

algebra to make place for so much geometry is hardly justifiable in a text of this kind. Possibly it would have been of advantage to pay more attention to the theory of the quadratic equation—a subject which so many freshmen have not mastered. On page 155, line 4, the word “inequalities” should be changed to “equalities.”

Finally, it is my opinion that the book is distinctly a college text; that the subject has been concretely presented, and that an effort has been made to awaken the spirit of critical revision in the mind of the student.

JOSEPH EUGENE ROWE.

Das Problem der Kreisteilung. Ein Beitrag zur Geschichte seiner Entwicklung. Von DR. ARTHUR MITZSCHERLING. Leipzig, Teubner, 1913. vi + 214 pp. M 7.

THIS book falls naturally into three sections, treating the following topics: (a) the division of the circle into equal parts, (b) the trisection of angles, (c) the polysection of angles. Each section is written from the historical point of view and contains for its general topic an account of the relevant geometric constructions, both exact and approximate, and of instruments by means of which the corresponding practical constructions may readily be made.

The book will be of interest to those who desire an elementary historical account of the topics treated.

R. D. CARMICHAEL.

Allgemeine Theorie der Raumkurven und Flächen. Von V. KOMMERELL und K. KOMMERELL. (Sammlung Schubert XXIX and XLIV.) Zweite Auflage, I. Band, 1909, pp. viii+172; II. Band, 1911, pp. vi+188. G. J. Göschen'sche Verlagshandlung, Leipzig. Price 4.80+5.80 marks.

WITHIN the last two or three years, new works, or old works in new editions, have accumulated rapidly in the field of differential geometry. For do we not have Bell, Darboux, Demartres, Forsyth, Knoblauch, Kommerell, Lilienthal, Salmon, Scheffers, and Smith? There are many American colleges, no doubt, where lecture courses, and texts in a foreign language, are deemed inadvisable. In such places the teacher who offers an introductory course in differential geometry is distinctly at a loss. Bell, Frost, Salmon, and

Smith will not, probably, appeal to any American professor as suitable texts in this connection, whilst the exposition of Eisenhart and of Forsyth is too detailed or is otherwise inadequate. Indeed, only one suitable work is available. That is Goursat-Hedrick's *Analysis*, volume I.* With portions of this work somewhat amplified, with the English edition of Gauss's famous memoir published by the Princeton University Library, and with selections from Smith, a satisfactory course may be worked up. An appropriate single volume in English is therefore much to be desired. We need such elementary books as Raffy, with its clear-cut, elegant and rigorous demonstrations, or this new edition of Kommerell with theory presented in simple form interspersed with ample problem illustration, while authoritative comment† on the historical development stimulates the interest.

The new edition of Kommerell differs widely from the old, which appeared in 1903. There are corrections, freshly drawn figures, expansions, new paragraphs, rearrangements, new illustrations, new problems, and the elaboration of the second volume of 218 pages into one of 194 and another of 177. The original work of 350 pages has been increased in size by 200 pages, to form a treatise of about double the size of Raffy.

To the first volume only 28 pages were added and, as before, it is devoted to the discussion of space curves, and of surfaces whose equations are in the form $F(x, y, z) = 0$. The second volume originally contained two sections (each of which is now treated in a separate volume): the first (118 pages) on surfaces whose equations are in parametric form, the second (94 pages) on special surfaces (W, minimal, of constant curvature, ruled, triply orthogonal) and congruences.‡

For use in the field indicated, the volumes can be heartily recommended.

R. C. ARCHIBALD.

* Boston, 1904. A new edition in two volumes may be expected in a year or so.

† Dr. V. Kommerell was the author of "Analytische Geometrie der Ebene und des Raumes" in Cantor's *Vorlesungen über Geschichte der Mathematik*, Bd. 4 (1908), pp. 453-576.

‡ The new volume on this subject is entitled: *Spezielle Flächen und Theorie der Strahlensysteme*, Leipzig, 1911, and was reviewed in this *BULLETIN*, vol. 19 (1913), pp. 253-4, by Professor Cowley.