ment with many cuts and pictures of the following six topics : 1) Les instruments arithmétiques ; 2) Les machines arithmétiques ; 3) Les instruments et machines logarithmiques : 4) Les tables numériques (barèmes) ; 5) Les tracés graphiques ; 6) Les tables graphiques (nomogrammes ou abaques). The volume also includes an interesting introduction and many historical notes.

L. I. HEWES.

Theorie der elliptischen Funktionen. Von H. DURÈGE. In fünfter Auflage neu bearbeitet von LUDWIG MAURER. Leipzig, B. G. Teubner, 1908. 436 + viii pp.

IT is difficult to understand on what ground this work can appropriately be called a new edition of Durège's well-known and admired book, since scarcely a trace of the original seems to have been left.

The first edition appeared in 1861, and was followed by successive editions at intervals of ten years or less, until the fourth in 1887, which was hardly more than a reprint of the third. There can be little doubt as to the inadvisability of further revising this work, now over twenty years old in its latest form, and which represents the state of the theory substantially as it was at the time of Jacobi. Since then this field has been transformed by the new theories of Weierstrass and Riemann, and has been more or less modified or influenced by other lines of mathematical activity such as the theory of groups and the Galois theory of equations. Moreover, the recently developed elliptic modular functions and the still more general class of the automorphic functions afford an extension or generalization which has not only placed the elliptic functions themselves in a new light, but has laid stress on their properties when the periods are regarded as additional independent variables.

It would evidently be quite out of the question to engraft all of these new methods and ideas on to the older theory as expounded by Durège, and Professor Maurer has started *de novo* in his treatment without attempting, as far as we can observe, to incorporate any of the material of the older work except that of course the jacobian functions are given their proper share of attention. The Weierstrassian functions and methods, however, predominate, and the influence of the great work of Klein and Fricke on the elliptic modular functions is observable throughout.

The first chapter treats of the elementary theory of the elliptic integrals, their transformation and reduction to normal forms. The second chapter considers the elliptic Riemann surface and the rational functions on it, while their integrals are discussed in the third chapter. The elliptic functions are studied in the next, and their analytic expressions in the fifth chapter. The sixth is devoted to such applications as the rectification of curves, parametric study of cubic curves, elliptic coordinates, the spherical pendulum, and the rotation of a body about its center of gravity. The seventh chapter is a brief resumé of the elements of group theory and the Galois theory of equations; the eighth treats of the division and transformation of the elliptic functions, and the ninth and last chapter deals with the modular functions. The important formulas are collected together at the end for convenience of reference, and a brief index closes the work.

We believe that Professor Maurer's book will prove to be one of the most useful that has been written on this subject. It embraces in a moderate compass a remarkably well considered and comprehensive view of a large and many-sided field.

J. I. HUTCHINSON.

Introduction to Infinitesimal Analysis. Functions of one Real Variable. By OSWALD VEBLEN and N. J. LENNES. New York, Wiley and Sons, 1907.

JUST fifteen years ago the first treatise in the English language on the theory of functions was published. Until then, this theory, which had been cultivated with great assiduity and success for half a century on the continent, was all but ignored by the English-speaking race, and in this country perhaps not half a dozen universities gave instruction in it. What a change has taken place in the few short years which have meanwhile elapsed! To-day all our better universities regularly give courses in this subject and, strange to relate, the most extended and scholarly treatise on the theory of functions of a complex variable is the work of an American.

During these years, a sister theory has come into prominence; we have now not only a theory of functions of complex variables, but also one for real variables. The work under review treats of this younger theory. Its two hundred and twenty odd pages contain a comprehensive and scholarly presentation of the foundation of the calculus, which on all sides is marked by