

Chapters 24–28, comprising 34 pages, are on borrowing and loaning, and include the modern field of contract purchases and installment payments.

Chapters 29–36, covering 54 pages, are devoted to business expenses, such as wages and payrolls, insurance and taxation, and include such modern topics as depreciation, advertising and the income tax.

Chapters 37–60, covering 19 pages, are concerned with business organization, partnership, corporations, insolvency and bankruptcy.

Chapters 41–45, occupying 40 pages, relate to business efficiency, and form the most up-to-date section of the entire book. The nature of this section is apparent from the list of topics covered, which include factory costs, buying and selling expenses, determination of profit and loss by departments and for separate sales, and tabulations for the sales manager such as department and salesmen's records.

Chapters 46–48, occupying 12 pages, conclude the work with miscellaneous topics not previously treated, such as consignments and commissions, life insurance and farm management.

The impression made by this book is that the authors have succeeded in producing not only an unusually complete and well written treatise on business arithmetic, but also a work that is eminently teachable, as it is bright and interesting, and well arranged for classroom purposes.

S. E. SLOCUM.

Plane Trigonometry with Tables. By E. H. BARKER. Philadelphia, P. Blakiston's Son and Co., 1917. 172 pp.

BARKER's Trigonometry treats, in its few pages, the usual topics of the subject. The functions of an acute angle are defined as ratios in the first chapter, the functions of a general angle being postponed to Chapter IV, while the intervening chapters deal with the relations between the functions of an acute angle. For the graphs the line values of the functions are used. The addition formulas are proved for acute angles, without the use of directed lines. Geometrical proof is given for the laws of sines and cosines, and analytical proof for the law of tangents. Some unusual formulas are given in the work on solutions of triangles. The ninth chapter, on circular measurement of angles and inverse identities, completes

the work on trigonometry. The definition, explanation and use of logarithms are given in Chapter X.

Since there is such a variety of trigonometry texts on the market, one looks critically at each new text to see what good points warrant adding one more book to the already large supply. Among the virtues possessed by Barker's Trigonometry we note its small amount of detail in general, reinforced, however, by a wealth of applications in some cases where familiarity with the ideas can be gained only by repeated practice with them. Occasionally the author seems to lose sight of this apparent ideal of brevity, and gives details certainly unnecessary for a college freshman and probably equally unnecessary for any student of trigonometry. Yet, in other places the student is given credit for power which few students of trigonometry would possess.

The author gives some excellent advice to students, especially in urging the fullest use of given material in preference to computed material, in suggesting a reasonably accurate figure as a guide to the solution of a triangle and as a check on results, and in emphasizing checks for results in general. Throughout, the text offers a large number of examples chosen from varied material, and often useful for developing the initiative of the student.

The author has given "special attention to the preparation of the tables and has designed the tabular arrangement to give the computer maximum efficiency with a minimum of labor." In two respects the opposite of this aim seems to be the result of this special attention. First, the entire five digit mantissa is repeated for each number, giving the pages of the logarithms of numbers a most compact, dense appearance which is hard on the eyes of the computer. Second, the natural functions are given in two separate tables, one for sines and cosines, one for tangents and cotangents, thus often requiring double work in securing two functions of the same angle.

The introductory explanation of the theory of logarithms is clearly given with a well chosen minimum of material. However, it is surprising to find advice to the student to approximate with a four-digit number by taking the preceding four-digit number instead of the nearest four-digit number. The use of four-digit approximation is so frequent throughout the book that the student has very little practice in interpolation.

In fact, the book does not at all help the student to realize the ideal expressed by the author, that "the student should at all times strive to get answers as nearly accurate as the tables will permit." Nothing whatever is said about the degree of accuracy warranted by the given statistics of a problem.

Errata are numerous in the text. Some parts of the book are poorly written. There is a dearth of punctuation in general, and of periods in particular. In places the arrangement of the material is very poor, while in other portions of the text the material is well spaced and the page presents its salient points at a glance. The figures and curves are very good.

M. E. WELLS.

Tables numériques usuelles. Par L. ZORETTI. Paris, Gauthier-Villars, 1917. 8vo. 52 pp. 3 fr.

THESE small tables are designed for the use of engineers, students of college and lower grades, and general computers. They consist of multiplication tables for the multipliers 1, 2, ..., 9 and multiplicands of three figures; together with columns that give for three figure arguments the reciprocal, the square and the common logarithm to four places. A table of trigonometric functions, grades, and radians for every degree and quarter degree follows. Tables of logarithms of certain common constants, and the values of πd and $\frac{1}{4}\pi d^2$ for two figure arguments close the volume. The leaves are thumb-indexed and by proper spacing made otherwise convenient. The type is clear and the paper with no glare. The book is ample for most of the computations involved in the author's general course in mathematics.

JAMES BYRNIE SHAW.

Ueber gewisse Teilbereiche und Erweiterungen von Ringen. By Dr. Phil. ADOLF FRAENKEL. Leipzig und Berlin, Teubner, 1916. 64 pp.

IN the investigations of the arithmetic properties of the algebraic numbers the fundamental notion is that of domain of rationality, in which the four operations of arithmetic, excluding only division by zero, are permissible. Besides these certain other sets, called orders by Dedekind and rings