The section on factorization of symmetric functions in Chapter IV; the determination of the integral roots of equations of higher degree than the second in Chapter V, rather than in the later chapter on the theory of equations; the treatment of determinants in the chapter on linear simultaneous equations and the application of determinants to the solution of systems of n linear homogeneous equations in n variables and of n linear non-homogeneous equations in n or in $n - 1$ variables.

The treatment of the theory of limits in Chapter XV should be noticed for its excellence; the substance of the ϵ, δ definitions of limits is given verbally, and illustrated graphically without using the algebraic statement of the definitions; the presentation of infinite sequences and series becomes clear as a result of this treatment of limits.

The exercises in verbally expressing the formulas used are a welcome aid in the efforts to combat the carelessness of expression to which our students are so largely accustomed. The method of graphing a function is explained in Chapter V, but is made very little use of in the later chapters. One misses the graphical illustrations particularly in the chapters on simultaneous equations and in the chapter on variation, while the graphical methods could have been used to greater advantage in the chapter on theory of equations and in the chapter on limits.

ARNOLD DRESDEN.

Spezielle algebraische und tranzendente ebene Kurven, Theorie und Geschichte. Von GINO LORIA. Autorisierte nach dem italienischen Manuskript bearbeitete Ausgabe von F. SCHÜTTE. Zweite Auflage. Leipzig, B. G. Teubner. Erster Band: *Die algebraischen Kurven*, 488 pp. and 14 plates, 1910. Zweiter Band: *Die tranzendenten und abgeleiteten Kurven*, 384 pp. and 6 plates, 1911.

THE value and importance of this work, which was first published in 1902, are partially indicated by this early appearance of a complete revision. About one hundred and twenty-five pages and three plates have been added. Since 1902 much has been done in the theory of special plane curves, and this work has, as far as possible, been incorporated in the new edition, which is now published in two volumes instead of one.

Many of the excellent features of the work were pointed out and discussed at some length in Professor E. B. Wilson's

review of the first edition.* As these have been retained unchanged in the revision, it is only necessary in the present notice to call attention to the principal additions to material and changes in arrangement.

The original edition contained extensive accounts of the curves of the third and fourth orders, but nothing on curves of the fifth order. Since then a good deal has been written on special curves of order five by Morley, Basset, Snyder, Field, and others, so that it is but natural to find in the revised work an account of these researches and of the theory and history of the general quintic. It may be noted that the theory of the general sextic is now included, in addition to the treatment of the special sextics given in the earlier edition.

In the review mentioned Professor Wilson discussed in detail what Loria called panalgebraic curves, and stated that for advanced students this section, which was then relegated to a note at the end of the volume, was of more interest and importance than all the rest of the book. The change of arrangement by which this discussion is brought to the dignified position of Chapter I seems to the reviewer most advantageous and important. In this position the subject is better situated to attract students, and before many years it may receive merited attention.

The other changes in the work are made principally for the purpose of bringing the older treatment up to date or to complete the history. C. L. E. MOORE.

Encyklopädie der Elementar-Mathematik. Von HEINRICH WEBER und JOSEF WELLSTEIN. Erster Band: *Elementare Algebra und Analysis.* Bearbeitet von H. WEBER. Dritte Auflage. Leipzig, Teubner, 1909. xviii + 532 pp.

THE first edition of this book has been reviewed in this BULLETIN.† The third edition differs from the first primarily in the introduction of nearly 100 pages of new subject matter. These additions consist chiefly of historical notes, which are appended to a number of chapters, and an entirely new chapter at the end, which is devoted to the graphical representation of a function, differentiation, and integration.

The value of the book is much increased by the additions, which harmonize with the spirit of the earlier editions.

F. W. OWENS.

* BULLETIN, vol. 9 (1903), pp. 492–501.
† Vol. 10, pp. 200–204.