

# THE GREAT IDEAS ONLINE

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*When there is an apparent conflict between science and philosophy, it is to philosophy that we must turn for the resolution. Science cannot provide it. When scientists such as Einstein, Bohr, and Heisenberg become involved with mixed questions, they must philosophize. They cannot discuss these questions merely as scientists; the principles for the statement and solution of such problems come from philosophy, not from science.*

—Mortimer Adler



**"Philosophy is dead."**

- Stephen Hawking & Leonard Mlodinow, 2010

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## PHILOSOPHY LIVES

John Haldane

Philosophy, Étienne Gilson observed, “always buries its undertakers.” “Philosophy,” according to Stephen Hawking and Leonard Mlodinow, in their new book *The Grand Design*, “is dead.” It has “not kept up with modern developments in science, particularly physics, [and] scientists have become the bearers of the torch of discovery in our quest for knowledge.” Not only, according to Hawking and Mlodinow, has philosophy passed away;

so, too, has natural theology. At any rate, the traditional argument from the order apparent in the structure and operations of the universe to a transcendent cause of these, namely God, is wholly redundant—or so they claim: “[Just] as Darwin and Wallace explained how the apparently miraculous design of living forms could appear without intervention by a supreme being, the multiverse concept can explain the fine tuning of physical law without the need for a benevolent creator who made the Universe for our benefit. Because there is a law of gravity, the Universe can and will create itself from nothing. Spontaneous creation is the reason there is something rather than nothing, why the Universe exists, why we exist.”

Notwithstanding their death notice for philosophy, in introducing their idea of a fundamental physical account of the universe, M-theory, the authors themselves cannot resist engaging in evident philosophizing about the nature of theories and their relationship to reality. To address the paradoxes arising from quantum physics, they use what they call “model-dependent realism,” which “is based on the idea that our brains interpret the input from our sensory organs by making a model of the world.”

When such a model is successful at explaining events, we tend to attribute to it, and to the elements and concepts that constitute it, the quality of reality or absolute truth. But there may be different ways in which one could model the same physical situation, with each employing different fundamental elements and concepts. If two such physical theories or models accurately predict the same events, one cannot be said to be more real than the other.

While a professional philosopher might disambiguate and refine some of these expressions and formulations, Hawking and Mlodinow are describing a position familiar within the philosophy of science and known variously as “constructive empiricism,” “pragmatism,” and “conceptual relativism.” They are not replacing philosophy with science. Indeed, their discussion shows that, at its most abstract, theoretical physics leaves ordinary empirical science behind and enters the sphere of philosophy, where it becomes vulnerable to refutation by reason.

Certainly their argument from M-theory to the redundancy of the God hypothesis, for example, is open to direct philosophical criticism. If the necessary conditions of our existence did not obtain, we would not exist, and if the necessary conditions of the necessary conditions of our existence had not obtained, then neither we

nor many other aspects and elements of the present universe would have been. Any scientific theory that is incompatible with things having been as they had to have been, in order for the universe to be as it is, is thereby refuted.

None of this may be very profound or took science to establish, but it does raise a question: Is the obtaining of the necessary conditions in question explicable, and, if so, how? What we know about the observable universe, and what we can infer about what is unobservable, indicate that it is composed of a number of types of entities and forces whose members exhibit common properties and are subject to a small number of simple laws.

There is nothing obviously inevitable about this fact. The universe could have been spatially and temporally chaotic. Yet it isn't. Chemistry tells us that elements share well-defined structural properties in virtue of which they can and do enter into systematic combinations, and physics tells us that these elements are themselves constructed out of more basic items whose properties are, if anything, purer and simpler.

Why is there order rather than chaos? One might say that, if there had been chaos, the question would not arise because we would not exist. In a sense that is true, but it leaves untouched the central question, which is that of the preconditions of the possibility of order. Cosmic regularity makes our existence possible; the underlying issue concerns the enabling conditions of this order itself.

Some "proofs" of God as existing cause and sustainer of the universe (and of the enabling conditions) argue from spatiotemporal regularity alone. They reason that, while events in nature can be explained by reference to the fundamental particles and the laws under which they operate, natural science cannot explain these factors. Natural explanations having reached their logical limit, we are forced to say that either the orderliness of the universe has no explanation or that it has an extra-natural one.

The latter course cannot plausibly take the form of embedding the facts of the universe within the laws and initial conditions of a SuperUniverse. That would amount to retracting the claim to have specified the ultimate facts of the material universe, and nature would then be regarded as a spatial and / or temporal part of SuperNature. The search for the source of order must reach a dead end if scientific explanation is the only sort there is. But it is not the only sort, for there is also explanation by reference to purpose and intention.

The universe's otherwise inexplicable regularity will have an adequate explanation if it derives from the purposes of an agent. By definition, no natural agent could have made the universe, so the only possible explanation of its regularity is that the natural order has a transcendent cause outside of the universe, which introduces the idea of a creator God.

This traditional argument predates the physical and cosmological investigations that produced the evidence of "fine tuning" Hawking and Mlodinow discuss under the heading of "The Apparent Miracle." They correctly observe that earlier versions of this argument, such as that favored by Newton, focused on our "strangely habitable solar system," and they point out that this argument lost its power when it was discovered that our sun is but one of many stars orbited by countless planets. "That makes the coincidences of our planetary conditions far less remarkable and far less compelling as evidence that the Earth was carefully designed just to please us as human beings."

They then go on to note, however, that "it is not only the peculiar characteristics of our solar system that seem oddly conducive to the development of human life but also the characteristics of our entire Universe, and that is much more difficult to explain." The forces of nature had to allow the production of carbon and other heavy elements, and allow them to exist stably; they had to facilitate the formation of stars and galaxies but also the periodic explosion of stars to distribute the elements needed for life more widely, permitting the formation of planets suitably composed for the evolution of life; and the strengths of the forces themselves and the masses of the fundamental particles on which they operate had to be of the correct orders of magnitude, and these lie within very small ranges.

"What," they ask, "can we make of these coincidences? . . . Our Universe and its laws appear to have a design that both is tailor made to support us and, if we are to exist, leaves little room for alteration. That is not easily explained and raises the natural question of why it is that way." Fortunately, however, M-theory provides a scientific answer, and it is analogous to the many-solar-systems response to Newton's wonder at the habitability of our solar system. Hawking and Mlodinow write:

According to M-theory, ours is not the only universe. Instead M-theory predicts that a great many universes were created out of nothing. Their creation does not require the intervention of

some supernatural being or god. Rather these multiple universes arise naturally from physical law. They are a prediction of science. Each universe has many possible histories and many possible states at later times, that is, at times like the present, long after their creation. Most of these states will be quite unlike the Universe we observe and quite unsuitable for the existence of any form of life. Only a few would allow creatures like us to exist.

In short, and sparing the detail, ours is but one of an indefinite number of universes with different laws and forces, each universe being a spontaneous creation out of nothing: “Because there is a law such as gravity, the Universe [that is, ours] can and will create itself from nothing.”

There are two telling objections to this: the first to the idea of spontaneous creation, the second to that of multiple universes.

What of spontaneous creation? When Aquinas and others in the Western natural-theology tradition argued from the character of the universe to the existence of its transcendent cause, they were acute enough to describe that original source of the being and character of things as an uncaused cause and not as the cause of itself. That was a matter of logical coherence, since the idea that something could create itself from nothing simply makes no sense—be that something God or the Universe. In order to create, one first has to exist.

What then of “multiverses”? How effective is this response to the argument from cosmic order? If there are infinitely many other universes, ordered either in parallel or in temporal sequence, it may seem inevitable that at least one like ours should exist, but all one can say is that, as the number of universes proceeds towards infinity, the probability of a difference between the actual distribution and the probable one diminishes almost to zero. Further, unless the theory claims that all possibilities are or must be realized, it concedes that a finely tuned universe might not have existed and thereby allows a probability argument for design.


One may query directly the coherence of the many-universe hypothesis, however. What is meant by talking about many universes? It might mean unobservable regions of the universe—the one spatio-temporal-causal continuum—or, although this is much harder to make sense of, entirely distinct cosmic setups, wholly discontinuous with the universe we inhabit. The first possibility fails to serve Hawking and Mlodinow’s purpose. Any evidence we

could have for these distant regions would necessarily be evidence for situations exhibiting the same orderliness whose existence seemed to call for explanation.

The second possibility—that there are many universes, entirely distinct realities, wholly discontinuous and sharing no common elements—fails also. There can be no empirical evidence in support of the hypothesis, nor could it be derived as a necessary condition of the possible existence and character of the only universe of which we have or could have scientific knowledge.

Hawking and Mlodinow write that the “multiverse idea is not a notion invented to account for the miracle of fine tuning.” Whether or not it was invented as such, its deployment in this context appears ad hoc, introduced only to avoid the conclusion that the general regularities and particular fine-tuning are due to the agency of a creator.

The basic components of the material universe and the forces operating on them exhibit properties of stability and regularity that invite explanation—the more so given the narrow band within which they have to lie in order for there to be intelligent animals able to investigate and reflect on the conditions of their own existence. Science cannot provide an ultimate explanation of order.

As Hawking and Mlodinow occasionally seem to recognize, far from philosophy being dead, having been killed by science, the deepest arguments in this area are not scientific but philosophical. And if the philosophical reasoning runs in the direction I have suggested, it is not only philosophy but also natural theology that is alive and ready to bury its latest would-be undertakers. 

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***We welcome your comments, questions or suggestions.***

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