

Elías H. Alves
José E. de Almeida Moura

ON SOME HIGHER-ORDER PREDICATE CALCULI

In this paper we present a hierarchy of higher-order predicate calculi based on the calculi C_n , $1 \leq n < \omega$, of da Costa (see N. C. da Costa, *on the theory of inconsistent formal systems*, **Notre Dame Journal of Formal Logic** XV (1974), pp. 497–510, and E. H. Alves, *Lógica e Inconsistência, um estudo dos cálculos C_n , $1 \leq n \leq \omega$* (thesis), 1976). We denote these calculi by P_n^m , $1 \leq n < \omega$, $1 \leq m \leq \omega$, where n indicates which of the calculi C_n is being considered and the superscript m indicates the order. We give details only concerning the calculus P_1^2 , that is, the second-order calculus based on C_1 . The generalization to other cases is immediate. We introduce also a semantics for these calculi, which is a generalization of the semantics of C_1^- , presented in A. I. Arruda and N. C. A. da Costa, *Une sémantique pour le calcul C_1^-* , **C. R. Acad. Sc. Paris** 284 A (1977), pp. 279–282. We show also that these calculi are weakly complete relatively to this semantics. Finally, we show how the classical arithmetic can be obtained from P_1^m , $m > 2$.

*Centro de Lógica, Epistemologia e
História da Ciência, Universidade Estadual de Campinas, Brazil*

*Departamento de Filosofia,
Universidade Federal do Rio Grande do Norte,
Brazil*