Chapters are devoted to thermodynamics, ordinary differential equations, special functions, vector analysis, coordinate systems, calculus of variations, partial differential equations of classical physics, eigenvalues and eigenfunctions, mechanics of molecules, matrices and matrix algebra, quantum mechanics, statistical mechanics, numerical calculations, linear integral equations and group theory.

An advanced course, based upon this text, for physicists and chemists, could afford to be supplemented by material on linear systems, transforms, approximate and asymptotic evaluating of integrals, and some elementary theory of acoustics and hydrodynamics.

Some illustrative problems are worked as examples, others, often supplementary to the text material, are included as student exercises. Typographical errors were fairly numerous in the first printing.

This book has been enthusiastically received by graduate students of physics, chemistry and mathematics, although not without criticism of certain sections. It has stimulated considerable interest in the topics covered.

PAUL C. CROSS

O sentido da nova lôgica. By Willard Van Orman Quine. São Paulo, Livraria Martins Editora, 1944. 252 pp.

This is a well organized exposition of modern formal logic addressed to the general philosophical reader. There is at the end a list of the principles most often referred to, a list of all the formal definitions (in symbolic notation), an extensive bibliography, and an alphabetical index. All these will help the studious reader who wishes to master the technique, but the book is not equipped with exercise material, nor designed for classroom drill. The style, at least up to the last chapter, is reasonably simple, with well chosen local illustrations and appropriate cautionary remarks. Rarely, except on questions of ontology, does the author present at length, and then dispose of, views opposed to his own. Throughout the text, generous but brief remarks attribute credit to previous workers.

Following an illuminating introduction, the text falls into four chapters: I Theory of composition, II Theory of quantification, III Identity and existence, IV Class, relation and number. In I, truth value tables (called "quadros") are treated in detail. This treatment covers the translation from everyday language to the more precise, symbolic notation. As distinguished from the "if-then" rule of composition of propositions, the author here, as previously, reserves "implication" to state a relation between propositions. If "$\sim(p \cdot \sim q)$," then "'p' implies 'q'," where 'p', 'q' are substantives, naming the

propositions concerned. "Compositional implication" and "compositional truth" are then explained. In II, the theory of quantification introduces logical pronouns (the "variable arguments" of some writers), and matrices (called by many "propositional forms"). Seven deductive operations are listed and used. In III is emphasized the contrast between object and symbol, and the nature of description. Only one kind of existence (material existence in the case of physical objects) is accepted; the question is reduced to whether a pronoun has an application. A brief argument is presented for the elimination, in logic, of all substantives other than pronouns. In IV, attributes are compared with and contrasted to the more readily handled classes. The *pure matrices* in the theory of classes employ only the notions of conjunction, negation, quantification and pertinence (using the "ϵ" of membership). Applications, even in the abstract field of mathematics, which bring in other signs, not themselves defined in logical terms, involve *impure* matrices. A brief survey of the construction of the number system out of pure logical concepts follows. The notion of pertinence adopted is such that "$z \epsilon y$" has the sense: "z is a number of y, if y is a class, and $z=y$, if y is not a class." A virtual theory of classes and relations, while using familiar phraseology, succeeds in eliminating the ontological presuppositions by offering acceptable defined equivalents. The chapter closes with a description of Gödel's Theorem.

Save possibly that this book may give the idea that all important problems in logical theory have been disposed of, the confident tone and clear, enthusiastic and well organized statements commend the book to all thoughtful readers—who read Portuguese.

ALBERT A. BENNETT

Rings with minimum condition. By Emil Artin, Cecil J. Nesbitt and Robert M. Thrall. University of Michigan Press, 1944. 7+123 pp. $1.50.

The major portion of this book is devoted to a new exposition of the classical theory of associative and distributive rings satisfying the minimum condition for left ideals. The authors envisage in their treatment further developments of the theory. They announce the basic observation that the theory of rings proper should not be separated from the corresponding theory of representations. In connection with this thesis it is worthwhile mentioning that the proof of Wedderburn's structure theorem for simple rings involves the theory of representations.