

**ELEMENTARY MECHANICS,
INCLUDING HYDROSTATICS
AND PNEUMATICS. NEW
EDITION**

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SIR OLIVER J. LODGE & ALFRED LODGE & CHARLES S. LODGE

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1914.

PREFACE TO THE 1896 EDITION.

THE present book aims at giving a clear knowledge of the principles of the subject, in as elementary and even popular a manner as is consistent with careful accuracy, and without assuming any mathematical knowledge beyond the most rudimentary algebra. At the same time it is hoped that students who use this manual will be able to master the elements of the science in such a way that they may rise from it to more advanced treatises, not only without having anything to unlearn, but with a very sound knowledge of principles. Copious illustrations and explanations have been inserted, and the needs of students who are without the aid of a teacher have been kept steadily in view.

The subject is treated as an introduction to Physics, and its laws are deduced from the first principles of familiar experience rather than from special experiment. Experiments in Mechanics have a subordinate though most useful part in illustrating and emphasising the facts, but the author has no faith in making the establishment of principles depend on special experiments. So also in Geometry: drawing, measuring, and weighing may well be used for purposes of instruction and illustration, but propositions should be otherwise proved.

The early examples at the ends of the chapters are typical ones, and are intended not only to be worked without looking

at the answers, but also to be read almost as part of the book, because they frequently direct attention to important details. A large number of examples for practice have now been added to these, and the text has been thoroughly revised. In this work, as stated on the title-page, the author has had the collaboration of his brother.

The statements made in a book should be carefully criticised, and not taken for granted; and all kinds of special cases should be thought of or tried, to see if an exception cannot be found. *It is by thinking one's self on a subject that it becomes really known to one's self; it will never be really known if we only try to understand and remember what the book says.*

The author thinks that students will derive benefit from referring to Part I. of Deschanel's *Natural Philosophy*, translated by Dr Everett, as a supplementary well-illustrated work introductory to general Physics, and reference is accordingly made to it or to the corresponding portion of Ganot's *Physics* for details which would unduly swell the size of the present book. From the more engineering side, Professor Perry's *Practical Mechanics* is also to be recommended.

The book, as now revised, is intended to be not only an easy introduction to the subject, but, as far as it goes, a philosophical work. If at any place it is unable to stand the test of hostile criticism, the failure is a defect which the author will gladly utilise the aid of the critic to remove. From friendly critics he has already received several welcome minor corrections.

OLIVER J. LODGE.

SUGGESTIONS FOR READING.

BEGINNERS are recommended to omit the following sections on a first reading : 17, 18, 31, 40-43, 53, 55, 56, 76, 80-82, 104, 105, 123 ; and then to return and read the omitted portions together, and finally to read the whole book carefully through without omitting anything. Students preparing only for London University matriculation, or for the elementary stage of the Science and Art Department, may with safety omit any of the above sections over which they experience much difficulty until the examination is over. The introduction being harder than many other parts of the book, its complete reading may be deferred. It is inadvisable to begin the study of either Mechanics or Physics without a knowledge of the Greek alphabet.