the rationals and not merely a subset isomorphic to the rationals (a modification of the Dedekind cut is used); Ordinal numbers (von Neumann's version), transfinite induction and recursion; Cardinal numbers, introduced (again following von Neumann) as initial ordinals; the Axiom of Choice and its equivalents. Part III is a description of, and an interesting discussion of the relations between, the main axiomatic systems of set theory—essentially those of Russell, Zermelo, von Neumann-Bernays and two systems of the author.

The book is practically self-contained, assuming some knowledge of logic (elementary quantification theory) but no previous knowledge of mathematics or set theory. This, together with its soundness and readability, makes it suitable reading not only for mathematics students (at graduate or undergraduate level), whether as part of an organised course on axiomatic set theory or not, but also for philosophers with an interest in the foundations of mathematics. An excellent index and system of numbering formulæ make it also a useful reference book. More advanced readers will regret the relegation of proof theory to footnotes and parentheses.

A. A. TREHERNE

HERVÉ, M., *Several Complex Variables: Local Theory* (Oxford University Press, 1963), 26s. 6d.

The Theory of Several Complex Variables has, in the past fifteen years, undergone a remarkable development as a result of the work of Oka, Cartan, Stein, Grauert and Remmert. No books on the subject however have appeared for very many years, and the time seems certainly ripe for more modern texts.

The present book by Professor Hervé is a modest but useful contribution. It is essentially self-contained and develops the local theory from its foundations. It begins with the classical results—Weierstrass preparation, Hartogs Theorem, etc. and ends up with detailed results on the structure of analytic sets, including the proof of the coherence of the sheaf of an analytic set.

Compared with the treatment of the same topics given by Cartan in his Séminaires 1951-52 the present exposition strikes the reviewer as a little heavy-handed. This is no doubt due to the author's rather concrete and classical approach, and may be compensated by the fact that little is required of the reader except diligence.

M. F. ATIYAH

HELGASON, S., *Differential Geometry and Symmetric Spaces* (Academic Press, 1962), 486 pp., 89s. 6d.

This book is the first to give a comprehensive account of Cartan's theory of symmetric spaces, i.e. Riemannian manifolds for which the curvature tensor is invariant under all parallel displacements, and of the more modern developments concerning functions defined on these spaces. The book is well written but, since the style is very compact, it will be difficult reading for anyone not already acquainted with the basic ideas of modern differential geometry and the theory of Lie groups. A reading of Lichnerowicz's little book on Tensor Calculus and the recent book by Flanders on Differential Forms would be an excellent propaedeutic to the serious study of the book. However, features of the book which add to its value as a textbook are the short summaries provided at the beginning of each chapter and the collections of problems at the end of each chapter. The bibliography, occupying 15 pages of text, is also an asset. An extraordinary amount of material is included in the book, and anyone prepared to work through it conscientiously will be richly rewarded not only by what he will learn about symmetric spaces but by the sound knowledge he will acquire of many matters of fundamental importance in the study of global differential geometry. The chapter headings are as follows: I Elementary Differential Geometry, II Lie Groups and Lie Algebras, III Structure of Semisimple Lie Algebras, IV Symmetric Spaces, V Decomposition of Symmetric Spaces, VI Symmetric Spaces of the Noncompact Type, VII Symmetric Spaces of the Compact Type, VIII Hermitian Symmetric Spaces, IX On the Classification of Symmetric Spaces, X Functions on Symmetric Spaces.

D. MARTIN

HEADING, J., *Mathematics Problem Book I: Algebra and Complex Numbers* (Pergamon Press, 1964), 184 pp., 21s.

The stated intention of the author of this little paper-backed book is to supply a large number of examination-type problems suitable for first and second year students of Science and Engineering. The subject matter includes Determinants, Theory and Solution of Equations, Partial Fractions, Binomial, Exponential and related series, Convergence, Algebraic Curves, Inequalities, Hyperbolic Functions, Matrix Algebra, Complex Numbers, Conformal Transformations and the Cauchy-Riemann Equations.

Each chapter contains a short summary of results and methods together with a large number of problems. Answers are supplied. Students will no doubt find this book mainly of value as a source of problems for examination preparation.

D. S. MACNAB

TODD, JOHN, *Introduction to the Constructive Theory of Functions* (Basel, Switzerland: Birkhäuser Verlag, 1963), 127 pp., Fr. 27.50.

The author declares his objectives to be:

(i) to present to prospective mathematicians an account of some elegant but usually overlooked ideas from classical analysis;
(ii) to provide a carrier for some mild propaganda for numerical analysis; and
(iii) to put on record in a palatable context some basic formulas and properties of the classical orthogonal polynomials.

These objectives and the manner in which they are attained make this a timely and valuable contribution to mathematical literature in view of the intense interest which is generating in numerical analysis and the influence which it is having on the content of mathematical courses both at the undergraduate and postgraduate levels. The material, much of it extracted from original papers, is selected with the needs of the numerical analyst in mind. The more general theory is developed in the text with particular results contained in sets of problems which appear at the ends of the chapters and for which outline solutions are given at the end of the book. The presentation is concise, satisfying to the classical analyst yet should be comprehensible to prospective honours degree graduates, and if recommended as collateral reading would unify concepts which may appear in lecture courses in a variety of contexts.

The subject matter is essentially concerned with the approximate representation of functions in terms of simpler ones. This may be obscured by the title which has been adopted from the Russian school of mathematicians to whom much of the development of the subject is due. The chapter headings are: 1. Results from Algebra and Analysis: 2. The Theorems of Weierstrass: 3. The Chebyshev Theory: 4. The Theorems of the Markoffs: 5. Orthogonal Polynomials: 6. Interpolation and Interpolation Processes: 7. Bernoulli Polynomials: 8. Function Spaces: 9. Approximate Quadrature.

This book is the first of a new series of expository texts on numerical mathematics, The International series on Numerical Mathematics, and it augurs well for the series that it should be initiated so competently. The price is high in relation to size but the quality of production is good and the content and presentation are excellent.

JAMES FULTON