ELECTRICITY:

ITS THEORY, SOURCES, AND APPLICATIONS.

BY

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(GREATLY ENLARGED).

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PREFACE.

THE fact that the first edition of 2000 copies of this work has been readily purchased, together with letters received from electricians and students all over the world, may be taken to justify the author in believing that, in departing from the nearly universal system of electrical text-books, he has met a widely felt want.

There are two electricities known to the scientific world: the electricity which exists in nature; and the electricity which, created by mathematicians, exists chiefly upon the blackboards of the professor's class-room. It is the first of these electricities which this work endeavours to elucidate. The artificial electricity serves a very useful purpose in calculating the effects which we may look for when using electricity. But that it does not satisfy earnest thinkers is manifest from the fact that recent text-books are gradually adopting and teaching doctrines which were accounted utter heresies when this book first appeared.

As stated in the preface to the first edition, the work was based upon papers which had appeared in the 'English Mechanic' and the 'Telegraphic Journal,' and much of the new matter in this edition has in like manner appeared in the pages of the 'Electrician.'

A few words as to the object of the Author may prevent some misconception. The work is not intended to enable the reader to "cram" for an examination, but to lead him to *think for himself;* not so much to give specific instructions as to any special case, as to assist in forming a clear conception of those general principles which include all cases; and it is hoped that the great number of questions which have been addressed to

the Author will have enabled him to understand, and in considerable degree to meet the desires of the class of readers for whom the work is intended.

As stated in the first preface, "the object has been to review the leading and essential facts, and to so systematize them as to form of them a *catalogue raisonné*, in which all information obtained elsewhere may be readily inserted, and be as readily available when required. Many mere facts found in all other books on electricity may here be omitted, or only slightly glanced at; but on the other hand, *principles* are dwelt upon, and the instruments necessary for their study fully explained, so that those who may have some mechanical aptitude may construct them for themselves, the very best possible way of understanding them."

It has been the aim of the Author to keep up with the great and rapid progress of electrical applications, so that the work is very greatly enlarged and several additional branches of the subject taken up. The rapid advances made, and the fact that the work has been eighteen months in passing through the press, may account for some peculiarities in the arrangement and treatment of some parts of the subject.

In these days of claims and counterclaims as to priority of ideas, it may be as well to remark that the history of electric discovery and progress does not enter within the scope of this work, but that, where occasion calls for reference to such subjects, it has been the desire of the Author to give honour where honour is due upon purely scientific considerations.

117, GREEN LANE, BIRMINGHAM,
April, 1884.

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