

BOOK REVIEWS—COMPTES RENDUS CRITIQUES

Foundations of Mathematics. xii + 195 pages. Symposium papers commemorating the sixtieth birthday of Kurt Gödel, edited by J. J. Bulloff, T. C. Holyoke, and S. W. Hahn. Springer-Verlag, New York, 1969. U.S. \$9.75.

The title explains the reason for the book. It contains a tribute to Gödel, written in 1951 by John von Neumann, and a complete bibliography of Gödel's work. The contributions include: papers in set theory by R. M. Solovay, G. E. Sacks, G. Takeuti, and A. Lévy; a paper in constructive mathematics (in German) by E. Wette; papers by H. Rubin on the foundations of probability; by H. B. Curry on λ -conversion; by B. Meltzer on theorem proving by machines; by S. F. Barker on the philosophy of mathematics. The paper by Solovay, on the cardinality of sets of reals, would seem to be of particular interest.

PHILIP OLIN,
MCGILL UNIVERSITY

Fields and/or Particles, by D. K. Sen. x + 139 pages. Ryerson Press, Toronto; Academic Press, London, 1968. 50s.

This compact book brings together a wealth of information concerning many of the standard and nonstandard approaches to electrodynamics, general relativity, quantum theories of particles and fields and unified field theories. The author manages to make coherent this vast range of theories and speculations by means of a consistent viewpoint. The discussion is based on the role played by the fundamental concepts of fields and particles in dualistic and nondualistic theories. A dualistic theory supposes that the source of the field forms a separate entity apart from the field it generates. A theory is nondualistic if it is based on the concept of a pure field or if it uses only particles as fundamental constituents of matter. A theory is unified nondualistic if it unifies the concepts of fields and particles.

Part I presents a concise development of the well-known dualistic theories; electrodynamics, gravitation and the quantum theory of a particle. Parts II and III deal with nondualistic theories including, besides the standard development of renormalized quantum field theory, a wide range of nonstandard approaches to general relativity (including electrodynamics) and quantum theory. The essential features of Weyl manifolds in classical unified field theory, of Wheeler–Misner geometrodynamics, and of Heisenberg's nonlinear field theory are explained. And this is not by any means a complete list! This is an impressive work of scholarship which makes accessible a variety of significant approaches to the fundamental

problems of theoretical physics. It deserves to be widely read and should serve as a valuable source of research problems and of additional material for conventional courses in general relativity and quantum field theory.

J. E. TURNER,
MCGILL UNIVERSITY

Perspectives in Nonlinearity, by Melvyn S. Berger and Marion S. Berger. 189 pages. Benjamin, New York, 1968. Cloth U.S. \$12.50; Paper U.S. \$3.95.

The book centres around the degree of a mapping and critical point theory in a way directed to applications in differential equations. The careful introduction of the main concepts, through the finite dimensional case to infinite dimensions, makes this book an excellent starting point for students of the subject. The selected applications in both ordinary and elliptic differential equations are well suited to indicate the power of the theory and give the student a feeling for its use.

HALLDÓR I. ELÍASSON,
REYKJAVÍK, ICELAND

Exercices de Combinatoire avec Solutions: Tome 1, par A. Kaufmann et D. Coster. XII + 155 pages. Dunod, Paris, 1969. 29F.

The first part of Kaufmann's *Introduction à la Combinatoire en vue des applications*, which was reviewed in this Bulletin, (1) 12 (1969), p. 112, deals with the classical enumeration problems. The present volume contains the solutions to nearly all the exercises in this part of the book; the solutions of the exercises in the remainder of the book are reserved for later volumes. The solutions and explanations are sufficiently detailed to be useful, perhaps, in a course on combinatorics even if Kaufmann's book is not used as the text.

J. W. MOON,
UNIVERSITY OF ALBERTA

An Introduction to Mathematical Logic, by Gerson B. Robison. xii + 212 pages. Prentice-Hall, Englewood Cliffs, N.J., 1969.

The author states that this textbook is intended for use by mathematics students in their middle undergraduate years. There are twelve chapters. In the first three the student is introduced very gently to the propositional calculus ("Where do little axioms come from?"). Ch. IV through X introduce the first order predicate calculus (Ch. IX being devoted to "Techniques of Negation"). And Ch. XI and XII introduce the membership relation and Boolean algebras. In the reviewer's