

Point Sets

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From the author preface from 1936

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FROM THE AUTHORS PREFACE FROM 1936

Set theory has in contemporary mathematics quite a different role than it had in the mathematics of the last generation. The misbelief, with which the protagonists of the classical mathematics regarded the first successes of this youngest part of the mathematical research, is vanished for ever. In algebra, in analysis, in geometry, in probability theory, everywhere, the tendency to set theoretical methods was not only able to find ways for new powerful development where the classical methods gave nothing new, but also the fundamentals of mathematical disciplines themselves appeared in a new and profound light. Set theory is a very substantial and particularly characteristic part of new progresses in mathematics: moreover, in the teaching of higher mathematics the tendency to treat various disciplines on the set set-theoretical basis is increasing.

Set theory was as yet presented in the Czech literature only in Jarník's "Introduction into the set theory", which was published 1931 by JČMF in the form of an appendix to the second edition of Petr's "Integral Calculus". The Jarník's exposition is extraordinarily lucid and precise. However, it is limited to a quite narrow field. Thus, the present book is, strictly speaking, a first attempt of a systematic Czech textbook on set theory.

I found it important to limit the textbook to such a size that every good student of mathematics is able to study it in detail. Therefore I limited the exposition mostly to the abstract general basis and did not undertake the task to convince a beginner about the usefulness and fertility of the discussed theorems, supposing that this deficit may be compensated by university lectures, and, later on, perhaps, by more special textbooks. I used the space obtained this way to prove, for an already convinced student, the important theorems needed later for the study of special questions.

Choosing the material, I tried to attend to those parts, the knowledge of which is necessary for the study of other mathematical disciplines, in particular analysis. The whole textbook is divided into two volumes. In this volume I begin (in Chapter I) with the so called general set theory, limiting the explanations to a concise survey of the most elementary notions, leaving aside, e.g., the infinite cardinal and ordinal numbers which are dealt with in the Jarník's "Introduction into the set theory" mentioned above. Chapters II and III deal with the topology of metric spaces, a large space being devoted to the important theory of Baire's functions of the first class. I was, of course, forced to leave aside the general theory of Baire's

functions. The second volume will be devoted to the notions of connectedness and local connectedness, and to the fundamentals of the topology of the plane.

I tried to give to the book an elementary character proving statements, as a rule, in more detail than it is done in other set theory textbooks. On the other hand, however, I took quite openly a considerably abstract standpoint, being convinced that this is not only the way of the contemporary research, but will also soon influence the teaching of mathematics to an unforeseen extent.

I tried to facilitate the study of the book by appending to each paragraph a series of easy exercises. I seldom cite the exercises in the text (and when, then the easiest ones); such exercises are noted by an asterisk.

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