PREFACE

The substance of this booklet was presented in five lectures at the University of Notre Dame, April 12-15, 1948.

The booklet has two purposes. On the one hand it presents certain researches on the methodology of formal systems as explained in the introduction. On the other hand it aims to give a self-contained account of the approach to the logical calculus by means of inferential rules as given by Gentzen in his thesis [35]. These two purposes are not antagonistic; on the contrary they are logically related, and they supplement and mutually influence one another.

In regard to the expository aspect, I share in the opinion that the inferential rules of Gentzen and Jaśkowski form one of the most natural and fruitful approaches to the propositional and predicate calculuses. They have shown themselves to be interesting even to some hardboiled practicians of neighboring fields. A systematic exposition of this approach is, therefore, a desideratum. The exposition attempted here is intended for mature persons. Except in certain portions, easily skipped, no technical knowledge of mathematical logic - or of mathematics either - is presupposed; yet it is assumed that the reader can cope with mathematical arguments of considerable generality and abstractness, including some of the more involved applications of mathematical induction. A rudimentary acquaintance with the meaning, as opposed to the technique, of ordinary logical symbolism, although perhaps not strictly necessary, is nevertheless advantageous. Such an acquaintance may be obtained from Tarski's elementary book [81], especially Chapters I, II, III, IV, and VI; or alternatively from a number of other books, e.g., the following listed in the bibliography: [2,3,4,11,14,29,46,57,87,88,92]. Further suggestions will be found in [91].

In regard to the research aspect, these lectures constitute the publication, with additions, of the paper presented to the American Mathematical Society in September, 1937, for which the abstract is [25]. Various considerations, concerning which my memory is now rather vague, prevented publication of that paper until the war made it necessary to put mathematical logic on the shelf. On receiving the invitation from the University of Notre Dame to deliver these lectures, I decided that the connection of these results with the expository hiatus, mentioned in the preceding paragraph, made them an ideal subject for the purpose. With this connection in mind, and with due regard for what I have learned since, those results have been thoroughly revised. These lectures are the result of that revision.