

1 *The big questions*

Stephen Hawking is, without doubt, the world's most famous living scientist. He has recently retired from the Lucasian Professorship in Cambridge, a chair once held by Sir Isaac Newton. Hawking has occupied this position with great distinction. He has been made a Companion of Honour by Her Majesty the Queen, and his academic career has been marked by an accolade of honorary degrees from all over the world.

He has also been an outstanding symbol of fortitude, having suffered the ravages of motor neurone disease for over forty years. During many of these he has been confined to a wheelchair, with his only means of verbal communication being a specially designed electronic voice synthesizer. Its instantly recognizable "voice" is known all over the world.

With many distinguished colleagues and students, Hawking has explored the frontiers of mathematical physics – most famously, perhaps, the counter-intuitive mysteries of black holes. His work has led to the prediction of "Hawking Radiation", which, if verified experimentally, would surely qualify him for a Nobel Prize.

In his runaway best-seller, *A Brief History of Time*⁴, Hawking brought the recondite world of fundamental physics to the coffee table (although many people have confessed to finding the contents rather beyond them).

⁴ London, Bantam Press, 1988.

This book was followed by several others in the same vein, which attempted quite successfully to excite a wider readership with the buzz of great science.

Since his books deal with the origin of the universe, it was inevitable that he should consider the matter of the existence of a Divine Creator. However, *A Brief History of Time* left this matter tantalizingly open, by ending with the much-quoted statement that if physicists were to find a “Theory of Everything” (that is, a theory that unified the four fundamental forces of nature: the strong and weak nuclear forces, electromagnetism and gravity), we would “know the Mind of God”.

In his latest book, *The Grand Design*⁵, co-authored with Leonard Mlodinow⁶, Hawking’s reticence has disappeared, and he challenges belief in the divine creation of the universe. According to him it is the laws of physics, not the will of God, that provide the real explanation as to how the universe came into being. The Big Bang, he argues, was the inevitable consequence of these laws: “because there is a law such as gravity, the universe can and will create itself from nothing”.

The title, *The Grand Design*, will suggest for many people the existence of a Grand Designer – but that is actually what the book is designed to deny. Hawking’s grand conclusion is: “Spontaneous creation is the reason there is something rather than nothing, why the universe exists, why we exist. It is not necessary to invoke God to light the blue touch paper and set the universe going.”⁷

⁵ London, Bantam Press, 2010.

⁶ From here on I shall refer to Hawking’s book. I adopt this convention simply for convenience of expression. No disrespect is intended for the co-author, Leonard Mlodinow.

⁷ Op. cit. p. 180.

In this book I wish to engage in the main not with Hawking’s science but with what he deduces from it regarding the existence, or rather the non-existence, of God. Although Hawking’s argument, that science shows God is unnecessary, has been hailed as ground-breaking, it is hardly new. For years other scientists have made similar claims, maintaining that the awesome, sophisticated complexity of the world around us can be interpreted solely by reference to the basic stuff of the universe (mass/energy), or to the physical laws that describe the behaviour of the universe, such as the law of gravity. Indeed, it is difficult at first glance to see quite how this new book adds much to what Hawking wrote in *A Brief History of Time*.

The Grand Design opens with a list of the big questions that people have always asked: “How can we understand the world in which we find ourselves? How does the universe behave? What is the nature of reality? Where did all this come from? Did the universe need a Creator?”⁸ These questions, emanating from such a famous person, excite the imagination with the anticipation of hearing a world-class scientist give his insights on some of the profoundest questions of metaphysics. It is, after all, fascinating to listen in on a great mind exploring the philosophical questions that we all ask from time to time.

An inadequate view of philosophy

If that is what we expect we are in for a shock; for, in his very next words, Hawking dismisses philosophy.

⁸ Op. cit. p. 5.

Referring to his list of questions, he writes: “Traditionally these are questions for philosophy, but philosophy is dead. It has not kept up with modern developments in science, particularly in physics. As a result scientists have become the bearers of the torch of discovery in our quest for knowledge.”⁹

Apart from the unwarranted hubris of this dismissal of philosophy (a discipline well represented and respected at his own university of Cambridge), it constitutes rather disturbing evidence that at least one scientist, Hawking himself, has not even kept up with philosophy sufficiently to realize that he himself is engaging in it throughout his book.

For, the very first thing I notice is that Hawking’s statement about philosophy is itself a philosophical statement. It is manifestly not a statement of science: it is a metaphysical statement *about* science. Therefore, his statement that philosophy is dead contradicts itself. It is a classic example of logical incoherence.

Furthermore, the view that “scientists have become the bearers of the torch of discovery” smacks of scientism – the view that science is the only way to truth. It is a conviction characteristic of that movement in secular thought known as the “New Atheism”, although its ideas are mostly only new in the aggressive way they are presented, rather than in their intellectual content.

For any scientist, let alone a science superstar, to disparage philosophy on the one hand, and then at once to adopt a self-contradictory philosophical stance on the other, is not the wisest thing to do – especially at the beginning of a book that is designed to be convincing.

⁹ Op. cit. p. 5.

Nobel Laureate Sir Peter Medawar pointed out this danger long ago in his excellent book *Advice to a Young Scientist*, which ought to be compulsory reading for all scientists.

There is no quicker way for a scientist to bring discredit upon himself and upon his profession than roundly to declare – particularly when no declaration of any kind is called for – that science knows, or soon will know, the answers to all questions worth asking, and that questions which do not admit a scientific answer are in some way non-questions or “pseudo-questions” that only simpletons ask and only the gullible profess to be able to answer.

Medawar goes on to say: “The existence of a limit to science is, however, made clear by its inability to answer childlike elementary questions having to do with first and last things – questions such as: ‘How did everything begin?’ ‘What are we all here for?’ ‘What is the point of living?’”¹⁰ He adds that we must turn to imaginative literature and religion for the answers to such questions.

Francis Collins is equally clear on the limitations of science: “Science is powerless to answer questions such as ‘Why did the universe come into being?’ ‘What is the meaning of human existence?’ ‘What happens after we die?’”¹¹

Obviously Medawar and Collins are passionate scientists. So there is clearly no inconsistency involved

¹⁰ *Advice to a Young Scientist*, London, Harper and Row, 1979, p. 31; see also his book *The Limits of Science*, Oxford, Oxford University Press, 1984, p. 66.

¹¹ *The Language of God*, New York, The Free Press, 2006.

in being a committed scientist at the highest level, while simultaneously recognizing that science cannot answer every kind of question, including some of the deepest questions that human beings can ask.

For instance, there is widespread acknowledgment that it is very difficult to get a base for morality in science. Albert Einstein saw this clearly. In a discussion on science and religion in Berlin in 1930, he said that our human sense of beauty and our religious instinct are “tributary forms in helping the reasoning faculty towards its highest achievements. You are right in speaking of the moral foundations of science, but you cannot turn round and speak of the scientific foundations of morality.” Einstein proceeded to point out that science cannot form a base for morality: “every attempt to reduce ethics to scientific formulae must fail”.¹²

Richard Feynman, also a Nobel Prize-winning physicist, shared Einstein’s view: “Even the greatest forces and abilities don’t seem to carry any clear instructions on how to use them. As an example, the great accumulation of understanding as to how the physical world behaves only convinces one that this behaviour has a kind of meaninglessness about it. The sciences do not directly teach good or bad.”¹³ Elsewhere he states that “ethical values lie outside the scientific realm”.¹⁴

Yet Hawking seems to deny this, by assigning to science a role beyond its capacity. Not only that but, after disparaging philosophy, he then proceeds to engage in it. For, insofar as he is interpreting and applying science

to ultimate questions like the existence of God, Hawking is doing metaphysics. Now, let us be clear, I do not fault him for doing that; I shall be engaging in metaphysics all through this book. My concern is that he does not seem to recognize this.

Let’s look a little more closely at Hawking’s two lists of questions. Here is the first list:

- How can we understand the world in which we find ourselves?
- How does the universe behave?
- What is the nature of reality?
- Where did all this come from?
- Did the universe need a Creator?¹⁵

The second of these questions is scientific: a typical “how” question that does not raise the matter of ultimate purpose. The first and the last three questions are fundamental questions of philosophy.

Hawking’s second list is to be found at the end of his first chapter:

- Why is there something rather than nothing?
- Why do we exist?
- Why this particular set of laws and not some other?¹⁶

These are also well-known great questions of philosophy.

Now science, of course, is one of the voices that will have an input into attempting to answer these questions; but it is by no means the only, nor indeed necessarily the most important, voice.

¹² For this and Einstein’s stance on religion and science see the definitive work of Max Jammer, *Einstein and Religion*, Princeton, Princeton University Press, 1999. The citation here is from p. 69.

¹³ *The Meaning of It All*, London, Penguin, 2007, p. 32.

¹⁴ Op. cit. p. 43.

¹⁵ Op. cit. p. 5.

¹⁶ Op. cit. p. 10.

Philosophy may be dead according to Hawking, but he seems to believe in giving it an immediate resurrection! Calling his three questions “The Ultimate Questions of Life, the Universe and Everything”, Hawking says: “We shall attempt to answer them in this book.”

An inadequate view of God

The consequence of sailing through one red light is that you are likely to sail through a good many more, and that is exactly what happens. Hawking’s inadequate view of philosophy soon shows itself in an inadequate view of God. He writes: “Ignorance of nature’s ways led people in ancient times to invent gods to lord it over every aspect of human life.” He then says that this began to change with ancient Greek thinkers like Thales of Miletus about 2,600 years ago: “The idea arose that nature follows consistent principles that could be deciphered. And so began the long process of replacing the notion of the reign of the gods with the concept of the notion of a universe that is governed by laws of nature, and created according to a blueprint we could someday learn to read.”¹⁷

The impression given by this is that the concept of God, or the gods, is a placeholder for human ignorance – a “God of the Gaps”, who will increasingly be displaced as the gaps in our knowledge are filled by scientific explanations, so that he will eventually disappear completely, like the smile on the face of the proverbial Cheshire cat. In the past there have been many gaps in

the scientific picture that have been occupied by God; but Hawking now claims that physics has no longer any room for God, as it has removed the last place where he might be found – the moment of creation. The last piece of the scientific jigsaw has been snapped into place and it leaves us with a closed universe.

He is but a step away from regarding atheism as a necessary prerequisite for doing science.

First of all, let us look at the element of truth in what Hawking says. When it thunders, if we suppose that it is a god roaring – as some of the ancients did – we would scarcely be in a mood to investigate the mechanism behind the noise. Only by assuming that there are no gods of this kind can we be free to investigate the mechanisms of nature in a scientific manner.

So we certainly need to remove deification of the forces of nature in order to be free to study nature. This was a revolutionary step in thinking, taken, as Hawking points out, by early Greek natural philosophers like Thales, Anaximander, and Anaximenes of Miletus over 2,500 years ago.

They were not content with mythological explanations, such as those written down by Homer and Hesiod around 700 BC. They sought explanations in terms of natural processes and chalked up some notable scientific successes. Thales is accredited with calculating the length of the year as 365 days, accurately predicting a solar eclipse in 585 BC, and using geometric methods to calculate the height of pyramids from their shadows, and even to estimate the size of the earth and moon. Anaximander invented a sundial and a weatherproof clock, and made the first world and star maps. The Milesians were therefore among the earliest “scientists”,

¹⁷ Op. cit. p. 17.

although the word “scientist” was first introduced (by William Whewell) in the nineteenth century.

Of great interest in the present context is Xenophanes (c. 570–478 BC) of Colophon (near Izmir in present-day Turkey), who, though he was known for his attempts to understand the significance of the fossils of sea creatures found in Malta, is even more famous for his trenchant denunciation of the mythological world-view. He pointed out that certain behaviour was attributed to the gods which would be regarded as utterly shameful among humans: the gods were rogues, thieves, and adulterers. Not unreasonably, Xenophanes held that these gods had been made in the images of the peoples that believed in them: Ethiopians have gods that are dark and flat-nosed, Thracians made them blue-eyed and red-haired. He added derisively: “If cows and horses or lions had hands and could draw, then horses would draw the forms of gods like horses, cows like cows, making their bodies similar in shape to their own.” Thus, for Xenophanes, these gods were but childish fiction drawn from the fertile imaginations of those who believed in them.

Furthermore, the influential Greek atomist philosopher, Epicurus (born in 341 BC just after the death of Plato), who gave his name to Epicurean philosophy, wished to remove the myths from explanation in order to improve understanding: “Thunderbolts can be produced in several different ways – just be sure the myths are kept out of it! And they will be kept out of it if one follows rightly the appearances and takes them as signs of what is unobservable.”

Such denunciation of the gods, together with a determination to investigate the natural processes

hitherto almost exclusively understood to be the activity of those gods, inevitably led to the decline of mythological interpretations of the universe and paved the way for scientific advance.

Xenophanes was, however, not the only ancient thinker to criticize the polytheistic world-view. More importantly, he wasn’t the first to do so. Unknown to him presumably (there does not seem to be much information on the matter), and centuries beforehand, the Hebrew leader Moses had warned against worshipping “other gods, bowing down to them or to the sun or the moon or the stars of the sky”. Later, the prophet Jeremiah, writing in about 600 BC, similarly denounced the absurdity of deifying nature and worshipping the sun, moon and stars.

We now reach a crucial error that seems to have escaped Hawking’s attention. It is to imagine that getting rid of gods either necessitates, or is the same as, getting rid of God. Far from it. For Moses and the Hebrew prophets it was absurd to bow down to various bits of the universe, like the sun, moon and stars, as gods. But they regarded it equally as absurd not to believe in, and bow down to, the Creator God who had made both the universe and them.

Nor were they introducing a radically novel idea. They did not have to have their universe de-deified as the Greeks did, for the simple reason that they had never believed in such gods. What had saved them from that superstition was their belief in the One True God, Creator of heaven and earth. What Moses and the prophets were protesting about was the *introduction* of the gods into a previously monotheistic culture.

That is, the idolatrous and polytheistic universe described by Homer and Hesiod was not the original

world-picture of humankind. Nevertheless, this is an impression often gained from books on science and philosophy (including *The Grand Design*) that start with the ancient Greeks and rightly emphasize the importance of the de-deification of the universe, yet singularly fail to point out that the Hebrews had vigorously protested against idolatrous interpretations of the universe long before the time of the Greeks. This obscures the fact that polytheism arguably constitutes a perversion of an original belief in the One Creator God. It was this perversion that needed to be corrected, by recovering belief in the Creator and not by jettisoning it. The same is true today.

In order to avoid confusion, we should explore the depth of the gulf between the Greek and Hebrew views of the universe a little further, just to see how vast and unbridgeable it is. Commenting on Hesiod's poem "Theogony" ("The genesis of the gods"), Werner Jaeger writes:

If we compare this Greek hypostasis of the world-creative Eros with that of the Logos in the Hebrew account of creation, we may observe a deep-lying difference in the outlook of the two peoples. The Logos is a substantialization of an intellectual property or power of God the creator, who is stationed outside the world and brings that world into existence by his own personal fiat. The Greek gods are stationed inside the world; they are descended from Heaven and Earth ... they are generated by the mighty power of Eros who likewise belongs within the world as an all-engendering primitive force. Thus they are already subject to what we should call natural law

... When Hesiod's thought at last gives way to truly philosophical thinking, the Divine is sought inside the world – not outside it, as in the Jewish Christian theology that develops out of the book of Genesis.¹⁸

It is therefore a very striking fact that Xenophanes, despite being steeped in a polytheistic culture, did not make the mistake of confusing God with the gods and thus reject the former with the latter. He believed in one God who ruled the universe. He wrote: "There is one God ... similar to mortals neither in shape nor in thought ... remote and effortless he governs all there is."

Hawking is surely not expecting us to fall for the common trick of rubbishing religion by rubbishing primitive concepts of God or the gods. Yet, whether deliberately or not, he confuses God with the gods. And that inevitably leads him to a completely inadequate view of God, as a God of the Gaps who can be displaced by scientific advance. It is, however, a view of God that is not to be found in any major monotheistic religion, where God is not a God of the Gaps but the author of the whole show. Nor, incidentally, is he the God of the deists, who lit the blue touch paper to start the universe going and then retired to a vast uninvolved distance. God both created the universe and constantly sustains it in existence. Without him, nothing would be there for physicists like Stephen Hawking and Leonard Mlodinow to study.

In particular, therefore, God is the creator both of the bits of the universe we don't understand and of

¹⁸ *The Theology of the Early Greek Philosophers*, Oxford, Oxford University Press, 1967 paperback, pp. 16–17.

the bits that we do. And it is, of course, the bits that we do understand that give the most evidence of God's existence and activity. Just as my admiration of the genius behind a work of engineering or art increases the more I understand it, so my worship of the Creator increases the more I understand the universe he has created.