

Looking for ultimate explanations in the wrong place

Michael Heller, *Ultimate Explanations of the Cosmos*, 2009, Springer, Heidelberg

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This is a very odd book. The first part gives an account of developments in cosmology, roughly from Einstein's contribution onwards. Then, abruptly, we jump to Christian accounts of creation, from early biblical ideas up to Newton and Leibniz. Then, in four final chapters, the author attempts to bring together the two earlier, jarringly discordant parts not, in my view, successfully.

The book opens with an attempt to say what an "ultimate explanation" is. An explanation, we are told, is "a series of statements connected with each other by means of systematic proof" (p. 2). An "ultimate explanation" would be "an explanation of itself" (p. 2). Or it might possibly be "in the nature of circular explanations – a closed chain of inferences: the current conclusion becomes the reason for the statements of which it is an inference" (p. 3).

Not much clarity, in short, is brought to the key notion of the book. It would have been better to say, merely, that an ultimate explanation is provided, in principle, by the true, unified physical "theory of everything" (if there is such a thing).

We then get informal accounts of Einstein's contribution to cosmology, and the contributions of Lemaître, Friedman, Tolman, Gödel, and Wheeler. There is an account of the battle between the steady state and big bang cosmological theories. We encounter inflation, the idea that the cosmos arose as a quantum fluctuation in the vacuum, the Wheeler-De Witt equation, and Hartle and Hawking's theory of the quantum creation of the universe. There is then a sceptical discussion of the anthropic principle and multiuniverse ideas.

None of these cosmological theories, we are told, succeeds as an ultimate explanation, and any such theory must postulate a physically interpreted mathematical structure without being able itself to explain why this structure exists, or why some other structure does not exist instead. In order to understand the mystery of the physical comprehensibility of the universe "we shall have to transcend the boundary of the mathematical and experimental method" (p. 121). This provides the cue to plunge into early Christian ideas about the creation.

That the bible opens with an account of God's creation of the world may lead us to think that cosmology is essential to the biblical story. But this, our author tells us, is not really so. The *Book of Genesis* was not the earliest part of the bible to be written. And "the familiar story of the Creation was not devised as a strictly cosmological doctrine, but rather as a backup to the belief that God had always been present in the history of His People" (p. 124). Subsequently, however, Christian thinkers did take seriously the problem of reconciling the biblical account of creation with ancient Greek cosmological thought which, despite its great variety of ideas, tended to hold that the universe is eternal.

Origen (ca. 185-254) held that God is always creating the universe, there being no unique past period of creation. This, however, was too radical a view to have much

influence. He did however influence Augustine of Hippo (354-430), who held that God exists outside time, and creates the entire universe, past, present and future, in one act of creation. Creation is “the giving of existence” at all times; if it were ever suspended “the world would instantly disintegrate into nothingness” (p. 131). Aquinas (1225-1274) continued this line of thought, but in an Aristotelian context. He asked, in effect, “How can the universe be both eternal and created?” and answered that this becomes possible when we understand that God sustains the existence of substance in the world, from instant to instant.

After a brief discussion of the manner in which Kepler, Galileo and other founding fathers of modern science developed, and did not just reject, traditional ideas, Michael Heller goes on to consider the theological ideas of Newton and Leibniz. Newton held that God exists in space and, eternally, in time, and created the universe at a specific time in space, subsequently adjusting velocities of bodies when necessary. Leibniz rejected all this as violating his principle of sufficient reason. There could not be a “sufficient reason” to create the universe at one place rather than another, or at one time. The very Newtonian idea of absolute space violates the principle of sufficient reason, since there cannot be a sufficient reason why the material universe is not six feet away from its present position in absolute space. Time and space are not independent of things; they are, rather, relations between things or events. “God did not create the universe *in* time and space, but *with* time and space” (p. 158).

There then follow the four final chapters of the book in which Heller seeks to draw some conclusions from the juxtaposition of the two earlier, discordant parts. This is what he has to say. Despite speculative ideas discussed in the first part of the book, science cannot really say anything significant about what led up to the big bang until a viable theory of quantum gravity has been discovered. (Heller has almost nothing to say about M-theory, and its possible cosmological implications.) Theology should not seize upon the big bang as giving a role for God. As we have seen, Christian theology has long interpreted God’s creation of the universe in such a way that this does not involve an act of origination at some past moment. We should not look for signs of God in this or that detail, but see such signs in the whole comprehensible structure of the universe. Proponents of creationism and intelligent design are wrong, and miss the point. Probabilistic occurrences – however wildly improbable – are “fully controlled” by God (p. 174). Leibniz’s request for an explanation as to why anything exists at all should be treated sympathetically, since science never stops asking questions. Finally in contemplating the nature of God we should take “negative theology” seriously, and Wittgenstein’s injunction that “whereof one cannot speak, thereof one must be silent”.

These conclusions, spelled out by Heller in the last four chapters, do not, in my view, justify the very odd structure of this book. And this remains true, in my view, even if one takes it as given that God exists. In that case it would have made more sense, it seems to me, to have begun with the question “How can what modern science tells us about the cosmos be reconciled with God’s existence?”, subsequent chapters exploring this question.

I do not believe in the orthodox Christian God because I do not see how an all-powerful, all-knowing Being could be anything other than a cosmic monster. Such a Being would knowingly torture and kill all those who suffer and die from natural causes. Heller says nothing whatsoever about this well-known, fundamental objection.

Much more can be said about ultimate explanations than Heller manages to say. To begin with, much more can be said about what it means to say of a physical theory that it is “unified” or “explanatory”. Again, as I have long argued, if the true unified physical “theory of everything” is interpreted in a “conjecturally essentialistic” way, so that all the laws of the theory are analytic truths, true in virtue of the meaning of the constituent terms, and thus necessary truths, all the factual import of the theory being concentrated in the existential assertion “an entity exists that has the necessitating properties specified by the laws”, then the theory, interpreted in this way, would indeed provide, in principle, ultimate explanations. Given that what the theory asserts to exist really does exist, any instantaneous state of the universe necessarily determines all other states (or necessarily determines all other states probabilistically, if the theory is fundamentally probabilistic). Such a theory would not explain itself, but that seems to me obviously impossible. There is, however, still Einstein’s problem – or a version of it: Why is such a universe comprehensible *to us*? That too has an answer, as I have shown. (For these points see my *The Comprehensibility of the Universe*, 1998, Oxford University Press, Oxford, chapter 4; and *The Human World in the Physical Universe*, 2001, Rowman and Littlefield, Lanham, Maryland, pp. 254-8.)