Mathematische Formelsammlung. By O. Th. Bürklen, revised by F. Ringleb. Berlin and Leipzig, de Gruyter, 1931. 255 pp.

This volume is Number 51 of the Sammlung Göschen, the first edition of which appeared in 1927 and was reviewed in this Bulletin, vol. 34, page 669. In the new edition there has been no change in the general plan of the book. The astronomical data in Chapter IX have been corrected and a few additions have been made to the chapters on analytic geometry and calculus. One chapter has been added and gives the fundamental formulas of vector analysis.

W. R. LONGLEY

Theoretical Mechanics. By William Duncan MacMillan. *Statics and Dynamics of a Particle.* pp. xviii+430. 1927. *The Theory of the Potential.* pp. xii+469. 1930. New York, McGraw-Hill.

The first volume of this series by Professor MacMillan deals with the foundations of mechanics, the statics of particles, rigid and deformable bodies including elastic solids, and the dynamics of a single particle. A later volume covering the omitted phases of dynamics is promised. The book is clearly written, and is a suitable text for students with a good grounding in the calculus, introducing them to the equations of Lagrange and Hamilton. The main treatment of dynamics is based on Newton's laws, with clear indications as to the definitional character of parts of these. Later, alternative treatents are indicated.

A few statements in the text require amplification. For instance, on page 2, the statement that vectors can be moved about freely is followed by the remark that forces are typical vectors. Again on page 133, a definition of number of degrees of freedom is found which would not apply to non-holonomic systems.

In the second volume, there is collected a large amount of material on the theory of the potential function. The emphasis is on methods capable of concrete physical application, rather than on those of the greatest generality. However, the standard of rigor is relatively high, and while practically no results of the past twenty-five years are expounded in the text, the bibliography includes references to recent summaries of modern work. Although the presentation is clear in detail, there is a lack of indication of the relation of the parts of the subject to one another and to other fields of mathematics. For example, the Dirichlet principle is explained, with the Weierstrass critique, but without an explicit indication to the student that two methods of rigorously establishing the existence in question are to be given in the next chapter. Similarly, the analogy of the expansion of a function in a series of spherical harmonics to the more familiar Fourier expansion is not mentioned. In the proof of this expansion theorem (p. 386) the author writes "generally continuous" function, when he means *differentiable* function, as otherwise the derivatives which appear on integrating by parts need not exist. This misuse of terms was a little more pardonable in Darboux's paper of 1874, which the author follows, than in a book of 1930. This volume on potential theory may serve those who wish a revised text along the lines of B. O. Pierce's *Newtonian Potential Function.*

PHILIP FRANKLIN