

is expressed in vector notation, it may be necessary to add some explanation or to put things in a way that is not too abstract in order that the student meeting the expression for the first time may see clearly the significance of the matter under discussion, for vector methods should add not only brevity but clearness. The second chapter on vector analysis would seem less elegant but would be more easily understood by a student if more effort were made to bring out either geometric or physical interpretations.

The author has done well in showing no particular aversion to the cartesian coordinate system, as a familiarity with the various quantities in both the vector and cartesian notation is needed. In view of the statement in the preface that it was desired to show how to treat problems that arise either in science or in the field of technical applications, it is surprising that so little attention was paid to graphical statics. On the other hand it may of course be argued that the one thing in mechanics which the engineer is sure to be familiar with is graphical statics. The treatment in many cases is very elegant, as for instance in the derivation of the acceleration, the theorem of Coriolis, and Euler's equations.

The book is suited to our seniors and graduate students and could be covered in a three-hour course throughout the year.

PETER FIELD.

*Mathematik des Geld- und Zahlungsverkehrs.* By Alfred Loewy. Leipzig and Berlin, Teubner, 1920. viii + 273 pp.

This work is a very readable elementary treatise on the mathematics of finance with the usual chapters on simple interest, compound interest, annuities certain, amortization and sinking funds, with the accompanying compound interest and annuity tables. Life annuities and insurance problems are not discussed. The general treatment is not so formal as that of most of the English and American books on financial mathematics. Much historical and economic matter is included:—for example there is a very interesting historical account of the rate of interest from the earliest times and a clear explanation of the question of foreign exchange. The book had been sent to the publisher in 1918, but was withdrawn by the author and practically rewritten in order to bring it up to date for German readers by inserting discussions of the various new laws and taxes arising out of the financial condition of the country at the close of the war. At one point the author rather gloomily concludes a discussion of the low exchange value of the mark: "An einem Übergang zur Bareinlösung des jetzt in Deutschland valutarischen Papiergeldes durch Gold ist für lange Zeit nicht zu denken."

The notation of the Text-Book of the Institute of Actuaries is used in the book with a few trifling exceptions, the most noticeable being  $j^{(m)}$  as an abbreviation for  $m\{(1+i)^{1/m} - 1\}$  instead of the usual notation  $j_{(m)}$ .

On the physical side there is much to be desired in this book. The typography is fairly good, but the matter is very much crowded on the narrow-margined page. Before the reviewer had finished reading, the book had changed into a mass of loose leaves of very poor paper.

A. R. CRATHORNE.