

**PRACTICAL PHYSICS FOR  
SCHOOLS AND  
THE JUNIOR STUDENTS  
OF COLLEGES. VOL. I**

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Practical physics for schools and the junior students of colleges. Vol. I by Balfour Stewart & W. Haldane Gee

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**BALFOUR STEWART & W. W. HALDANE GEE**

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# PRACTICAL PHYSICS

FOR

SCHOOLS AND THE JUNIOR STUDENTS  
OF COLLEGES

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VOL. I.

ELECTRICITY AND MAGNETISM

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## PREFACE

It has frequently been a matter of remark that while many schools are provided with fully equipped chemical laboratories, yet very few have any appliances for teaching Practical Physics. The reason is certainly not to be found in any fundamental unsuitability of Practical Physics as a training for the mind, inasmuch as the subject is universally acknowledged to be of very great importance in this respect. There are several causes which have militated against the introduction of Practical Physics, the chief, perhaps, being the want of properly trained teachers, the absence of organised methods, and the difficulty of obtaining suitable apparatus. We venture to think that, as the importance of the subject comes to be realised, there will be no lack of good teachers, each of whom will be capable of controlling a system of instruction suitable to the boys under his charge. Again, we think that instrument makers are becoming more alive to the requirements of elementary students, their strength hitherto having been mainly directed towards the manufacture of instruments suitable for commercial purposes and scientific research.

It was represented to us by several teachers that abstracts of our *Elementary Lessons in Practical Physics* might be made the basis of good school courses. We have accordingly tried the experiment with Electricity and Magnetism, so that the present volume largely consists of simple experi-

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ments and measurements in Electrostatics, Magnetism, and Current Electricity, the principles of which are at the same time explained to the student. We have, however, prepared something more than an abstract. Chapter I. has been supplemented by several new lessons. Chapter II. has been largely rewritten, new instruments have been devised, and a number of new engravings have been prepared. In the Appendix will be found plans of certain typical school laboratories, a list of apparatus, tools and materials, and other information that should be of value to the teacher.

Furthermore, to make the volume complete in itself, we have given, at the commencement, a series of Introductory Measurements, with which it is essential the student of Electricity and Magnetism should be familiar.

The greater part of our course should be easily within the range of schoolboys, whilst sixth-form boys should find the more difficult portions a good introduction to advanced work.

Our thanks are due to Professor T. H. Core for looking over the proofs, and to Messrs. Henry Holden, B.Sc.; C. H. Lees, B.Sc.; and R. W. Stewart, for help in preparing the new lessons.

THE OWENS COLLEGE, MANCHESTER,

*December 1887.*

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