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.

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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.

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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-