

a number of cases in which the continuous one-to-one correspondence of the boundary points may be shown by Schwarz's principle of reflexion. L. Fejér proves some simple and elegant theorems on the convergence of power series, defining a conformal representation, on their convergence circle, and O. Hölder deals with the question of the variation of the solution of a differential equation when the form of the latter is varied. A. Hurwitz solves the problem, proposed by Weierstrass, of the possibility of defining the elliptic sigma function by its addition theorem, while P. Koebe has an article, also inspired by Weierstrass, on analytic functions possessing an algebraic addition theorem. E. Landau carries his researches on prime numbers into definite quadratic forms and pure cubic number fields, Ch. Müntz gives an elegant extension of Weierstrass's theorem on approximation by ordinary polynomials to such as involve non-integral powers, and E. Schmidt presents simple proofs of the fundamental properties of the Newtonian potential, beautiful by their unity of method. J. Schur investigates the expansion of a function in a series of characteristic functions of a positive definite kernel, M. Simon contributes an attractive sketch of the life and works of Sophie Germain, O. Toeplitz gives an example throwing much light upon the scope of Mercer's theorem in integral equations, and in the final paper of the volume, D. Hilbert deals with a general question in the theory of invariants, closely connected with his work in the early nineties.

T. H. GRONWALL.

Graphische Methoden. Von C. RUNGE. Leipzig, Teubner, 1915. iv+142 pp.

THIS book, which appears as No. 18 of Jahnke's collection of mathematical and physical texts, is a translation of the lectures delivered by the author in 1909-10 at Columbia University and published in 1912 as No. 4 of the publications of the Ernest Kempton Adams Fund for Physical Research.

Chapter I gives the means for performing graphically the four elementary operations on real numbers, the graphical calculation of polynomials in one variable and of linear functions of n variables, including the solution of a system of linear equations, and ends with the representation of complex numbers in the Gaussian plane.

Chapter II deals with graphs of functions of one variable,

the principle of the slide rule, change of variables, the calculation of $z = f(x, y)$ by contour lines of the corresponding surface, and its dual method in line coordinates, the nomography of d'Ocagne. The extension of the latter to more than three variables is briefly indicated. Chapter III contains various methods of graphical integration and differentiation, including the determination of the integral curves of differential equations of the first and second order.

The presentation is concise and very clear, and supported by well chosen illustrative examples and 94 figures, the neatness of which forms a much-needed object lesson to many writers of texts on geometry and graphics.

Regarding literature, there is only a general reference to the corresponding articles in the *Encyklopädie*; it would have been appropriate to give at least some references for further study, as for instance to d'Ocagne's *Calcul graphique et Nomographie*, and various papers by Runge, Kutta and others on the graphical integration of differential equations. The book under review brings forth one sad reflection: when will our writers of calculus texts for engineering students see fit to give something really modern and practical on graphical integration and solution of differential equations?

T. H. GRONWALL.

Über die Theorie des Kreisels. Von F. KLEIN und A. SOMMERFELD. Heft I: *Die kinematischen und kinetischen Grundlagen der Theorie.* Zweiter durchgesehener Abdruck. Leipzig, Teubner, 1914. viii+196 pp.

THE second edition of the first part of this standard work differs but slightly from the first one. Literature references have been brought up to date, and occasionally the wording of a theorem is changed.

T. H. GRONWALL.

Konstruktionen in Begrenzter Ebene. Mathematische Bibliothek, herausgegeben von W. LIETZMANN und A. WITTING, XI. Von P. ZÜHLKE. Leipzig und Berlin, B. G. Teubner, 1913. 39 pp. 65 fig.

THIS book treats the subject of constructions in a limited plane primarily from the standpoint of drawing. No restriction is made to a particular set of axioms for proofs, or to any particular set of instruments for constructions. Both metric