BOOK REVIEWS

KREYSZIG, ERWIN, *Differential Geometry* (2nd ed., Mathematical Expositions No. 11, Toronto and Oxford University Presses, 1964), pp. 377, 68s.

The first edition of this valuable book appeared in 1959 and a review by Professor A. G. Walker is to be found in Vol. 12 (series II) Part 3 of these Proceedings. This second edition differs little from the first; minor corrections have been made to the text and further problems for solution have been added.

The author describes his book as an introduction to differential geometry of curves and surfaces in three-dimensional Euclidean space, and presents his material in eight chapters whose headings are as follows: I. Preliminaries; II. Theory of curves; III. Concept of a surface. First fundamental form. Foundations of tensor calculus; IV. Second fundamental form. Gaussian and mean curvature of a surface; V. Geodesic curvature and geodesics; VI. Mappings; VII. Absolute differentiation and parallel displacement; VIII. Special surfaces.

The reader will appreciate the clarity of the writing, the abundance of excellent illustrative figures and the supply of interesting problems scattered throughout the text—especially as thirty pages towards the end of the book are devoted to the solution of the latter. The author makes full use of tensor calculus, introducing the basic concepts and rules early in his initial chapter on surfaces and presenting all subsequent results in its compact notation. For the reader previously unfamiliar with tensors this is not the easiest approach to a study of surfaces, but for the reader already acquainted with tensor calculus or already familiar with the properties of surfaces the presentation could not be improved.

Chapter V contains the Gauss-Bonnet theorem and some of its corollaries. In chapter VI discussion of the properties of isometric and conformal mappings is followed by investigation of the mappings of Mercator, Lambert, Sanson and Bonne, names perhaps more familiar to the cartographer than to the mathematician. Chapters VII and VIII seem to the reviewer to be the best in the book—chapter VII for its extreme clarity of exposition and chapter VIII partly for its fascinating figures.

The printing and layout of the volume are excellent.

ELIZABETH A. MCHARG

JANS, J. P., *Rings and Homology* (Holt, Rinehart and Winston, London, 1964), 88 pp., 28s.

This monograph comprises an introduction to the structure theory of rings with minimum condition combined with an introduction to the homological algebra of modules. Briefly, the idea behind the monograph is to use the concepts of homological algebra to motivate and develop the structure theory of such rings and then to consider the homological algebra in more detail. After an introductory chapter, semi-simple rings with minimum condition are introduced as those rings R with the property that every R-module is projective (or, alternatively, injective). From this definition, it is deduced in fifteen pages that any such ring is the direct sum of matrix rings over division rings and this decomposition is unique. This chapter is a masterpiece of compression and may, consequently, be found difficult by a reader new to the subject. In chapter III the reader is taken from the definition of a complex and