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CANTORIAN SET THEORY AS AN ANALYSIS OF ACTUAL INFINITE:
PAST AND PRESENT BETWEEN MATHEMATICS AND PHILOSOPHY

Abstract

The aim of this paper is to introduce the reader into some topics in both classical and contemporary set theory and to put a stress on their mathematical and philosophical relevance.

In particular, I'll give an account of set theory as mathematical theory of the actual infinite. To this end, I'll begin with a historical approach, showing in § 1 how G. Cantor first analyzed the actual infinite in a rigorous mathematical way. In § 2 I'll briefly sketch, in a more technical way but not formally, the present status of the mathematical research concerning the actual infinite. In contemporary set theory the implications of many new *large cardinal axioms* are being intensively investigated. Particularly significant seems to me the so called "*axiom of measurable cardinal*". In fact it is a mathematically powerful hypothesis and its consequences are relevant not only to set theory but also to other areas of mathematics.

While § 1 and § 2 are exclusively concerned with mathematical developments, § 3 deals with some philosophical questions implied by the former. I'll take into account some contributions of set theorists about the general features of their own mathematical practice, starting from Cantor. I'll also consider how these contributions are interpreted in contemporary philosophy of mathematics. Indeed, the relevant amount of technical considerations in § 1 e § 2 is necessary to focus, in a sufficiently accurate way, on those mathematical developments, when one has to know in order to understand the philosophical debates, which § 3 is concerned with.