

SHORTER NOTICES.

Calcul Graphique et Nomographie. Par M. D'OCAGNE. Paris, Octave Doin, 1908. xxvi + 381 pp.

Le Calcul Simplifié. Par M. D'OCAGNE. Paris, 1905. 225 pp.

THE first mentioned volume occurs in the division Sciences Appliquées of the Encyclopédie Scientifique, now publishing under the direction of Dr. Toulouse. It forms a part of the section Science du Calcul. The author's object is to develop as an independent discipline the theory of graphical processes of calculation. The work is therefore mainly to give system and revision to previously published material of his own and that of Culmann, Massau, Mehmke, and others. To this end the volume is divided into Livres I and II.

Livre I, Calcul Graphique, is subdivided into two chapters: Arithmétique et Algèbre graphique and Intégration graphique. In reading these two chapters one would perhaps better forget that any but graphical methods are available. Such methods of necessity often involve trying detail and sometimes sag under their own weight. They lead in the last step to the measurement of a segment by a scale. The author begins therefore with a discussion of "Echelles métriques," and easily converts one to the elegance of the "contre-échelle."

The dominating construction of this first book is that for graphic multiplication: "Si, entre deux parallèles, mM et nN à Oy (* * * lignes de rappel) séparées par l'intervalle $mm = a$, nous tirons une droite MN de coefficient angulaire b , la différence NH ou c des ordonnées des points M et N est égal à ab . Pour avoir * * * b il suffit * * * ayant pris sur la partie négative de Ox le segment OQ égal à l'unité * * * de porter sur Oy le segment OQ égal à b , pris avec son signe, et de tirer PQ . La droite MN est dès lors parallèle à PQ ." This paragraph is typical of the character and detail of presentation of much of the text.

The value of $a_1b_1 + a_2b_2 + \dots + a_nb_n$ is then constructed by laying off the coefficients a on OX and b as angular coefficients consecutively and then measuring the segment on the n th *ligne de rappel* or ordinate. Such a construction serves also to solve the linear equation

$$a_0 + a_1z_1 + \dots + a_{n-1}z_{n-1} + a_nz_n = 0$$