

Search & Browse

- Simple Search
- Advanced Search
- Browse by Subject
- Browse by Year
- Browse by Conferences/Volumes
- Latest Additions

Information


- Home
- About the Archive
- Archive Policy
- History
- Help
- FAQ
- Journal Eprint Policies
- Register
- Contact Us

News

- Guide to new PhilSci-Archive features.

The Principle of Least Action as the Logical Empiricist's Shibboleth

Stöltzner, Michael (2002) *The Principle of Least Action as the Logical Empiricist's Shibboleth*. [Preprint]



Microsoft Word (.doc)
[Download \(291Kb\)](#)

Abstract

The present paper investigates why Logical Empiricists remained silent about one of the most philosophy-laden matters of theoretical physics of the day, the Principle of Least Action (PLA). In the two decades around 1900, the PLA enjoyed a remarkable renaissance as a formal unification of mechanics, electrodynamics, thermodynamics, and relativity theory. Taking Ernst Mach's historico-critical stance, it could be liberated from much of its physico-theological dross. Variational calculus, the mathematical discipline on which the PLA was based, obtained a new rigorous basis. These three developments prompted Max Planck to consider the PLA as formal embodiment of his convergent realist methodology. Typically rejecting ontological reductionism, David Hilbert took the PLA as the key concept in his axiomatizations of physical theories. It served one of the main goals of the axiomatic method: 'deepening the foundations'. Although Moritz Schlick was a student of Planck's, and Hans Hahn and Philipp Frank enjoyed close ties to Göttingen, the PLA became a veritable Shibboleth to them. Rather than being worried by its historical connections with teleology and determinism, they erroneously identified Hilbert's axiomatic method tout court with Planck's metaphysical realism. Logical Empiricists' strict containment policy against metaphysics required so strict a separation between physics and mathematics to exclude even those features of the PLA and the axiomatic method not tainted with metaphysics.

Export/Citation: [EndNote](#) | [BibTeX](#) | [Dublin Core](#) | [ASCII \(Chicago style\)](#) | [HTML Citation](#) | [OpenURL](#)
Social Networking: [Share](#) |

Item Type: Preprint

Keywords: Principle of Least Action, calculus of variations, Hilbert's axiomatic method in physics, Mach-Planck controversy, Logical Empiricism, Moritz Schlick, Hans Hahn, Philipp Frank.

Subjects: [General Issues > Causation](#)
[Specific Sciences > Physics > Classical Physics](#)
[General Issues > History of Philosophy of Science](#)
[General Issues > Logical Positivism/Logical Empiricism](#)
[General Issues > Philosophers of Science](#)

Depositing User: [Michael Stoeltzner](#)

Date Deposited: 13 Apr 2002

Last Modified: 07 Oct 2010 11:10

Item ID: 616

URI: <http://philsci-archive.pitt.edu/id/eprint/616>

Actions (login required)



View Item

Document Downloads



This site is hosted by the [University Library System](#) of the [University of Pittsburgh](#) as part of its [D-Scribe Digital Publishing Program](#)



Philsici Archive is powered by [EPrints 3](#) which is developed by the [School of Electronics and Computer Science](#) at the University of Southampton. [More information and software credits.](#)



Atom



RSS 1.0



RSS 2.0