Theoretical Mechanics. A Vectorial Treatment. By C. J. Coe. New York, Macmillan, 1938. 13+555 pp.

This treatise on classical mechanics contains in fourteen chapters 534 pages of text. In the first chapter the author discusses briefly the divisions, postulates, and validity of mechanics. The second of these is more extensively considered in Chapter XII on the General Principles of Mechanics, such as: Lagrange's Equations, Hamilton's Principle, Least Action, and Gauss' Least Constraint.

The second chapter deals with Rectilinear Motion of a Particle making use of the customary scalar calculus method. This is followed by a long chapter on the theory of vectors through the double cross-product and simple differentiation and integration of vectors. More of the calculus of vectors is presented in Chapter XIII as a foundation for the proof of Stokes' and Green's Theorems and a final chapter on Potential Theory.

From the second chapter onward the vector approach is used consistently and beautifully effectively in presenting the theory by classifying vectors as free, sliding, or attached. However, in applications, the solution is frequently effected principally by scalar calculus. Many of the more advanced theorems of classical mechanics are stated and proved by vector analysis. The particular order of presentation postpones a treatment of statics until Chapter VII, where it is considered to be a special case of zero acceleration and velocity.

Chapters VII to XI discuss: Statics of a Particle and of a Rigid Body, Statics of a Flexible Cord, Principle of Virtual Work, Kinetics of a Particle and Kinetics of a Rigid Body. Some topics of considerable technical importance, such as the elastic catenary, impact, and cases of chains involving variable momentum are not included.

In the introduction the author states that "this book presents sufficient material for an introductory and advanced course each running through the year." It is an excellent procedure for a serious student of mechanics to take a two-year course such as this book provides. He will thus obtain a knowledge of vector analysis and at the same time acquire considerable facility in its use in the field of mechanics. Unfortunately, in most undergraduate curricula there is not sufficient time allowed for a student of mechanics to follow this procedure.

Apparently the trend in technical schools is rather away from heavy courses in mechanics than towards them. The teacher finds himself forced to do the best he can with the usual preparation in calculus, no matter how desirable a knowledge of vector analysis may be in a study of analytic mechanics. For this reason, the reviewer doubts that Professor Coe's treatise will find broad use in undergraduate courses. However, for advanced students wishing to combine a study of vector analysis with mechanics, or for students specializing in mechanics, it appears to be a very fine presentation.

J. B. REYNOLDS

Introduction to Bessel Functions. By F. Bowman. London, Longmans, Green, 1938. 135 pp.

Chapter I (19 pages) gives elementary properties of Bessel functions of order 0, and comments (without proofs) on expansions of "ordinary functions of mathematical physics" in terms of orthogonal Bessel functions of order 0. Chapter II (21 pages) derives some partial differential equations and sets up and solves some boundary-value problems. These problems are well chosen to exhibit standard methods of solution. The problems are not carefully phrased in that nothing is said as to whether the differential equation is to be satisfied at points on the boundary, or indeed whether