

ELEMENTARY LOGIC WITHOUT REFERENTIAL QUANTIFICATION

JOHN THOMAS CANTY

Introduction This paper suggests an alternative way of presenting elementary logic with identity. The paper is preliminary to a program of axiomatizing a system, providing adequate semantics, and establishing the relation of these enterprises to the classical predicate calculus. In section 1 the classical semantics for elementary theories is recalled. Section 2 presents a few theorems which suggest a non-referential view of quantification while section 3 provides a semantical basis for the plausibility of these suggestions.

1. *Referential quantification and semantics* Elementary theories are considered here as systems which incorporate all truth-functional tautologies as theorems, employ classical principles of quantification with respect to one sort of variable, and contain primitive functors which form statements when applied to variables, that is, primitive predicates subject to given axioms. The predicates may be thought of as divided into two classes: logical (for example, identity) and non-logical (none of which will be treated in this paper). Besides the above, elementary theories may contain constants of the same sort as the variables, that is, substitutable for variables.

In order to provide classical models for elementary logical theories, an arbitrary non-empty set of elements is specified, called the domain of discourse or universe. This set is taken to be the range of the variables of the theory and then, any association or interpretation of predicates with respect to relations over the universe (constants with respect to elements of the universe) which satisfies the theorems of the theory, is a model for the theory.

From the point of view of this (classical) semantics, all consistent theories have *ontological commitment*. Since the range of values of the variables of quantification is identified with the domain of discourse, it follows that "...entities of a given sort are assumed by a theory if and only if some of them must be counted among the values of the variables in order that the statements affirmed in the theory be true" (see [1], p. 103).