

assigned to students for their home-work, among the total of 1080 problems gathered in this book.

The problems are classified into six parts: I. Derivatives, differentials, geometric applications. II. Integral calculus. III. Differential equations (ordinary). IV. Partial differential equations. V. Functions of a complex variable. VI. Supplements. Each part is subdivided into smaller chapters, and the latter in turn into paragraphs. Each paragraph is supplied with short outlines of the corresponding parts of the theory, which not always are above reproach, particularly when the attempt is made to be rigorous.

Most completely treated are the applications of calculus to geometry, especially those which require formal computations. Some other topics, however, are treated quite inadequately: they might have been omitted altogether without any loss; as for instance, ruled surfaces (2 problems), contact of plane curves (1), improper integrals (3), elliptic and hyper-elliptic integrals (6), transformations of surfaces (3), trigonometric series (4), calculus of variations (6) and so on.

The order of the problems is not always the best possible; some problems are repeated at different places. Some problems are not very clearly or carefully stated; see for instance, p. 8 (20, 21), p. 124 (43).

The book is very neatly printed, although misprints are not infrequent.

J. D. TAMARKIN

*A Treatise on the Analytical Dynamics of Particles and Rigid Bodies; with an Introduction to the Problem of Three Bodies.* By E. T. Whittaker. Third Edition. Cambridge, University Press, 1927. xiv+456 pp.

The first edition of this book, which was published in 1904, received an extensive review by E. B. Wilson in this Bulletin (vol. 12 (1906), pp. 451-458). The second edition, which appeared in 1917, (see this Bulletin, vol. 26 (1920), p. 183) differed from the first mainly in the matter of references to or brief outlines of more recent researches.

In the third edition the first fourteen chapters, with some corrections and additional references, have been reproduced photographically from the second edition. Chapter XV on the general theory of orbits and Chapter XVI on integration by series have been completely rewritten in order to present the subject as it has been developed by the researches of the last eleven years. As illustrations of periodic and asymptotic orbits the author has treated the paths which small particles describe in the gravitational field due to a single attracting mass when the newtonian law of gravitation is replaced by the laws belonging to the general relativity theory. There is also a brief account of Synge's geometry of dynamics, in which dynamical problems are treated by aid of the tensor analysis. References only are given to the work of Birkhoff on the classification of the various types of motion of a dynamical system with two degrees of freedom.

Wilson's excellent account of the characteristics of the first edition makes it unnecessary to comment in more detail upon the present edition.

W. R. LONGLEY