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Understanding the universe
Order of creation

Even Stephen Hawking doesn't quite manage to explain why we are here

Sep 9th 2010



Here comes the sun

The Grand Design. By Stephen Hawking and Leonard Mlodinow. *Bantam*; 198 pages; \$28 and £18.99. Buy from Amazon.com, Amazon.co.uk

IN 1988, Stephen Hawking, a British cosmologist, ended his best-selling book, "A Brief History of Time", on a cliff hanger. If we find a physical theory that explains everything, he wrote—suggesting that this happy day was not too far off—"then we would know the mind of God." But the professor didn't mean it literally. God played no part in the book, which was renowned for being bought by everyone and understood by few. Twenty-two years later, Professor Hawking tells a similar story, joined this time by Leonard Mlodinow, a physicist and writer at the California Institute of Technology.

In their "The Grand Design", the authors discuss "M-theory", a composite of various versions of cosmological "string" theory that was developed in the mid-1990s, and announce that, if it is confirmed by observation, "we will have found the grand design." Yet this is another tease. Despite much talk of the universe appearing to be "fine-tuned" for human existence, the authors do not in fact think that it was in any sense designed. And once more we are told that we are on the brink of understanding everything.

The authors may be in this enviable state of enlightenment, but most readers will not have a clue what they are on about. Some physics fans will enjoy "The Grand Design" nonetheless. The problem is not that the book is technically rigorous—like "A Brief History of Time", it has no formulae—but because whenever the going threatens to get tough, the authors retreat into hand-waving, and move briskly on to the next awe-inspiring notion. Anyone who can follow their closing paragraphs on the relation between negative gravitational energy and the creation of the universe probably knows it all already. This is physics by sound-bite.

There are some useful colour diagrams and photographs, and the prose is jaunty. The book is peppered with quips, presumably to remind the reader that he is not studying for an exam but is supposed to be having fun. These attempted jokes usually fuse the weighty with the quotidian, in the manner of Woody Allen, only without the laughs. ("While perhaps offering great tanning opportunities, any solar system with multiple suns would probably never allow life to develop.") There is a potted history of physics, which is adequate as far as it goes, though given what the authors have to say about Aristotle, one can only hope that they are more reliable about what happened billions of years ago at the birth of the universe than they are about what happened in Greece in the fourth century BC. Their account appears to be based on unreliable popularisations, and they cannot even get right the number of elements in Aristotle's universe (it is five,

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not four).

The authors rather fancy themselves as philosophers, though they would presumably balk at the description, since they confidently assert on their first page that "philosophy is dead." It is, allegedly, now the exclusive right of scientists to answer the three fundamental why-questions with which the authors purport to deal in their book. Why is there something rather than nothing? Why do we exist? And why this particular set of laws and not some other?

It is hard to evaluate their case against recent philosophy, because the only subsequent mention of it, after the announcement of its death, is, rather oddly, an approving reference to a philosopher's analysis of the concept of a law of nature, which, they say, "is a more subtle question than one may at first think." There are actually rather a lot of questions that are more subtle than the authors think. It soon becomes evident that Professor Hawking and Mr Mlodinow regard a philosophical problem as something you knock off over a quick cup of tea after you have run out of Sudoku puzzles.

The main novelty in "The Grand Design" is the authors' application of a way of interpreting quantum mechanics, derived from the ideas of the late Richard Feynman, to the universe as a whole. According to this way of thinking, "the universe does not have just a single existence or history, but rather every possible version of the universe exists simultaneously." The authors also assert that the world's past did not unfold of its own accord, but that "we create history by our observation, rather than history creating us." They say that these surprising ideas have passed every experimental test to which they have been put, but that is misleading in a way that is unfortunately typical of the authors. It is the bare bones of quantum mechanics that have proved to be consistent with what is presently known of the subatomic world. The authors' interpretations and extrapolations of it have not been subjected to any decisive tests, and it is not clear that they ever could be.

Once upon a time it was the province of philosophy to propose ambitious and outlandish theories in advance of any concrete evidence for them. Perhaps science, as Professor Hawking and Mr Mlodinow practice it in their airier moments, has indeed changed places with philosophy, though probably not quite in the way that they think.

Books and Arts

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