general theory of Schmidt is presented. The theory is summarized in ten fundamental theorems, five of which are stated without proof. The proofs which are given are sometimes intentionally lacking in rigor, in order to achieve brevity for a class of readers more interested in applications than in mathematical logic. Where such gaps have been allowed, the author gives references to other sources.

The second part follows less exactly the original lectures. It is concerned chiefly with the method of Fredholm and includes a brief mention of singular kernels and non-linear integral equations.

W. R. LONGLEY

A Treatise on the Analytical Dynamics of Particles and Rigid Bodies with an Introduction to the Problem of Three Bodies. By E. T. Whittaker. 4th edition. Cambridge University Press, 1937. 14+456 pp.

This excellent text has been reviewed three times in this Bulletin as follows: E. B. Wilson, vol. 12 (1906), pp. 451–458; G. D. Birkhoff, vol. 26 (1920), p. 183; W. R. Longley, vol. 34 (1928), p. 671.

The present edition is identical with the third except that a few errors have been corrected and the references have been brought more nearly up to date.

The account of the problem of three bodies is indeed brief and will be difficult reading for one not already acquainted with the subject. One wonders whether the author has read some recent papers on the problem of three bodies which have appeared in American journals, particularly those which discuss the stability of the equilateral triangle positions for three finite masses. In this connection it may be remarked that the references to recent American papers are incomplete, but this does not detract from the merit of the text, which this reviewer regards as the best in its field in the English language.

H. E. BUCHANAN

Teoria Dinamica dei Regimi Fluidi Turbolenti. By G. D. Mattioli. Padua, Milani, 1937. 323 pp.

In this work, which consists largely of a development of ideas put forward by Mattioli in fifteen papers published in Italian journals and in the Comptes Rendus, the leading idea is that a turbulent mass of fluid consists more or less of discrete elements which mix chaotically, an element being regarded as having both linear momentum and angular momentum about its center of mass. Such a gyrostatic element is supposed to have an ephemeral existence, and its momentary separation from the main body of fluid leads to a local state of instability of flow.

With the aid of these gyrostatic elements of finite size and notions that are generally accepted, equations are set up and then a limiting process is used which Karman thinks is not quite clear, as it seems to eliminate the finiteness of size on which the angular momentum depends. Mattioli has, however, recently written to Karman, explaining his views more fully. In the second part of the book the equations are applied in an able manner to the standard problems of turbulence such as jets, flow through a straight pipe, and flow round a curved channel. In the last case a comparison is made between the theoretical results and some measurements made at Pasadena by Wattendorf.

Among the results of mathematical interest may be mentioned the occurrence of special functions such as the incomplete gamma function, the dilogarithm, and a function defined by an indefinite integral with respect to t in which $Ce^{at}-t$ appears in the denominator.

HARRY BATEMAN