

Review

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SMITH, D. E. and REEVE, W. D. *The Teaching of Junior High School Mathematics*. Boston, Ginn and Company, 1927. viii+411 pages. \$2.00.

WEIDA, F. M. *The Logarithmic Slide-Rule*. New York, The Macmillan Company, 1927. 7 pages.

REVIEWS

Cremona Transformations in Plane and Space. By HILDA P. HUDSON. Cambridge, England, University Press, 1927. xx+454 pages. Price £2 2s.

The Cambridge University Press is famous for its comprehensive list of standard works on fundamental subjects of mathematics. Geometers will welcome this one to a worthy place in that distinguished company. The general plan is an elevated one; in the opening chapter the reader is introduced to homaloidal nets, postulation and equivalence of plane systems, the direct and inverse fundamental systems, followed in the second by Clebsch's theorem and its arithmetic consequences. Quadratic transformations are discussed under three headings; planes distinct, planes superposed, involutions, in 24 pages, yet nearly every known result is included. Then follows the discussion of series of composition, involution, and the application to the resolution of singularities of plane curves. This last chapter could have been made more useful and attractive by the use of figures and of more illustrative examples. The theory of plane transformations is well rounded out in the first third of the book.

In space, one immediately feels a different atmosphere—here so much remains still undone, and the road is by no means clear how to proceed further. Postulation and equivalence are treated at length, but the various genera of a surface are hardly mentioned. In the discussion of particular elements the concept of contact has a prominent position; it is pointed out that not only do the ordinary formulas fail in this case, but that higher singularities involving contact cannot be expressed in terms of simpler ones linearly. Then follows a detailed discussion of a number of special transformations of cubics, most of which is the work of the author. The minute study of a (3, 4) transformation defined by cubics with a basic conic and osculating a line is a gem. A chapter is devoted to the resolution of singularities of surfaces, following the methods of Levi and Chisini. It represents a great amount of careful work, yet the presentation is sketchy and frequently not convincing. There is still plenty of room for the efforts of the most skillful investigators in this field.

At the end of the book the characteristics of the plane Cremona transformations of orders 2 to 16 are given, and the 75 forms of cubic transformations in space. The book contains no foot-notes. At the end appear the titles, names of authors, and complete reference to every article made use of in the book. In

the text, usually in a paragraph heading, appears a number in type used for no other purpose, referring to a specific entry in the list at the end, while after each paper appear the numbers of the pages in which that article is cited. The list is not complete, but is nearly enough so to make the work a veritable hand-book. Indeed the author states explicitly that the list is incomplete, and generously leaves a few blank pages for further entries. Typographically the work has attained a degree of excellence hardly found elsewhere; errors in the numerous formulas do not exist. It is particularly appropriate that an author who has enriched the field by so many important contributions has now put them in a proper setting by presenting this well-proportioned and carefully elaborated treatise on the whole subject.

VIRGIL SNYDER

Mathematical Statistics. By H. L. RIETZ. The Carus Mathematical Monographs. Number Three. Chicago, The Open Court Publishing Company, 1927. xi+181 pages.

This little book serves as an admirable introduction to Mathematical Statistics. Although the mathematics involved does not go beyond the calculus, and in most chapters not often beyond college algebra, nevertheless, very fundamental concepts in the theory of statistics and probability are set forth in unusually clear form. This is no easy task to perform and the ability to carry it through successfully comes only from long experience in dealing with practical problems in statistics and familiarity with the literature on the subject. It is difficult enough to get these concepts straightened out in one's own mind not to mention getting them across to others, particularly if they are not familiar with the elements of statistics. This monograph is a striking illustration of the fairly successful carrying out of the idea and purpose of the Carus Foundation. There are seven short chapters dealing with the following topics: the underlying concepts of mathematical statistics, relative frequencies in simple sampling, frequency functions of one variable, correlation, random sampling fluctuations, the Lexis theory, and a development of the Gram-Charlier series. The author has not attempted a detailed exposition, but he has emphasized and brought into relief the high spots under these captions.

In the first chapter stress is laid on two general types of problems which occur in mathematical statistics. In connection with problems falling under these two types the author gives detailed consideration to certain underlying concepts, taken in pairs, as follows: relative frequency and probability, observed and theoretical frequency distributions, arithmetic mean and mathematical expectation, mode and most probable value, moments and mathematical expectations of a power of a variable. The second chapter brings out the important points in