

THE THEORY OF ELECTRICITY.

Theorie der Elektrizität. Von M. ABRAHAM. Zweiter Band :
Elektromagnetische Theorie der Strahlung. Leipzig, B. G.
 Teubner, 1905. x + 404 pp.

THE first volume of Abraham's treatise on electricity, which was written as a revision of Föppl's earlier book on the same subject, has already been reviewed in the BULLETIN.* At the close of that notice the statement was made that "The second volume will be awaited with impatience." The volume appeared within a few months, and by this time the author would probably feel justified in concluding that however much the reviewer may have been impatient for the appearance of the volume, he was not particularly impatient to review it. This very tardiness will, however, be of no inconsiderable aid in writing a comment on the book.

Abraham's second volume deals with the theory of electrons. It is divided into two parts of which the first treats the field and motion of individual electrons and the second the electromagnetic phenomena in ponderable bodies. Although physical science has taken long strides in the past forty months along the path of electron theory, so that now the electron and its major properties must be considered by all as firmly entrenched facts of physics instead of grudgingly acknowledged theories, and although J. J. Thomson in a recent number of the *Philosophical Magazine* has contributed much in the way of enlightenment to our hitherto very vague notion of the nature of positive electricity, nevertheless comparatively little of that which has been accomplished in addition to what was known at the time of the publication of this volume can as yet be construed as offering very material aid in constructing or revising the mathematical theory of electricity from the electronic point of view. What the electron does in the large — a large which may be measured in small fractions of a $\mu\mu$ — is tolerably well known ; but what its characteristics and behavior may be within a distance of one or two 10^{13} ths of a centimeter from its center is still much of an eleusinian mystery.

* Volume 11, pp. 383-387 (April, 1905). The date at the end of the review should be February, 1905, not February, 1904. — We may note that a new edition of this first volume has just appeared.