

**LESSONS IN ELEMENTARY  
PRACTICAL PHYSICS:  
STEWART AND GEE  
SERIES, VOL. III, PART I**

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Lessons in elementary practical Physics: Stewart and Gee series, Vol. III, Part I by C. L. Barnes

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**C. L. BARNES**

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LESSONS  
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ELEMENTARY PRACTICAL PHYSICS  
STEWART AND GEE SERIES

BY  
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VOL. III. PART I.  
*PRACTICAL ACOUSTICS*

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## PREFACE

THIS book forms the first part of Volume III. of the "Elementary Practical Physics" series begun in 1885 at Owens College by Professor Balfour Stewart and Mr. W. W. Haldane Gee. Upon the lamented decease of the former in 1887, and the subsequent acceptance by Mr. Gee of an appointment as Chief Lecturer in the electrical department at the Manchester Technical School, the work was allowed to lapse for some years. Ultimately it was decided, with the concurrence of the Publishers, to entrust the remaining sections to separate coadjutors. That on Heat is in preparation by the general Editor, to whom the present writer is indebted for help and suggestions: the final volume (Optics) will appear later.

In the following pages are collected most of the experiments in Acoustics which can be performed with the usual appliances at the command of a student; others of a more elaborate character are described or referred to, though not numbered as

part of the course. More than one experiment is sometimes included under the same heading in order to avoid a needlessly minute subdivision.

In the other volumes of the series the wealth of quantitative experiments has marked out the broad lines upon which the work should proceed; but in Acoustics, where this feature is lacking, some alteration in plan is inevitable: hence this volume is in some respects a general text-book.

The order of the experiments has not been settled without difficulty: probably there is no arrangement against which some more or less serious objection might not be urged. To begin by discussing the nature of Harmonic Motion in detail usually results in the student's being recommended to omit it on a first reading; to delay it too long is to keep in the background the fundamental principle of the science. It is hoped that the middle course here adopted will prove satisfactory.

A number of references to original papers in the *Philosophical Magazine*, *Nature*, and elsewhere, are given, so that those who have the volumes at command will be able to supplement what is here presented. No one can now or hereafter write a book on Sound worthy of the name, without being under extensive obligations to Lord Rayleigh's great work; a free acknowledgment of the assistance derived from this source is here offered.

Many of the figures are original, some have been taken, by the kind permission of Dr. Koenig, from his *Catalogue des Appareils d'Aoustique*, the remainder are from well-known sources.

In Appendix IV. a list of names of workers in theoretical or experimental Aoustics is given, with dates of birth and death. Only in some such way as this can any idea of the perspective of things be gathered: it is avowedly imperfect, but to prepare an exact chronological table is impossible, and any more serious attempt appeared not to be worth the extra trouble it would involve.

The author is well aware that a book of this kind cannot be presented in its best or most permanent form at a first attempt, and will be glad to receive suggestions on any point from those engaged in teaching the subject. These will be carefully considered if a second edition should be called for.

MANCHESTER, 2nd April 1897.