

## PREFACE

My lectures in mechanics, given for many years at the Jan Kazimierz University and the Lwów Polytechnic Institute, consisted of the contents of this work.

I have limited myself to the mechanics of a system of material points and a rigid body. The material covered is suitable in general for university requirements, however, keeping in mind the needs of the students at the Polytechnic Institute, chapter VI which treats of the statics of a rigid body was worked out so that it could be accessible without a knowledge of kinematics and dynamics. It can be read immediately after chapter I when supplemented with several facts according to instructions included in the footnote on p. 231. Taking into account the requirements in mechanics at the Polytechnic Institute, I have also given in chapter VI certain information from engineering mechanics.

The mathematics necessary to understand this work in its entirety is limited to the elements of analytic geometry as well as to the differential and integral calculus. Other necessary notions and theorems have been given in the text in order not to send the reader to works too specialized. In particular, I give in the Appendix (at the end of the work) a method of solving ordinary differential equations of second order with constant coefficients which arise frequently in mechanics.

I have endeavoured to give in this book as easy an exposition as possible. The more difficult considerations are illustrated by many examples. Problems to be solved have not been inserted in the text; the reader will find them in most textbooks and in the collections of problems which are given below. I have also considered it unnecessary to burden the contents with the names of the authors of particular theorems or examples, since I consider the material contained in this book as classical.

The reader will find detailed bibliographic instructions in corresponding articles of volume IV of the *Enzyklopädie der mathematischen Wissenschaften* (Teubner, Leipzig 1901-1935) as well as in volume V of the work *Handbuch der Physik* (Berlin 1927), and historical data and cri-

tical remarks in the work of E. MACH, *Die Mechanik in ihrer Entwicklung* (9 Aufl., Leipzig 1933). Here I limit myself to the presentation from literature of a number of the more important works, namely:

P. APPELL, *Traité de mécanique rationnelle*, vol. I, 5-ème éd., Paris 1926, vol. II, 4-ème éd., Paris 1931;

P. APPELL et G. DAUTHEVILLE, *Précis de mécanique rationnelle*, 5-ème éd., Paris 1934;

A. FÖPPL, *Vorlesungen über technische Mechanik*, Bd. I, II, IV, VI, 4-8 Aufl., Leipzig 1921-1933;

G. HAMEL, *Elementare Mechanik*, Leipzig 1912;

T. LEVI-CIVITA e U. AMALDI, *Lezioni di meccanica razionale*, vol. I, Bologna 1922, vol. II, Bologna 1927;

A. E. H. LOVE, *Theoretical Mechanics*, 2<sup>nd</sup> ed., Cambridge 1921;

J. NIELSEN, *Elementare Mechanik*, Berlin 1935;

Ch. de la VALLÉE-POUSSIN, *Leçons de mécanique analytique*, vol. I, 2-ème éd., Paris 1926;

E. J. ROUTH, *An elementary treatise on the dynamics of a system of rigid bodies*, 3<sup>rd</sup> ed., London 1877;

E. J. ROUTH, *A treatise of analytical statics*, vol. I, II, 2<sup>nd</sup> ed., Cambridge 1902;

E. J. ROUTH, *Dynamics of a system of rigid bodies*, 7<sup>th</sup> ed., London 1905;

Cl. SCHÄFER, *Einführung in die theoretische Physik*, 3. Aufl., I. Bd., Berlin-Leipzig 1928;

Cl. SCHÄFER, *Die Prinzipien der Mechanik*, Berlin-Leipzig 1919;

A. G. WEBSTER, *The dynamics of particles and of rigid, elastic and fluid bodies*, 3<sup>rd</sup> ed., Leipzig 1925;

E. T. WHITTAKER, *A treatise on the analytical dynamics of particles and rigid bodies*, 3<sup>rd</sup> ed., Cambridge 1927;

F. WITTENBAUER, *Aufgaben aus der technischen Mechanik*, 6. Aufl., I. Bd., Berlin 1929.

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*Stefan Banach.*

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