What is the origin of the universe?

In the last section we briefly touched upon some answers that Christians would give to questions on the origins of human life and why others would reject those approaches in favour of a scientific explanation of human origins. What we will do in this section is progress to a deeper analysis and evaluation of these approaches to determine whether or not some compatibility can be established between a Christian understanding of the origins of the universe and human life and that of scientific enquiry.

Christianity and the origins of the universe: a creator God

(You will need to have read Genesis 1 before reading this section.)

You will remember from the first section of this book how Christians approach the Bible in differing ways. Some Christians, while accepting that the Bible is the word of God, will nevertheless explore the Bible using the methods of contemporary Biblical criticism to understand the precise nature of the writing they are dealing with. Others accept the Bible as the word of God exactly as it is without question and believe that the methods of Biblical criticism are an unworthy way to approach what God has revealed. You must keep this in mind when reading what follows.

Why do Christians take such differing approaches to the story of creation? It all stems from the text of Genesis itself! Look closely at the text: looking at day four, 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? Well, another close look at Genesis will begin to help us answer this.

If you take up your Bible again and turn to Genesis 2:5–25, you will find another account of creation which is distinctly different from that of chapter one and yet communicates the same message, i.e. that God is the creator of the universe. Why are there two accounts of creation? Well the answer to that question brings us to why some Christians don't accept a literal explanation of the book of Genesis and look to Biblical criticism to help them understand the text and its message.

The first thing that must be understood is how the Bible came into existence. The Bible was not compiled as one big book. Throughout time, the people of Israel reflected on their faith in the God of Abraham, the one God. They did this in a variety of ways, through story, song, law, wise sayings and history. These were originally handed on by word of mouth (oral tradition) before being consigned to writing at a later date. When these were consigned to writing, the influence of the person writing the text would be brought to bear on the traditions he was working with. Scholars believe that the texts we are dealing with are based on a response of the people of Israel to the culture and religion of Mesopotamia and Canaan.

During their time in these lands, the people of Israel were exposed to beliefs that were incompatible with their faith in one God, because this culture believed in many gods and explained the origins of the world and human beings in relation to these gods. The great Mesopotamian account of creation is called the *Enuma Elish* and in this account the chaos at the beginning of creation is personified in a male god, Apsu, and a female god, Tiamat. These two are the source of all human beings, having first given life to gods who subsequently rebel against their parents. In this conflict, Apsu is slain and Tiamat is revealed as the dragon of chaos. She gives birth to a host of demons who attack her offspring, who in turn seek protection from other gods. The god Marduk defends them, slays Tiamat and uses the carcass to form the universe. In this world the disc of the earth rests on the seas. Over this spans the sky with the stars, and above this is the place where the rain is contained. Above all this Marduk builds his heavenly palace. Man is created by mixing the blood of a slain god, an ally of Tiamat, with clay in order to carry on the worship of

the gods. In this story chaos is the orginator of all that is and is subsequently overcome by the creator god, Tiamat.

It is in response to this that the people of Israel formed their own account of creation, which corresponds to their belief in the one God who revealed himself to Abraham and who entered into a covenant with His people. In Genesis the sole creator is the one God, not chaos. God is in control of all things, and all that is comes to be by his command, not the fighting of demons and gods, nor the carcass of a dead god. Man is made in the image of God and is brought to life by the very breath of God, not by the blood of a slain god. Man is called to communion with God from the very beginning and not, as in Enuma Elish, to slavishly indulge gods. The God of Israel is the one God who alone is the sustainer of the universe and all that is.

For this reason, 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 have to accept this as a blow-by-blow account of what actually took place, but are rather 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.

For these Christians then, 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 manner in which He began the process of creation. The working out of that process leads them to see His presence in the world:

The question about the origins of the world and of man has been the object of many scientific studies which have splendidly enriched our knowledge of the age and dimension of the cosmos, the development of life forms and the appearance of man. These discoveries invite us to even greater admiration for the Creator, prompting us to give him thanks for all his works and for the understanding and wisdom he gives to scholars and researchers.
(The Catechism of the Catholic Church, no. 283)

Other Christians cannot accept this view at all. Some of them are known as Fundamentalists or Literalists, and others as Creationists although they would prefer the term ‘creation science’ to ‘creationism’. They 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. Accepting the Big Bang Theory would mean denying that God is the creator and preserver of the universe. Relying solely on science to provide us with accurate knowledge of how the world came to be is insufficient because it depends purely on observation and is prone to missing the bigger picture.

Why do they think this? Well, they see the problem arising with Isaac Newton who laid the foundation for understanding the world as a machine and God as a watchmaker who winds the world up and lets it go on it own way. On this basis there was no longer any need to admit of divine intervention in sustaining the world and that any divine intervention would take place through cause-and-effect relationships. With God reduced to this level of intervention, all science has to do is provide the reason for these cause-and-effect relationships and God is gradually surplus to requirements. Humans can explain the source, meaning and purpose of the universe themselves! So, for these Christians, the Bible is the sole guide for what to believe concerning the creation of the world.

If you look with the eyes of faith you see God in nature, both in creation and in preservation. But if you look only with the eye of reason and of cause and effect you may not see Him. This is why the Creationist can see God while the man who does not look on the phenomena of nature with the same faith does not see him there. (John W. Klotz, Creationist Viewpoints, in *A Symposium on Creation*, Vol.1, Baker Book House 1968, pp. 34–52)

For Creationists therefore, the world cannot be the result of a random explosion known as the Big Bang. On the basis of the Bible, they will argue that God created the world in six days, but that these ‘days’ are actually a longer period of time than 24 hours. 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. Take, for example, the properties of water. The amount of water on the earth’s surface, estimated to be enough to form a layer over a mile deep spread evenly over the earth’s surface, tends to prevent sudden increases and decreases in temperature,

as for example between day and night. A rock, for instance, is very hot during the day and very cold during the night. The change in temperature of water, by comparison, is insignificant. The presence of large quantities of water in the great lakes and the oceans is responsible for the fact that that coastal cities are not as warm in the summer or as cold in the winter as inland areas: they have natural air conditioning. The Creationist Christian would argue that this is no accident but is the design of a creator God.

St Thomas Aquinas – The Cosmological Argument

Both of these groups of Christians, despite their differing approaches to the question of the origins of the world, accept one thing and that is that God is the creator of the universe. How does God create the universe? This has been explained in a variety of ways throughout the centuries and one of the most significant of these is the *Cosmological Argument*, which was developed by St Thomas Aquinas in his *Five Ways.*

The Cosmological Argument is actually 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.* They do this 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. This type of argument is called *a posteriori argument* because it uses as its starting point a given experience – the existence of the world.

The First Way: the argument from motion (cause and effect)

This argument takes as its starting point the fact of motion. Why? Well, there are many things in the world that are in motion: cars, trains, human beings, birds, etc. If something is moving then it must have been moved by something. If you follow this series of motions backwards you will eventually come to the first mover, the one who started it all off. To see the reasoning behind this, imagine you were watching a game of snooker on television and you saw the black ball disappear into a pocket. You ask someone how the black ball managed to drop into the pocket and they reply 'It just did!'. You would not accept that for an answer.

Surely the black ball must have been moved by something? Well the answer is 'yes'. It was a pink ball that moved the black ball into the pocket. But what caused the pink ball to move the black ball? Well, the pink ball was struck by a red ball, which moved the pink ball towards the black ball, which was hit and sent into the pocket. Now this backwards series can go on and on until we get to the cue ball which actually hit the first of the ten remaining red balls on the table. So we have arrived at the answer? Well, no. What moved the cue ball? Well, the cue moved the cue ball and (yes, you've guessed it) the player moved the cue!

For St Thomas, this chain cannot go on into infinity in relation the movement of the world, so there must have been a *Prime Mover*, someone who set the whole process in motion. And this is what St Thomas argues is what people would call God. God is the unmoved mover.

It is important to note what St Thomas means when he actually speaks of motion. When he uses the word 'motion' he does not *only* mean things that actually move, but also a change in size or a change in the state of something, in other words moving from *potentiality* to *actuality.* Take, for example, a piece of wood that we want to light to make a fire. Before it is lit, it is *potentially* hot. What makes it become hot is something that is *actually* hot (fire). When it is actually hot, then the wood has the *potential* to become cold again. What makes the wood actually hot, or for that matter cold, is something that acts on it from outside and changes it. When the wood is on fire and becomes hot then its state has changed; it has moved from its previous (not hot) to its present state (hot).

The Second Way: the argument from efficient causes

St Thomas' Second Way is based on what is called the *First Cause Argument*. 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:

i. In the world there are efficient causes.

ii. Nothing can be the efficient cause of itself because it would be the cause of its own existence.

iii. Efficient causes cannot go on infinitely because the first cause causes the next, and so on, to an ultimate cause.

iv. If you take away the cause you take away the effect.

v. If you take away the first cause among efficient causes there can be no other causes in the world, neither intermediate nor ultimate causes, and this is plainly false.

vi. Therefore, it is necessary to admit a first efficient cause, to which everyone gives the name God.

The Third Way: the argument from possibility and contingency

St Thomas' Third Way is based on arguing from the *contingency* of things in the world. Contingency means something has a dependency for its existence because it need not have existed in the first place, or could have been other than it actually is. Again this is based on observing things in the world.
When we look at things in the world we know that, even although they exist at this present moment, there was a time when they either did not exist or existed differently from the way in which they do now. Things are brought into existence and then they go out of existence. This is particularly true of human life, and therefore human life is contingent; its existence depends on a whole series of other factors. In other words, everything in the world points beyond itself to something else. This is where St Thomas makes his critical move in the argument. He argues that, if all beings were contingent, then at some point there would have been nothing in

existence since all things depend on something outside of themselves for the their existence because at some time they did not exist. However, since there are things that actually do exist, there must be something that is not contingent (a necessary being) to be the causal agency for the things that are contingent, and this is what we call God. St Thomas' argument can be simplified as follows:

I. Some contingent beings exist.

II. Therefore, if these contingent beings exist, the necessary being which causes these to exist must exist.

Some criticisms of St Thomas' Three Ways

The argument from motion

Some people today argue that St Thomas Aquinas' argument is no longer valid because he is thinking within a cosmology that is different from ours. Scientific discoveries have helped advance our understanding of the world we live in so that we now know that two cold things being rubbed together will actually provide heat. It has also been observed that human beings and animals move themselves!

The argument from efficient causes

If you begin with the premise that nothing can cause itself, then surely it must follow that God is also caused? Moreover, why can we not assume that the world has no cause and that it simply exists? This was picked up by David Hume in his *Dialogues Concerning Natural Religion,* when he argued that even if the universe did have a beginning it does not necessarily follow from this that anything caused it to come into existence.

The argument from possibility and contingency

Some people would argue that the world is not contingent but is actually necessary. They argue that objects may come into existence and then perish, but the matter from which they are made is eternal and carries on necessarily. The world therefore could not *not* exist. There are really no ultimate questions about a creator God therefore, but only questions about matter.

The First Cause Argument - Simplified

(The argument is also known as the "Cosmological argument" because it deals with the origin of the universe). Very simply the argument states that everything has a cause. Since everything has a cause, the universe must have a cause. The name we give to this first cause of the universe is God. Let's unpack the argument by means of an example; a piece of chalk.

Q. Where did this piece of chalk come from?
A. From the ground? Chalk is calcium carbonate. A naturally occurring mineral.

Q. How did it come to be in the ground?
A. It is the fossilised remains of dead crustaceans that lived many millions of years ago. Their shells built up on the sea bed, forming layers of chalk.

Q. Where did the crustaceans get the calcium, the carbon and the oxygen to make into their shells.
A. From their environment.

Q. How did these elements come to be in the crustaceans' environment?
A. They were there when the earth was formed?

Q. Where did the earth come from?
A. The earth was formed from the debris of an exploding star- a supernova. A star is an element factory. In a star hydrogen atoms are fusing together to form helium atoms. When all the hydrogen has fused to helium the star becomes unstable. Helium and hydrogen atoms start fusing together to form new elements, like the calcium, carbon and oxygen necessary to produce our chalk. The energy released causes the star to explode. Such a supernova exploded close to our sun (a star) about four and a half billion years ago (4,500,000,000). The debris from this explosion was pulled into the gravitational pull of the sun thus forming the planets including the earth. So the chalk was originally in the form of hydrogen in a neighbouring star.

Q. Where did that star come from?

A. It was formed as a result of the Big Bang -the cataclysmic explosion which brought the universe into existence some seventeen billion years ago.

Q. What caused the Big Bang?
A. I don't know but let's call it something.

Q. OK. What caused something?
A. I don't know but lets call it pre-something.

Q. What caused pre-something?
A. Pre-pre-something

Q. What caused -
A. I know what your going to say - "What caused pre-pre-pre-something?" Well this is starting to get rather silly. Look there are really two possibilities : Either we carry on like this forever- that is to say there is an Infinite Regress of causes. OR 2. We eventually will get to a First Cause.

Q. So what is it, a first cause or an infinite regress?
A. If it were an infinite regress then that would mean things had no beginning. If things had no beginning then they couldn't be here now. You couldn't be here now unless you were born. The chalk couldn't be here now unless it had a beginning. So there has to be first cause. You can call this first cause whatever you want but it is usually called, "God."

Q. So God made the chalk?

How did the Universe begin?

This is one of the most intriguing questions that humanity has asked for thousands of years. Did the universe have a beginning or has it always been there?

The study of the origin and structure of the universe is called Cosmology. The study of cosmology is within the realm of physics.
It has been said that of all the sciences, modern physics offers the most fruitful dialogue with religion. This is because both religion and physics believe that the universe has order and rationality . In fact until the 19th Century, physics was generally called natural philosophy.

There are so many questions to be answered.
No one knows the exact size or age of the universe.
Our galaxy is called 'the Milky Way' but it is just one of possibly 100,000 other galaxies.
How did these come into being…and when? Will they all die out? Is earth the only planet with life as we know it, or is there another planet the same distance from a sun as we are, and with the same conditions? Did everything just happen by itself, by chance? If so, where does God fit into this huge picture, if at all? Was there a First Cause… the Who that caused the Who that caused…?

There are different scientific theories on whether or not the universe had a beginning but the most well-known are

- the Steady State theory
- the Big Bang theory
- and the Chaos theory.

Most scientists prefer the theory of the Big Bang and an expanding universe but it is not the only possible explanation of its origin.

As we saw in the first section on Scientific Method, nothing is absolutely provable; it all depends on how individuals understand and interpret the evidence. Scientists interpret the same evidence in different ways.

Science and the origins of the universe: the Big Bang Theory

Not all scientists reject the idea of a creator God; however, many of them do because they feel that science has put an end to the view of the universe that was put forward by the Church based on the Bible. These scientists believe that the idea of a creator God is a device that was developed to fill the gaps in human knowledge, and 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. So what do these scientists put in the place of a creator God?

These scientists use the *Big Bang Theory* to show that there is no creator God. However, it must be pointed out from the very beginning that scientists who *do* accept a creator God can also use the Big Bang Theory to point to the existence of a creator God.

The Big Bang Theory begins from the observation of the universe as it is at the moment, and on the basis of these observations, calculates what happened at the beginning of the universe. 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: between 10 billion and 20 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. This process eventually developed the capacities for human life to evolve on the planet that we now inhabit.

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*, Penguin 1990, p. 173)

Overview

The Big bang and the origins of the Earth

The Big Bang Explanation of the universe is supported by a great deal of evidence and is almost universally accepted. We saw how Hubble used the Doppler theory to put together the Big Bang hypothesis. Later in the 1960's two scientists working for the Bell telephone company succeeded in detecting the dying echoes of this cataclysmic event. What follows is a very brief summary of the theory.

This universe of space, matter and time came into existence some 15 - 17.5 billion years ago in an enormous explosion. Before that there was nothing at all. By nothing we mean no time, no space and no matter. (Since there was no time before the Big Bang it is meaningless to ask what was before the Big Bang.)

3.5 minutes after the explosion the basic building blocks of the universe, atomic nuclei were formed- 1 million years later the first atoms were formed (these were the atoms of hydrogen and helium when electrons joined with the nuclei). Millions of years later these atoms began to form into vast clouds, slowly spinning.

These clouds were the beginning of galaxies. Within these young galaxies, smaller clouds of gas developed. The effect of gravity made them spin faster and also made them very hot; so hot that nuclear reactions occurred which produced the first stars.
Within stars hydrogen atoms fuse to form helium. Eventually, when a star becomes old, it becomes unstable and other elements start to be fused. For example, 3 helium atoms will form a carbon atom, 4 helium atoms will form an atom of oxygen and so on.
Eventually the star erupts in an explosion, throwing its elements out into space. About 4.5 billion years ago it is probable that a neighbouring star went supernova. The debris from the resulting explosion was pulled into the orbit of our sun. This matter formed the planets of our solar system.

So the universe is not infinitely old but had a beginning. Up until recently many scientists had held the belief that the universe was infinitely old. The reason why the scientific community accept that the universe had a beginning stems from a body of evidence known as the second law of thermodynamics.

Paul Davies says, "In its widest sense this law (the second law of thermodynamics) states that every day the universe becomes more disordered. There is a sort of gradual but inexorable descent into chaos. Examples of this law are to be found everywhere; buildings fall down, people grow old, mountains and shorelines are eroded, natural resources are depleted.....

At first sight there seem to be many counter-examples of this law. New buildings are erected. New structures grow. Isn't every new - born baby an example of order arising out of disorder? In these cases you have to be sure you are looking at the total system, not merely the subject of interest. The concentration of order in one region of the universe is always paid for by increasing disorder some-where else. Take the construction of a new building, for example. The materials used inevitably deplete the world's resources, while the energy expended in the building process is also lost irretrievably.

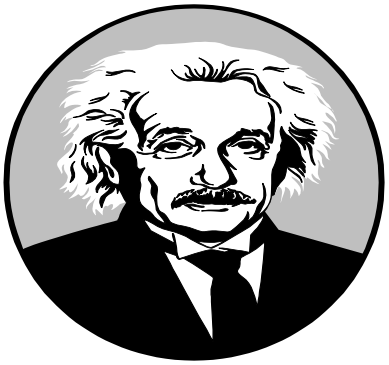
When a full balance sheet is drawn up, disorder always wins.....
Physicists have invented a mathematical quantity called entropy to quantify disorder, and many careful experiments verify that total entropy in a system never decreases.....

If the universe has a finite stock of disorder, and is changing irreversibly towards disorder two inferences follow. The first is that the universe will eventually die, wallowing, as it were , in its own entropy. This is known among physicists as the heat death of the universe. The second is that the universe cannot have existed for ever, otherwise it would have reached its equilibrium end state an infinite time ago.

Conclusion: the universe did not always exist.
The universe is not infinitely old nor is it infinite in size. According to Einstein it can be imagined as the surface of a sphere bending back on itself, without edges.

A further major argument against an infinite universe is based on logic for in an infinite universe anything would go. All possibilities would become inevitabilities as the combination of conditions which produced the present situation were endlessly
repeated with an infinite number of variations. This would lead to some impossible consequences. Think about it - as well as the normal you here, there would inevitably have to be an infinite number of exact copies and very near copies of you. Somewhere you would be the prime-minister, somewhere else you would be suffering in great pain, somewhere else

you would be Cliff Richard as the conditions that made you were repeated over and over again in an infinite multitude of variations.


Albert Einstein

Einstein, like most other scientists in the early part of this century, believed the basic structure of the universe was static and unchanging. When Einstein proposed his General Theory of Relativity in 1917, he and some other scientists saw a difficulty, because his theory implied that the universe was getting bigger. So Einstein introduced the idea of a 'cosmological constant' which stopped the universe getting bigger. He realised later that this was his 'greatest blunder' when a Belgian priest Abbe Georges Lemaitre convinced him that the universe was in fact expanding after all….

An expanding universe – key dates in the story

1922 and 1927

A Russian meteorologist Alexander Friedman in 1922 and a monk Georges Lemaitre in 1927, both came to the same conclusion independently, that the universe was expanding and that it must have had a beginning with the explosion of a primaeval atom. They may be said therefore to have 'fathered' the Big Bang theory.

1929

In the 1920's, astronomers believed the universe was less than 200,000 light years in diameter. However, an American astronomer Edwin Hubble noticed that light coming from very distant galaxies was shifted towards the red end of the spectrum, therefore very far away.

- This suggested that the galaxies were rushing away from each other
- If that was the case, they must have been closer than they are now.
- The universe must have therefore been hotter and denser.
- Maybe then the universe had a beginning and an ending.

1948

A group of scientists one of whom was George Gamow, proposed a 'Big Bang', a primal explosion for the universe's beginning, but his theory did not seem plausible at the time.

1963

The next piece of evidence was when astronomers discovered small new very bright objects further over to the red end of the spectrum, moving very fast.

These were called quasars and their brightness was evidence that they were moving very fast indeed, over billions of years.

The development of the Big Bang theory

Some scientists preferred a Big Bang theory but more evidence was needed and this was discovered mostly by accident.

1964-5

Two scientists called Arno Penzias and Robert Wilson were working at the Bell Laboratories a satellite communications system in new Jersey.

They were trying to detect cosmic microwave background radiation but found that a constant hiss was ruining their experiments. At first they blamed pigeons roosting on the antenna, but even when the pigeons were removed, the hiss was still there.

It was in fact background radiation and it was everywhere. Physicists from Princeton University, led by Robert Dicke, realised the importance of this discovery. Dicke realised that this background radiation provided a really important clue to the origin of the universe.

Therefore the evidence for the Big Bang was:

1. The universe was expanding; galaxies were rushing away from each other
2. There was background radiation in the universe
3. Experiments seem to fit in with the theory that the universe began very hot and dense before it expanded
4. Experiments on the distribution of hydrogen and helium in the universe pointed to the likelihood that there was once a massive explosion

The Challenges to Christianity of the Big Bang theory.

- If the Universe began 10-15 million years ago, how does that fit in with the 6 day Creation story in Genesis 1?

♦ The word 'creation' should not be used as it is misleading. Scientists don't need to speak about' Creation' in the 21st century because they have precise explanations of what happened. People just used the words Creation and Creator in the past because they did not have any scientific explanations.

♦ If there are very precise explanations of how the universe came into existence, is a God needed at all? Didn't it all happen by itself, by chance?…..

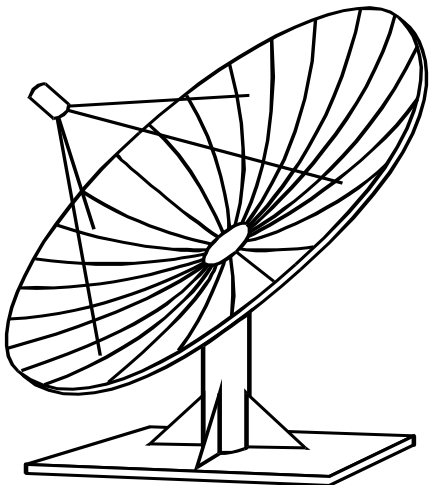
"a universe with no edge in space, no beginning or end in time, and nothing for a creator to do." (Carl Sagan writing about Stephen Hawking's book 'A Brief History of Time')

♦ The universe is vast. Doesn't that make it too impersonal? How can there be a loving God interested in one small planet, when there are so many galaxies in the universe?

"The more the universe seems comprehensible, the more it also seems pointless"
(Nobel Prize winner for physics Steven Weinberg)

♦ According to a Christian writer in the thirteenth century called Thomas Aquinas, there must be a 'First Cause'. He said that the chain of explanations: Who made the who that made the who……?? can't go on for ever. There had to be something there first that did not need a cause. It just exists. This, he said, must be God. However, it could just as easily have been the universe that was there first. A famous philosopher and humanist called Bertrand Russell wrote

"If there can be anything without a cause, it might just as well be the world as God, so there cannot be any validity in that argument."



Christian Responses to the Challenges

♦ What about the 6 days of Creation?

Christians understand Genesis 1-3 in different ways.
Some Christians take the stories of creation literally, meaning happened exactly as described. These Christians are called Creationists and they therefore believe that the scientists are wrong about the Big Bang and the millions of years timescale.

Other Christians understand the stories as being symbolic.
There are two stories in the Bible; only the first mentions time.
This particular story, in Genesis 1- 2v4 is saying that God is the mind behind the whole universe, including earth. It is not meant to be a scientific account.

- It all depends what you mean by 'creation'. The word 'creation' doesn't necessarily mean the opposite of a scientific explanation. In his book 'The Big Bang', Joseph Silk calls one section of his book 'The Physics of Creation'. Creation is the word used at the very beginning of his book when he writes:

"The Big Bang is the modern version of creation" (p115)

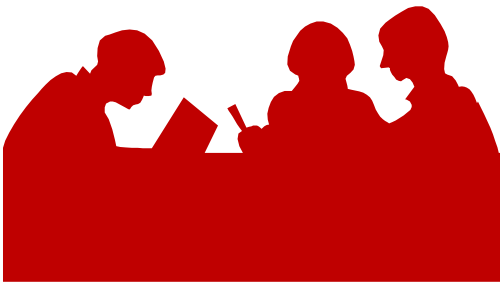
The word 'creation' is only in conflict with science when it is used to describe the creation of the universe in 6 days. In 1951, the Pope declared that the Big Bang was compatible with the Christian doctrine of Creation.

- Didn't it all 'just happen'? Many scientists such as Paul Davies and John Polkinghorne discuss the 'fine tuning' of the universe. There were a number of things that had to be just right, for the universe to end up with our existence on earth. This is called the Anthropic principle.

- Is the universe too large and impersonal for any God to care? As individuals we seem to be very small and insignificant when we think about the size of the universe. But the question is, does size matter for our worth as human beings? We are devastated when someone close to us dies. So if size is irrelevant for how much we care, it is the same for God.

- The 'First Cause' of Thomas Aquinas. None of the above proves God's existence, but shows the distinct possibility that there is a 'Mind' behind everything, that there had to be a start somewhere. Time and Space did not exist before the Big Bang so what was there before the Big Bang? Albert Einstein was himself a believer in God and wrote..

'When I see the glories of the cosmos, I can't help but believe there is a divine hand behind it all.'



Points of View

Karl Barth – Traditional theologian – stated that God is known through revelation (a direct experience of God) and not through science.

Rudolph Bultmann – Existentialist theologian - states that God acts in experience not in historical fact. Religion and science therefore operate in separate spheres of reality.

Creationists state that Genesis is literally correct. Science is wrong and misleading people.

Some Christians argue that science is important but God acts directly in the universe too, so science can never provide a total world picture.

Another point of view is that the process of creation should have a totally scientific explanation. God is not a God of the Gaps. If God exists then he must be in and through the whole process, not used for what science hasn't yet discovered.

Thomas Torrance, a former professor in theology and the philosophy of science, states that religion and science do not need to contradict each other. People today are moving away from 19th century attitudes of conflict to the opinion that science actually enhances religion.

"Physics like theology draws people towards thinking about reality"

They can easily fit together to give a total picture of reality. The important thing is to have an open mind.

In Torrance's view, the new physics has created a new attitude to the universe as a whole in the following ways:

- Science helps theology in terms of its methods of analysis
- Science gives theology a larger understanding of the universe
- Both theology and science are built on human experience and interpreting that experience
- Both theology and science are motivated by belief

A Reductionist or Holistic understanding of the universe

Reductionist – all reality is reduced to a mechanistic explanation. Everything, including human emotions, such as falling in love, caring for each other in society, or the appreciation of art and music, are only the result of the interactions of forces and particles in our brain.

Holistic – reality is more than purely physical or chemical reactions.
A piece of music, a work of art or a poem is more than just dots on a page. There is a spiritual dimension to reality, especially in a complex human being.

For a reductionist view of reality

Jacques Monod – a biologist wrote
"Mankind is nothing but the product of chance; human bodies are nothing but the bearer of genes."

Richard Dawkins in his book 'The Selfish Gene' states that human beings are nothing but a collection of cells, carriers of genetic information. Human qualities such as caring for others, are part of the genetic survival process. There is no such thing as spirituality.

Simon van der Meer, Dutch physicist at Cern said
"To be a physicist you must have a split personality if you're still going to be able to believe in a God."
To der Meer only science can predict reality. Religion is a source of self deception and fanaticism.

Against a reductionist view of reality

John Polkinghorne- a particle physicist- states that the whole is always more than the sum of its part. Animals are a collection of atoms but you don't describe them in terms of atomic physics.

Ian Bradley in his book 'God is Green' feels that reductionist beliefs are very negative. The perception of science both in biology and quantum physics is that of an underlying interdependence and wholeness at the very heart of nature. *"Qantum physics suggests that at the deepest level the universe is a single unified whole."*

Key Points

Origin of the Universe – Science: The Big Bang

- Galaxies moving away – red light observed
- Shows that universe had a point of beginning
- Massive explosion of energy – a 'singularity'
- Star stuff' (ingredients) emerged from this explosion
- Hot gas cools, condenses to form stars and galaxies
- Protons, neutrons and electrons – building blocks of atoms
- Over billions of years this 'stuff' evolved into the universe as it is today
- Life emerges from this
- Universe is between 12-15 billion years old
- Cosmic microwave radiation confirms Big Bang
- Hydrogen and helium proportions lend weight to discovery

Origin of the Universe – Christianity: Genesis

- In the beginning there is nothing
- Void and formless
- God creates order
- God creates planets/light/dark/day/night/etc

Big Bang & Revelation

Creationist Response

- Scriptures are factual
- Big Bang is a theory
- Science has been wrong in the past
- Bible comes from God, therefore it cannot be wrong

Compatibility

- No contradiction
- Big Bang is method used by God
- Revelation contained in nature
- Bible has to be viewed in context
- Science can be revelation too

Scientism

- Reject revelation, based on faith not empirical evidence
- Proves uncertainty of some Christians
- Based on blind and obstinate faith
- Scriptures are not objective
- Contrary to what is observed and evidence

First Cause Argument

- Based on Reason, everything requires a cause
- Everything must have a beginning or start – a first cause
- Based on what is observable
- The thing that caused the universe must be greater than the universe
- The only thing greater than the universe is God
- God is uncaused – necessary, not contingent

First Cause Limits

- Claim that everything requires a cause
- Therefore, God requires a cause
- Contradictory
- Universe cold be infinite
- Universe may have always just existed
- First cause may not be God
- May not be ‘God’ as we think of him