many passages. Illustrations include 25 pictures of Merriam and persons or places associated with him. The bibliography of primary and secondary sources is extensive. Unfortunately, there is no index. The text is reproduced from typescript of uneven quality. Misprints are fairly numerous, but most are flagged in a list of 56 errata pasted in the back.

CLAUDE ALBRITTON
Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas

Cytogenetics of Malignancy

Chromosomes and Cancer. JAMES GERMAN, Ed. Wiley, New York, 1974. xxviii, 756 pp., illus. $35. Chromosomes Series, vol. 1. A Wiley Biomedical-Health Publication.

This volume is the first in a proposed series on chromosomes and related topics. It is appropriate that the initial subject is the chromosomal basis of cancer, since the relationship of these topics has been the subject of speculation from the time of Boveri. (It is also true that the intrinsic interest in cancer has recently been augmented by the glitter of federal gold.)

It is probable that the high expectations engendered by this combination of topics could never be met by any book. The multifarious nature of cancer, with its plethora of questions and dearth of answers, has necessitated multiple authorship. While the list of authors is most impressive, their very multiplicity exaggerated the problems of organization and coordination. Although the editor's words give evidence of the effort he has made to solve these problems, as well as to achieve comprehensibility for the nonspecialist, it is this reviewer's opinion that these goals have only partially been met.

It should first be noted that there is no introductory chapter covering chromosomes and their structure in general terms, despite the professed concern for the nonspecialist. In particular, no review of chromosome nomenclature or chromosome banding is included. It is likely that much of the planning for this book was undertaken before the current techniques of chromosome banding were developed. In many chapters, the latest citations are from 1972. Since chromosome banding did not attain widespread application until 1971, significantly less than half of the current information from this technique has been covered by many of the contributors.

The rapidity with which new developments occur in cytogenetics shortens the lifetime of some arguments. Ohno's chapter, for example, explores the possibility that malignancy is a recessive condition. Under this scheme, mutation leading to malignancy would be more likely to develop in an aneuploid cell that is monosomic for part of a chromosome and hence possibly hemizygous for some critical loci. At the time the chapter was written, the Philadelphia chromosome was thought to be a deletion, and its association with chronic myelogenous leukemia is cited as support for Ohno's thesis. Unfortunately for the thesis, the Philadelphia chromosome is now believed to be part of a reciprocal translocation and is *not* evidence for hemizygosity. No footnote to acknowledge this new information is included in Ohno's chapter, although the information appears in several other chapters. Such unevenness in information flow is found repeatedly in the book.

Several of the sections of the book are sufficiently basic in approach and broad in subject matter to remain valuable despite the passage of time. Comings's chapter "What is a chromosome break?" and Evans's chapter on ionizing radiation are particularly excellent. Their lucid explanation of basic concepts and their copious diagrams are worth special mention.

Other sections are of value for their synthesis of published information or their summarization of their authors' research or both. About one-third of the book has these virtues and may well provide the principal justification for reading or purchasing the book. The clinical cytogeneticist, hematologist, and oncologist will find the information useful for interpreting the cytogenetic phenomena encountered in their patients.

The interface between two such explosively developing fields ought to be an area of intellectual ferment. Only two chapters conveyed such an atmosphere to me. O. J. Miller's review of cell hybridization in the analysis of the malignant process is thorough and beautifully written. Miller effectively transmits his conviction that this tool will be a major source of new understanding of malignancy. Bloom and his co-authors are equally successful in their presentation on the development of established human lymphocyte cell lines and their cytogenetic characterization. No cancer researcher can afford to omit these writings from his readling list.

The excellence of the sections by Miller and Bloom points out how much the reader benefits from contributions preparing him for future developments. It is always easier to judge the importance of topics in retrospect, but there are some omissions that it seems to me should have been obvious. One of the themes pervading this book is the probable importance of aneuploidy as a determinant of, at least, tumor phenotype. This is essentially a problem in gene dosage, about which much could have been written. Testing for gene dosage in aneuploid states in turn requires a knowledge of the chromosomal location of specific loci. There was more than enough information available several years ago to warrant giving this subject significant space.

In summary, this book will provide a good review of the facts known prior to 1973 but will not alert the reader to the areas that are exciting in 1975.

My last comment is directed to the publisher. The book is printed on heavy, glossy paper that should withstand many years of usage. The binding, however, significantly deteriorated during the first reading.

PARK S. GERALD
Children's Hospital Medical Center, Boston, Massachusetts

Models of Memory

Human Memory. Theory and Data. BENNET B. MURDOCK, JR. Erlbaum, Potomac, Md., 1974 (distributor, Halsted [Wiley], New York). xii, 362 pp., illus. $12.95. Experimental Psychology Series.

Over the last 15 years work on human memory has undergone two changes of paradigm. About 1960 the stranglehold of interference theory was broken, to be replaced mainly by information-processing approaches. Yet it was soon discovered that apparently simple critical experiments in the new paradigm were in fact very complex, and the number of plausible models escalated. This metaproblem has led more recently to some widening of the empiricist methodology typical of experimental psychology: the use of a broader relation between theory and data and of ideas derived from linguistics, artificial intelligence, phenomenology, and neuropsychology.

Whether these new methods will be more fruitful is not yet clear, but at present they represent the more exciting parts of the field. Murdock's book, however, stands very squarely within the paradigm of the 1960's. The experimental situations and narrow quantitative models considered stem directly from the work on human memory of that time. The organization of the book makes this clear with four pairs of chapters comparing theories and data on item information, associations, serial order, and free recall, the first two pairs being primarily concerned with recognition memory and paired associates. Only in a final chapter does Murdock move