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The Most Measured Understanding of Spacetime

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Abstract

Newton and Einstein each in his way showed us the following: an epistemologically responsible physicist adopts the most measured understanding possible of spacetime structure. The proper way to infer a doctrine of spacetime is by a kind of measuring inference -- a deduction from phenomena. Thus it was (I argue) by an out-and-out deduction from the phenomena of inertiality (as colligated by the three laws of motion) that Newton delineated the conceptual presuppositions concerning spacetime structure that are needed before we can actually think coherently about these phenomena. And Einstein (I argue) very much recapitulated this argument pattern, twice over in fact, recolligating the phenomena first so as to add something from the laws of electromagnetism, and then so as to add everything about gravitation, into what he understood by inertiality. Notably, to deduce ones theoretical conclusions from phenomena is both more cautious and more cogent than to "infer to the best explanation". And in the context of the development of a doctrine of spacetime, deductions from phenomena lay before us formal rather than causal understanding. Deductions from phenomena tell us, in this context, not what things or what causes there are, but rather what our concepts should be like. The more measured the inference is, however, the more definitively it tells us this. For these reasons the most measured understanding of spacetime lies on a line between conventionalism and realism, between relationalism and absolutism, and indeed (as I demonstrate) between empiricism and rationalism. Spacetime is understood as neither merely immanent in material goings-on, nor truly transcendent of them either. In order to explain this understanding as adequately as I can and in order to remark its excellences most fully, I consider some respects in which the tertium quid between metaphysical realism and strict empiricism about spacetime is wise in the sense of practical wisdom. The wisest understanding of spacetime illustrates, I argue, an original and fundamental connection that epistemology has with ethics.

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