WHYBURN, G. T., *Topological Analysis*, revised edition (Princeton Mathematical Series, no. 23, Princeton University Press; London: Oxford University Press, 1964), xii + 125 pp., 40s.

The first edition of this book, devoted to the proof of theorems of analysis from a topological base, was published in 1958. In this new edition the first five chapters, covering definitions and elementary results in topology and complex variable, and the introduction of the topological index, are unchanged except for the addition of a section on Cartesian product spaces to Chapter 1. The second half of the book has been revised to incorporate new developments in the subject.

One of the major developments has been the discovery in 1960 by E. Connell and A. H. Read, working independently, of topological proofs (i.e. proofs not depending on integration) of the existence of the second derivative of a function analytic in a region. More recently the author, who was aware of the results of Connell and P. Porcelli, has given a simpler method of obtaining them, and this method has been followed in the new edition of the book. It makes no direct use of the openness or lightness of a mapping generated by a differentiable function, but instead appeals to a form of the maximum modulus theorem which was already available and indeed was used previously in proving lightness and openness. As a by-product, new proofs of these topological properties are obtained, and in fact the new proofs are shorter and simpler than those given in the first edition.

For the applications to differentiable functions, the treatment of the topological index may be confined to the simple case of a rectangle, and Professor Whyburn has added a six-page appendix giving such a minimal treatment. Stoïlow's theorem in the large as well as in the small has been included, and also the Vitali and Ascoli theorems.

The revisions have added greatly to the interest and value of the book. There are a number of misprints, some of which have survived from the first edition; those noticed by the reviewer were of a trivial nature. The printing and layout of the book are of the high standard familiar to readers of the first edition. PHILIP HEYWOOD

BACHMAN, GEORGE, *Introduction to p-Adic Numbers and Valuation Theory* (Academic Press, New York, 1964), 173 pp., 24s. 6d.

The first two chapters of this book would form an excellent text for a short course on valuations and p-adic numbers for Honours students. The remaining three chapters, go much deeper and demand more maturity. Valuation rings, places, ordered groups, mappings into ordered groups (with a zero element added) and non-archimedean valuations of general rank are defined and extensions of valuations are studied. A certain number of applications to algebraic number fields are given. There is a useful appendix which serves as a glossary for the algebraic concepts used, but is not intended to make the book absolutely self-contained; for example, Definition 3.2 (p. 77) of the rank of an ordered group demands a knowledge of the concept of order type, which does not appear to be explained anywhere in the text. In the example on p-adic division on p. 40 the digit 3 should be replaced by 2 in each of the four places where it occurs; in the working the digit 4 should, in two places, be replaced by a 3. R. A. RANKIN

F. VALENTINE, *Convex Sets* (McGraw-Hill, 1964), 238 pp., 96s.

This is a clear and rigorous account of the theory of convex sets for both finite and infinite-dimensional linear spaces. Among the subjects treated are the Minkowski metric, the support function, the dual cone, and the theorems of Helly, Krasnosel'skiĭ and Motzkin. The final part contains an interesting collection of exercises, propositions and unsolved problems, and an appendix gives a useful summary of the main