Rheticus for every 10″ of arc, and carrying these to ten decimal places as in the original table.

The arrangement of the table is not semiquadrantal, as in those in common use. This latter form does not lend itself easily to a large octavo page when the work is carried out to every second. Otherwise the arrangement is similar to that found in Chambers and other familiar tables. A convenient table of differences is given in the margin for each half of each page,—that is, for every 5′ of arc.

As to the accuracy of the work it is too early to speak. A set of tables containing a million and a half figures is sure to have errors, particularly as nine of the ten columns on a page represent new calculations. On the other hand Mrs. Gifford is a careful and experienced computer, she has had the aid of the best machinery and tables, and she has checked her work with care, so that it is probable that the number of misprints and errors in calculation has been reduced much below that found in the older type of tables.

Aside from the recent work of M. Andoyer, no such notable contribution to this kind of mathematical literature has been made for many years, and Mrs. Gifford is to be congratulated upon the completion of her labors in this important field. The tables should be in the library of every higher institution of learning, and in every astronomical and mathematical laboratory. DAVID EUGENE SMITH.

Applied Mathematics. By H. E. COBB. Ginn and Company, 1911. vii + 274 pp.

WE meet many calls for "real problems" and "useful mathematics" but too often there is a failure to distinguish carefully between what is useful, what is real, and what is concrete. Carson* has ably drawn the distinction between these terms and forcefully argues that real mathematics is what we need. "The essence of reality is found in definite recognizable percepts or concepts, and is therefore a function of the individual and the time"; that is, reality depends upon the past experiences of the individual and not only upon the subject matter. It is doubtful whether the author of the book under review has kept this important distinction in mind, but the teacher may select such parts as represent reality for his particular students.

* Essays on Mathematical Education, Ginn and Co., p. 35.

The book is a collection of problems intended to be useful in the student's future work. The use of such problems the author believes will also correlate the several mathematical subjects among themselves as well as with physics.

The problems are grouped under the following heads: measurement and approximate number, vernier and micrometer calipers, work and power, lever and beams, specific gravity, geometrical constructions with algebraic applications, the use of squared paper, functionality, maximum and minimum values, algebraic solution of geometry problems, logarithms, the slide rule, angle functions, variation, exercises in solid geometry, heat, electricity, and logarithmic paper. In the appendix are tables of unit equivalents, four-place logarithms, and a bibliography of problem sources.

Some problems require the student to obtain his own data by measuring, weighing, etc. Many problems contain two sets of numbers, one set leading to integral results and one involving fractions. The part on numerical calculation and approximation deserves special mention. Necessary definitions and a minimum of theory precede each set of problems. This collection is just such a set of problems as live teachers wish to have at hand for frequent selection of those which may be *real* for their students.

ERNEST B. LYTLE.

Handbuch der angewandten Mathematik. Herausgegeben von H. E. TIMERDING. Berlin and Leipzig, B. G. Teubner.

Vol. 1. *Praktische Analysis.* Von H. v. SANDEN. 1914. 185 pages.

Vol. 2. *Darstellende Geometrie.* Von J. HJELMSLEV. 1914. 320 pages.

ONE or two decades ago there was considerable agitation to have mathematics taught to technical students by engineers rather than by professional mathematicians. The reaction against this tendency, in which the Perry movement played an important part, has been decisive and possibly extreme. Now every reputable technical school in Europe and America has its mathematics taught according to mathematical standards by men trained as mathematicians.

But the engineers had a legitimate grievance; the theoretically trained man was too frequently unable to apply his knowledge to concrete problems. The reason the Perry move-