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On the advent of non-standard mathematics. (O advento da matemática não-standard.)
(Portuguese. English summary) [Zbl 0695.03029]

Summary: Nonstandard Analysis, created in the early sixties by A. Robinson is regarded by many people as one of the greatest achievements of twentieth century mathematics, tying closely the methods and results of modern logic and mathematics and with far-reaching implications in both foundations and philosophy of mathematics. However, the mathematical community in general has taken a long time to come to terms with the new methodological perspectives afforded by nonstandard mathematics. In this expository survey we try to place the starting-point of nonstandard mathematics in the historical and philosophical context, explaining by means of examples not only its naturalness in face of well-known limitations of formalisms for current mathematics but also its usefulness in surpassing some of these limitations and in applications. The style is informal, aiming at a general audience with only a background knowledge of the fundamental notions of logic and set theory and the basic structures of mathematics (number systems). Extensive references complement the exposition with the aim of pointing out the way to further reading and confrontation with or deepening of the views defended by the author.

MSC:

03Hxx Nonstandard models
00A35 Methodology of mathematics
03-03 History of mathematical logic and foundations
03-01 Introductory exposition (textbooks, tutorial papers, etc.) pertaining to mathematical logic and foundations
01A65 Development of contemporary mathematics

Keywords:

expository survey