

Platonism in classical logic versus formalism in the proposed non-Aristotelian finitary logic

Srinivasan, Radhakrishnan (2003) Platonism in classical logic versus formalism in the proposed non-Aristotelian finitary logic.

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Abstract

The main thesis of this paper is that Platonism is inherent in classical infinitary reasoning and that strict formalism inevitably leads one to the author's non-Aristotelian finitary logic (NAFL) proposed in the PhilSci preprint ID Code 635. This claim is established by an elementary analysis of Peano Arithmetic and its weak fragments (especially Successor Arithmetic). Hence it is argued that Hilbert's program is decisively settled negatively -- classical infinitary reasoning stands refuted from the finitary and formalistic standpoints. The philosophical basis for NAFL is discussed thoroughly and motivated via consideration of several examples, including the Schroedinger cat and four-mirror experiments of quantum mechanics. Particular attention is paid to the delicate interplay between syntax and semantics in NAFL, and the differences in this regard between NAFL and classical/intuitionistic/constructive logics. The meaning of 'existence' of mathematical objects and the concept of negation in NAFL are discussed. NAFL also correctly handles time-dependent truth values for propositions involving future contingencies; this is illustrated with examples, such as, Aristotle's 'There will be a sea battle tomorrow'. That NAFL justifies quantum superposition on the one hand, while emphatically rejecting much of classical infinitary reasoning and the continuum-based relativity theories (see also the PhilSci preprint ID Code 666) on the other, means that the incompatibility between quantum mechanics and the theory of relativity is clearly established in NAFL. Another important implication for quantum mechanics is that NAFL requires the concept of 'measurement' to be confined to the metatheory, i.e., it is not formalizable.

Commentary on: [Srinivasan, Radhakrishnan \(2002\) Quantum superposition justified in a new non-Aristotelian finitary logic.](#)

EPrint Type: Preprint

Keywords: foundations of mathematics, foundations of quantum mechanics, classical first-order predicate logic, intuitionistic logic, constructive logics, quantum logic, law of the excluded middle, law of non-contradiction, Goedel's incompleteness theorems, Turing's halting problem, nonstandard models, Peano Arithmetic, undecidability, Hilbert's program.

Subjects: [Specific Sciences: Mathematics](#)
[Specific Sciences: Physics](#)
[Specific Sciences: Physics: Quantum Mechanics](#)

ID Code: 1166

Deposited By: [Srinivasan, Radhakrishnan](#)

Deposited On: 21 May 2003

Additional Information: Minor corrections/improvements made to PhilSci preprint ID Code 984.

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