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ONTOLOGY: AN EMPIRICAL FUNDAMENTALIST APPROACH

ABSTRACT. I apply the philosophical program Empirical Fundamentalism to the topic of ontology. My advice is to represent reality using two related components: a model of fundamental reality and a model of what we can observe in principle called an ‘empirical surrogate’. The empirical surrogate need not be fundamental but can abstract away from fundamental reality while reducing to fundamental reality. Our ideal guess at ontology is a model of fundamental reality that (1) is a reduction base for the appropriate empirical surrogate, (2) posits no conspiratorial structure, and (3) has no redundant structure. I contrast my approach to alternatives that appeal to beables or primitive ontology.

1. Introduction

My aim here is to demonstrate how a general metaphysical framework can be fruitfully integrated with contemporary fundamental physics to address issues like ontology in classical and quantum physics. The basic idea is that metaphysics concerns fundamental reality and how fundamental reality is related to reality. If we accept that fundamental reality includes fundamental physics, then the investigation of fundamental reality by physicists is one component of the overall undertaking of metaphysics. The distinctively philosophical components include (1) identifying how fundamental reality relates to reality, (2) clarifying our epistemic grasp of fundamental reality, and (3) comparing our answers to existing alternatives. It would take considerable effort to accomplish each of these tasks fully, but in the following discussion, I hope to sketch one particular philosophical program and how it can address them. My goal is to provide a proof of concept.

1 A fourth task, too large to be taken up here, is to ascertain whether fundamental reality includes more than fundamental physics.

for a scientific metaphysics that is broader and more conceptually oriented than science itself, yet is capable of supporting the conclusion that the actual world is ultimately just fundamental physics.

I will first sketch my proposed philosophical program and its central distinction between fundamental and derivative reality. In order to support adoption of the program, I will then address tasks (1) and (2) by introducing a formal device called an ‘empirical surrogate’. Its purpose is to idealize the empirical phenomena that scientific theories attempt to predict and explain so that the fundamental theory can explain all empirical phenomena by explaining the empirical surrogate. My ‘empirical surrogate’ is intended as an alternative to Wilfrid Sellars’ (1962) ‘manifest image’ and to a more recently proposed concept, ‘primitive ontology’. In sections 4 and 5, I will illustrate the fundamental/derivative distinction and ‘empirical surrogate’ by applying them to the classic debate over the ontological status of space in classical mechanics and to contemporary debate over quantum ontology. Finally, I will address task (3) by contrasting my approach to some recent advocacy for primitive ontology and to Bell’s appeal to ‘local beables’.

2. Fundamental Reality

The purpose of this section is to summarize the four components of the philosophical program known as Empirical Fundamentalism that are most relevant to the relation between physics and metaphysics. Brevity prevents a fully adequate defense of the overall Empirical Fundamentalist framework, but the program has already been discussed extensively in (Kutach 2011, 2013). The arguments provided here are intended to support Empirical Fundamentalism by showing how its conception of fundamentality clarifies what is at stake in debates about ontology, whether classical or quantum. Of course, many other successful applications of this philosophical system must be spelled out in detail before an adequate case can be made for its adoption as a general metaphysical framework.

Let us now take up task (1), identifying how fundamental reality relates to reality. Three broad observations are worth making.

First, according to Empirical Fundamentalism, reality is understood as the totality of what exists. Reality is partitioned into exactly two parts, fundamental and derivative. That is, every existent is either fundamental or derivative, and no existent is both. This conception of fundamentality differs from other conceptions by requiring no levels of reality, no more-fundamental-than relation, and no relations of ontological dependence, ontological priority, or grounding. These concepts suggest that we understand