BOOK REVIEWS

KLEENE, S. C. AND VESLEY, R. E., *The Foundations of Intuitionistic Mathematics* (North-Holland Publishing Company, 1965), viii+206 pp., 80s.

In this mongraph, Kleene and one of his former students apply metamathematical and model theoretic methods to L. E. J. Brouwer's constructive version of mathematics. The result is a detailed formal treatment of intuitionistic number theory and analysis which is likely to be more acceptable than the mystical approach of Brouwer, at least to mathematicians not completely and exclusively committed to the philosophy of intuitionism.

The first chapter is devoted to a new formalisation of intuitionistic analysis. This is followed by an account of Kleene's interpretations of the formal theory within the theory of recursive functions, which includes modifications and extensions of previously published work. In the third chapter, Vesley develops the intuitionistic theory of the continuum within the Kleene system and in the final chapter Kleene investigates the claims made by Brouwer in a paper on the properties of the intuitionistic continuum. There is no account of the recent work of other mathematicians in the field.

The book is written in typical Kleene style on the assumption of familiarity with Chapters I-XII of Kleene's earlier book *Introduction to Metamathematics*. Proofs are presented using an elaborate system of cross references (which refer to this earlier book as well as to the book under review), and this involves anyone trying to follow them in a good deal of hard work. Certainly this is an important and original contribution to the literature on intuitionistic mathematics, but it is not the book for the reader wanting a first introduction to the subject. A. A. TREHERNE

NACHBIN, L., *The Haar Integral* (D. van Nostrand, London, 1965), xii+156 pp., 51s.

The Haar integral (that is, to a first approximation, the generalisation of the Lebesgue integral to locally compact topological groups) has established itself as one of the most useful tools in analysis. In the past, its treatment has usually been relegated to an appendix or to a (necessarily somewhat condensed) chapter in a treatise on some related larger topic; examples are provided by two other volumes in the present series. Here we have for the first time a text devoted primarily to the Haar integral itself.

The author's aim is to provide an elementary introduction rather than an exhaustive account. Accordingly, he requires relatively little background of the reader. The necessary parts of integration theory in locally compact spaces are developed in the first chapter, together with much of the relevant topology. The reader is assumed to know what a Hausdorff space is but not—for example—to know anything about compactness. The first chapter provides a convenient and readable introduction to the Bourbaki theory of integration. In the second chapter the Haar integral itself is discussed; the existence proofs of Weil and Cartan are both presented. In a short third chapter the basic existence and uniqueness theorem s extended to locally compact homogeneous spaces.

Throughout, there is careful motivation, and there are many interesting illustrative examples, usually discussed in detail. The book should be easily accessible to any