Time
– Extra –

The Time Delusion

Not long after I circulated 'Time', the *New Scientist* did a feature article on the subject ('The time delusion', 6 July 2019) which covered several relevant aspects of the subject. All quotes are from the article.

> "Time's passage is perhaps the most fundamental feature of our experience, and yet modern physics can't decide if it is a fundamental property of the universe."

In other words: does time really exist, or is it just an illusion – probably created by our brains?

Many people are afraid that time is not real – really afraid, not just asking the question in a philosophical "Let's see if we can doubt this" fashion. This fear throws into doubt all our perception of the world, as time – as the article says – is a fundamental feature of our experience.

Part of the problem is that, while we know that time appears to speed up or slow down in various – reasonably predictable – ways, our experience of time seems to be based on Newton's "master clock" model, which the physicists no longer believe in.

> "Alas, absolute time fell apart in the wake of Albert Einstein's theories of relativity. They revealed that space and time are unified as four-dimensional space-time, a medium that is warped by both gravity and motion so that no two observers can ever agree on what happened when. Past, present and future are a matter of perspective, not something universal. Hence, Einstein insisted that the flow of time is a 'stubbornly persistent illusion' and many physicists today maintain that there is no such thing as an objective 'now'."

The sceptical realist response is to say that our brains perceive and respond to something: it may not be time in the simple Newtonian sense – but then, it may not be time in the Einsteinian relativistic sense, either. Events happen and entropy increases: the 'before' and the 'after' can be clearly distinguished, and there is little doubt that the whole egg in my hand came before the smashed egg on the floor and not the other way round.

Some scientists claim that the illusion of time is created by processes within the brain – but those processes are themselves events which happen in time, in a specific sequence, with clearly distinguished 'before' and 'after' states. According to Dean Buonomano, a neuroscientist working at the University of California in Los Angeles:

> "In the case of time perception, I think our senses are probably telling us something real about the universe. I struggle to see why we would have evolved to see the present as special if it really wasn't."

Two more observations. Firstly, Einstein's claim that you cannot objectively tell what happened when does not undermine our basic understanding of cause and effect: when you cannot tell which of two events happened first, they are separated far enough in space that they could not affect each other. Cause and effect is a local phenomena and not affected by Relativity. As I understand it, while Einstein doubts that time is real, he does not doubt that first I open my hand and then the egg falls.

Secondly, if God knows – perceives – everything, then there is an underlying reality (the 'everything') which God perceives. This does not necessarily mean that the Newtonian "master clock" underlies God's perception, but it does provide a basis for believing in the reality of time which is more objective than my personal experience of time passing.

Time and Creation

Some people are suggesting that the question about whether God is 'inside' or 'outside' time is a false dichotomy: He is, they suggest, 'inside time' in His interactions with the created universe, but otherwise 'outside time'. There are two basic arguments, as I understand it, supporting the idea that God has to be, in Himself, 'outside time', even if He interacts with us 'inside time'.

- Firstly, time is a feature of the created universe, so it could not have existed before creation.
- Secondly, time can not have existed for God before creation because, if it did, then there must have been an eternity before the point of creation, and there could have been no reason to create at that point rather than any other.

I'm sceptical of these ideas. Here are a few quick thoughts in response. Do get in touch if you think I have misunderstood the ideas or missed something out.

The arguments for God operating in two modes rest on philosophical arguments, not Biblical revelation. I am more interested in Biblical truth than in abstract philosophy. The Bible tells us about God as He reveals Himself to us in the created universe and it tells us about Who God is, not What God is. You can believe what you like about the nature of God when He is not dealing with creation, but you can't base it on Biblical revelation.

Also, the philosophical arguments are particularly weak: they are statements of a philosophical belief, rather than arguments for it; they are not self-evident. An infinity can contain special points. There is an infinite number of whole numbers: you can claim that, given the starting point of an infinite sequence of increasing negative numbers (… -56, -55, -54, …), it is impossible for this sequence to suddenly turn positive. But, strangely, our sequence does just that (… -3, -2, -1, 0, 1, 2, 3 ...) and then gives us an infinite sequence of increasing positive numbers.

You are free to believe if you like that time is a feature of the created universe, but nothing in the Bible tells us so – and neither science nor philosophy can give us much reliable insight into the nature of reality outside creation. You cannot argue that

because we measure time in the created universe, therefore time only exists as part of creation: you might as well argue that because numbers are a feature of books (we number the pages and chapters in a book) therefore numbers only exist in books!

The argument that time could not exist before creation does not stand up: you can equally well argue that if there is no time there can be no change, and therefore no act of creation can take place.

If we believe that the three Persons of the Trinity were in a loving relationship before the creation, that surely implies they were interacting and therefore time, or something very like it, existed before creation.

If the Lamb of God was slain before the foundation of the world (Revelation 13:8) then, whatever this refers to, something – some action or decision – happened before creation; and if it took place *before* creation, then time did not start at the beginning of creation.

We do not know what God was doing before He created. Maybe our is just one of an infinite number of universes he has created, each one uniquely wonderful. We are like children who imagine that their parents did not really have any sort of life before they were born. Maybe, when we get to Heaven, we will discover that we are part of a much larger and more extraordinary reality than we ever suspected. Maybe an infinitely complex reality requires an infinity of time to set up the conditions just right before starting the act of creation. Maybe we will discover why God chose to create our universe when He did, or maybe not, but our understanding – or lack of it – does not constrain God.

And have people never heard of Occam's Razor? Why posit that God has two modes of operation, one inside time and one outside time? Why do we need to speculate about God being 'outside time' when not dealing with creation, when everything we know about Him and everything we are told about Him in the Bible says that He acts in time?

There must be many things about God which we know nothing about, but speculating about such things seems rather futile. When we assert that we know things about the nature of God which we have not been told and which cannot possibly affect the way we live or the way we interact with Him, we claim a belief for which we have no evidence, and which makes no difference. I simply have to ask: why?

Rethinking Quantum Mechanics

Another *New Scientist* article is relevant to this discussion. In 'Beyond Weird' (24 August 2019, pages 35-37), the theoretical physicist Lee Smolin argues that we need a new model of reality, and describes some initial proposals for what this model might include, which he drew up with Martina Cortês.

The starting point is that we (the physicists, that is!) have three incompatible models of reality, each following their own unique laws. At the large scale, General Relativity applies. At the small scale, most of the time, Quantum Mechanics describes quantum objects (at least in part) as wave functions which exist in complex superpositions, not restricted to being in one place at one time. And also at the small

scale, Quantum Mechanics describes events called ‘measurements’ which collapse the superpositions into a single reality, a single location – and the more we try to understand what a measurement is, the less we understand it.

I won’t attempt to spell out the conflicts between these three set of laws, these three models of reality – the job has been well done many times. Lee and Cortês seek to explain both General Relativity and Quantum Mechanics (both parts!) by using a new model – actually, a new set of models, the ‘energetic causal set models’ – which explains what we observe, not in terms of objects situated in space, but in terms of events and the relationships between them.

This new proposal has both causality and the flow of time as vital components – which, as I understand it, fits rather well with the set of arguments I set out in the main article to support the idea that time is real – neither an illusion created by our brains, nor an artefact of some more fundamental reality.

For those who want physics to confirm their assumptions about the nature of reality, this article will not provide what they are looking for – but no attempt to unify General Relativity and Quantum Mechanics is likely to achieve that. But the nature of time, as described in this article, is closer to our intuitive understanding than the current models, which seems like an astonishing achievement.

Of course, a couple of scientists arguing the point does not guarantee that the idea will be generally accepted. But it seems to me that science, as we know and practice it, is based on the idea of causation, and we can see the flow of time in the nature of the causation: you open your hand to drop the egg, which then falls.

Causation only works forward in time, even if the equations of Quantum Mechanics can work just as well each way: the egg never flies upwards, to make the open hand close around it. And any scientific theory which denies causality and the flow of time in one direction is cutting off the branch it sits upon. This theory may prove to be wrong, but my bet is that aspects of it will survive. Either that, or we will find we need to rebuild all of science on a new foundation, which will be even more exciting.

Next steps

This was written by Paul Hazelden as a contribution to the *Strong Foundations* exploration. You are welcome to use it and distribute it how you like, but feedback would be appreciated. There are three key questions. Is it helpful? Would you change anything? And would you like to talk about how we can learn from each other about how best to follow Jesus where we are?

You can contact me through the web form (http://mad-bristol.org.uk/contact/) or join the conversation on the website (http://strongfoundations.pbworks.com).

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