or of balls in the pile from which bags are filled with justifies one in making an assumption as to the laws of the frequencies in the bag in question. A table constructed upon this hypothesis may be tested by experience and found correct. The whole matter depends upon the validity of the assumption.

The method of the book assumes a given list of deaths according to sex, age and cause, and to this is added the biological hypothesis:

"The frequency distribution of deaths according to age from certain groups of causes of death among the survivors in a mortality table tend to cluster around certain ages in such a manner that the frequency distribution can be represented by either a Laplacean-Charlier or a Poisson-Charlier frequency curve."

With this goes a classification of causes of death according to some seven or eight groups. The mortality curve is considered as a compound curve made up from component frequency curves corresponding to the groups. The characteristics of these components are supposed known a priori.

Upon this foundation, Fisher is able to build up a mortality table. In the book he goes through the actual calculation of several tables that turn out to be satisfactory. In the mind of the reviewer the book marks a step forward in actuarial science in that it points out a method of attack on problems connected with that great mass of data in which the exposed to risk is difficult or impossible to find. There is no claim made that the method supersedes the old conventional method depending upon the number exposed to risk and losses among such exposures. However, it is possible that further experience with the method by the author and by others will show limitations in its applications. Before it is accepted by the conservative actuary, he will require much more evidence in the nature of satisfactory tables computed by many actuaries.

A. R. CRATHORNE

Analytical Mechanics. Second edition. By Edwin H. Barton. London, Longmans, Green and Company, 1924. 593 pp.

The first edition of this book was published in 1911. The new material in the second edition consists mainly of alternative proofs and more examples. About three hundred examples chosen from London examination questions set in the years 1911–23 have been added, bringing the total number to more than a thousand. To these a complete set of answers is now given separately at the end.

The text, divided into six parts, covers the field of mechanics quite thoroughly. Besides a preliminary survey of the scope of mechanics, the introductory part contains a collection of formulas from algebra, geometry, trigonometry, and the calculus. The second part gives a

very complete account of the kinematics of a point and of a rigid body, including mechanisms and strains. The treatment of kinetics is preceded by a discussion of Newton's principles and criticisms of these principles by Mach and others. Statics follows kinetics and includes a good chapter on attractions and potential. Part V contains a chapter on hydrostatics and one on hydrokinetics. The sixth part consists of a short chapter on statics of elastic solids.

The author expects that most users of the book will bring to it some previous knowledge of the subject, and the elementary parts are briefly outlined to serve as a reference and for logical completeness. The general scope and treatment is designed to meet the needs of degree candidates of London and other universities. Very few, if any, American universities offer courses for which this book would be suitable as a text. But as a reference book for the teacher it would be very valuable because of the large number of examples and the very complete index.

W. R. LONGLEY

Clerk Maxwell's Electromagnetic Theory (The Rede Lecture for 1923). By H. A. Lorentz. Cambridge University Press, 1923. 35 pp.

The Theory of Relativity, Studies and Contributions. By Archibald Henderson, A. W. Hobbs, and J. L. Lasley. University of North Carolina Press, Chapel Hill, N. C., 1924. xiii+99 pp.

Some men can put into a brief exposition a revelation of such insight and appreciation of the scientific significance of their topics as they may have won after years of detailed study. Among authors who have written on the theory of relativity, A. S. Eddington has written expositions of the type which I have in mind, his Romanes Lecture (delivered in 1922 at the Sheldonian Theater in Oxford) being an excellent example. The more recent lecture by Lorentz, mentioned above, is in the same class, conveying a nontechnical appreciation of the place of Maxwell's theory in the modern development of physics.

On the other hand the booklet by Professor Henderson and his colleagues is a disappointment to those who have read Professor Henderson's magazine articles on Bernard Shaw. One might have expected a mathematician of comparatively broad interests to bring to the subject of relativity a more novel point of view and a more significant insight into the physical meaning of the subject. Instead he has hurriedly and carelessly written a formal outline of the theory. As an example of carelessness I will refer to page 66 where the reader is suddenly confronted with the statement that the mass of the sun is 1.47 kilometers, with no explanation of the use of a linear unit for mass. Eddington's Report to the Physical Society of London is a better and less expensive work of approximately the same scope.

C. N. REYNOLDS, JR.