Geschichte der Elementar-Mathematik in systematischer Darstellung mit besonderer Berücksichtigung der Fachwörter. By J. Tropfke. Dritte verbesserte und vermehrte Auflage. Vol. I: *Rechnen,* vi+222 pp. 1930. Vol. II: *Allgemeine Arithmetik,* iv+266 pp. 1933. Berlin and Leipzig, Walter de Gruyter.

The earlier editions of this work have been exceedingly useful, not only for the great amount of material which they contain but also for their many references both to the sources and to secondary material. The first two volumes of the third edition promise well for those still to come, for the bulk of each has been considerably increased, and the number of foot notes has been enlarged in even greater proportion. The additions to the two volumes indicate our increasing knowledge of the mathematics of Egypt and Babylonia and give evidence of the activities of the last decade in the study of Hindu mathematics. Since the second editions of these volumes (1921), important studies of the Rhind Papyrus have been published by T. Eric Peet and by Chancellor Chace and his collaborators. Work has been done with the Moscow Papyrus. The Michigan Papyrus 620 has added to our knowledge of Greek algebra. In addition, many intensive studies have been made of special fields as, for example, the work of the late Dr. Wieleitner, *Über das x der Mathematiker.* In general, the additions are noted by the insertions of sentences or paragraphs rather than by the recasting of the text.

The first volume, *Rechnen,* treats numerals, computation, and certain applications to business problems. Beside the increased attention to the mathematics of Egypt and Babylonia already noted, we find that the table of the development of Hindu-Arabic numerals has been enlarged to three times its length in the second edition. It now includes numerals from the Asóka inscriptions and from the Bahksali manuscript, and Gobar numerals from two undated Arabic manuscripts. It is unfortunate that the Herodianic Greek numerals were set in type instead of being in a cut, for the exigencies of the composition spoil the appearance of the numerals. Again and again in these two volumes, the reader wishes that Dr. Tropfke might have made the lavish use of cuts and facsimiles that the late Professor Cajori was allowed in his *History of Mathematical Notations.*

The second volume, *Allgemeine Arithmetik,* treats the name algebra, the development of the number concept, algebraic operations and their symbols, and logarithms. The question of the spelling of proper names has in general been met by using the standardized transliterations for the Greek and Hindu ones, and in using the form which those in our alphabet have in their own language. An exception appears in the case of Napier, who is consistently called "Neper." In spite of the "Neperschen Logarithmen," Napier would probably be the preferable spelling. A trivial slip is in spelling Barrow's first name as Isaak.

The author has given up the spelling of Fibonacci's *Liber Abaci* used in the second edition of the *Allgemeine Arithmetik,* and has taken the spelling *Liber Abbaci,* apparently without giving any reason for this change. He has kept to the date 1228, which is that of a revision of the work, instead of using the 1202 which appears in the *incipit.*

The slips in proofreading seem to be few. Professor Karpinski sometimes

appears with a y. An article by Dr. Gandz is given the title "The origine of the term algebre."

As was the case in the earlier editions, the index will appear in volume 7. It is possible, however, to make use of the index of the second edition, for in each of these parts of the third edition the author has included tables which show the correspondence between page numbers and footnote numbers in the second and third editions.

VERA SANFORD

The General Properties of Matter. By F. H. Newman and V. H. L. Searle. New York, Macmillan, 1933. 338 pp.

This is the second edition of a work first published in 1928. It plans to give a general introduction to physics and covers such topics as gravitation, gyroscopic motion, elasticity, surface tension, viscosity, kinetic theory of matter, Fourier's theorem, osmosis and diffusion, hydrodynamics and wave motion. On the whole the work is up-to-date and sound, but the mathematics is quite heuristic and sometimes unsound. For example the only purely mathematical chapter is one of eight pages devoted to Fourier's theorem, and in this is announced the theorem that any continuous function is equivalent to its Fourier series. The writers quite correctly state that a rigid proof of this (incorrect) theorem is beyond the scope of their book. The references in this chapter are quite out-of-date. In startling contrast is the immediately following fine chapter on osmosis and diffusion. We can recommend the work strongly to mathematicians who wish to find in compact and easily understandable form illustrations of the important applications of elementary mathematics to physical problems.

F. D. MURNAGHAN

Leçons d'Analyse Vectorielle. By Gustave Juvet. Paris, Gauthier-Villars, 1933. 120 pp.

This book contains the mathematical part of a course in vector analysis. A second volume containing the applications to physics will appear later. The subjects treated in the present volume are vector algebra, curves, surfaces, the differential and integral operators, and the analysis of scalar and vector fields.

The notation (dot, cross, inverted delta) is that of Gibbs. Vectors are distinguished from scalars by the use of arrows. In the proofs continuity and analytic character of functions are assumed and free use is made of geometrical intuition. The differential operators are defined by the integration method of Ignatowsky, the existence of the limit being assumed. Exercises are given at the end of each chapter.

The main purpose of vector analysis is to provide a notation and collect together a set of theorems which are found useful in the exposition of such subjects as theoretical electricity, hydrodynamics, theory of elasticity. For such use the little volume of M. Juvet may be heartily recommended.

H. B. PHILLIPS