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Vienna Indeterminism II: From Exner's Synthesis to Frank and von Mises

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Abstract

This paper continues an earlier investigation into the philosophical tradition of Vienna Indeterminism until the formation of the Vienna Circle in 1929. It focuses in particular on how Philipp Frank and Richard von Mises were able to contemplate genuine indeterminism in physics before the advent of quantum mechanics. On this account, all apparently deterministic laws could well be the macroscopic limit of indeterministic basic laws valid for the single micro-events. Philosophically Vienna Indeterminism was launched by Mach's redefinition of causality in terms of functional dependencies. This severed the rigid bond between causality and empirical realism characteristic of the Kantian conception and made possible to adjust the ontology according to the needs of a single theory. The debates between Max Planck and Franz Serafin Exner teach that the indeterminism issue was also a struggle about Boltzmann's philosophical legacy between Vienna and Berlin. Quite in line with Mach's firm empiricism, Vienna Indeterminists rejected any final decision between determinism and indeterminism on the metaphysical level. Once the frequency interpretation had won favor, the empiricist stance, moreover, permitted them to consider mass phenomena as generic observational facts coordinated to statistical collectives and to treat them on a par with moving point particles. The only condition imposed on this ontology was the uniqueness of this coordination, a condition that could be viewed as a late heir of Mach's principle of unique determination which had complemented his relational ontology.

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