

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.

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*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