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 results from related fields. As the author remarks many of the theorems can be understood by a gifted high school student, but a full understanding requires considerable concentration and some maturity from the reader. The printing is excellent and there are numerous illustrations motivating the proofs. R. A. RANKIN

KNOPP, K., *Theorie und Anwendung der unendlichen Reihen* (Springer, 5th edition, 1964), 582 pp., DM. 48.

The author of this famous textbook died in 1957. The fifth edition appears to be a photographic reprint of the fourth edition of 1947 with insignificant alterations; the quality of the printed text is inferior to the high standards normally expected from the house of Springer. The English translation published by Blackie in 1928 occupies a place between the second and third German editions and differs from the later editions in minor respects; for example, new proofs are given for two theorems on divergent series in the third and following editions. It is somewhat surprising that no attempt has been made to bring references up to date by including, for example, mention of G. H. Hardy's *Divergent Series* (O.U.P., 1949).

R. A. RANKIN

HEMMERLING, EDWIN M., *Fundamentals of College Geometry* (John Wiley & Sons, 1964).

The treatment is entirely deductive, based upon 15 briefly stated axioms together with 33 postulates which include that of Playfair. The notations of set theory and of mathematical logic are introduced, but are not much in evidence later. Thereafter the matter is roughly that of a British " O " level course, with the emphasis in important proofs being laid upon underlying reasons, step and justification occupying parallel columns. There are short chapters on the trigonometry of right-angled triangles and on the coordinate geometry of the straight line. In Chapter 12, the results of 18 theorems on 3-dimensional geometry are stated without proof.

The theorem and its converse on the bisectors of the vertical angle of a triangle does not appear either in text or examples, nor does the fact that a striaght line perpendicular to each of two intersecting straight lines at their common point, is perpendicular to their plane.

The book is excellently arranged and produced, only two misprints being noticed. Within the limitations set himself by the author, and despite a claim on the dust-cover to show students " how to relate abstract materials of geometry to experiential areas such as politics, sociology and advertising," the work should in fact enable some, preferably having prior knowledge of Euclidean geometry, to increase their understanding of its underlying assumptions. S. READ

ALDER, H. L. AND ROESSLER, E. B., *Introduction to Probability and Statistics*, 3rd edition (W. H. Freeman and Co., San Francisco and London, 1964), xiv+313 pp., 36s.

The first and second editions of this book were reviewed in this journal in June 1961 and June 1963 respectively. The third edition has expanded the brief chapter on the Sign Test to a more general chapter on Non-parametric Tests and includes details and examples of the Wilcoxon Tests for two general samples and two paired samples. Tables of the Wilcoxon Distributions are included. The only other change is the inclusion, in the chapter on Analysis of Variance, of a section dealing with transformations of data which may be required to ensure that standard methods of analysis are applicable. Details are given of square root, logarithmic, reciprocal and arc sin transformations together with a table for the transformation of percentage to arc sine $\sqrt{}$(percentage). The additional material is lucidly presented and enhances the value of the book. J. R. GRAY