The figures employed are all of an elementary nature, circles, rectangles, triangles, and squares. On the other hand some of the results of these chapters are stated in the book for the first time. Schoenflies (Bericht, II, page 93) has incorrectly reported the decisive examples on pages 275–283. The surprising result that a countable closed set of points in the plane may have positive linear content, which may even be infinite, has entirely escaped comment in the "Bericht." An appendix deals with various questions that arose during the printing of the book but too late for insertion in the main body of it. At the end a very full bibliography is given,—so full as to be rather discouraging. It would be of real service if the book contained in a short compass a statement of the contributions to point set theory by the different investigators.

Throughout there are many well constructed figures which assist the reader very materially. The large number of problems exhibiting a multitude of phases of the subject bear eloquent witness to the care with which the authors themselves have mastered the subject and the great amount of energy expended in writing the book.

Inasmuch as this is practically the only treatise of its kind (Schoenflies's Bericht apparently having a quite different purpose), it is difficult to judge how greatly it differs from the riper treatises which are bound to come in the future. But we are surely justified in saying that the authors have done the cause of mathematics a real service by placing at the disposal of the student a treatment of point sets exceptionally readable and with unimportant exceptions entirely trustworthy.

A very considerable number of misprints have been detected.

N. J. LENNES.

Leçons élémentaires sur la Théorie des Fonctions analytiques. 2nd edition. By ÉDOUARD A. FOUËT. Vol. I: *Les Fonctions en général.* 1907. xiii + 112 pp. Vol. II: *Les Fonctions algébriques. Les Séries simples et multiples. — Les Intégrales.* Paris, Gauthier-Villars, 1910. xi + 263 pp.

A COMPARISON of the first and second editions shows that the author has completely revised his work, adding new material to include some of the latest developments, enlarging some of the subjects already treated and rewriting other portions. The one volume of the first edition has been expanded into two.

In the first volume the author seeks to give a general introduction to analytic functions, laying special emphasis upon the fundamental ideas, and indicating the growth of these ideas from the simplest naive notions to the present extended conceptions. Thus, the growth of the idea of function is traced from the earliest analysts, who restricted the use of the word to the powers of a quantity, through the various stages represented by Euler, Cauchy, Riemann, Fourier, and Dirichlet, to the present general conception which is broad enough to include a correspondence which represents a space-filling curve.

After treating the subjects of number and function, the author takes up at some length the principles of assemblages. He then considers the principal types of functions and their classification. He introduces the subject of the general analytic function, gives the Cauchy-Riemann partial differential equations, studies conformal representation, considers various singularities, introduces groups and applies them to periodic and automorphic functions.

The second volume is a study of functions from the three points of view suggested by the names of Riemann, Weierstrass, and Cauchy. The first chapter, on algebraic functions, is dominated by the geometric point of view. It studies various transformations, the fundamental properties of algebraic functions, and contains an exposition of the Riemann surface.

The subject of series is treated very fully. A general discussion of convergence is followed by a treatment of the power series, infinite products, trigonometric series, and divergent series (presenting largely the points of view of Poincaré and Borel). The theory is followed by applications to e^z, $\sin z$, $\zeta(z)$ of Riemann, etc., and by a consideration of the hypergeometric series.

Series in two or more variables are also studied, and applied to various transcendental functions, e. g., the ζ, γ, γ' functions of Weierstrass, the θ functions of Jacobi, etc.

The last chapter deals with functions as defined by the definite integral, the epoch-making conception of Cauchy, which, according to Hermite, is the most fruitful conception in mathematics. The objective of this chapter is the integrals of Cauchy and Taylor's series.

Throughout the two volumes we find a double purpose: the author seeks to give an elementary account of the subject from the most modern standpoint; and aims, at the same time, at completeness. He accomplishes his purpose very well by the introduction of copious footnotes which deal with sources, historical information, difficult demonstrations, interesting generalizations, and conceptions too advanced for the text proper. Thus, the discussion of the theory of assemblages is supplemented in the footnotes by reference to transfinite assemblages; and the ordinary presentation of the integral is supplemented by the introduction of upper and lower integrals.

The comprehensive, suggestive, critical footnotes greatly enhance the value of the work.

The volumes under review are especially valuable for those who wish a thorough treatment of the fundamental conceptions, and an introduction to the latest ideas, for the author has not only given a sketch of these phases of the subject, but has also indicated many sources.

GEO. N. BAUER.

Lectures de Mécanique: La mécanique enseignée par les Auteurs originaux. Par E. JOUGUET. Deuxième partie: *L'Organisation de la Mécanique.* Paris, Gauthier-Villars, 1909. 284 pp.

MANY of the mathematicians who teach the elements of mechanics may have more or less serious *arrières pensées* relative to the way in which they have presented the fundamental concepts to their students, and they may form many a good resolution as to the severe logical thinking they will expend upon the subject to the end that the next time they teach it the presentation may gain much in completeness and consistency. To all such Jouguet's Lectures are a godsend,— not that all the difficulties of the doubting ones will be relieved by the perusal of the work, but that the doubts and perplexities of the great creators of mechanics, and the way they settled them or at least thrust them aside, are here detailed. For the plan of the work, as the subtitle indicates, is to teach (the foundations of) mechanics by (large extracts from) the original authors. We may say that Jouguet selects his quotations well and makes each one sufficiently long to be intelligible of itself; but one must add that his own careful critical comments are very helpful toward the fullest interpretation both of the material cited and of the subject itself.

The work consists of three parts: the first, which is not at hand, called La naissance de la mécanique; the second, which is under review, entitled L'organisation de la mécanique; the