

Reference and Projection of Scientific Concepts

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Abstract

What is the relation between scientific terms (scientific concepts) and the world? In this article I argue that the several versions of causal theory of reference fail to provide a good answer to this question. As the notion of reference is presupposed, the versions encounter some unsolvable difficulties. But there is a better approach along the notion of projection. I claim that some degree of correlation between scientific terms or concepts and the world can be established through projection.

This article proposes and develops an Empirical Projection Theory (EPT) for scientific concepts. The theory exhibits an essential characteristic of the scientific concept: empirical projectibility. EPT claims the following theses. (1) Scientific concepts can be projected onto the world by the mind and confirmed by constructing realizable models. (2) Each scientific concept is a part of a conceptual network that is constituted by a classificatory system. (3) The correlation between each scientific concept and phenomena depends on the concept's topological location or the way it is linked to the other concepts. (4) When the object projected by a scientific concept is confirmed or realized, the scientific concept and its correspondent scientific term refers to the realized object. (5) The same scientific term occurring in different scientific theories would then correspond to different scientific concepts.

Some scientific cases, such as calorimetry, thermodynamics, and phlogiston theory, are taken as examples to justify EPT in this article.

Key Words: scientific realism, the causal theory of reference, projection, scientific concepts, philosophy of science