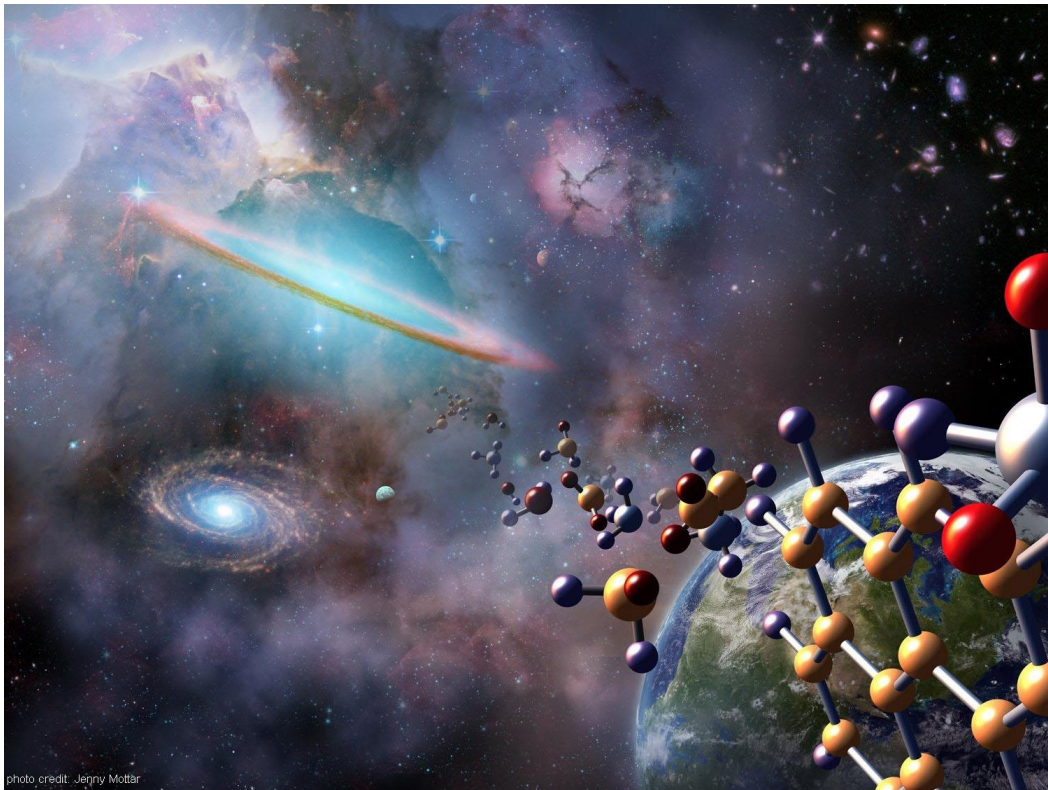


# Religious & Philosophical Questions

# Origins

RMPS  
Higher & N5



# Contents

## **Was everything created?**

- 1     Origins – An Introduction
- 2     Scripture
- 4     Revelation
- 5     Scientific Method

## **Origins of the Universe**

- 9     Genesis 1
- 11    Cosmological Argument
- 13    Big Bang Theory
- 14    Evidence for the Big Bang theory

## **Origins of Life**

- 15    Genesis 2
- 16    Teleological Argument
- 19    Evolutionary Theory
- 20    Evidence for Evolutionary Theory

## **Approaches to dialogue**

- 22    Approaches to dialogue
  - 23    Areas of compatibility and incompatibility: faith and reason
- 32    Revision Questions

# Higher Origins

## Mandatory Content

Higher	N5
<p><b>Was the universe and life created?</b></p> <ul style="list-style-type: none"> <li>• How does religion explain the origins of the universe and of life?</li> <li>• What evidence does religion use to support these explanations?</li> <li>• What are the strengths and weaknesses of evidence/explanations?</li> <li>• How does science explain the origins of the universe and of life?</li> <li>• What evidence does science use to support these explanations?</li> <li>• What are the strengths and weaknesses of evidence/explanations?</li> <li>• Can religious and scientific views on origins be compatible?</li> </ul>	<p><b>Role of creator</b></p>
	<p><b>Origins of the universe:</b></p> <ul style="list-style-type: none"> <li>• Big Bang</li> <li>• Literal and non-literal</li> <li>• interpretation of creation stories</li> <li>• Religious explanations only</li> <li>• Scientific explanations only</li> <li>• Both religious and scientific explanations</li> </ul>
	<p><b>Origins of life</b></p> <ul style="list-style-type: none"> <li>• Evolution</li> <li>• Interpretation of creation stories</li> <li>• Literal and non-literal</li> <li>• interpretation of creation stories</li> <li>• Religious explanations only</li> <li>• Scientific explanations only</li> <li>• Both religious and scientific explanations</li> </ul>

# Introduction: Origins?

Where did we come from? Where did the earth come from? Why am I here?

These and many other questions have been around for a long time. They are important in people's lives as they try to find meaning and purpose for their existence, and to understand the environment around them. Yet so many people struggle to come up with answers, or to agree with the answers that others give. Why is this so difficult to do? One of the main reasons is that people look to different sources for guidance in their lives, some to religion and others to science.

Many people think that science and religion are complete opposites and deal with completely separate spheres of understanding. However, others feel they are in conflict with each other. In many cases, people feel that science has 'disproven' religion and that religion is no longer relevant. However, across the world, people still follow the teachings of religion and so it must still be relevant in today's society.

In this unit, you will study the different approaches science and religion take to understanding the world, where these are similar and where they differ. You will also study the arguments from each side regarding the origin of life, as this is one of the key issues that highlight the differences in the two approaches.

## *The pursuit of knowledge*

Both science and religion are ways in which humans try to understand the world around them and the purpose of their existence. They are ways of seeking knowledge.

The branch of Philosophy which deals with knowledge and how we acquire it is known as EPISTEMOLOGY. Epistemologists identify two major ways in which we gain knowledge; by using our *senses* and by using *reason*. Philosophers call knowledge acquired by using the senses *a posteriori* knowledge. We can also call it **empirical knowledge**, empirical meaning detectable by the senses.

Other things we can work out without using our senses at all; just thinking will suffice. We know that a triangle must have three sides, even if we never saw one, because this is something which is true by definition. We know that parallel lines will never meet because if they did they would not be parallel. Knowledge that we know to be true without using our senses, but just by thought and reason is termed *a priori* knowledge.

However, there is a third type of knowledge, and it is perhaps the most common. This is the knowledge that we gain from others, second-hand knowledge. It is authoritative knowledge. One of the great things about being a human is that we don't have to work out everything first hand for ourselves. The past wisdom of humanity is available to us. Each generation can pass on its received wisdom through the education of its youth. Science seeks understanding using these types of knowledge and you will study its methods more carefully later.

# Scripture

Christians believe that God has revealed himself in the story of the people of Israel, in the lives of significant individuals and events in the history of Israel – Abraham, Moses and the delivery from slavery in Egypt, King David, the Prophets and others. God was revealing himself in a particular way to save humankind from sinfulness. For Christians, this reaches its climax in the life, death and resurrection of Jesus of Nazareth in whom they have the forgiveness of their sins and are restored to their rightful relationship with God.

In the first instance these events were handed on by word of mouth so that their importance could be preserved for future generations. However, they were consigned to writing at various times and places and were eventually gathered together into what we now know as the Bible. Christians believe the Bible is the word of God, but they can mean different things when they say this.

## *Literal interpretation of scripture*

Some Christians believe that the Bible is God's word. These Christians believe that what is written in the Bible has to be taken literally as an exact record of what happened. So, for example, in relation to the book of Jonah in the Bible, which tells the story of Jonah being swallowed by a great sea monster, they would accept it as an accurate account. They believe that this was exactly what happened. These Christians are sometimes called fundamental Christians or *literalists*.

## *Metaphorical interpretation of scripture*

Other Christians understand the Bible to be the word of God in a different way. They would say that the Bible contains the message that God wants to communicate to them for their salvation. This approach avoids the temptation to make the Bible answer problems that the Biblical authors could never have thought of. Why do these Christians take this view?

They are influenced by what is called '**Biblical Criticism**'. This is an unfortunate term because in the English language the word 'criticism' is seen as something negative, but this is not what is meant. The word 'criticism' has its roots in Greek and actually means 'to judge' in the sense of evaluate. What this means, then, is that scholars take a particular book of the Bible and embark on a careful analysis of it, and this can take various forms. One form approaches the Bible as literature and looks at the way in which the author has composed the text, the techniques they have used, how they are using their characters if they are telling a story. When speaking of Biblical criticism most people refer to what is known as *historical criticism*. This involves seeking knowledge about the author's background, the problems he was facing, the people he was writing for and their particular situation at that time. This also involves a judgement about the type of writing the author is dealing with: is it history, poetry, law?

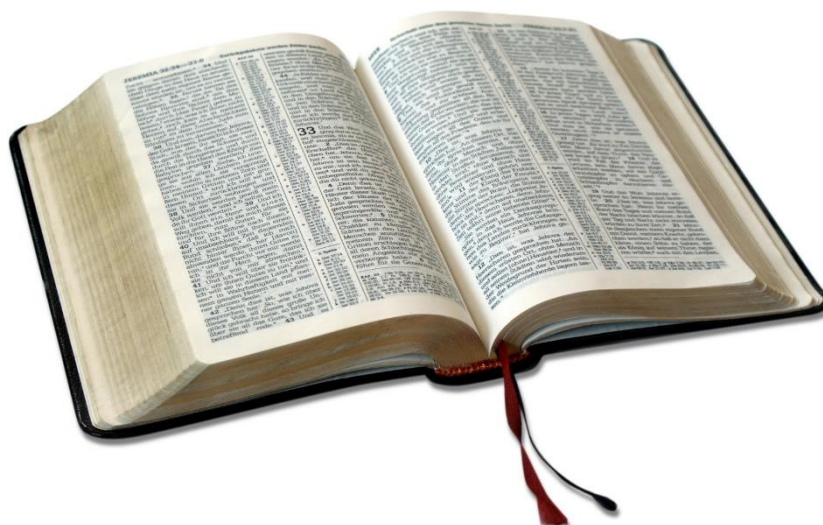
This approach to the Bible tries to get to the heart of what the author was really trying to say to those for whom he was writing. It does not mean that God is not involved in the process of inspiring the Bible, but what it does recognise is the importance of the context in which the limited human knowledge of the author was at work. These Christians are often known as **liberal Christians**.

### **LITERALIST VIEW**

- If it is in the Bible – then it’s true.
- It is God’s word which is infallible
- God can do anything – he made the world the way and time scale he wanted.
- Bible is a book of Faith not science
- Creation story is a simple form for humans to understand and points to God as a creator. God didn’t need to go into very specific detail.
- The Bible is timeless; truths apply to all ages.
- Science is always changing – the Bible doesn’t.

### **SYMBOLIC VIEW**

- Symbolic rather than factual (a “day” may be a “period of time”)
- God can do anything but the story is in “pictures” so humans can understand it better. (I.E. no physics or complicated maths at the time the Bible was written)
- Bible is a book of faith which points to God as the creator but uses story and symbolism.
- The Bible is a spiritual book not a book of science. It should be seen in cultural context.



# Revelation

Religion also seeks understanding, and many religious people, including Christians, believe that they have been given authoritative knowledge, but not just from others, from God himself. The giving of this knowledge by God is called **revelation**. Revelation comes from the Latin word *revelare*, which means 'to remove the veil'. In the first instance, revelation has been understood to mean that there are certain facts or information that can be communicated about God and expressed in sentences.

Contemporary theologians tend to view revelation in a more 'personal' manner. God does not so much reveal facts about himself, but actually discloses who he is in himself. Revelation is about God making a gift of his own being to us: his self-revelation. In many ways it's the difference between knowing things about someone and knowing them personally.

## Examples of Revelation

- **SCRIPTURAL REVELATION.** For many Christians the Bible is the main way in which God has revealed himself to humanity
- **GENERAL REVELATION** is where God reveals his character, his wants and his desires through what he does. This can be seen through his acts of creation. General Revelation can mean simply an awareness that God is around.
- **SPECIAL REVELATION** God has chosen to reveal himself to humans in much more direct or special eg. Specific miracles – feeding the five thousand, Visions and dreams -Joseph
- **RELIGIOUS EXPERIENCE** Many Christians have argued that the only reliable way for God to reveal himself to us is through a direct experience of him communicating with us.

## Strengths of Revelation

- For some Christians there is no need to question
- Provides hope, certainty, security, comfort & guidance
- Unifying
- Unchanging and consistent
- Authoritative - does not require verification
- Provides proof of the existence of God
- Gives sense of purpose/meaning to life
- Provides morality

## Limitations of Revelation

- Problems of interpretation
- Apparent contradictions
- Can become outdated
- Possible conflict with science
- Limited to the religious community
- Unreliable - cannot be verified
- It is only there to provide a possible answer to the 'fear of the unknown'
- Tends to be an individual experience

# The Scientific Method

The word 'science' comes from the Latin word *scientia*, which means knowledge. Science is about gaining knowledge about ourselves and the world we live in. This means that there are obviously different types of knowledge: the study of how the human body works is called biology or physiology; the study of how various sounds are put into compositions is called music; the study of the use of colours, shapes and composition is called art; the study of numbers and formulae is called mathematics; and the study of the existence of God is called theology. These are all forms of knowledge (and there are many others also) and so they are sciences in their own right. However, today we are more inclined to view biology, chemistry, physics and maths as science because we believe that science is about observation, analysis and experimentation. Why is this?

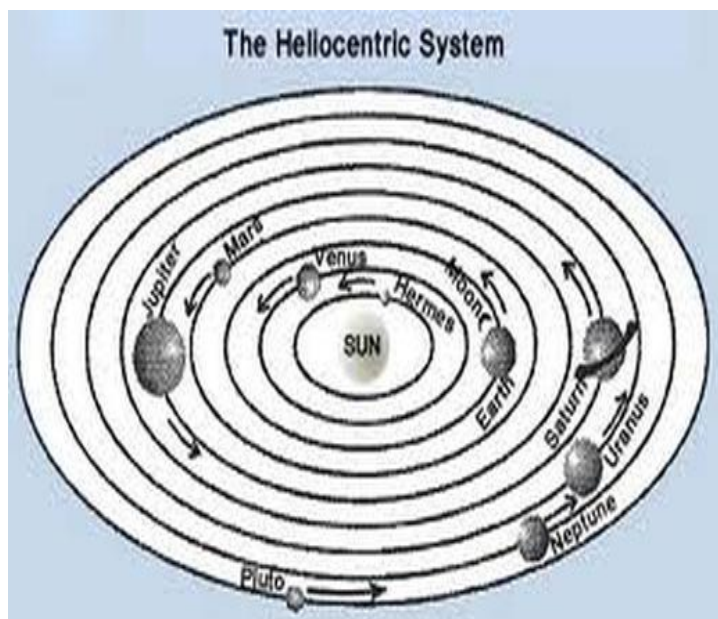
Believe it or not, the first scientists were actually religious people! They were usually philosophers and theologians who, marvelling at the wonders of the world they lived in, sought explanations for how the work of the creator God actually functioned. As time passed, however, this common purpose and vision became fragmented so that by the sixteenth century there was a separation of religion and science. Up until this time, our understanding of the world was informed by observation and mathematical calculations based on the fact that the earth was the centre of the universe. Science basically fitted in with the Christian view of the universe as expounded through the Bible and by theologians, using the physics and philosophy of Plato and Aristotle. The reality of the universe was explained in religious terms with a specifically geocentric (earth-centred) view of the universe being taught, as supported in the book of Genesis. God made the world and everything that moved therein was caused to do so by him.

Strangely enough, the first person to challenge this geocentric view of the universe was a Catholic priest named Nicolaus Copernicus! He was employed by the Church to produce a new calendar and, as a good astronomer, he set about gathering evidence from his observation of the stars to be able to do this. He noticed that there was no change in the position of the stars when they were viewed from two different places on earth and so he calculated that the stars must be further away from the earth than the sun. He published his findings in his work *De Revolutionibus Orbium* in which he claimed that the sun was the centre of the universe and that the earth went round the sun, as did the other planets, in perfect circular orbits, once per year. This was a highly significant discovery because it challenged the geocentric view of the universe held by the Church (informed by the philosophy of Aristotle) with a heliocentric (sun-centred) view of the universe based on mathematical calculations and observations. This suggested that the view held by the Church was wrong. This opened the way for others to develop the approach of Copernicus, especially in the thinking of a man called Galileo Galilei, which resulted in conflict between Church and science.

The key to understanding Galileo's ideas is based on the importance he gave to reason and observation in reaching his conclusions (he reached his conclusions by making his observations via a telescope). Galileo concluded that the world was not the centre of the universe and reasserted the Copernican view that we inhabit a heliocentric universe. His main work was the *Dialogue Concerning the Two Chief*



*World Systems* (1632), which led to the general acceptance of Copernicus' theories but brought him into conflict with the Catholic Church. Galileo was not anti-Christian, but his theories were considered to challenge what had been revealed by God in the Bible, and, because the Christian world-view of the time was a synthesis of theology and the philosophy of Aristotle, Galileo seemed to be challenging the entire system on which the Church's world-view was based. He was inevitably put on trial as a heretic and was found guilty, forced to recant, and his works were banned.



Galileo believed that in discovering more about the universe we actually discover more about God, and that science and the Bible were complementary to each other. However, by showing that we could gain knowledge about the world by observation and mathematical calculations, his theories paved the way for understanding the universe without reference to God. Scientists no longer needed to appeal to theology, the Church or the Bible as final arbiters on the way the world worked because they could determine this for themselves. This marked a massive shift in how humanity eventually came to understand its place in the world. If science can provide the answers to the great questions concerning the origins of the universe, then religion only has any use in supplying the answer to questions that science hasn't managed to answer yet, but probably will do in the future. This gave rise to the view of religion as belief in a 'God of the gaps'. God was the answer to the gaps in human knowledge.

The inevitable development from Galileo's thought was the advent of modern science. Modern science is based on the belief that the world is indeed orderly and intelligible, that knowledge can be acquired through measuring, testing and observing. This is known as the **scientific method**.

Using the scientific method, scientists gather as much evidence as possible through **observation** and ensure its relevance. This provides them with *empirical knowledge* – knowledge they have gathered through their senses. Using this knowledge, they then try to develop a **hypothesis**.

What is a hypothesis? It's quite simple: hypothesis means to propose, suppose, or literally: put under. This means that a hypothesis is an assumption that is *put under* an argument to support it, or a suggested explanation for a group of facts or phenomena, accepted either as a basis for further testing or as likely to be true.

As a result of a given hypothesis, scientists would logically expect other results to follow from an **experiment**.

If this proves to be the case then the hypothesis would be taken as **verified**, or it would be modified according to the results of the experiment, if this was necessary.

This is how scientists work out *scientific laws*. This does not mean laws in the sense of those composed and imposed by a government. Rather it means the description of how things *behave* given certain circumstances.

### OHEV: THE SCIENTIFIC METHOD

<b>O Only</b>	Observation	You observe something and you want to find out how it works, how it came to be, what caused it to be the way it is...
<b>H Hamsters</b>	Hypothesis	You gather as much evidence as is possible, making sure the evidence is relevant, and then we draw conclusions from the evidence.
<b>E Eat</b>	Experimentation	You carry out a number of experiments under controlled conditions to test your hypothesis and ensure that your hypothesis is correct.
<b>V Vomit</b>	Verification	You share your hypothesis and results with other scientists who can verify what you have found

### *The problem with science*

Descartes neatly sums up some of the problems with science associated with the types of knowledge used. If the knowledge taken from others is flawed, so then will ours be. We can never fully trust our senses because at best they are only ever our physical body's interpretation of the environment around us, and at worst a delusion in our minds. Deductive logic does not add new information to our basis of knowledge, it only takes what we already know and reforms it, so again if there is a flaw in the knowledge already there, there will be a flaw in our logic.

In fact, science only ever gives us a provisional truth, never a final truth. Earlier we mentioned the idea of verification – proving a hypothesis correct. Unfortunately, the idea of verification is a myth. Hypotheses can only be said to be correct based on the information available up to a certain point in time, as later information may come along which proves earlier assumptions incorrect. This process is more accurately known as **falsification** – where something can be proven to be wrong.

Swans are a good example of the limitations of the scientific method. In the eighteenth century, before the discovery of Australia, the only swans ever seen by Europeans were white. Thousands upon thousands of sightings confirmed the view that all swans were white – a conclusion arrived at through a process of inductive reasoning. However, the discovery of black swans in Australia falsified this theory.

The belief that science has provided guaranteed answers is often known as **Scientism**, where science has been turned into an ideology, or a religion in itself. This is rejected by most scientists who recognise the uncertainties and see science as an ongoing search for truth. They appreciate that the problem with science is that scientific theory is only the best explanation to date and is always vulnerable to future modification. This is important to remember when studying the following scientific theories on the origins of life.

## What are the strengths and limitations of the scientific method?

Strengths	Limitations
<p data-bbox="335 450 699 488">Doesn't rely on blind faith</p> <p data-bbox="335 510 699 618">Based on what we 'know' as opposed to what we believe</p> <p data-bbox="335 645 671 712">Ordered, reasoned and consistent</p> <p data-bbox="335 739 596 806">Can be verified by anyone/everyone</p>	<p data-bbox="801 443 1153 510">Not 100% proof, open to future revision</p> <p data-bbox="801 555 1098 622">Cannot answer 'why' questions</p> <p data-bbox="801 672 1153 705">Senses can be deceived</p> <p data-bbox="801 750 1129 784">Based on assumptions</p>

## Origins of the Universe

### Genesis 1

The general consensus in Christianity is that all life originated with God. There are different ideas as to how exactly this happened, but ultimately God is responsible for not only the existence of life, but of everything required to support it. They believe that God made everything from the universe down to the smallest particle and this process is referred to as creation. Christians look to God's revelation in the Bible to help them understand this creation and there are two accounts, found in Genesis 1 and 2 respectively.

Genesis 1 records how God created the world in 6 days from nothing by the power of speaking things into existence, and how he rested on the 7<sup>th</sup> day. Genesis 2 contains a description of the creation of the first man and the first woman, and how they were put in charge of the rest of God's creation.

Remember, there are two main approaches to the Bible and understanding it. Literalist Christians accept the accounts in the Bible literally as they believe it to be God's word, whereas Liberal Christians are willing to apply biblical criticism to the text and evaluate it to get meaning from it. As a result, there are some widely different interpretations as to what the Bible is teaching.

Interpretation of these passages is relatively easy for a Literalist Christian. With the belief that the Bible is the exact word of God as was intended, they read this text as an accurate account of what happened at the beginning of the universe and human life. They are sometimes referred to as *Creationists* as they believe that God created the world in 6 days and rested on the 7<sup>th</sup>. The account in Genesis 2 is an expansion of the creation story, giving more detail regarding the creation of humans. In their understanding, the universe was created with the purpose of supporting human life and humanity is the ultimate expression of God's creative power. This gives humans a unique position and purpose at the centre of God's creation.

However, interpretation of these passages is somewhat more complex for liberal Christians. While willing to accept sections of the Bible as historical, there are several key questions raised by Genesis 1 and 2 which make it difficult to do so in this instance. Looking at day four in Genesis 1, we see that at this point God puts lights in the sky to divide day from night, which are the sun, the moon and the stars. Now how can this happen on the fourth day if there have already been three days? Surely to have a 'day' you would need to have the sun and the moon from the beginning, to mark when the sun rises and a new day begins, and when the sun sets and the day ends? What is this thing that God puts in the sky to divide the waters above the earth from those below? Why is there water above the earth? On the sixth day God creates every type of living creature, so this must mean that evolution is nonsense since God has already created every creature that there could be! If this all happened at the beginning then nobody could have been there to witness it, so where did all these details come from?

These are very valid questions and they inevitably point us to the nature of the text that we are dealing with. Is it a text that must be taken literally or is it possible to

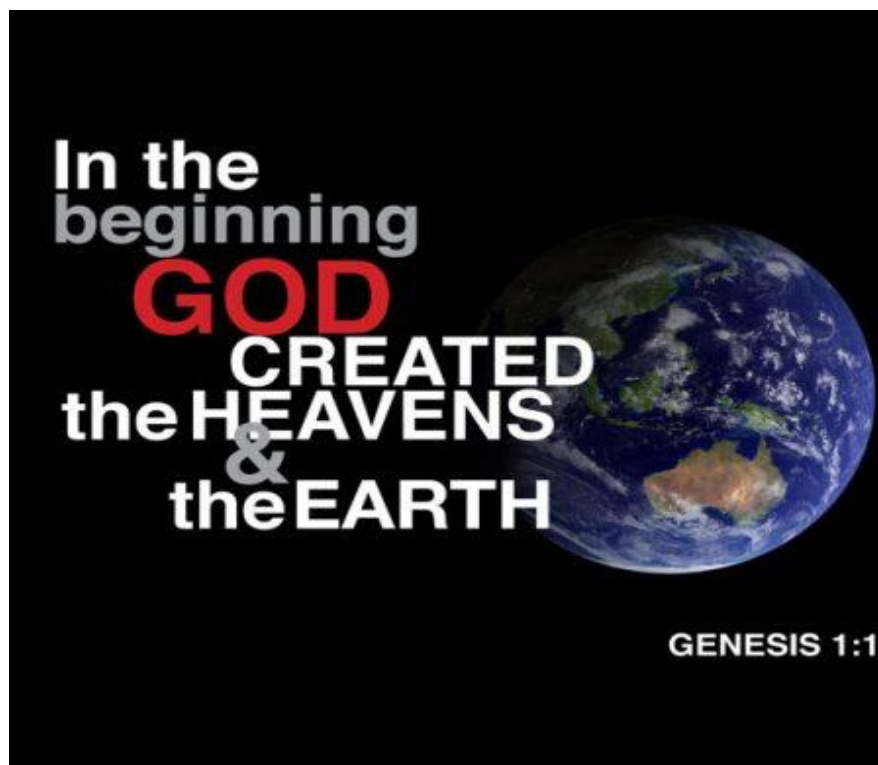
understand the text in another way while at the same time preserving the truths that it communicates?

Furthermore, the inclusion of a second account of creation in Genesis 2 raises additional questions: Why are there two accounts of creation? In Genesis 1, man and woman are created together, why in Genesis 2 is woman created much later?

Many Christians feel able to look at the Biblical account of creation and see it for what they believe it actually is: a symbolic account of God's creation, communicating very important truths about the purpose and meaning of creation. They do not believe that they must accept this as a blow-by-blow account of what actually took place, but rather are more able to articulate their faith in God's creation of the universe with what science has to say about the emergence of the world we live in.

This is not to deny what is revealed in the Bible about creation but is rather a means of understanding the origins and context in which the writing of Genesis occurred so that it can speak to them in their own context. Remember this later in the unit when we study science, as for these Christians science does not undermine faith but rather enhances faith so that it does not, in the end, matter if there was a 'Big Bang' that started the universe. These Christians believe that God could have created the Big Bang and that this is the way He began the process of creation. The working out of that process leads them to see His presence in the world:

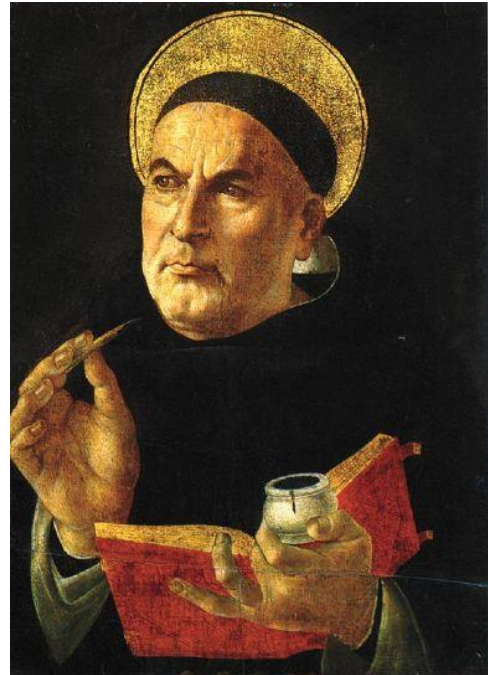
#### **SUMMARISE THE LITERALIST AND LIBERAL CHRISTIAN VIEWS ON GENESIS 1**



# The Cosmological Argument

Philosophy is the study of the fundamental nature of knowledge, reality and existence. In philosophy, an argument is a series of statements typically used to persuade someone of something or to present reasons for accepting a conclusion. One of the philosophical arguments used to support the existence of God, and ultimately his role as creator of the universe is *The Cosmological Argument*.

St Thomas Aquinas was an Italian philosopher and theologian (1224-1274). He was a priest in the Catholic Church and believed in the existence of God and felt he could prove it through reason. One of his arguments for the existence of God is known as the Cosmological Argument.



The Cosmological Argument is more than one argument. It is a series of related arguments that attempt to point to the existence of a creator God by relating to a *first cause*. However, they summarise into the same basic premise by looking at the fact of the world's existence and arguing from the experience of the world's existence to the existence of God.

The argument proceeds in this manner: Everything that exists has a cause and this cause in turn has a cause, and so on and so forth. Now this series of causes must either go on into infinity or have a starting point in a first cause. St Thomas rejects the idea of this series going on into infinity and so he posits that there must be a first cause, and this is what people would call God. Why does he argue this? Well, it is simple: I know that I exist and that I am writing these notes for you. If I am writing these notes for you then I must be the cause of these notes. The notes could not be their *own* cause because that would mean that the notes were *already in existence* before they were written down! This is, of course, logically impossible! Equally, the fact that I exist and am writing these notes presupposes that I am not the reason for my own existence and that I depend for my existence on a cause outside of myself. It is for this reason that St Thomas argues that there must at some point be a first cause, which is the reason for all the other causes in the world. St Thomas' argument can be broken down in this way:

## The Cosmological Argument:

1. Most things which exist are **caused** (or moved) to exist by something else.
2. Therefore, everything in the universe must have been caused to exist by something coming before it.
3. There must have been a **first cause** to all this as it is not logical that things go backwards to infinity.
4. At the beginning there must have been something which was itself **uncaused** to set in motion the chain of all following causes.
5. The only thing that cannot be caused by definition is God.
6. Therefore, God must be the **First Cause**.
7. Therefore, God exists.

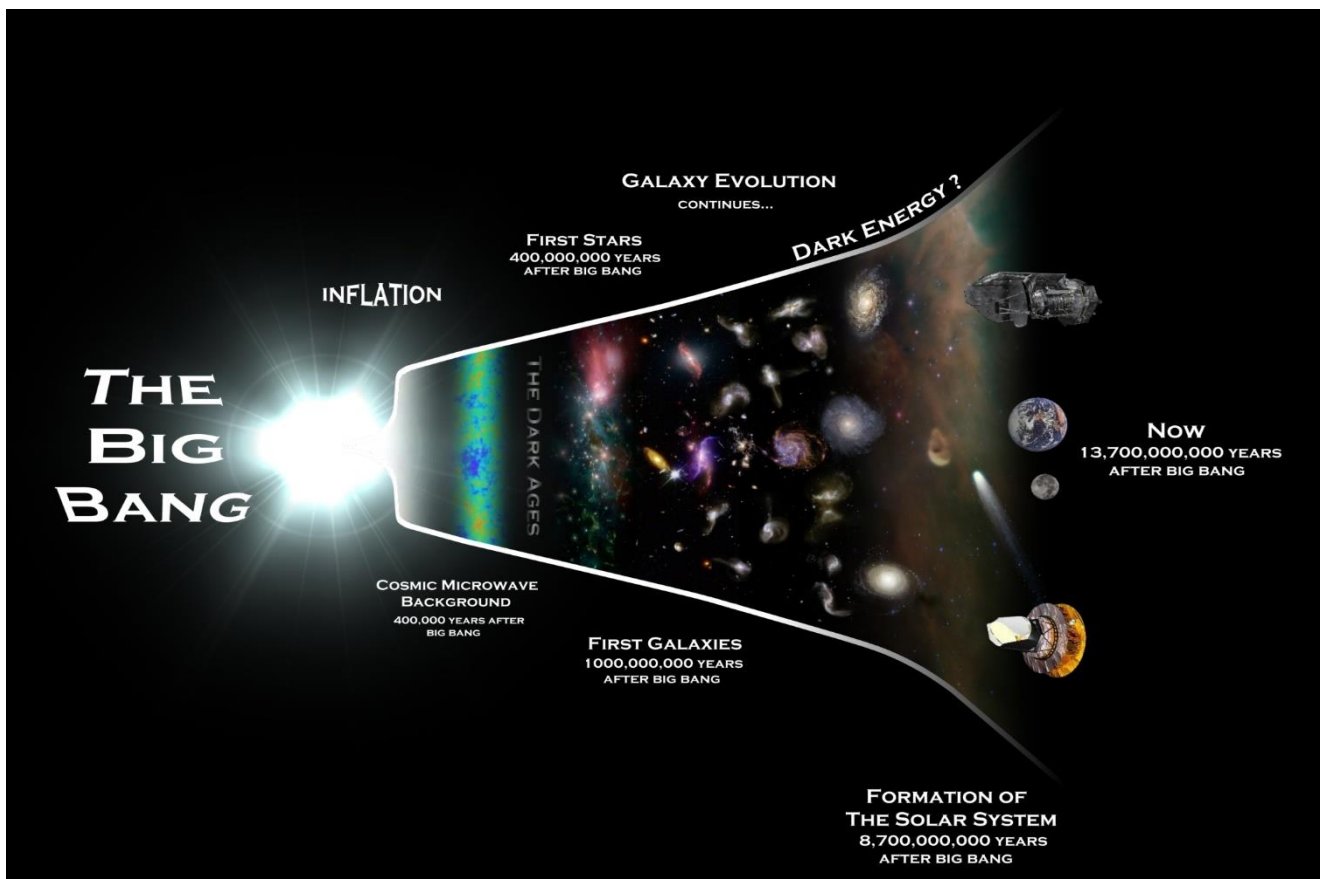
## Criticisms of the Cosmological Argument

ARGUMENTS FOR	ARGUMENTS AGAINST
God does not need a cause	...but everything has a cause, therefore so must God
God as the first cause solves the problem of going backwards infinitely	Why stop at God? Maybe an even bigger, more powerful God caused God, and so on
The first cause must have been the God of Christianity	Huge assumption and 'leap' to go from 'needs a cause' to 'it must be God', and why the God of Christianity? Maybe it was lots of Gods?
As God was the first cause this proves that he still exists	Even if God was the first cause, that doesn't actually prove that he exists or is still alive
Nothing can come into existence spontaneously without a previous cause	Therefore neither can God. Quantum physics suggests that some things can spontaneously appear/disappear without a cause. This does away with the need for an uncaused cause

# the **BiG** **BANG** THEORY

The predominant scientific theory on the origin of the universe is *The Big Bang Theory*. Not all scientists reject the idea of a creator God; however, many of them feel that these theories provide a better explanation as to the origin of the universe than a literal interpretation of a religious scripture. They believe this as they start with observation of the universe and life in it and try to find suitable explanations for it, rather than looking to a revelation from God.

This process has meant that there are also many scientists who do completely reject the idea of a creator God. They feel that science has actually put an end to the view of the universe that was put forward by the Church based on the Bible and that the idea of a creator God is a device that was developed to fill the gaps in human knowledge. Now that science has given the real answers to the origins of the universe, there is no need to use God as this kind of device.





Scientists begin by observing the universe as it is at the moment, and on the basis of their observations, try to calculate what happened at the beginning of the universe. Most scientists now agree that there was an actual beginning to the universe because it is an observable fact that the galaxies are moving apart. Those further away from us are moving away faster than those closest to us and, on the basis of this fact, scientists argue that at one time all the galaxies were actually closer together and that they are now moving apart in different directions. Scientists can therefore tell how far away a galaxy is from us based on the speed by which it is moving away from us. What they also discovered was that the spectrum of light changes if a body is moving away at a high speed in space and, detecting that some distant galaxies seemed to give off a red light, they concluded that the universe is expanding in all directions.

This brings us to the key point. If the universe is expanding in all directions, then what caused this process of expansion to take place? This is where the Big Bang Theory comes in: around 15 billion years ago there was an enormous explosion of energy which set the process of expansion in motion; this is called a *space-time singularity* by scientists. This is very important because it is the point at which space and time are created simultaneously. As a result of this huge explosion, matter in the form of hot gas spread out over enormous distances. As it began to cool down, it condensed to form stars and galaxies that now make up the universe. It is probable that approximately 4.5 billion years ago, a nearby star to our sun went supernova (essentially, died) and that the matter formed from this was drawn into the orbit of our sun and eventually created the planets of our solar system, including earth

### **The Big Bang Key Points**

1. The universe began with an 'explosion' around 15 billion years ago
2. Particles from the explosion produced the main atoms and molecules of the universe (hydrogen and helium only as it was too hot for anything else)
3. These particles expanded and cooled, clumping together under the force of gravity, to form galaxies and suns
4. Clouds of gas developed, spinning under the force of gravity, heat and stars
5. Solar systems eventually appeared including our own about 10.5 billion years ago

### **Evidence supporting the Big Bang Theory**

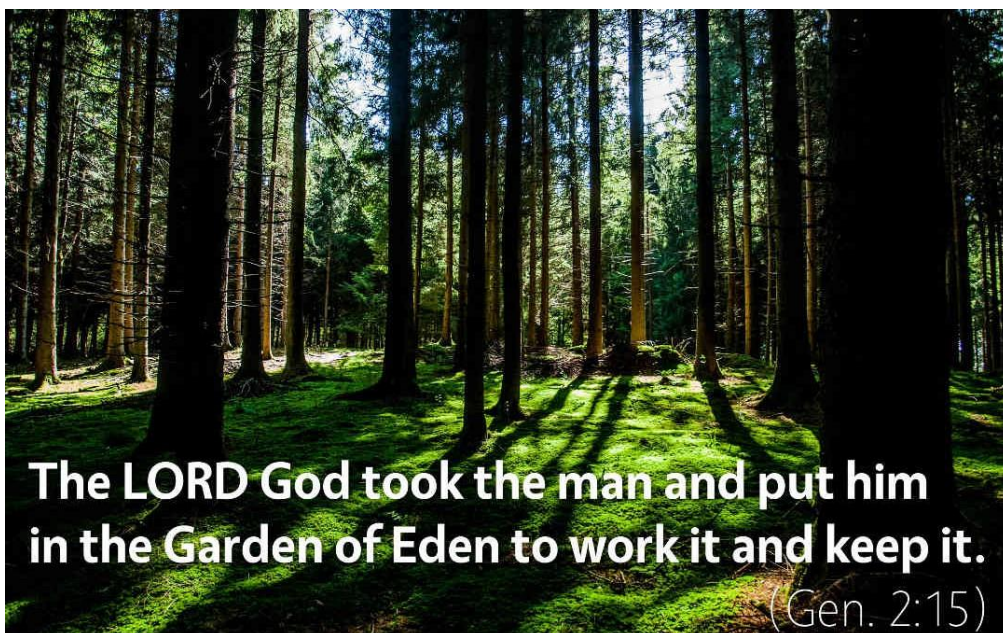
- a) The rate at which the galaxies are moving away from each other suggests the universe is expanding
- b) Light that emanates from various galaxies changes colour the further it travels away (red shift principle)
- c) Background radiation, in the form of microwaves, can still be detected from the original explosion
- d) The amount of material in the universe is just what you'd expect after a Big Bang.

## Origins of Life Genesis 2

In the same way that they are able to accept the story in Genesis 1 as pointing to the nature of God and the purpose of creation rather than a literal account, Liberal Christians are also able to read Genesis 2 and see meaning and purpose in the text.

Once again, it is important to be aware of the context in which the accounts of the creation of human life originate. When looking at these stories, Biblical criticism points to the fact that the name given to the man 'Adam' is not actually a proper name. In fact, it is more accurately translated as 'earth being/creature', and the word 'Eve' actually means 'the mother of all'. The key point of the stories of the creation of the first humans is richly symbolic. Human beings are actually made in the image of God and share in his divine life through his breathing his spirit into them. Humans are not merely material beings but are made of body and soul in order to enjoy life with God. Human beings are made male and female so that they can cooperate with God in bringing new life into existence, and they are to be stewards of the earth.

This is a brief summary of the key beliefs that can be taken from the Biblical accounts in Genesis. In essence, Liberal Christians see the accounts in Genesis as telling us something that is profoundly true about us, about who we are, why we experience life the way we do, and what our destiny is. For them, to get caught up in questions about being formed from clay or a rib, or whether or not Adam and Eve had belly buttons, is to miss the point! What Genesis does, using symbolic and figurative language, is describe what happened at the beginning of time when no eyewitness account would have been possible.



## The Teleological Argument

The Teleological Argument has existed in many forms for a long time. However, one of the most famous versions was propagated by William Paley (1743-1805).



Paley's argument is essentially an argument from design. His argument is also analogical in that it is based on analogy between a watch and the world. An argument from analogy moves from the known to the unknown and uses the following formula 'just as... so too ...' Paley uses the watch to demonstrate a design, or purpose, in the world. *Just as* the watch has been made for an intelligent purpose and has clearly been designed, *so too* the earth has a designer because it is clear from the way the world works that it must be the product of a designer. Paley argues this from the scientific knowledge of the time concerning the rotation of the planets etc. and believes that his argument would still stand even if you had never seen

a watch before or could not work out how some of the parts operated. You would know by the very nature of a watch that there must be a designer, and the same applies to the world we live in.

The Teleological Argument looks to many aspects of nature to support the idea that the world shows evidence of design. The following examples are so well suited to their purpose that many people argue they must have been designed and could not possibly have come about by accident or coincidence:

### 1. *The Bucket Orchid*

This plant has the most amazing method of pollination. It naturally produces a rich sugary food – a nectar which is very attractive to bees (apparently the bee thinks he smells a lady bee!). When the bee arrives, it lands on the surface of the orchid near to the lip of the 'bucket'. The surface is very slippery, so frequently bees fall in, landing in a pool of liquid which has been produced by a gland in the plant. The bee doesn't drown in the substance but becomes stuck. However, there is one possible escape route. At the side of the bucket there is a tunnel leading out the side of the bucket. The exit from the tunnel is conveniently aided by a step and hairs suitably placed near the surface. As the bee is about to emerge, the opening contracts, pinning the bee down. Whilst held in this position, the plant 'glues' two pollen sacs onto the bee's back. The glue takes a short while to set so the plant carefully holds the bee in position long enough to ensure that the pollen won't fall off when it eventually flies away. Some of these sac-bearing bees are again attracted to other flowers. The bees clearly haven't learned their lesson as they frequently end up back in the bucket. This time as they approach the tunnel exit hole, a special 'hook' on the roof picks the two sacs off the unsuspecting bee's back and cross-pollination takes place.



## 2. Wings and flight

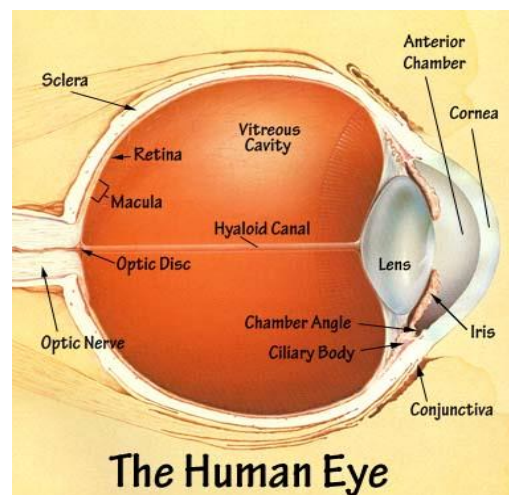
The hummingbird is an incredible creature. Most birds partly glide through the sky with their wings outstretched. The hummingbird can't do this; so to allow it to stay airborne it has to beat its wings very fast. The unique wing 'design' means that hummingbirds are the only birds that are capable of sustained hovering. To do this they must beat their wings an amazing 60 times every second! They can even fly backwards.



If you think the hummingbird has amazing wings, you might be surprised to know that insects are even more incredible. For example, the common fly has wings that beat about 200 times per second. A honey bee has two pairs of wings that can beat an amazing 250 times per second. The complex motion of its wings also lets the bee hover in one spot.

## 3. The Human Eye

Each part of the human eye plays a vital role in providing clear vision. The cornea takes widely diverging rays of light and bends them through the pupil, the dark round opening in the centre of the iris. The iris and the pupil constantly adjust the amount of light let into the eye. The lens focuses this light onto the retina at the back of the eye. The retina contains photoreceptor nerve cells that translate the light rays into electrical impulses. These are sent through the optic nerve to the brain, where an image is perceived.



## David Hume's critique of the Teleological Argument

Hume's critiques of the Teleological Argument actually existed before Paley developed his own version of the argument. Hume's position was set out in his work *Dialogues Concerning Natural Religion* (1779), 23 years before Paley, which gives some indication of the lack of attention paid to philosophical arguments at the time! So how did he deal with the Teleological Argument?

First of all, Hume does not explicitly deny that the argument works. What he essentially does is demonstrate the fact that, from his perspective, the argument produces what can only be considered a very limited God. The fact that the world has so many imperfections (tidal waves, earthquakes, diseases, etc.) would seem to point to what he calls an 'infant deity' or a malevolent God, rather than a superior designer. Moreover, he argues further that it can take many people to design and build

something that is sophisticated in its operation. Why should we not also conclude that there are many gods?

Hume goes on to argue that it is indeed possible to argue that the universe was created by chance. He admits that there is what appears to be design in the world, but he questions whether or not this actually implies the existence of a designer. Can we make the leap from admitting order in the world to a design of the world? It is entirely plausible that the world arose by chance.

Hume attacks the validity of the analogy that is used in the argument from design, and this is where many consider Paley to fall victim to Hume. Basically, Hume argues is that the analogy is not close enough to really have any value whatsoever. Applied to Paley's argument, the mechanical design of a watch is insignificant compared to the vast functions of the universe, therefore, how can they possibly be compared?

The result of these critiques is that Hume claims that we should suspend judgement on the existence, or otherwise, of God because there is insufficient evidence to prove his existence.

## **SUMMARY**

### **What is the teleological argument?**

- It is a logical argument
- Concerned with 'telos' – order and purpose in the world
- Presumes the existence of God due to the presence of order
- Another example of this argument can be seen in looking at the human eye – it is so complex and clever that it must have a designer

### **What are the strengths of the teleological argument?**

- The teleological argument uses natural science (ie. The human eye) and applies this very simply to theology and the existence of God
- It uses everyday objects to allow people to grasp the argument
- The use on analogies such as Paley's Watch are very convincing
- The human mind naturally looks for order which fits in well with this argument
- If you consider your own existence to be the centre and purpose of the universe then it is easy to see how 'design' works
- Design is easy to see in retrospect and with a selective view on the past.

### **What are the weaknesses of the teleological argument?**

- Analogy is weak (watch is mechanical but the universe is not)
- In infinite time, anything is possible
- It does not prove the existence of God
- Complexity of the world does not imply design
- It requires a leap of faith
- Natural disasters etc imply that if God is either malevolent or a poor designer
- Perhaps it took many Gods to create the universe, not just one

## The Theory of Evolution

The theory of evolution is the most widely accepted explanation of the origin of human life and is most commonly associated with Charles Darwin (1809-1882). Up until the eighteenth century, it was generally accepted that God had created all living things and had created them with a special purpose in mind (as supported by Paley's teleological argument). However, with the advent of modern science and the rise of observation as the basis of knowledge, developments in both geology and biology began to question this belief.

Layers in rock formations yielded different creatures in the older sections than those in the younger sections, or that existed in that day. Charles Lyell (1797-1875), a prominent geologist, proposed that God had created a succession of different life forms. Jean-Baptiste Lamarck (1744-1829), a French naturalist, observed that parents passed on their characteristics to their offspring. He proposed that each generation passed on its characteristics to the next and eventually different species evolved. However, while the differences and changes in species had been noted, along with the fact that generations pass on characteristics to the next, there was no satisfactory reasons as to *why* this occurred.

The theory of evolution is so closely linked to Charles Darwin as he was the first one to provide a plausible explanation of how evolution might occur in his famous work 'On the Origin of the Species' (1859). It is important to note that Darwin was a student of religion and highly respected Paley and his teleological argument. However, on a 5-year voyage around the world, he found so much evidence that he struggled to coalesce with this argument that he was compelled to look for an alternative explanation. He came to the conclusion that species did change over long periods of time and that this happened because life was a constant battle to survive.

All living creatures are locked in a fight to survive as more individuals are born than can be supported. Due to this, those that are most suited to their environment survive, and those who are not die out. This is known as *survival of the fittest*, and the process by which it happens is *natural selection*. A theoretical example of this could be a herd of deer under attack from wolves. The faster deer have more chance of escaping the threat and ultimately living longer and having the opportunity to reproduce, which means they have the opportunity to pass onto their offspring the 'fast' characteristic. Those who are too slow are killed by the wolves and never have the opportunity to reproduce. (Horse breeders carry on this process artificially, as opposed to naturally, to produce the fastest race horses.)

### The Peppered Moth

Charles Darwin accumulated a tremendous collection of facts to support the theory of evolution by natural selection. One of the difficulties in demonstrating the theory, however, was the lack of an example of evolution over a short period of time, which could be observed as it was taking place in nature. Although Darwin was unaware of it, remarkable examples of evolution, which might have helped to persuade people of his theory, were in the countryside of his native England. One such example is the evolution of the peppered moth, *Biston betularia*.



The economic changes known as the industrial revolution began in the middle of the eighteenth century. Since then, tons of soot has been deposited on the countryside around industrial areas. The soot discoloured and generally darkened the surfaces of trees and rocks. In 1848, a dark coloured moth was first recorded. Today, in some areas, 90% or more of the peppered moths are dark in colour. More than 70 species of moth in England have undergone a change from light to dark. Similar observations have been made in other industrial nations, including the United States.

The theory of evolution has been further developed by the discovery in the 1950s of DNA. We now have a better understanding of how characteristics are passed on from one generation to the next. DNA is the controlling factor in the body, determining genes, chromosomes and ultimately the creation of proteins that make up the body. Half the genes you have in your cells come from your biological mother and half from your biological father. This makes you similar to your parents. However, each new combination of genes is unique and this is what makes you different from your parents and your siblings.

While evolutionary developments happen over the course of time due to natural selection, more dramatic evolutionary changes can occur if these genes mutate in the process of a next generation being formed. Generally, gene mutations are negative and lead to offspring that are less adapted to survive in their environment. However, occasionally the gene mutation causes a change that is advantageous and makes offspring better suited to the environment, and again natural selection kicks in and the species experiences survival of the fittest.

While we now have good explanations for the latter part of the evolutionary process, the initial stages are less clear. Currently, the best explanation is that somewhere in the long history of the earth, some chance occurrence combined with ideal conditions led to emergence of simple single celled creatures, rather like the amoeba found in ponds today. Through the processes of gene mutation and natural selection, these evolved into ever more complex life forms. What happens in the process of evolution is that primitive forms of life give way to more sophisticated forms of life so that plant and animal life today can be traced back to what might be called a common origin. This means that one species can be traced to another species, although that species might be different from it. A common misconception is that humans evolved from apes, but it is more appropriate to say that both humans and apes evolved from a *common ancestor*, which in turn developed from some form of mammal and so on, to the most basic form of life at the beginning of life itself.

## **SUMMARY**

### **Evolution through Natural selection – Charles Darwin**

- A living thing depends upon its environment to survive, and it can only survive if it fits in to the environment in which it lives
- Fitting in depends, for example, on a close relationship between the living thing's biology, the food source upon which it depends and the climate in which it lives.
- The living things which were suited (or adapted) to their living conditions survived, and those which weren't, didn't.
- These adaptations developed through time as each generation passed on to the following generation the adaptation which increased their likelihood of survival
- Just as breeders select the features they want in a species and breed only from that to pass the required features on to offspring, so in the process of natural selection nature selects those species which develop the necessary features to live in any particular environment.
- If the environment changes (gradually or rapidly), then only those who are adapted to the change survive to reproduce and pass on their survival advantages to their offspring.

### **Survival of the Fittest**

This explains evolution. The characteristics of a species that help it survive are passed on until all members of that species have the same characteristic.

### **Natural selection**

The process by which a species develops the characteristics necessary to survive.

- Random mutations occur
- Some individuals have characteristics which make them better suited to their environment
- Makes them more likely to survive to adulthood
- Advantageous characteristics passed on through reproduction

### **What evidence might science put forward to support evolutionary theory?**

- Big Bang Theory
- Discoveries in Biology
- Archaeological evidence
  - Fossils
- Theories of evolution
  - Peppered Moth
- Darwin's discoveries
  - His studies of tortoises on Galapagos for example



## Approaches to Dialogue

Both of these theories have led to big challenges for Christians. The Big Bang theory seriously undermines a literal interpretation of the creation accounts in Genesis. In these, God created the universe, but the Big Bang Theory offers an explanation that requires no ultimate cause for the Universe. The Ptolemaic view of the Universe was that everything was geocentric and moved in various spheres around the earth. This had been the long-established view of the church, supported by the biblical teaching that the sun, moon and stars were created to give light to the earth. The Big Bang Theory offers a very different view of the Universe with galaxies, planets, stars etc. In Genesis 1 the sun was created after plants, but we now know that there would be no life on the earth without the sun.

In addition to this there is a problem with the relative timescales. Many Christians believe the world to be just over 6000 years old and saw creation as complete. The Big Bang Theory challenges this, with timescales for the creation of the universe at between 15-17 billion years ago and the earth itself at approximately 4.5 billion years ago. It also sees continuing change, evolution, in the Universe itself and ultimately the living beings within it.

Which brings us to the challenge that the Theory of Evolution poses for Christians. As stated, Christians believed that creation was complete, that all creatures and species had been created as intended and had remained the same since. This is known as *fixity of species*. Evolutionary theory denies this as it is based on the fact that species are continually changing and the copious evidence to back this up. In the Christian world view, humans were the pinnacle of God's creation, created in his image, whereas with evolutionary theory humans are now only another stage in the evolutionary process. Our 'image' is more like that of apes than God.

Again, the timescales are incompatible, with creation of humans believed to be instantaneous in accordance with Genesis, and yet the evolution of humans being a process over millions, and indeed billions, of years. Furthermore, Paley's argument relies on the evidence of design in the natural world, but the mechanism of evolution is one of chance.

All of these inconsistencies have called into question the reliability of religion to answer questions about the origin of life as science has the weight of empirical evidence to back it up. We have mentioned before how it has been suggested that 'God' is an explanation only relevant when we don't have the answer – 'God' fills the 'gaps' in our knowledge. So, what happens to 'God' if there are no longer any gaps in our knowledge, nowhere needing 'God' to fill? Some scientists now feel this is the position that we have arrived at and that we have no longer any need for God. This is the fundamental problem for Christians. If God does not exist, there is no basis for their faith or religion. It undermines their whole belief system. The problem is even more complex than this. It impacts on every part of a religious person's life. If God does not exist, there is no basis for morality, no guide for living life and the ever-present risk that society will devolve into chaos.

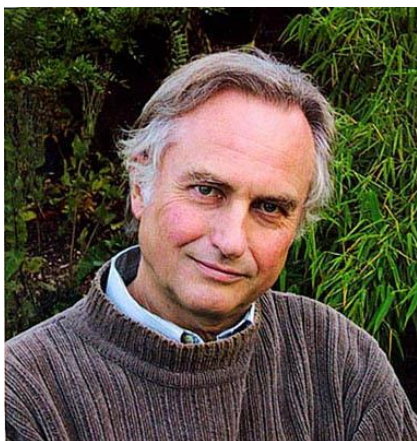
## Areas of compatibility between faith and reason

People have responded to the challenge of science in many ways. For many scientists, these theories actually put a complete end to the authority of the Bible and reduce religion to an obscurity. They feel religion has nothing useful to say about the origins of human life. As far as they are concerned, the Bible is nothing other than an archaic, outmoded way of looking at the world and human life and has been superseded by science, which gives concrete answers to the questions concerning the origins of human life.

This opinion often stems from the philosophy of *logical positivism*. This view was advanced by a group of philosophers who came together around 1922 and were known as the *Vienna Circle*. Scientists came to their conclusions based on observations, testing, measuring over a sustained period of time. In philosophy, their methodology is called *empiricism* because it is based on what is learned from experience. **Logical Positivism** was actually logical empiricism because it held that the only knowledge worthy of the name was based on what was empirically verifiable. In relation to the origins of the world, logical positivism would reject any notion of a creator God because God is not something that is empirically verifiable – we cannot prove God’s existence by observation, measurement or testing. Therefore, it is irrelevant whether or not God exists – the concept of God is entirely meaningless since it is not verifiable! This is a view that many, though not all, scientists take today, as well as many ordinary people who believe that science has provided all the answers to questions concerning the origins of the world and human life. The problem with this view, however, is that it falls prey to its own premise of verification (testability). It cannot be verified that a statement is only meaningful if it can be verified.

*To explain the origin of the DNA/protein machine by invoking a supernatural designer is to explain precisely nothing, for it leaves unexplained the origin of the designer. You have to say something like ‘God was always there’, and if you allow yourself that kind of lazy way out, you might just as well just say ‘DNA was always there’, or ‘Life was always there’, and be done with it.*

Richard Dawkins, *The Blind Watchmaker*



Richard Dawkins is a contemporary supporter of Darwin’s theory of evolution. In his book *The Blind Watchmaker* he dismisses any notion of their being a creator God and believes that anyone who argues for the existence of a God who creates human life is basing their belief on what he calls ‘Arguments from personal incredulity’. By this he means that because a person cannot think of any other explanation for the existence of the world they simply opt for belief in God. For Dawkins, the order in the world is not due to God, but rather is due to a blind, unconscious and automatic process.

Dawkins also argues that humans have a selfish gene and that we are inherently selfish because that is the way in which we have developed to survive through natural selection. We act the way we do because we are effectively robots/machines programmed to preserve our gene pool and transfer it to the next generation.

Dawkins would reject any claims that the book of Genesis says anything of value about the origins of human life. Dawkins rejects the existence of an immortal soul in human beings, but he still accepts that there is human dignity. This comes from the way in which an individual's genetic code is passed on to future generations so that we have now reached the point where we can actually try to discover the meaning of life. This, for Dawkins, is the most marvellous aspect of human development; that humans can reflect on the fact that they are in the universe!

For scientists who follow the philosophy of logical positivism, reason and faith are completely incompatible, as their idea of reason, based solely on the scientific method and empirical evidence, automatically precludes any idea of faith.

With this in mind, is it then the case that it is a matter of choosing a religious explanation of the world and risking being accused of living in the dark ages, or choosing a scientific approach to explaining the world and being accused of rejecting belief in God?

### *Christian responses to the challenge of science*

For many people in Britain today, Christianity no longer plays an influential part in their lives, and many of the questions they ask about the meaning of life in this world are answered by science. Nevertheless, there are still a significant number of people for whom Christianity is the foundation of their lives and for whom Christianity provides the answers to the deepest questions about the meaning of this world and life beyond death. How do they respond to these challenges from science?

#### **A Creationist response**

Some Christians (sometimes called 'Creationists' or 'Literalists') see the Big Bang and evolution as theories which undermine what God has revealed through the Bible. This approach is based upon the belief that the Bible alone reveals God's will and God's law, and so anything of human invention (contemporary science) that would deny what has been revealed by God cannot be accepted as providing accurate knowledge of how humans came into existence. For these Christians, what Genesis describes in relation to the origins of the world and human life is exactly what happened, because they want to maintain the fact of human life being directly created by God.

*In six days I, the Lord, made the earth, the sky, the sea, and everything in them, but on the seventh day I rested. That is why I, the Lord, blessed the Sabbath and made it holy.*

Exodus 20:11

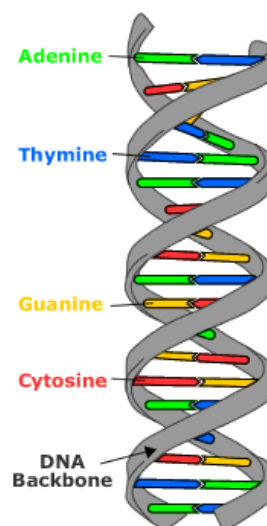
For Creationists, creation is a miracle, but it is not a miracle for God, who is the master of all things. Creationists believe that the Bible can be used to trace back to when God first created the world and Anglican Archbishop James Usher (1581–1656)

attempted to calculate the age of the world by adding the ages of the 21 generations of the Old Testament together. Usher proposed a date for the creation of the world as 4004 BC. While this date is sometimes queried, most Creationists agree that the earth is between 6,000 - 10,000 years old. This is sometimes known as *Young Earth Creationism*. It proposes a literal six-day creation. They claim that there is no fossil evidence to demonstrate that man existed more than 6,000 years ago. Genesis chapters 7 and 8 tell of a man called Noah and a great flood covering the earth and creationists point to evidence from Jewish, pagan and worldwide tribal traditions that there was a worldwide flood around the supposed time, substantiating the Biblical story.

Creationists cannot accept the Big Bang Theory because it seems to undermine their belief that God has created all that there is and that the Bible bears witness to this. For them, accepting the Big Bang Theory would mean denying that God is the creator and preserver of the universe. For Creationists the world cannot be the result of a random explosion known as the Big Bang. They believe that God's revelation is complete, and that if a Big Bang had occurred it would be recorded in the Bible. The world itself is too complex to be anything other than the result of a prime mover who has instilled his creative purpose in the whole of creation. They believe that the creation of the world was an orderly, controlled process and not the chance of a random explosion.

Similarly, Creationists reject the theory of evolution. Looking at the accounts of the creation of the first human beings, Creationists believe that God created Adam and Eve as adults, so that the Bible, and only the Bible, is seen as the source of truth concerning the origins of human life. The creation of the first humans took place exactly as described in the book of Genesis and in no other way.

Any recourse to fossil evidence for the evolution of life from lower forms is rejected on the basis that before fossils appear in rock there is no record of life of any kind. Instead, Creationists claim that fossils explode into existence suddenly, pointing to the existence of a Creator at work. Creationists reject any argument that suggests that DNA is the key to understanding the origins and evolution of human life. If you were to place the 10 trillion strands of DNA found in the human body end to end they would span the solar system, and because of this complex nature, Creationists claim that DNA must be the direct work of a divine designer and not an accident of the upward spiral of the process of evolution.



What must be made absolutely clear is that Creationists are not fools. They have clearly researched their positions very carefully and link them with what the Bible says. They are anxious to preserve faith in the fact that God created human beings and see the theory of evolution as undermining what revelation has to say on the matter. Since the Bible is the sole rule of faith and is the word of God, science has nothing to contribute to the discussion.

*We know that many reptile and mammal skeletons look almost the same structurally, even though the rest of each creature is extremely different. Of course! They were designed, not randomly evolved in some mystical evolutionary sequence. Our designer may have 'mixed and matched' parts when He was designing. The human eye is closely related to the octopus eye. Human milk is closest to that of donkeys. The human skeleton may be close to that of some primates – but so many of our other biological parts are not! Evolution is a myth and underneath the covers it is actually a spiritual deception.* <http://www.creationism.org/topbar/mutations.htm>

For Creationists, reason based on the scientific method is incompatible with faith if it contradicts what has been revealed in the Bible, as the Bible is the word of God and the ultimate truth.

### **Alternative Christian responses**

Other Christians, especially those who look to Biblical criticism to explain the nature of the stories of creation, cannot accept the position of Creationists. They believe that God is the creator of human life but are open to accepting scientific theories that add to their understanding. These liberal Christians see the Creationist position as problematic because it is based on a literalist approach to the Biblical texts and therefore, for them, completely misunderstands the nature of scripture. Scientific theories do not necessarily contradict belief in God as creator and, based on the most recent scientific enquiry, the creation of human beings probably did not happen exactly as the Bible describes it. They approach the story of creation in the book of Genesis as symbolic rather than literal.

When considering liberal Christians, it is important to note that it is an umbrella term covering a wide range of groups with a variety of schools of thought. Some of these Christians have questioned the philosophy of logical positivism, whereby the only things worth consideration as those that are empirically verifiable. They point to the fact that human existence and experience goes far beyond empirical evidence. To start, what about questions of purpose and meaning? Science can only really deal in the realm of how things happen, not necessarily why, and these Christians believe these are two very separate realms. The language we use in the realm of faith is very different to that which we use in the realm of reason, and this is because they are so distinct. For these Christians they do not overlap, one has little to say to the other.

For these liberal Christians, the question of compatibility between reason and faith is irrelevant, as each are dealing with completely separate spheres of existence and understanding.

While some liberal Christians look to distinguish between science and religion as being two separate entities, others are working towards creating a synthesis of faith and reason. They believe that, rather than disproving the existence of God, science actually points to His existence and that both Christian belief and science shed light on the same truths. Let's revisit the Big Bang Theory to see how they go about this.

If we look at these pages we know that we can actually trace their origin back to the Big Bang. They are on paper, and the paper came from a tree, and the tree grew from seeds from another tree and the whole species of the tree came from an even simpler plant, which in turn evolved from even simpler plant life, right back to the beginning of life on earth. We know that life was caused by a complex arrangement of chemicals which, in turn, can be traced all the way back to the initial explosion of energy about 10 billion–20 billion years ago. At this point we run out of causes in the universe.

This does not exhaust the questions for some Christians. They believe we can still ask *why* the universe exists and *why* it is the way that it is. The universe is contingent, and this has been shown by scientific developments in modern times that allow us to describe the behaviour of the universe as a whole. Not only do the things *in* the universe obey the laws of science, the universe *itself* obeys them! This means that the Big Bang must point beyond itself to a cause because if the universe obeys the laws of science then the cause of the universe cannot be part of the universe itself but must be outside of the universe. This would seem to suggest for these Christians that there is indeed a creator God who sets the whole process of the origins of the cosmos in motion through the Big Bang.

*My conclusion then, is that the physical universe is not compelled to exist as it is; it could have been otherwise. In that case we are returned to the problem of why it is as it is... We have no choice but to seek an explanation in something beyond our outside physical world – in something metaphysical – because, as we have seen, a contingent physical universe cannot contain within itself an explanation for itself.*

Paul Davies, *The Mind of God*

This seems to take us back to St Thomas Aquinas, and so it does, but these Christians are trying to produce a synthesis between what St Thomas had argued about the need for a first cause and what science says about the Big Bang. In response to the argument put forward by some scientists that we do not need a first cause if the chain of causality is infinitely long, these Christians would respond that because a chain is infinitely long it does not mean that it has to exist. If the chain does not have to exist, then it needs a reason for its existence. Moreover, because science has revealed that the world is not infinitely old, then infinite chains must be ruled out as logically impossible. Therefore, as far as these Christians are concerned, God is not someone dreamt up by humans to fill in the gaps in their knowledge. Rather, God is necessary if we are to make sense of the existence of the universe at all!

These Christians also take another very interesting approach to demonstrating compatibility between Christian faith in a creator God and the Big Bang. They do this by arguing for a Unity Law, which is based on the scientific fact of the existence of harmony and order in the universe. When Sir Isaac Newton ‘discovered’ gravity, what he actually did was discover the universality of gravitation. The force that makes the apple fall to the earth is the same force that makes the moon stay in orbit around the earth and makes the earth orbit the sun. Gravity, therefore, is not just something on the earth, but is found throughout the universe. Scientists have now discovered that this same gravity is responsible for the formation of the stars and the formation of the universe as a whole from the time of the Big Bang onwards.

**Rev. Dr. John Polkinghorne,  
a physicist, theologian, and  
Anglican priest.**



'...religion isn't just a question of shutting your eyes, gritting your teeth, and believing impossible things on some unquestionable authority... I think, under the skin, science and religion are cousins in the search for truth.'

Scientists have now shown, through investigations in physics, that all the fundamental laws in the universe are actually aspects of two laws – quantum mechanics and general relativity. This points to the very real possibility that there will be a Grand Unified Theory that is the foundation of all the variations that exist in the universe, which these Christians would call a 'Unity Law'. This would clearly demonstrate that the whole physical universe is not just the accidental development of the Big Bang, but is rather an ordered unity because it obeys a single law of unity:

*Thus science is discovering a single law or principle behind or above the material universe, a law which brings about everything that exists and everything that happens in the universe. This is of the greatest importance, because this discovery is remarkably similar in many ways to the idea of God. God the creator is a unity, who causes everything that exists and everything that happens in the universe. This is really strong evidence that science is rediscovering God...*

*However, there is a crucial difference between the Unity-Law and God himself. No law of science can exist by itself. The laws of science are properties of matter; they just describe how matter behaves. So the laws only exist where matter exists. Consequently, the laws of science cannot explain how matter comes into existence...*

*The only answer is that where there is a law there must be a lawgiver. The law itself cannot be the cause of the universe. God is the lawgiver, the First Cause. The Unity-Law is the expression of the wisdom of God. It shows us that God's creation manifests his supreme intelligence.*

David Barrett and Stephen Dingley (eds), *Can we be sure God exists?*

For these Christians, science does not put an end to belief in a creator God. Rather the complexity of the universe, as revealed through scientific investigation, points to the existence of God. The Bible, in its own way, teaches that God is the creator of all that is, and so reveals the purpose of creation.

Turning to evolution, these Christians do not reject this theory outright. Rather, they reject what they call Darwinism – the theory that natural selection by survival of the fittest is the mechanism by which evolution takes place. They reject this because even the simplest life forms are so complex that they cannot be explained by merely suggesting they are the result of blind chance. Whatever the process is, these Christians accept that DNA has shown the profound link between all living creatures but that the differing genetic codes drive the developments of these creatures. It is precisely this insight that alarms Creationists because they see in it a tendency towards claiming that the evolution of human beings is merely blind chance. So how

do other Christians reconcile faith in God's creation of human beings with an acceptance of scientific theories about human development? In other words, what makes man unique?

One of the first things that can be said about human beings is that they are radically different from animals. Unlike animals, humans are able to move beyond the confines of their environment and instead are able to develop their own environment. Human beings are not determined by the laws that govern matter, we control and manipulate nature to such an extent that we are marked out as being a radically different creature from any other on the face of the earth (sometimes with remarkable, and other times with devastating, effects). What is it that makes us so radically different?

Humans share characteristics that are similar to animals. We reproduce, we defend out territories, we have the need to eat and the need for shelter etc. But we have characteristics that take us beyond the animals, such as our capacity to appreciate beauty, to be creative in dance, music and song, and to think and know that we are thinking! The very fact that we can think about the whole process of creation and develop scientific theories to explain this is itself an indication of the special nature of human beings.

These Christians believe that this is due to the fact that human beings are not purely material beings as scientists like Dawkins would have us believe. All the feelings we have are not just the effect of millions of brain cells interacting but are actually due to the fact that we have a soul. Why do they believe this? They believe this because physical processes, no matter how many of them are present in the body (or in this case the brain), will always be physical processes, and human consciousness has moved beyond the merely physical processes of the body.

In animals, the brain controls their instinct. The brain is part of the material universe and it must be tuned to the cycles of nature to do its job in animals, and this happens from the things in its environment. As the evolutionary process moves on from simple life forms to ever more complex ones, the size of the brain increases and the area of the cortex (grey matter) enlarges to facilitate ever more complex behaviour. In actual fact, the human brain is three times bigger than the brain that would have been predicted for a primate of our build. For some Christians then, something unique has happened in the origins of human life that was not present in the evolutionary process until that point.

If everything in the universe, especially the brain, is under the control and direction of the laws that govern nature, then it should not be possible to break out of that control. Nature cannot break its own laws without disastrous effects. So how do we account for this transformation in the human brain? For these Christians, the evolution of the universe is not part of a random process of blind chance. As we saw earlier, the Unity Law shows that there must be a creator God. God therefore brings evolution to the point where it is possible for human life to emerge. This is known as the *Anthropic Principle*. As basic life forms evolve into ever more complex forms, accompanied by a significant enlargement of the brain, God puts in place the means by which the brain can move beyond control by the environment through the human soul. This soul gives humans the power of self-control and the conscious power to



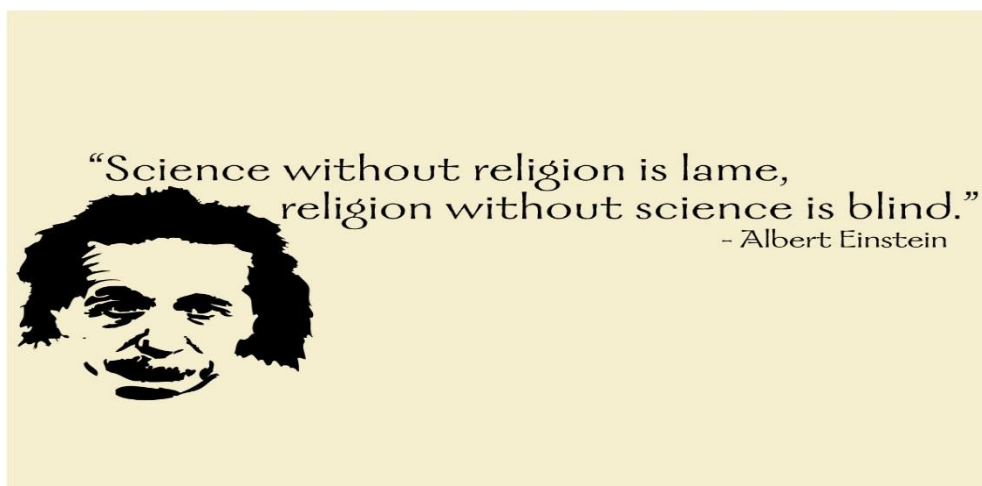
think, choose and act. It is at this moment in the evolutionary process that man emerges, body and soul in one being.

*The miracle of man is that the material mutation, which is born within nature to be this new form with this super power of energy in the brain, is by its very nature as physical directed to the order of the spiritual – to the soul, made in the likeness of God, and which only God can give ... The two principles of being that make man, the material body and the soul, must be mutually made for each other. The physical ‘formula’ which is the brain of man was ordered in the beginning as the unique and peak achievement of that Unity-Law which framed the universe in the moment of the Big Bang ... Thus in its very physical reality man’s body calls for, and is intelligible only in relationship to, that personal soul which God alone can create. God must give this soul within the womb at the very ‘moment of man’, under the very Law of His own wisdom in creating. In this way man is at once a product of the evolution of the material creation and **also** a special creation through the soul.*

Edward Holloway, *Perspectives in Theology*

With this thinking, there is absolutely no contradiction in believing that God created human life using the mechanism of evolution. They rely on a synthesis between revelation and science that brings about a complimentary understanding rather than conflict between the two. In this respect, what science demonstrates is the clear purpose that God had in mind for creation from the very beginning, that God created the world, with all its propose and intelligible order, so that he could create man and share his life with him. The book of Genesis and science both confirm the truth of this.

For these liberal Christians, reason and faith are not only completely compatible, but are, in fact, interdependent and incomplete one without the other. As Einstein said:



## Faith and Reason: Similarities and Differences

### SUMMARY

SIMILARITIES	DIFFERENCES
<ul style="list-style-type: none"> <li>• Both have similar epistemologies (ways of knowing). Observation, imagination, intuition, reliance on the authority of others and reason are all called for.</li> <li>• Both are provisional. Religions often claim to have absolute truth on their side but history shows, that like science, they change and develop over time. Religions are considered to move from polytheism (belief in many gods) to monotheism (belief in one God) to internalised monotheism (God as something inside people as opposed to being something out-there).</li> <li>• Both can be turned into absolute systems (<i>Fundamentalism</i> and <i>Scientific Materialism</i>.) with bad consequences.</li> <li>• Both use models, symbols, analogies and paradigms.</li> <li>• Neither is objective since both work on assumptions. This is obvious for religion but scientists also work on assumptions; e.g. that the world makes sense and is predictable</li> </ul>	<p><b>Science: -</b></p> <ul style="list-style-type: none"> <li>• Concerned with <b>how</b> things occur.</li> <li>• Answers empirical questions.</li> <li>• Concerned with <b>is</b> - the way the world actually is.</li> <li>• Analyses events back to more fundamental causes but tends to be silent about ultimate causes. (Science can take us back to the first milliseconds of the Big Bang, however because the laws of physics start to break down here science can't tell us about the ultimate cause of the Universe.)</li> <li>• Until recently science has tended to be <b>reductive</b> - tries to solve problems by taking things apart and examining their constituents.</li> <li>• Operates at the level of empirical reality. Beliefs based on physical Evidence</li> </ul> <p><b>Religion: -</b></p> <ul style="list-style-type: none"> <li>• Concerned with <b>why</b> the universe is here and the search for meaning, value and purpose.</li> <li>• Answers existential questions.</li> <li>• Concerned with <b>OUGHT</b>- how the world ought to be.</li> <li>• Concerned with ultimate causes.</li> <li>• Concerned with the search for liberation.</li> <li>• Tends to be <b>holistic</b> - looking for a common pattern behind the various dimensions of life- looking for the "big picture" which will make sense of it all.</li> <li>• Beliefs usually based on "faith", scriptures, authoritative individuals and institutions.</li> </ul>

**Revision Questions**  
**10 marks per essay**

1. "The origins of the universe do not point to a Creator." Discuss
2. "Life in the universe requires a Creator." Discuss
3. To what extent do non-religious views of origins rule out the need for a creator?
4. "The universe has a Creator."  
Discuss religious and non-religious responses to this statement.
5. "Religious views on the origins of life are just as likely to be right as non-religious views on the origins of life." Discuss
6. "Religious views on the origins of the universe always contradict non-religious views. How far do you agree?"
7. "Both religious and non-religious views on origins lack proof." Is this a fair assessment?
8. "Religion offers a better explanation for the origins of life than non-religious explanations." Discuss
9. "Non-religious views on the origins of the universe can be believed more than religious views." Discuss
10. "We cannot ever get an answer to origins." Discuss
11. To what extent can religious and non-religious people agree on origins of life?
12. To what extent can religious and non-religious people agree on origins of the universe?

