A Source Book in Mathematics. Edited by David Eugene Smith. New York, McGraw-Hill, 1929. xvii+701 pp. Price $5.00.

A grant of $10,000 by the Carnegie Corporation to the American Philosophical Association in 1927 has made possible a series of source books in the history of the sciences. The first volume issued deals appropriately with astronomy and the second volume, issued in 1929, deals with mathematical science.

The general editor of the series is Professor Gregory D. Walcott. For the volume on mathematics the editorship was entrusted naturally to David Eugene Smith whose activity in the history of mathematics has given America a real position in this field. An advisory committee consisting of R. C. Archibald of Brown, Florian Cajori (deceased), and L. E. Dickson, gave further guarantee of a work of high order of scholarship.

This series of some ninety-six excerpts from classical contributions to the development of mathematics marks a notable step in the progress of the history of science in America. For many years courses in the history of mathematics have been given in most institutions without the possibility of reference to original sources. Even in those institutions where many of the original works are available the language difficulty has proved a barrier to any wide use of the original materials. With this volume the English-speaking student of mathematics has the possibility of easy access to many of the most fundamental contributions to mathematics.

As the plan of the series of which this is a part does not include the development of mathematics before the invention of printing, many fundamental developments of elementary mathematics are left untouched. Every student of the history of mathematics will second the wish expressed by the editor that a volume devoted to the earlier phases of mathematics may be included in the series.

The various mathematical topics are arranged under five divisions: The Field of Number, The Field of Algebra, The Field of Geometry, The Field of Probability, The Field of Calculus, Functions, Quaternions.

It is particularly worthy of note that so much material has been included which is of immediate interest even to high school students. Robert Recorde's *Declaration of the Profit of Arithmeticke* is material which is of interest to any cultured person. The work on decimal fractions, irrational numbers, complex numbers, π, logarithms, the slide rule, the cubic and biquadratic, Horner's method, the law of sines and other articles on trigonometry, all connect directly with material offered today in America in the larger high schools.

Ninety-six topics are not sufficient to cover the really important developments of modern mathematics and doubtless in some later edition other topics and other classical names will be included. However the editor and the committee have rendered a valuable service to mathematical science, emphasizing the international character of the developments in mathematics and the essential underlying unity of the contributions which have been made over a period of four hundred and fifty years.

The printing has been done with a great deal of care. The historical notes have also been well edited. Doubtless the reference to the trigonometric work by Regiomontanus (p. 432) should not refer to it as the first work devoted solely

to trigonometry, since an Arab, Nasir ed-din al-Tusi (1201–1274), wrote a separate treatise on the subject. Such errors are more or less unavoidable. Particular attention is directed to this point, however, since it would seem that special effort should be made to give to the Arabs, the Hindus, the Egyptians, and Babylonians, recognition of their achievements in mathematics, since this emphasizes the universality of the appeal of mathematics.

This handsome volume should find a place in every high school and university library. Through its pages generations of students will find inspiring contact with the old masters of mathematics whose work has made possible so many of the most remarkable developments of modern civilization.

L. C. KARPINSKI

Theorie der Raumkurven und krummen Flächen. By V. Kommerell and K. Kommerell. I. *Krummung der Raumkurven und Flächen.* 205 pp. II. *Kurven auf Flächen. Specielle Flächen. Theorie der Strahlensystem.* 194 pp. (Göschen's Lehrbücherei. I. Gruppe: Reine und angewandte Mathematik. Band 20 und 21.) Berlin, de Gruyter, 1931.

These two volumes are a fourth edition, completely revised, of three volumes of the Sammlung Schubert of which the latest editions were published in 1921. The chief differences from the earlier editions, as pointed out in the preface, are: the introduction from the beginning of the parametric representation of surfaces; greater rigor of presentation; the introduction of Levi-Civita's parallel displacement and the Riemann-Christoffel curvature tensor with a brief reference to relativity; a new treatment of the Gauss-Bonnet formula; a fundamental revision of the treatment of the transformation of parameters and of differential parameters. K. Kommerell is chiefly responsible for the scientific content, V. Kommerell for the didactic side of the work.

These volumes seem to us to give a full and extremely good presentation of classical differential geometry. We agree with the statement made by the authors in the preface that the diligent student of this book will be in a position to read original papers and even himself to undertake scientific investigation. We think that the book is not altogether easy to read and hesitate to recommend it to a beginner in the subject. As to content it is roughly comparable to Eisenhart's *Differential Geometry*. The treatment follows classical methods with occasional use of vector calculus, the latter, we think, not used with any gain in simplicity and not enough used to give the reader any familiarity with the subject. The work is rich in reference to original sources and contains several interesting historical discussions, notably those of minimal surfaces and of non-euclidean geometry. The last forty pages of text give an excellent treatment of rectilinear congruences. At the end of the second volume there are 115 exercises covering the whole work. These vary greatly in difficulty. For a number of them references to the original discussions of these problems are given. Each volume has a table of contents at the beginning and, at the end, an index of authors referred to and an index of topics. The book seems remarkably free from errors: we have noticed but one, a misplaced "2" in the equation of the catenary on page 76 of volume II.

J. K. WHITTEMORE