

Commentary

The Grand Design: The Elimination of Mind

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Abstract | In his book, ‘The Grand Design’ (with Leonard Mlodinow, Bantam Books, London, 2010), Stephen Hawking agrees that we should attempt to answer the questions ‘Why is there something rather than nothing? Why do we exist?’ and ‘Why this particular set of laws and not some other?’ (p. 19). In his book he proposes to answer those questions, from a purely scientific point of view (‘Philosophy is dead’, he announces on p. 13, even though the whole book is an exercise in scientifically informed philosophy). But there is something very odd about this. Nowhere in the book does he mention consciousness, value, or thought. In fact he finally gives the game away on p. 228 by saying, ‘we human beings ...are ourselves mere collections of fundamental particles’. That is a philosophical view if ever there was one! It is precisely what is usually called eliminative reductionism, and I regard it as a non-starter, if you want to give a complete explanation of the universe.

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In his book, ‘The Grand Design’ (with Leonard Mlodinow, Bantam Books, London, 2010), Stephen Hawking agrees that we should attempt to answer the questions ‘Why is there something rather than nothing? Why do we exist?’ and ‘Why this particular set of laws and not some other?’ (p. 19). In his book he proposes to answer those questions, from a purely scientific point of view (‘Philosophy is dead’, he announces on p. 13, even though the whole book is an exercise in scientifically informed philosophy). But there is something very odd about this. Nowhere in the book does he mention consciousness, value, or thought. In fact he finally gives the game away on p. 228 by saying, ‘we human beings ...are ourselves mere collections of fundamental particles’. That is a philosophical view if ever there was one! It is precisely what is usually called eliminative reductionism, and I regard it as a non-starter, if you want to give a complete explanation of the universe.

If you seriously want to tackle the question ‘Why do we exist?’, you have to begin by accepting that we are

conscious, thinking, feeling beings, and not ‘mere collections of particles’. No purely physical account of the universe can explain consciousness, thought, and feeling. Let me modify that blunt statement a little. If you are a reductionist, then you do not need to explain thought and feeling. But no one has come anywhere near providing a comprehensive and convincing account of reductionism. Even hard-line materialists usually admit that the problem of explaining consciousness is the ‘hard problem’ in science, and that we are nowhere near solving it. And if philosophy is not quite dead, maybe many half-dead philosophers would say that it is not just a hard but an insoluble problem if you are trying to do it in purely physical terms. Because thoughts and feelings are just not physical.

At this point we all have to agree that there are some basic philosophical questions that do not look as if they are ever going to be agreed. The problem of mind and body is one of them, perhaps the most basic one of all. For people like me, the evidence that thoughts

and feelings are real is indisputable, obvious, and completely convincing. It consists of my thoughts and feelings, which nobody else knows, or can know, in the way that I do. But for many people the findings of physical science are so compelling that they simply cannot admit that there could be anything it does not explain, at least in principle. And there you are! Stale-mate!

Fundamental Perspectives

In this situation, the only reasonable thing to do is to admit that the evidence is not universally compelling, in that it will never be agreed. Yet it is completely convincing to people who disagree completely about what it says. Questions about such evidence are inherently unresolvable. To one group of people (apparently including Stephen Hawking) a completely convincing explanation of why we exist can be given in purely physical terms about how the universe originated from a quantum vacuum in accordance with the laws of a very complicated theory called M-theory (which has not been worked out yet). But to another group of people (including Thomas Nagel – in ‘Mind and Cosmos’, Oxford University Press, 2012 – and me) any complete explanation of why we exist must somehow include and unite both physical factors of cosmic evolution and some explanation of how mind and consciousness are central to the existence of the universe. Philosophers have argued with each other and scientists have argued with each other interminably about this, and we know we are not all going to agree. That does not stop us thinking that our views are wholly reasonable. What we get out of this discussion are two main points: there are unresolvable questions, and good evidence does not have to be universally compelling.

The Quantum Vacuum

Although Hawking ignores questions about mind and value, he does offer an explanation of the universe in terms of eternity and necessity. This is because he explains the origin of the universe, at the ‘Big Bang’, by saying that it arises from the quantum vacuum and from quantum laws. Now whatever the quantum vacuum is, it is beyond the time of our universe. That is, it is eternal. And quantum laws, being elegant mathematical laws, are in some sense necessary. That is because mathematics cannot be any other than it is. Mathematical truths do not just happen to be true;

they have to be true; there is no alternative.

You may say that there could be different axioms in mathematics, and that is the case. But the whole set of mathematical truths, including all the axioms there could possibly be, is necessarily what it is. And it could be that there is only one set of mathematical truths (of quantum laws) that could give rise to a universe containing carbon-based intelligent life-forms like us.

In fact, Hawking proposes that all mathematically possible combinations actually give rise to actual universes. Perhaps, he says, for technical reasons there could be 10 to the power of 500 universes – that is an enormous number of universes. But the vast majority of them would never give rise to the conditions that make intelligent life possible. Maybe only a few, maybe only one, possible universe can give rise to life-forms like us.

On this theory, many forms of necessity are involved. There is the necessity of the whole array of possible mathematical systems. There is the necessity that these systems give rise to actual universes. There is the necessity that, once universes exist, they will obey just one set of mathematical laws exactly and without fail. And there is the necessity that one of these universes (ours) will eventually give rise to intelligent life.

If all this was true, it would indeed explain the nature of our universe very satisfactorily. By the necessary laws of mathematics, which are eternally true, every mathematically possible universe will exist, and at least one of them would necessarily give rise to us. We are no longer a surprising accident. We are completely explained!

We, and the whole universe, are dependent upon a time-transcending (eternal) and necessary (mathematically modelled) reality (the quantum vacuum plus the quantum laws), and we necessarily arise from it, just as we are. This theory is uncannily like the theory of God, an eternal and necessary reality from which the universe arises. Yet it is proposed as a competitor with God, whom, Hawking says, we no longer need. But is it really a competitor, or is it maybe just a partial and truncated view of God?

Absolute Explanations

Anybody who thinks minds, with their thoughts and feelings, values and purposes, need to be explained, as well as physical particles, will find something deficient about the Hawking hypothesis. Because the fact is that, far from explaining minds, he never once mentions them. It is as though they did not exist – even though his theory only exists because it was invented by a very rational mind, and almost entirely by pure thought.

It is obvious that the Hawking hypothesis is very speculative, and highly disputed among mathematical physicists. But nobody says it is stupid, or superstitious, or that there is no evidence for it. Hawking sets out his criteria for a good explanation on page 68 of his book. A good explanation has to be elegant, contain few arbitrary elements, agree with all existing observations, and make detailed predictions about the future. M-theory, he says, is elegant, and it is consistent with the best scientific knowledge. Does it contain few arbitrary elements? Well, you might think that postulating 10⁵⁰⁰ universe is a bit arbitrary. On the other hand, it follows from a very elegant theory, and that is not arbitrary, even if it seems rather excessive. Does it make detailed predictions about the future? Not directly, because it is far from complete as yet. But it is a key part of a whole system more specific parts of which do make such predictions, and they have all been confirmed to a great degree of accuracy.

Could you say this about the theory of God too? It is elegant, because it posits just one ultimate being from which the whole complete universe originates, and it provides just one ultimate principle for originating a universe – for the sake of the distinctive values that the universe makes possible. It is, or in some versions it is, compatible with all existing observations. It contains no arbitrary assumptions – unless God is thought to be an arbitrary assumption. But if the existence of human minds needs explaining, it seems that in some sense mind will have to be seen as a basic and irreducible constituent of the universe, and God certainly fulfils that role.

The God theory is not a scientific theory because it makes no detailed predictions about the future. That is hardly surprising, since the God theory is not meant to be a scientific theory. It does make some predictions – goodness will triumph, evil will be eliminated, the righteous will see God. But these predictions are not testable at the moment, and mostly lie far in the

future, or even in some other form of existence. The job of the God theory is not, however, to provide predictions. It is to provide a basis for believing that the universe, and each life in particular, has a unique and valuable purpose which is given to it by a being of supreme perfection and power who can ensure that purpose will be realised.

Scientific theories are practically useful because they enable us to predict and so to use physical features of the world for our well-being. The theory of God is practically useful because it enables us to see what true human well-being is, and how to achieve it. Even when we say something as abstract sounding as: ‘God is eternal and necessary’, we are in fact saying something of immense practical usefulness. We are saying that the being who gives value to human life and promises its realisation cannot be weakened or destroyed by time (is eternal) and will never change in love, compassion, and care for us and for all sentient beings (is necessary). Even the most abstract thoughts about God have a real and immediate practical importance, and those abstract thoughts are the results of pursuing the grounds for our trust and confidence in God as far as we can.

The belief that God is eternal and necessary is based on the development of an elegant explanatory theory for explaining why the universe is the way it is, and why we exist. Such explanations, according to Hawking and to many others, would ideally end in a reality that was eternal and necessary. That is because natural science works by pursuing the question, ‘Why did this happen?’ as far as it possibly can. Physicists used to think that you could not get beyond the Big Bang, and you just had to accept that as a brute inexplicable fact. But with the rise of quantum physics, cosmologists have pressed their questions further, and now try to explain the origin of space and time by showing that it arises from the quantum vacuum by necessity.

Once you get to a timeless reality, you can no longer ask ‘What caused this to happen?’ because no other being could cause an eternal being to exist (could bring it into existence). Once you get to a necessary reality, you can no longer ask, ‘Why did this happen?’ because there is no alternative to it. We cannot know for certain this is the case, but as a postulate it finally answers all scientific questions about why the universe exists by saying it has its origin in a reality that could not be otherwise and logically could have no cause.

That would be the final and absolute explanation of the universe, and it would be very satisfying for a physicist.

A philosopher cannot fail to notice that this is a replay of the first three of Thomas Aquinas' 'Five Ways of demonstrating the existence of God' (Aquinas, 'Summa Theologiae', Part 1a, Question 2, Article 3). The universe must have an uncaused, changeless, and necessary cause if we are to have an absolute explanation of its existence. As every student of Aquinas' arguments knows, there does not have to be an absolute explanation of the universe. Perhaps the very idea of a necessary being is incoherent. Maybe it is not even true that every event has to have a cause, or that there is a reason for everything.

It is generally agreed that these arguments are not demonstrative proofs, which will convince any reasonable person. To find them convincing, you have to accept that the universe is intelligible (there is a reason for everything), that the idea of necessary existence makes sense, and that there is an absolute explanation for the universe (the universe is not just an accident or an inexplicable brute fact). There is no proof of these beliefs. But many notable scientists (including Stephen Hawking) do seem to accept them. They are very reasonable beliefs to have. Maybe they are implicit in the practice of science and are basic assumptions that are conditions of finding the universe fully rational.

Is there evidence for these beliefs? It seems that the great success of the sciences is evidence for the intelligibility of the universe, and that the similar success of pure mathematics is evidence for the coherence of necessary truths. The main evidence lies in the elegance, consistency, coherence, and explanatory power of the postulate of an eternal and necessary being. That makes it rationally acceptable, though it cannot compel assent, and there will always be disagreements about it. Like some other evidence for God, it is strong but essentially disputable. As I have suggested, there is nothing wrong with that, from a rational point of view.

Teleology and God

Despite the similarity of Hawking's theory to the arguments of Aquinas (which themselves derive from Aristotle), Hawking offers his theory as an alternative to God, not as part of a 'proof' of God. I think this

is mostly due to his complete neglect of mind, value, consciousness, and purpose in the universe. If mind is an irreducible element of reality, which cannot be completely explained in purely physical terms, mind will have to enter into any absolute explanation of the universe in some way. All Hawking offers is mathematically beautiful laws and various complex forms of energy in their lowest energy states (the quantum vacuum), which exist and act by blind necessity.

If you add mind to this mix, you have something which is conscious of those laws and operates on a principle that is not part of natural science. That is the principle of axiology, by which I mean: doing something for a reason. Minds, as we know them, typically operate by thinking of possible future states which they prefer or value, and then acting so as to make those states actually exist. Minds, in other words, act to make possible states into actual states, to realise potentialities for the sake of obtaining actual states that they value.

Thinking of possible states is, as far as we know, something that only quite sophisticated minds do. It involves being in an actual state (a state of thinking about the future) which internally refers to a possible state, to something beyond itself. The mental state is not just an actual state; it is about something that does not exist. This 'aboutness' is a property that only minds have – philosophers call it 'intentionality'. It shows that thoughts about the future cannot be reduced to a physical description of minds in the present.

The other main property that only minds have is the ability to act in order to make such thoughts into actual things. I think about the nice taste of ice cream, and go out to buy one, in order to enjoy the state I have just thought of. Minds have intentional thoughts, and act in intentional ways. That, in short, is the distinctively mental principle of conscious purpose or axiology.

This suggests that if mind must enter into the absolute explanation of the universe, there must be some place for values or purposes among the ultimate principles of the universe.

This is actually very helpful in solving the problem of how purely mathematical laws can govern the ultimate energies of the universe, and of how we can be sure that they will continue to do so. That is a real problem for Hawking. As he famously asked, 'What is it that breathes fire into equations?' ('A Brief His-

tory of Time', Bantam Press, London, 1988, p. 174). That is, what gives mere mathematical equations, passive and inert as they seem to be, the power to give rise to actual physical universes, and continue to run them in predictable ways?

If you have a mind which is aware of all those equations, which knows how they would govern physical states if they were applied to physical energies, then that mind could choose to make some of those laws apply to basic energy for the sake of outcomes which it values. The principle of axiology could apply to the universe. We would not then have to say that all possible universes arise by blind necessity. We would say that the mind that conceives all possible universes chooses to create one or more of them for the sake of producing states which it values.

The Mind of God

If you wanted to appeal to Occam's Razor – that you should choose the theory that appeals to the fewest number of entities – you would unhesitatingly choose such an originating mind over the necessary existing of 10 (+500 zeros) universes. Necessity would no longer be blind. Given a primordial cosmic mind, it would originate a universe for a good reason – and it would not originate zillions of spare universes for which there was no good reason. The principle of axiology, which only minds can operate, provides an elegant selection-principle for originating specific universes. The universe will not just emanate unconsciously for the primordial vacuum. It will be created by rational choice from the primordial ocean of possibilities which are a necessary part of the mind of God.

This seems such a good theory that it seems odd that Hawking does not take it more seriously. I think there are various reasons for this, but I do not think any of them are very strong. One is the reductionist theory that minds are nothing but collections of physical particles, so a cosmic mind that was not physical could not exist. This view collapses if you think that thoughts, feelings, and perceptions are different in kind from physical particles. Even if you think that human minds do not exist without physical brains, this seems to be a matter of fact, not a necessary truth. In other words, a being could have thoughts and feelings even if it had no brain. We are not likely to find this out by any physical experiment. But a simple

thought-experiment – just imagine having a view of Mount Everest without having a body, a brain, or eyes to see with – seems to demonstrate that, though we do not think it is going to happen to us, it is perfectly possible.

I do not think it is at all difficult to think of a cosmic mind that knows many things about the universe, and can do many things in the universe, but has no brain or body. Of course that does not show there is such a mind. It shows that, as far as we can see, there could be a non-human mind that was not a collection of physical particles. If we can postulate eternal and necessary laws and energies as the basis of the universe, we can equally easily postulate an eternal and necessary mind, as an elegant theory to explain why the universe exists.

But Hawking says that God is not needed. A scientific explanation is enough – 'the beginning of the universe was governed by the laws of science and doesn't need to be set in motion by some god' (p. 173). This is basically an argument that we should go for the simplest explanation. But it seems simpler to have one cosmic mind than to have a whole battery of separate mathematical laws and forces and fields like gravity, inflation, electric charge, spin, and so on, which have no very obvious connection with one another. If they were all elements of one mind, that would give unity and integration to such laws and energies, which would be a great gain in simplicity. The God theory would also eliminate vast numbers of spare universes, and leave just a few very interesting, complex, and valuable universes, which is another gain in simplicity.

In any case, simplicity should not be bought at the price of ignoring consciousness and value. A simple theory should also be comprehensive, so any satisfactory theory of everything must include minds as well as physical states in some way. There are a number of theories that might do this, but mind-like explanations have an explanatory advantage over physical theories. Whereas a purely physical theory cannot account for consciousness, a theory of cosmic intelligence is able to account for matter in a very satisfactory way. A material universe provides the environment for generating consciousness, gives objects of knowledge for consciousness, and provides a theatre of operations in which many minds can act and co-operate in action. A world of many finite minds needs some sort of physical universe, whereas a physical universe does not need, and cannot really account for, the ex-

istence of minds. So a mind theory of the universe is more inclusive and comprehensive than a purely materialistic theory. That has to be a good thing.

A key statement in Hawking's account is that God is not needed to 'set the universe in motion'. It is as though the physical account of the universe is complete, except for one thing, its starting point. If you can eliminate the need for a starting point, you eliminate the need for God. For some physicists, God only had that one job left anyway, having been made redundant from all God's traditional jobs, so not much is lost if you dispense with God altogether.

That is not, however, the point. Nobody seriously thinks that God just sets the universe going, and then ignores it altogether. The real question is not whether somebody had to push-start the universe, but whether the whole universe, at every moment, depends on some deeper reality beyond itself. Hawking obviously thinks it does, because on his theory the whole observable universe depends upon the quantum laws which exist apart from any particular universe, and the vacuum energies whose continued operation keep every universe going. Without those laws and energies, the observable universe would collapse. The universe does not keep going by itself. It is a consequence (almost a by-product) of deeper goings on beyond our space-time.

The theist agrees absolutely that this space-time is not capable of keeping going by itself. It depends upon some deeper reality which is beyond space and time and is necessary and self-sustaining in some profound sense. The theist agrees that the deeper reality is intelligible (not just accidental or arbitrary), conceptually elegant and beautiful, and the ultimate source of awe-inspiring powers and energies. All the theist adds to this is that the deeper reality is conscious and purposive, not blind and pointless. This cosmic mind does not just set the universe going. Without its continued existence and support, the universe would not exist at all.

The deepest reality is mind, eternal and necessary mind. Without that mind, the laws of science would not be recognised and applied to any universe, and they would not lead to the existence of conscious intelligent agents, to a universe which understands its own nature. Mind really is essential to the existence

of a universe like ours, and probably to the existence of any universe at all.

How Minds Create Reality

Strange as it may seem, there are strong hints of such a view in Hawking's theory. I have said that he did not mention mind and consciousness at all. But that is not quite right. He spends some time explaining the two-slit experiment in quantum theory. The results of this experiment can be put rather crudely by saying that particles like photons behave like waves when they are not being measured or observed, but they behave like particles when they are being measured. This very odd result was said by Richard Feynman to contain all the mysteries of quantum mechanics. Particles are shot at a wall with two slits in it, and then hit a detection screen. If one slit is closed, what you see is the impact of a particle. It seems that the particle has just gone through one slit. But if both slits are open, you see the impact of a wave. It seems that the particle has gone through both slits.

It is hard to say why this is so. But things get worse. If you keep both slits open, but observe one slit, so that you know which slit a particle goes through, the particle will behave just like a particle. But if you do not observe the slits, it will behave like a wave. It seems that the fact of observing which slit a particle goes through changes the object from a wave to a particle. Observation changes what is observed.

This is bad enough. But things are even worse. In what is called the 'delayed-choice experiment', Feynman delayed observing a particle until after it has passed through the two slits and just before it hits the detection screen. Again, the observation collapses a wave into a particle. But now it does so after the particle has 'decided' to go through either one or both slits. It looks as though, as Hawking puts it, 'observations you make on a system in the present affect its past' (p. 106). Our present observation seems to cause the particle to go through one slit instead of two – but that had already happened before we made the observation.

This is seriously weird. What Hawking proposes is that 'the universe doesn't have just a single history, but every possible history...and our observations in its current state affect its past and determine the differ-

ent histories of the universe' (p. 107). In other words, everything that is possible happens, but observations can make it the case that just one thing has happened, after all, at least as far as we are concerned.

He concludes with the astonishing claim that 'we create history by our observation, rather than history creating us' (p. 179). So 'the universe does not have a unique observer-independent history'. It is very hard to know what to make of all this. But one way of thinking about it is to say that observations collapse wave-functions, which speak of many possible universes, into particles, which are states of an actual universe. In other words, it is minds (the things which make observations, after all) that make physical things, the things we observe, actual.

If so, Hawking does give an important place to observing minds. Minds make possibilities actual. They 'create history'. And if the universe is not observer-independent, then there must be some observer to make the universe actual. I think it is obvious that the observer is not any human being. We come later in the history of the universe, and it really is pushing things a bit far to say that the Big Bang was not actual until some human being thought of it. It seems to call for an observer who existed even at the beginning of the universe. And that really is very like God.

If some mind is need to make possibilities actual, it is even more plausible to think that possibilities cannot just exist on their own. If they exist at all, they must exist in something actual. That cannot be just the set of possibilities itself, since a whole lot of possibilities is still no more than possible. A good candidate is the same cosmic mind as the one that makes some possibilities actual – namely, God.

All this no doubt seems very abstract and very weird. But at least we can see that the God theory is no more weird than some interpretations of quantum mechanics. It has a lot to be said for it, as an elegant and comprehensive theory. And there is good evidence for it, both in the demand for a 'Theory of Everything', and in some of the more mind-stretching experiments of quantum mechanics.

Most people do not believe in God because God is a good absolute explanation of the universe. That is not their main reason for believing. The main reason is likely to lie in experiences of a certain sort. But the question will always remain of what the most adequate description of the object of such experiences is. At that point questions of moral adequacy (universality and personal fulfilment) and explanatory force (coherence, integration, comprehensiveness, and elegance) arise.