occupying one-fourth of the 950 pages, is divided into four parts: (i) fundamental radiation biology; (ii) biology of ionizing radiations; (iii) biology of ultraviolet radiation; and (iv) photobiology. There are numerous textual references to the bibliography, but the usefulness of the volume as a reference work is limited by the absence of an index.

A comprehensive review of the gross and microscopic effects of radiation on each organ system is presented. This extensive pathophysiologic discussion is amply documented by carefully selected references to articles published in the English, French, and German languages.

For one author to attempt a review and critical summary of the extensive fields outlined above is indeed an ambitious project. Certainly the treatment of specialized subjects will not satisfy the expert in the field. The book's usefulness must therefore lie in its attempt to serve as an introduction to radiobiology and as a link between fields in radiobiology.

Surgeons and internists, not to mention radiotherapists, will pause at the sentence, "for the general public radiation therapy and treatment of cancer are almost synonymous." In the discussion of the radioactive iodine (I^{131}) therapy for hyperthyroidism, there are several errors, not the least of which are two errors in the formula to be used for calculation of the number of millicuries of radioactive iodine required to deliver a certain radiation dose to the thyroid.

In summary, this volume by a mature and forthright clinician and investigator may be useful to the experienced radiologist who wishes a survey, simply presented, of the field of radiobiology. It is not recommended for those uninitiated in the fundamentals of radiation physics or radiobiology, or both.

J. L. STEINFELD
National Institutes of Health

Parthenogenesis and Polyploidy in Mammalian Development. Cambridge Monographs in Experimental Biology No. 7. R. A. Beatty. Cambridge University Press, New York, 1957. xi + 132 pp. Illus. $3.

R. A. Beatty of the department of animal genetics of the University of Edinburgh has given us a very complete and critical account of parthenogenesis and heteroploidy in mammals. He is uniquely qualified for this task, for several reasons: together with M. Fischberg, now at Oxford, he has made a thorough investigation of spontaneous and induced heteroploidy in eggs and embryos of mice; in 1954 he published [*Intern. Rev. Cytol.* **3** (1954)] a lucid review under the title "How many chromosomes in mammalian somatic cells?", which summed up our knowledge of the real and, in some cases, spurious inconstancy of somatic chromosome numbers; last, but not least, he is probably the only mammalian cytologist who has had the enterprise to count his own chromosomes, in dividing cells of a hair follicle (I believe he found 48—or was it 46?).

The author places the primary emphasis on the "cytological variables" which furnish the known or surmised mechanisms of origin of the various observed or theoretically expected chromosome numbers. The principal variables are the suppression of the first or second meiotic division in the egg, or of the first cleavage mitosis, either with or without fertilization of the egg (amphimictic versus apomictic routes). In consideration of the various possible combinations of these variables, the material is classified in chapters 3, 4, and 5 under the headings "The eight apomictic routes in the major group," "The eight amphimictic routes in the major group," and "A minor group of routes of development." This treatment is logical but tends to make the organization of the material unnecessarily complicated, since the actual route which gave rise to some abnormal chromosome numbers is often not known with certainty. It might have been preferable to classify the various cases first according to chromosome number and then to subdivide these primary categories into secondary classes on the basis of the known or probable mode of origin.

A few omissions or inaccuracies should be mentioned. The paper by Ursula Jahn (1952) on colchicine-induced tetraploidy in *Rana esculenta* (which appears to be connected with gigantism, in contrast to all other observations on polyploid amphibia) is not mentioned; the study by A. A. Humphries (1956) on the occurrence of abnormal meiotic divisions in untreated coelomic or oviducal eggs of *Triturus viridescens*, which demonstrates the probable origins of spontaneous polyploids in this species, probably appeared too late to be considered. The term "poikiloploidy" mentioned on page 6 was first used by Levy (1920) to designate the occurrence of different abnormal chromosome numbers within the same embryo. The statement (page 9) that, "in amphibians, an *inverse* proportion exists between cell or nuclear volume and the number of chromosome sets" is obviously wrong, as is the assertion that the number of heterochromatic spots, important in determining the number of chromosome sets in tissues of some insects, has been used for the same purpose in amphibians by Fankhauser and Humphrey (1943); we used the number of nucleoli exclusively.

In chapter 6 Beatty discusses some general aspects of parthenogenesis and polyploidy in mammals. These include (i) the debated role of polyploidy in mammalian evolution; (ii) the question of whether polyploid mammalian fetuses are viable (so far no polyploid mouse embryos have ever been found after midterm); (iii) the question of whether spontaneously parthenogenetic mammals ever come to term and could be identified (which the author thinks highly improbable); (iv) some specific genetic aspects of parthenogenesis and polyploidy, such as gene dosage; (v) sex determination and fertility in polyploids; and (vi) their size and growth rate.

Beatty's book will be an important guide for all those who are interested in developmental genetics and the cytology of mammals and will stimulate many new experiments in this fascinating and relatively new field.

G. FANKHAUSER
Princeton University

The Fascination of Numbers. W. J. Reichmann. Essential Books, Fair Lawn, N.J., 1957. 176 pp. $4.

The theory of numbers is a many-sided mathematical theory, but first and foremost it is concerned with the properties of the integers 1, 2, 3, 4. . . . It is a fascinating theory; it has some problems which are so easy to formulate that an intelligent youngster in the eighth grade can fully understand them but so difficult to solve that the united effort of the greatest mathematicians of the last three centuries was unable to master them. The integers may have a singular attraction for an exceptionally gifted youngster and open his mind to science. Therefore, it is to be deplored that divisibility, prime numbers, and similar topics are almost completely neglected by our high schools (they are taught in the corresponding European schools). Under these circumstances a good popular book dealing with these topics would be highly welcome.

The present book deals with such topics, but, unfortunately, in my opinion, it does not fulfill the great promise of the subject matter. The sequence in which the topics are treated seems almost random. The difference between inductive evidence and strict proof is nowhere emphasized; both are often omitted without warning, but the worst of it is that neither is really neatly presented. Little previous knowledge is asked from the reader, and that is right; but there are a few pages, some right in the middle of the book, where the reader is sud-

denly supposed to understand logarithms or trigonometry or infinite series, or infinite continued fractions. There are a few incorrect assertions, some disconcerting typographical errors, and a few places where the author misapplies the simplest mathematical terms, such as *equation* or *identity*.

G. POLYA

Stanford University

Neutron Cross Sections. Donald J. Hughes. Pergamon, London and New York, 1957. x + 182 pp. Illus. $5.

Neutron Cross-Sections, by D. J. Hughes, is a monograph devoted to assisting people who do not have training in nuclear theory and who must use cross sections. As director of the neutron cross-sections compilation work at Brookhaven Laboratory, Hughes was in an excellent position to judge what terms caused nonphysicists the most trouble. The first chapter of the book is devoted to introducing the reader to the language of neutron physics by use of the terms in context; this monograph is not a dictionary.

The second chapter is devoted to the nomenclature employed by theoretical physicists in developing models to explain and correlate the experimental data. This chapter is a very nice demonstration of Hughes' ability as a writer to cover a complex subject concisely and simply.

In the last four chapters Hughes acquaints the reader with some of the details of specialized areas of neutron physics.

Those working in the fields of differential cross sections and inelastic scattering cross sections will probably regret that the author does not make a greater effort to clarify terminology in these areas.

A. WATTENBERG

Laboratory for Nuclear Science, Massachusetts Institute of Technology

Natural Magick. A volume in *The Collector's Series in Science.* John Baptista Porta. Derek J. Price, Ed. Basic Books, New York, 1957. ix + 419 pp. Illus. $7.50.

To penetrate the mystery of the rise of "modern science" in the 16th and 17th centuries, it is not enough to know something of Copernicus, Galileo, and the other giants. The republication of Porta's book (edition of 1658)—long a guarded treasure of the rare-book rooms of libraries—offers a pleasant and profitable tour through what the editor calls the "plain-lands" of early science, from which these giants sprang. This work is typical of a vast forgotten literature, best described in modern terminology as popular encyclopedias of the arts and sciences. Porta was no hack writer, however, but a competent, if not a profound, natural philosopher whose contributions to science were not insignificant. He was instrumental in founding the first modern "academy of science" (the Accademia Secretorum Naturae), and its proceedings are reflected in the present book.

The volume is attractively bound and boxed. The reproduction of the archaic type face of the original is a questionable advantage, but no great obstacle to the enjoyment of what may best serve as a sort of scientists's bedside book. According to his mood, the reader can sample the science and lore of magnetism before Gilbert or of optics before the telescope and microscope; or he can peruse relatively lucid accounts of the transmutation of metals or of the "new" fad in chemistry—distillation. In a lighter mood, he can discover how women were beautified in these centuries, or how secret communications were accomplished. Anyone interested in the history of science, or in history at all, can find profit and enjoyment in this book.

ROBERT MULTHAUF

Smithsonian Institution

Reptiles Round the World. A simplified natural history of the snakes, lizards, turtles, and crocodilians. Clifford H. Pope. Knopf, New York, 1957. xv + 204 pp. Illus. $3.50.

The author, well-known for previous herpetological works, both technical and semipopular, has prepared this new book with the younger generation in mind—the boys and girls whose interest in nature is beginning to be centered on a particular branch of natural history.

The professional scientist always faces a serious task in undertaking a book of this kind. Almost never is there a question of knowledge of the subject; the problem is one of presenting the subject in abbreviated and simplified form, yet in so well-balanced and attractive a manner as to encourage the young reader into expanding his field observations and studies. In this respect Pope has succeeded admirably. The book is interesting and instructive, and the facts regarding the several groups of reptiles are presented in the orderly manner so necessary for supplying the young reader with a basic understanding of the extent of the several groups and the subdivisions within them. Technical terms are largely avoided, as are the restrictions of taxonomy, since discussions are seldom carried below the generic level.

The subject is treated from two major viewpoints: first, there are chapters on the different features of reptile life, such as locomotion, food, reproduction, size, growth, enemies, and habits; these are followed by a survey of the distribution, by continents, of each major group. The discussions are illustrated by many attractive sketches by Helen Damrosch Tee-Van.

This book can be recommended as a foundation upon which the budding herpetologist can build his further studies. Among other sound advice, it even contains a word of caution to the youngster of exhibitionist tendencies who aspires to make a career of handling snakes before shocked but fascinated audiences (mostly female). The museums and zoos requiring herpetological curators are too few to supply a livelihood for more than a fraction of these aspirants; besides which, the duties of herpetological curators almost never involve such spectacular but nonscientific exploits.

LAURENCE M. KLAUBER

San Diego Museum of Natural History, San Diego, California

New Books

The Frogfishes of the Family Antennariidae. No. 3383, Proceedings of the U.S. National Museum, vol. 107. Leonard P. Schultz. Smithsonian Institution, Washington, D.C., 1957. 58 pp.

Discovery. No. 2, 1957. University of Melbourne. Melbourne University Press, Carlton, N.3, Victoria, 1957. 96 pp. 2s. 6d.

International Sanitary Regulations. Adopted by the Fourth World Health Assembly in 1951 and amended by the eighth and nine assemblies in 1955 and 1956. Annotated edition. World Health Organization, Geneva, 1957 (order from Columbia University Press, New York). 127 pp. $1.

Four Basic Aspects of Preventive Psychiatry. Report of the First Institute on Preventive Psychiatry held at the State University of Iowa, 3 Apr. 1957. Ralph H. Ojemann, Ed. State University of Iowa, Iowa City, 1957. 122 pp. $2.

The Biology and Systematics of the Pinfish, Lagodon Rhomboides (Linnaeus). Bulletin of the Florida State Museum, Biological Science, vol. 2, No. 6. David K. Caldwell. University of Florida, Gainesville, 1957. 98 pp. $1.25.

Handbuch der Physik. vol. XVI, *Electric Fields and Waves.* S. Flügge, Ed. Springer, Berlin, 1958. 760 pp. DM. 158.

Metabolism of the Nervous System. Derek Richter. Pergamon Press, New York and London, 1957. 613 pp. $16.

Queues, Inventories and Maintenance. The analysis of operational systems with variable demand and supply. Philip M. Morse. Wiley, New York; Chapman and Hall, London, 1958. 211 pp. $6.50.