

Can science advance effectively through philosophical criticism and reflection?

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Abstract

Prompted by Hasok Chang's conception of the history and philosophy of science (HPS) as the continuation of science by other means, I examine the possibility of obtaining scientific knowledge through philosophical criticism and reflection, in the light of four historical cases, concerning (i) the role of absolute space in Newtonian dynamics, (ii) the purported contraction of rods and retardation of clocks in Special Relativity, (iii) the reality of the electromagnetic ether, and (iv) the so-called problem of time's arrow. In all four cases it is clear that a better understanding of such matters can be achieved—and has been achieved—through conceptual analysis. On the other hand, however, it would seem that this kind of advance has more to do with philosophical questions in science than with narrowly scientific questions. Hence, if HPS in effect continues the work of science by other means, it could well be doing it for other ends than those that working scientists ordinarily have in mind.

Keywords: Absolute space – Inertial frames – Length contraction – Clock retardation – Special relativity – Ether – Time – Time directedness – Entropy – Boltzmann entropy

Subjects: [Specific Sciences: Physics: Relativity Theory](#)
[Specific Sciences: Physics: Statistical Mechanics/Thermodynamics](#)

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