the earth the author states: " . . . it becomes quite evident that the earth is not turning on its axis simply 'because it can not stop a motion that never was started,' but because Nature intelligently supplies a quarter quadrillion horse power engine to do the work."

This review may well end with the following quotation which Lepper himself gives, ascribing it to the director of the Smithsonian Institute, and which is illustrated by this volume. "Every large scientific institution or observatory has almost daily communications from persons of very moderate attainments who presume to question, nay rather to spurn, the most well-attested facts of human knowledge. . . . No argument can refute them because they have not the requisite learning to comprehend it, which is no disgrace but which should make men *modest* enough to have faith in *those who excel them immeasurably*. . . ."

F. H. SAFFORD

A Treatise on the Analytical Dynamics of Particles and Rigid Bodies; with an Introduction to the Problem of Three Bodies. By E. T. WHITTAKER. Second edition. Cambridge, University Press, 1917. xii + 432 pp.

THE second edition differs from its predecessor mainly in that references to more recent researches are given together with a brief outline in certain cases.

The book is invaluable as a condensed and suggestive presentation of the formal side of analytical dynamics. There is serious need for a complementary type of treatise in which the main emphasis is laid upon the deeper qualitative side which has played an increasingly larger part since the work of Poincaré.

As a single instance of the incompleteness of Whittaker's treatment in this respect, the fact may be mentioned that in his final chapter he treats the trigonometric series precisely in the spirit of Delaunay and does not even mention that these series are generally divergent nor refer to their asymptotic properties.

G. D. BIRKHOFF.