

8. Historical, social and cultural studies in the philosophy of science

Contributed Paper

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Realistic Claims in Logical Empiricism

Abstract

Scientific realism is the view that the theoretical entities of science exist. Atoms, forces, electromagnetic fields, and so on, are not merely instruments for organizing observational data but are real and causally effective. This view seems to be hardly compatible with the logical empiricist agenda: As common wisdom has it, logical empiricism is mainly characterized by a strong verification criterion of meaning, i.e., by the project of defining the meaning of theoretical terms by virtue of the meaning of purely observational terms. However, it has been largely ignored by the historians of logical empiricism that there indeed existed a *realist faction* within the logical empiricist movement. Among the few authors who have recognized both the historical and the programmatic relevance of this realist faction is Stathis Psillos who, in two recent papers, attempts to emphasize the important role played in this connection by Herbert Feigl¹ and by Hans Reichenbach². According to Psillos, it was these two thinkers

¹ See Stathis Psillos, "Choosing the Realist Framework", *Synthese* 180, 2011, pp. 301-316.

² See Stathis Psillos, "On Reichenbach's Argument for Scientific Realism", *Synthese* 181, 2011, pp. 23-40.

who documented in their writings the *compatibility* of logical empiricism and scientific realism.

Like Psillos I am of the opinion that the realist faction within the logical empiricist movement deserves more attention than it has received so far. However, I will come to a different result than Psillos. According to the view I wish to defend, Feigl and Reichenbach (and with them Psillos) are still too optimistic about the ontological impact of language. In order to establish the intended realist account of logical empiricism, more metaphysics is needed than Feigl and Reichenbach (and with them Psillos) would allow. As will be shown, among the logical empiricists themselves it was the Finnish philosopher Eino Kaila who came closest to this—less linguistic and more metaphysical—kind of approach.

My starting point is the conception of the realism problem as a typical metaphysical ‘pseudo-problem.’ This conception can be found in the writings of the early Rudolf Carnap and, obviously following Carnap, the writings of the later (‘Viennese’) Moritz Schlick. I will point out that the pseudo-problem account was the most extensively discussed approach toward the realism issue within the logical empiricist movement; but that it was not the only one. At least two other approaches must be distinguished within the (rather complex) logical empiricist framework: (1) the conception of the realism problem as a problem concerning *the language of science*; (2) the conception of the realism problem as a problem concerning *the ontology of science*.

As for the first, language-based conception, Reichenbach and Feigl might be regarded as the pioneering figures. As Psillos has rightly pointed out, both Reichenbach and Feigl refused to see in the realism problem a mere pseudo-problem. For them, the realism issue should be regarded as a serious scientific challenge. More precisely, the realism issue, according to Reichenbach and Feigl, can be adequately handled within *semantics*, on the one hand, and (at least as concerns Reichenbach) *probability theory*, on the other. However, by focusing on such concepts like reference, truth and probability, both Reichenbach and Feigl did not really go beyond what the later Carnap, for instance, *would have embraced without becoming a realist at all*. Carnap’s “Empiricism, Semantics, and Ontology” (1950) is a wonderful example for the programmatic flexibility of language-based accounts of scientific theory construction. As long as theories are seen as purely linguistic entities, an instrumentalist or, at least, neutral interpretation of the aim of theory construction seems to be the most plausible one.

But what if theories are not seen that way? Is the logical empiricist agenda abandoned then? Not necessarily! In any case, it appears plausible to take ontological questions seriously without at the same time falling back to the over-ambitious aims of speculative *Naturphilosophie* in the sense of Hegel or Schelling. And this is exactly the point where Kaila comes into play. The methodologically most remarkable feature in Kaila's thinking is that the reflection on the structure of language is *subordinated* to the reflection on the structure of the world. Kaila—himself professor of theoretical philosophy at the University of Turku and (after 1930) at the University of Helsinki—stood in contact with the members of the Vienna Circle since 1927 and visited Vienna in 1929 in order to discuss (among other things) the realism issue personally with Carnap. Although he was to a large extent inspired by the “exact philosophical method of the Vienna Circle”³, Kaila refused to take the ‘linguistic turn’. Instead, he focused on the explanatory constituents *of science itself*. By taking this broadly naturalistic perspective, Kaila was in a position to circumvent the conception of the realism issue as a pseudo-problem. What he had to offer—in the constructive sense—was an ontologically inspired theory of science and nature which was essentially grounded on the concept of *invariance*. In the talk, it will be shown that by taking invariance seriously, Kaila was in a position to furnish the logical empiricist conception of scientific theories with an *ontological foundation*. He thereby was able to install invariance as an explanatory principle and, in consequence, to account for the causal effectiveness of theoretically postulated entities. His (thoroughly anti-conventionalist) *theory of measurement* was intended to drive this point home.⁴

Possible problems of Kaila's invariantist ontology notwithstanding, the quest to make logical empiricism compatible with scientific realism unavoidably necessitates an affirmative approach toward the role of (non-speculative) metaphysics in the philosophy of science. Rather than reflecting on concerns of internal ‘language engineering’, the principle aim should be to figure out how and why the language of science *fits with the causal structure of the objective world*. Kaila's invariantist ontology might invest us with the basic means for achieving this goal in a logical empiricist *and at the same time* scientific realist account of science and nature.

³ Ilkka Niiniluoto, “Eino Kaila and Scientific Realism”, in: Ilkka Niiniluoto, Matti Sintonen, G.H. von Wright (eds.), *Eino Kaila and Logical Empiricism* (= Acta Philosophica Fennica, vol. 52). Helsinki: Societas Philosophica Fennica 1992, p. 103.

⁴ For the details of Kaila's theory of measurement, see Matthias Neuber, “Invariance, Structure, Measurement – Eino Kaila and the History of Logical Empiricism”, *Theoria* 78, 2012, pp. 358-383.