Gourhan's rubrics and otherwise exposes the superficial objectivity of the former work. But this is not the principal aim of Grand's book. Unfortunately, it pretends to survey the field of Paleolithic art while the text is subordinated to pictures to an extent which takes it out of the class of the two books reviewed above. The reasonableness and nuance of Grand's critical discussion surpass by far the superficiality of the rest of the text and make one wish Grand would publish on a more professional level. As it stands, her *Prehistoric Art* is an addition not to the library of scholarship but to that of gift picture books.

MORTON H. LEVINE
Department of Anthropology, Brooklyn College of the City University of New York, New York City

Single-Cell Technique

The Radiobiology of Cultured Mammalian Cells. MORTIMER M. ELKIND and GORDON F. WHITMORE. Prepared under the direction of the American Institute of Biological Sciences for the U.S. Atomic Energy Commission. Gordon and Breach, New York, 1967. xvi + 615 pp., illus. $13.50; to libraries, $32.

A few years ago a distinguished high-energy physicist had the opportunity to attend a major international meeting in radiation research. It seemed to him that radiobiology was in a state of confusion and that extracting order from the chaos would indeed be a difficult task. This attitude on the part of scientists from other disciplines is understandable. Radiobiology has been bedeviled by a plethora of only partly related facts, and many such facts are still accumulating. Unifying concepts and general models have been disappointingly few. One reason for this has been the difficulty of understanding radiation effects in whole animals. Systems more appropriate for quantitative study, single-cell organisms of a wide variety of types, have seemed not to satisfy the need for data that can be applied to man.

This situation has undergone a significant change in the past decade, a major factor being the development by Puck and Marcus of a quantitative technique with single mammalian cells in culture, paralleling techniques in use with microorganisms. The enthusiastic acceptance of these techniques and their further development have been of importance in biology generally, and of paramount importance in radiobiology. A fundamental link now exists between studies in single cells and studies in intact mammals. Although, as Elkind and Whitmore fully recognize, single-cell studies cannot tell the whole story for the complex mammal, understanding of the performance of cells in compartments in vivo and of their importance to the survival of the whole organism has received great impetus because of studies in single cells.

This important subject has, however, lacked an authoritative text. This book, written by two men who have themselves contributed much to the development of the field, should fill this need.

The book contains chapters on survival-curve theory, in vitro and in vivo survival curves, the influence of chemical and physical factors on survival, recovery from radiation damage, effects on division and growth, chromosome damage, and biochemical effects. A useful appendix and a much-needed glossary are also included. After laying a background in survival-curve theory, the authors discuss cell culture experiments critically and in considerable detail. The coverage of the literature is excellent for the most part, and most of the important techniques and procedures and the results obtained with them are described *in extenso*. Considering the rapidity with which this field is moving and the time required for publication, the book is well up to date in most of its chapters. Careful attention has been paid to the definition of terms, and some of these, such as "recovery" and "repair," have been clarified.

Considerable emphasis is placed on the importance of synchrony techniques, the development of which has contributed so much to our present understanding of the kinetics of irradiated populations, and on the effect of variations in age on response to irradiation. The authors predict (correctly, in my opinion) that synchrony techniques will have an even larger part to play in the future.

The material is presented in such detail that its contents will be appreciated most by the serious student and the specialist. However, there is much important material here for anyone concerned with the quantitative aspects of radiobiology. Although the chapter on survival-curve theory, for example, will not be easily understood by biologists lacking a physical background, and the authors suggest that it can be omitted by some readers, it is to be hoped that just those readers will study it carefully. It contains important principles that should be appreciated by more workers in this field.

The book has a logical beginning but, like radiobiology itself, no definable end. Its contents should serve to interest and guide others who may provide future contributions to our understanding in this field.

W. K. SINCLAIR
Division of Biological and Medical Research, Argonne National Laboratory, Argonne, Illinois

Parasites

Plant Nematology. W. R. JENKINS and D. P. TAYLOR. Reinhold, New York, 1967. xviii + 270 pp., illus. $12.50.

The authors designed this brief text primarily for general courses in plant nematology but also with an eye toward "plant pathologists, soil microbiologists, county agents, extension specialists and others concerned with plant production." Rather an ambitious goal.

An introductory text in nematology should, above all, interest the reader by placing the specialized subject in a frame of reference to the rest of soil and plant biology. It should also provide him with some tools and information he can use. On these criteria, the book falls short of being a satisfactory introductory text. The largest part of the text (62 percent) is an encyclopedia of important parasitic genera. By page count, the introduction and section on morphology comprise 16 percent, control takes 10 percent, and the chapter on damage to plants is a scant 6 percent. Illustrations are prominent, consisting of photographs of symptoms and bold, stylized diagrams of diagnostic features of each genus.

The discussion of the zoological position of nematodes is weak, there is no comprehensive treatment of nematode ecology or of the ecology of disease, and there is very little nematode physiology. The role of nematodes in the general biology of the soil is poorly presented. The text does not treat the larger aspects of the subject.

Another limitation is the lack of discussion of techniques. From this book the neophyte will gain no information on methods of collecting and handling nematodes, of preservation,