incomplete and beyond all rational comprehension - not least because some are totally weird or crackpot!

One thing they are agreed on. It will take decades or even centuries to come to any conclusions, so complicated is the mathematics involved, and it will involve the work of thousands of scientists. So science does not have an answer to that basic question: what's the universe for, and where do we fit in?

A Christian answer

Back to that statement in the Bible about God as the creator: "in the beginning." In the New Testament, that part of the Bible which tells us about the life and work of Jesus Christ, and his immediate disciples, there is an even more remarkable statement. It is in a letter written by Paul of Tarsus, Jesus' greatest disciple, to one of the earliest Christian churches in a city called Colossae.

Writing about thirty years after the lifetime of Jesus, Paul says that Jesus Christ "existed before creation began", that "through him everything in heaven and earth was made, whether visible or invisible", and, this is the crucial phrase, "that he holds it all together."

The Greek word Paul uses here, *synestéke*, means, literally, "to hold together". It would be used to describe the way in which a potter or a skilled craftsman joined two or more pieces together or glued them. Paul was not a scientist, but his word accurately describes the way scientists today picture the all-important and essential force of gravity that glues together our entire universe.

Christians, of course, believe that Jesus was not only co-creator of the universe with God, but that he also lived our human life on earth, died and was raised to life again. Sometimes only poetry can describe what this meant, speaking of his "hands that flung stars into space" being "to cruel nails surrendered" in his death on a cross at the hands of the Romans. The message for us is quite clear. God is not just "out there". He is also with us, in human form.

An act of faith

Science as we have seen can only take us so far in our understanding of the universe and why we are here. That further step requires an act of faith.

Try standing outside on a dark clear night, and looking up at the myriad stars. Hold your arms out wide, and remember that they represent all of time and space from Earth's beginning up to this moment. The psalmist puts it this way in Psalm 8: "When I look at the night sky and see the works of your fingers - the moon and the stars you have set in place - what are mere humans that you should care for us?"

Jesus was God's answer - as creator he *does* care for us.

The rest is easy. Just take a deep breath and believe. Far better than any fairy story "once upon a time". This could be your Grand Unifying Theory.

Bible passages referred to:

Genesis, 1:1, Psalm 8:3-4, Colossians1:14–17

Poetry taken from *The Servant King* - Graham Kendrick

Scientific authorities consulted include:

John Barrow, Brian Cox, Richard Dawkins, Brian Greene, Susan Greenfield, Stephen Hawking, Martin Rees.

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Occasional Leaflet 9

Science and God
A Grand Unifying Theory?

by Professor Ron Dingwall

This leaflet looks at some of the issues confronting science and a belief in God in this 21st century. Science seeks to answer basic questions about the universe, its nature and its future, and to resolve conflicting theories. God, in the Hebrew and Christian Bible, is seen as the creator and sustainer of this universe, and humankind its primary purpose. The question is asked whether it is possible to bring both together in a grand unifying theory.

Once upon a time.....

"Once upon a time" is the classic beginning to something we all recognise to be a fairy story, but it has a link with the scientific story of the origins of our universe. Most scientists agree that the entire visible universe began a very long time ago, some ten to fifteen billion years, though it could be more or less, with an event called the Big Bang, starting from a tiny particle of matter.

They are less agreed about how it will all come to an end. Some suggest that it will ultimately burn itself out, and cool down: the Big Chill. Others believe that it will contract again to the infinite speck from which it all started: the Big Crunch.

Individual stars also have a life cycle. Some new stars are being born right now, in our lifetime. Somewhere in the sky you can find your personal birth star, one that began its life during the year in which you were born. "Once upon a time" indeed.

Other stars are reaching the end of their existence. One day this will happen to our own star, the Sun, and life on our planet, Earth, will come to an end, too.

Scientists agree that time and space began with the Big Bang: "Once upon a time", but they don't pretend to understand what it can possibly mean.

Where do we fit in?

What about us humans? We have only been here on Earth for a very short time in its 4000 million year existence, at most not more than two to three million years, tracing back to our pre-human ancestors.

Try putting this into perspective. Fling your arms out wide to span all of Earth's evolution from its origin at your left fingertip up to today at your right fingertip. On this scale the entire story of us humans is contained in the thickness of a finger nail clipping on your right hand! And that is some clipping. The origins of all language would be only a tiny fragment of this clipping, and writing—the record of our human history recorded in all the world's books—is so recent on this scale that it would be almost an invisible speck, a singularity in scientific terms - in "once upon a time" language, a mere six thousand years!

What is the universe for?

Scientists are concerned to find an answer to one question in particular. It has baffled them for years: what exactly is the universe *for?*—and what happened before the Big Bang itself? They can dismiss most of the stories humans have told about the origin of our planet because most of them are just "once upon a time" fables, far removed from any scientific explanation. But one of the stories does concern them because it goes to the root of their own theoretical observations. It is found in the first book of the Hebrew and Christian Bible, Genesis, and in its first sentence, which states quite simply and boldly, "In the beginning God created (or as it can also be translated, began to create) the heavens and the earth."

Nothing else, no "stuff" existed alongside God out of which he fashioned the universe. It doesn't stop there...

This statement suggests that God has no beginning, that he exists in the present tense, that he is outside of time and space, the "stuff" of our universe: furthermore not only that he had a purpose in his creation - something that science has no answer for - but that he is continually active in it.

These are huge assumptions to make about the nature of God.

Scientific assumptions

Scientists make assumptions all the time, some of them equally huge. For instance, that nature is uniform, that the laws of physics as they understand them apply throughout the universe. In simple terms this means that given the same constants, the results of an experiment conducted today, at precisely 4.15pm will be the same as those conducted at 4.15pm yesterday. All their work is grounded in this being so. But, as with all assumptions, this falls short of absolute certainty. Scientists cannot be totally, mathematically certain.

Of course there are still huge gaps in scientific knowledge. Take the "stuff" of the universe. Scientists admit that they know nothing about 90% of it, to which they have given the name "dark matter" or "dark energy". At the European Centre for Nuclear Research, CERN, they are searching for the evidence that will provide an answer to this mystery.

It lies in detecting a tiny sub-atomic particle, called the Higgs boson, which they believe to exist. It has been nicknamed the "God particle" for one very good reason. If their assumption is right then this tiny particle fills the entire universe and interacts with all the other particles of matter, giving them their mass, the missing "stuff", the dark energy.

What this means is that, out of nothing, something comes after all, some "stuff" - a lamp post, a car, a dining table, a cow, a field of wild flowers, London, Paris, New York, you and me. In fact the universe is dominated by matter—all the galaxies, stars and suchlike stuff that we can see.

Why is this so important? Much hangs on this—our very understanding of physics itself. If dark energy weakens for any reason the universe will contract, ending in a Big Crunch. But dark energy, if it continues, will drive its expansion for ever, until the universe is a Big Chill.

So this is a big assumption to make, but scientists hope that it will be a step along the way to their ultimate goal, a Theory of Everything, a Grand Unifying Theory that will bring together and harmonise the conflicting theories that concern them at the moment.

Conflicting theories: relativity and quantum mechanics

Scientists are now trying to reconcile the differences between these two theories, both of which emerged in the twentieth century. One is relativity, the cornerstone on which an understanding of the universe, the structure of the stars and planets, depends: order and dependability. The other, quantum mechanics, concerns the weird world of tiny sub-atomic particles, like the Higgs boson: unpredictable and chaotic. This is a world in which electrons can behave like waves in one experiment, like particles in another, and that they can be in two places at the same time, with only a mathematical probability of being found in *one* of them.

Their attempt to account for this conflict between the two grand theories has led scientists to construct more and more elaborate models, involving complex mathematics, up to eleven dimensions of space-time, even multiple universes and much much more. Many scientists readily admit that these are still messy and