residues are next in order. We then have a full discussion of the properties of rational functions, with a proof of the fundamental theorem of algebra. Passing to transcendental functions, the Mittag-Leffler theorem in its simplest form is proved. An innovation in connection with this proof consists in the introduction of a figure as an aid to the reader in following the analytic reasoning. The function $\zeta(z)$ and the elliptic function $\wp(z) = - \zeta'(z)$ are used in illustration of the theorem. Such properties of infinite products as are essential to an understanding of Weierstrass's primary factors are developed. The chapter closes with a brief discussion of the properties of simply and doubly periodic functions.

Chapter VIII, the last, is devoted to a brief but fairly comprehensive treatment of the properties of multiple-valued functions.

On the whole the book is well coordinated with our undergraduate courses and covers just about the ground in function theory which the first year graduate student of mathematics should get well in hand.

H. B. PHILLIPS.

Plane and Spherical Trigonometry and Tables. By G. WENTWORTH and D. E. SMITH. Boston, Ginn and Company, 1914. 230 + 104 pp.

QUOTING from the preface, this is "a work to replace the Wentworth Trigonometry which has dominated the teaching of the subject in America for a whole generation." . . . "With respect to sequence the rule has been followed that the practical use of every new feature should be clearly set forth before the abstract theory is developed."

In several particulars the book could be made more useful for students intending to pursue mathematics further. For instance, no mention has been made of Argand's diagram or of hyperbolic functions, though the logarithms of negative numbers are unusually well treated. This excellence is balanced by the unfortunate use of negative characteristics which will lead the student into endless trouble later.

Inverse function theory merits more extensive treatment even at the cost of fewer examples, but the related general formulas for all angles having the same sine, cosine or tangent are to be commended. The small pink representations of coordinate paper are attractive to the eye, but the graphs of the trigonometric functions are too small and not accurate. One full page graph with carefully distinguished curves would be more satisfactory. In the early pages the definition of coordinates is correct, but unfortunately all notion of directed lines is abandoned in the proofs of the summation formulas for sines and cosines.

Reduction of functions to the first quadrant, which in many books is needlessly diffuse, is here given in a compact form which lacks only a good rule as a summary to be quite sufficient. The double inequality in the proof for the sines of small angles follows the usual course, and as in most of our text-books does not show that the two tangents are longer than the arc. The corresponding S and T tables have been made relatively inconspicuous and supplemented by more useful tables of functions of small angles given for each second.

In the discussion of variation of trigonometric functions double signs have been used to advantage with the zero values as well as with the infinity sign. The solid perspective figures in the latter part of the book are good, and at the end is found, what is none too common in our text-books, an index.

As a whole the book does not differ noticeably from the many text-books covering the same ground. Examples are particularly abundant while the theoretical portions might well be amplified and improved.

F. H. SAFFORD.

Wilhelm Schells Allgemeine Theorie der Kurven Doppelter Krümmung. Dritte Auflage neu bearbeitet von ERICH SALKOWSKI. Leipzig, B. G. Teubner, 1914. 196 pp. Price 8 marks.

THE first edition of this book appeared in 1859, the second in 1898. It was the purpose of the author to develop the elements of the theory of curves of double curvature by the geometric method of infinitesimals without recourse to higher analysis. Since the investigation included the study of the three surfaces generated by the tangents, principal normals, and binormals of a general curve, there appears incidentally a considerable amount of material concerning the geometry of a surface in the neighborhood of an ordinary point. Consequently a reader (who might easily be an undergraduate) could obtain from the book a very good idea of the elements of the differential geometry of curves and surfaces.