



## Cosmology and Infinity

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*Philosophy*, Vol. 48, No. 184. (Apr., 1973), pp. 186-187.

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*Philosophy* is currently published by Cambridge University Press.

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# Cosmology and Infinity

Pamela M. Huby

Mr Newton-Smith and Mr Boyce, in discussion notes in the January 1972 number of *Philosophy*, have raised a number of interesting points about my original paper. But I feel that they have not gone beyond a simple denial of the central argument, which is to be found on pp. 124–126 and 128–130 of the April 1971 number, and that much of what they say therefore fails by *petitio*.

Mr Boyce does not see that I hold that there is a difference between being a logical possibility and being, in the sense with which I am concerned, a real possibility. Thus his useful summary of current cosmological views is beside the point. The question remains, for instance, whether the paper-work of the Steady State theorists is more than an interesting piece of mathematics, for it contains certain assumptions which on my argument need examination. And it is no more satisfactory to say that because the Steady State theory is a logical possibility Hilbert's Hotel is a real possibility, than *vice versa*. Again, in his account of the Big Bang theory, Version I, Mr Boyce just dodges the question of what is meant by 'real'. Of course within the theory one can assume that future and past events are real and ignore some very important philosophical questions about time, but this does not help us when we are outside the theory.

The only point about current cosmological views which is of importance to my theory is that they do not exclude the possibility that the Universe had a beginning. Mr Boyce apparently tries to do this by repeating and strengthening the arguments of the antithesis of Kant's First Antinomy. It is not clear to me whether he accepts these arguments as valid; they are certainly puzzling, but I do not find them so compelling that they amount to a proof of the infinity of the Universe. And while it is true that Kant was concerned to show the limitations of pure reason, he also used the antinomies as evidence that the Universe was not fully real. But I do not myself wish to take a stand on these further issues. They require extensive consideration.

Mr Newton-Smith objects to what I say at the bottom of p. 127 about things in space. If this were intended as a self-contained and independent argument he would be right. But it is not. It is to be taken along with the immediately preceding paragraph about future events in time, and both are only *illustrations* of what I am getting at, which can only be understood by reading the main arguments. He also misses the point when he refers to my mention of the paradoxes that follow from the assumption that there can be  $\text{Aleph}_0$  real entities. I did not say that these were *logical* paradoxes,

and I accept what he says about Dedekind and Tarski without seeing that this affects my main argument.

He comes nearer to the heart of the matter when he deals with potentiality and actuality. He sees that my paper is as much concerned with the nature of numbers as with that of the Universe, but his play with the notion of potential numbers is, in this context, misplaced. The expression 'potential number' was used by me in a particular context, where I hoped by using it to clarify a difficult point, and I do not wish here to generalize about it. What I am concerned with primarily is the application of numbers in counting, or the application of mathematics to the world; and I would limit myself to the suggestion that for my purposes a potential number is a class of classes which may or may not be empty. For mathematicians this point is unimportant, but for me it is not.

I do not fully understand Mr Newton-Smith's suggestion that he can give empirical content to the claim that the Universe is spatially infinite. How do we even begin to see whether there is a maximum distance between pairs of galaxies, and, while it is easy to begin, how do we complete the correlation between the set of all galaxies and the set of all natural numbers?

One last comment about Hilbert's Hotel. If we accept this as a real possibility, the notion of a vicious infinite regress needs attention. I will confine myself to two cases. The first is a common interpretation of Plato's Third Man argument in the *Parmenides*. Many scholars write as if the fact that the assumptions of the Theory of Forms here being considered involve an infinite regress is itself a logical objection to them, but if the Third Man and all his successors to infinity can find a real resting-place in Hilbert's Hotel the objection cannot be sustained.<sup>1</sup> My second case is from the same number of *Philosophy*, p. 84, where Mr Haksar argues that Moore's reconciliation of freewill and determinism by an analysis of 'he could have chosen otherwise' as 'if he had chosen to make the choice he would have made the choice' involves a (vicious) regress. But, again, could not Moore's choices be correlated with Hilbert's rooms?

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<sup>1</sup> Many others have interpreted the Third Man argument without having to take the line being considered here. Most handle the regress part gingerly.