There is one disadvantage of this theory as compared to the ordinary analytic geometry. In the latter case the curve uniquely determines the (algebraic) function. But obviously we can find as many polynomials in x, y as we please, each passing through the same given points, finite in number. The real points on a modular curve $F \equiv 0$ do not therefore form an adequate picture of $F \equiv 0$. To this end and for the purpose of investigating intersections and all but the most trivial questions, we must introduce also the imaginary points of $F \equiv 0$, i. e., solutions of $F(x, y) \equiv 0 \pmod{m}$ in which x (and likewise y) is a root of any congruence modulo m with integral coefficients. The aggregate of the resulting infinitude of points gives an adequate representation of the function. If the author had recognized this point of view and had succeeded in materializing a suitable graphical representation of this infinitude of points, he would have made a substantial contribution to modular geometry. But in confining himself to real points, the author goes no further than earlier writers.* The author and his collaborators G. Tarry and Laisant are apparently not familiar with the history of Galois imaginaries, as there is no mention of Galois when such imaginaries (of the second order) are used and since a particular case of Galois' generalization of Fermat's theorem is attributed on page 148 to Tarry.

L. E. DICKSON.

La Logique déductive dans sa dernière Phase de Développement. Par ALESSANDRO PADOA. Paris, Gauthier-Villars, 1912. 106 pp.

THIS treatise is an adaptation of a course of lectures given by the author at Geneva, under the auspices of the university. The author had previously lectured on the subject in Brussels, Pavia, Rome, Padua, Cagliari, and presented memoirs before the congresses at Rome, Leghorn, Parma, Padua, and Bologna. The treatise contains an explanation, with abundant examples, of the symbols of logic as used in the Formulario Matematico, of Peano, some study of their properties, analysis of their relations, and their reduction to a minimum number. The author expresses his point of view very well in the following:

* Veblen and Bussey, "Finite projective geometries," *Trans. Amer. Math. Soc.*, vol. 7 (1906), p. 241. As the title shows, these authors were interested only in definite finite geometries and not in general modular geometry, so that the criticism of Arnoux's text does not apply to them.