Russell Stannard, published by Lion Hudson (May 2012).







# Science & Belief: The Big Issues

## Word list

**agnostic:** a person who is unsure about the reality of God, believing that the evidence is ambiguous or insufficient to decide for theism or atheism.

**altruism:** an ethical stance that values love or unselfishness, acting for the good of others even if one's own good is not served.

**altruism on behalf of close kin:** behaviour patterns arising from codes in the DNA that lead to altruistic acts on behalf of close kin, i.e. those sharing to a large extent the same DNA code.

**anthropic principle:** the recognition that for life to have developed, certain physical conditions had to have been satisfied, and, on the assumption that there is only the one universe, this is most unlikely to have happened purely by chance.

**Apocrypha:** contested ancient books excluded from Christian scripture which are not accepted as canonical or divinely inspired in the same ways as those in the Bible. These books are still regarded as of value, but not given authority like the canonical biblical books.

**astrophysics:** the branch of science that studies the stars and galaxies.

**atheist:** a person who believes there is no God

**Big Bang Theory:** this describes the conditions of the early universe about 13.7 billion years ago, when rapid initial expansion of matter from a singular point created the conditions of the universe, such as the expansion of space, the cooling universe and the formation of matter.

**conflict model:** the idea that science and religion are in conflict with each other.

**consciousness:** the human abilities to observe ourselves, to reflect, reason, remember and predict, to be aware and to know that we are finite.

**convergence:** the recognition that certain features, such as the ability to see, and to hear, and to be intelligent, have such strong survival value that they were almost certain to evolve one way or another.

**cosmology:** the study of the universe as a whole, through astrophysics and in relation to other sciences and philosophy.

**Council of Trent:** the council held by the Roman Church in the 1540s to clarify Catholic beliefs in the face of challenges posed by the Protestant movement.

**creation question:** the theological question: 'Why is there something rather than nothing?' As such, it must be distinguished from questions to do with the origin of the universe, such as for example, 'What caused the Big Bang?'

**creationist:** a person who believes that the world was created by God according to a sacred text, e.g. Genesis 1, creation in six days; Genesis 2 creation of the Garden of Eden. Creationists prioritise the authority of sacred texts over the authority of human reason or mainstream science.

**Darwinism:** the theory of evolution as propounded by Charles Darwin, which describes and accounts for biological diversification and change through natural selection or the survival of the fittest. Darwinian evolution is often, but not necessarily, associated with atheism.

**determinism:** the philosophical belief that despite our feeling of being free to take decisions and actions, human life

is predetermined by forces we do not control, e.g. the laws of nature, genetics, the will of Allah, divine predestination.

**DNA: deoxyribonucleic acid** is a nucleic acid which carries the basis of all living organisms, a complex double helix of two long polymer molecules which holds the genetic material that makes organic life possible. DNA contains the genetic instructions used in the development and functioning of all known living organisms.

**evolution:** the biological theory that describes the development of life on earth over millions of years through natural selection and the survival of the fittest.

**exoplanets:** planets orbiting other stars, that is extra-solar planets.

**extraterrestrial intelligence:** literally, intelligence beyond planet Earth, usually the idea that there might be intelligent life on planets orbiting other stars.

**foreknowledge:** a commonly held belief that God has knowledge of the future.

**galaxy:** a collection of stars bound by their gravitational attraction for each other. Our own sun is a member of the Milky Way Galaxy.

**genetically determined behaviour:** that aspect of instinctive animal behaviour that stems from codings in the DNA that have been formed by the process of evolution by natural selection. In human beings, because we have the ability consciously to go against our innate tendency to behave in certain ways, one talks of genetically *influenced* behaviour.

**genetics:** that aspect of biological science that studies the molecular structure and functions of genes in cells or organisms.

**'God of the Gaps':** this argues that gaps in incomplete scientific knowledge is evidence for God's reality. All such

arguments are vulnerable to increasing scientific discovery.

**independence model:** the idea that science and religion are independent of each other, dealing with different types of question.

**integration model:** the idea that a study of God the Creator through theology leads naturally to an interest in God's creation through science, and vice versa.

**intelligent design:** the idea that certain steps in the evolutionary chain leading to human beings were too great to be bridged other than by the direct intervention of God.

**interaction model:** the idea that science and religion can offer helpful insights to each other.

**laws of nature:** regularities and constants in the observed universe that scientific enquiry can build upon. Such laws are true in the universe as a whole and unchanging. But scientific enquiry may revise human understandings of laws of nature, e.g. Einstein's description of gravity superseding that of Newton.

**M theory:** the suggestion that there might be a law of nature that is responsible for spontaneously producing universes such as our own. It is to be noted that no such theory has as yet actually been formulated.

**meme:** Richard Dawkins coined this idea to describe concepts or patterns of thought communicated culturally down generations of humanity. He argues that, for example, the idea of God is a meme without a reference point in reality.

**miracle:** strictly speaking any occurrence that could be interpreted as God revealing himself in a special way. More commonly, the term refers to those events that would have required a supernatural act of God,

or an intervention in the world that comes from God's will. For believers, miracles can be a support for faith, but for atheists they may be an obstacle to belief about God. Key question: if God made the laws of nature, can he or would he break them?

**morality:** a system of ideas of right and wrong conduct.

**multiverse:** the idea that this observable universe is one of many. The others cannot be observed from within this universe.

**myth:** a sacred story of gods and humanity with the function of explaining meaning and purpose in life. It was a means by which ancient civilisations passed on the fruits of their accumulated wisdom to succeeding generations.

**predestination:** the Christian doctrine that God determines our destinies in advance of our birth.

**psychology:** the study of human behaviour and the mind both as individuals and in groups.

**reciprocal altruism:** altruism shown under circumstances where there is expected to be a payback ('You scratch my back, and I'll scratch yours').

**religion:** a religion is a view of the world based in beliefs, symbols, practice, community and spiritual life. Religions usually include sets of beliefs about life's meanings, purposes, virtues, origins and destiny.

**revelation:** the idea that there can be communication from the divine to the human. Different religions claim revelation variously through, for example, miracles, sacred texts, inner life or community life. In the debates about science and religion, claims to revelation include the idea of natural theology, that God is revealed in the cosmos or the earth.

**science:** the human enterprise of seeking knowledge through observation. Experimental science uses replicable tests to gather evidence, leading to the formulation, testing and systematic understanding of the world/universe.

**SETI:** the search for extraterrestrial intelligence. This covers a number of scientific and research-based ways of exploring beyond our planet for signs of life and intelligence.

**secular:** separate from religion. This can refer to an institution (secular state, school, radio station) or to a viewpoint (ideas about society, human rights). Secular ideas may separate religion from e.g. politics, not necessarily being anti-religious.

**theology:** the study of God. The discipline that studies ideas about God and religion in systematic and rational ways.

**transcendent:** that which is beyond or outside. In theology, the transcendence of God stresses the idea that God is beyond our universe or our understanding (opposite: immanence, closeness).

**Vatican II:** the council held by the Roman Catholic Church, 1962–65.

**verification:** showing an idea, belief or proposition to be valid or true. The philosopher Karl Popper claimed that strictly speaking, scientific statements were never verified, their defining characteristic being that they could be falsified.

**wish fulfilment:** the psychological process of satisfying a desire through involuntary thinking process or patterns, for example a sense of insecurity could explain why an individual develops a comforting belief in God, horoscopes or superstition. That this psychological process occurs might explain the existence of the belief, but says nothing much about whether in fact God is real.



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