The introductory chapters of this book present a valuable picture of Griffin the man and the archeologist and are significant contributions to our understanding of the development of archeology as a discipline. The first chapter, "James Bennett Griffin: Appreciation and reminiscences," is written by George Quimby, who was a student of Griffin's at Michigan in the '30's, and Charles Cleland, a student there in the early '60's. The second chapter, "James Bennett Griffin, archaeologist," is written by Volney Jones, who was Griffin's colleague at the Museum of Anthropology for most of his tenure. In these chapters are significant discussions of Griffin's graduate school days at the University of Chicago and his transfer to the University of Michigan. From them one gains an insight into the ways in which archeology was developing in the 1930's. Quimby utilizes excerpts of correspondence to illustrate the kinds of research problems that were of concern as well as the sort of joking relationship that existed between Griffin and his colleagues.

The postwar era is discussed by Cleland. Of particular significance is his insight into Griffin's sponsorship of field research in Michigan under the auspices of the National Science Foundation. Many archeologists were trained in these projects. Among them was Lewis Binford, who has presented a controversial commentary on this period in his book *An Archaeological Perspective* (Seminar Press, 1972). Cleland's comments place the perspective in perspective.

The remainder of the book is divided into five sections: Considerations of Variability in the Archaeological Record; Patterns of Culture History; Patterns of Mesoamerican Urbanism; Biotic Considerations in Prehistoric Adaptation; and Ethnohistory, Historic Archaeology, and Ethnicity. The papers in these sections are written by former students and former and present colleagues of Griffin's.

The papers vary in content and quality. The variation in content is characteristic of Griffin. Many persons have thought of Griffin as a pottery expert with a fine mind for ceramic detail. His interests have been broader than that, however, and, although he perhaps did not get directly involved in the research, he stimulated, encouraged, and got money for others to pursue avenues of significant investigation. Examples of the results are Albert Spaulding's "Multifactor analysis of association: An application to Owasco ceramics," Jeffrey Parsons's "The role of Chinampa agriculture in the food supply of Aztec Tenochtitlan," and Carol Mason's "Historic identification and Lake Winnebago focus Oneota."

One thing is lacking in most of the papers, except for the introductory ones, and that is a clear depiction of the relationship and contribution of Griffin to the writer and to the subject being discussed. A notable exception is Richard MacNeish's contribution, "The *in situ* Iroquois revisited and rethought." This chapter outlines very clearly the relationship of Griffin and MacNeish and how the Iroquois project originated and was carried out. MacNeish goes on to update his research on the development of the Iroquois, outlining the influence the research, stimulated by Griffin and carried out by MacNeish, has had on more recent studies of the Iroquois.

Most of the papers in this volume can best be evaluated by experts in the varied specialties they represent. They will be read and reread as contributions to their fields. The papers by Quimby and Cleland, Jones, and MacNeish will be read and reread for the insights they offer into the history and evolution of archeology and particularly the nature of James B. Griffin's contribution to that discipline.

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Spermatozoa

The Biology of the Sperm Cell. B. BACCETTI and B. A. AFZELIUS. Karger, Basel, 1976. vi, 254 pp., illus. Paper, $51.50. Monographs in Developmental Biology, vol. 10.

The spermatozoon is a cell highly specialized for the transmission of paternal genes to the next generation, and all spermatozoa have species-specific structural and biochemical properties. During the past three decades countless review articles and books dealing with spermatozoa have been published, but from them readers could obtain only fragmentary information. The authors of this book have made an extensive survey of the literature and summarize current knowledge concerning the structure of the spermatozoon in relation to its function and its phylogeny, the fine structure of the spermatozoon and its components, their biochemical composition and behavior, and the changes spermatozoa undergo in the fertilization process. To make such a survey throughout the animal kingdom is a formidable task, and the authors have accomplished it successfully. Furthermore, they have unified the information in terms of basic principles as no collection of papers by many authors could have done.

The book provides many interesting facts about spermatozoa. The reader will learn what a beautiful and astonishing cell the spermatozoon is. Among the many questions raised by the authors are: Why are so many spermatozoa necessary to fertilize one egg? How did internal fertilization evolve? Does chemotaxis of spermatozoa play an important role in animal fertilization? Why are mouse spermatozoa far bigger than whale spermatozoa? What determines the size and shape of spermatozoa? What is the fate of sperm mitochondrial DNA incorporated into the egg and what is its function? Can X- and Y-bearing spermatozoa be separated in order to control the sex of offspring? It is interesting and informative to read the authors' views regarding such questions and their discussion of the problems.

The list of animal species (from Protozoa to man) in which the fine structure of spermatozoa has been examined by electron microscopy and the list of more than 1500 references will be useful to those searching for details this book could not cover. The book will be of interest to students of human and veterinary reproductive biology, embryology, zoology, biochemistry, and cell biology in general. Its only weak point is its high price.

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Marine and Freshwater Fungi

Recent Advances in Aquatic Mycology. E. B. GARETH JONES, Ed. Halsted (Wiley), New York, 1976. xii, 750 pp., illus. $49.50.

This book is an eclectic assortment of papers covering many fields in addition to ecology and identifying and addressing a wide array of questions. That on every hand the reader runs into unanswered ones is a reflection of the unsettled state of the field, beginning with its boundaries. J. J. Kohlmeyer, an important contributor to the field, has stated that an organism, to be considered marine, must be proven to develop and reproduce in a marine habitat. S. Y. Newell, who writes here on the fungi on mangrove seedlings, rejects this view. Is the definition of aquatic fungus given by

C. T. Ingold in the book more acceptable in including all fungi "normally submerged in large volumes of free water such as streams and rivers, ponds and lakes"? Another type of definitional problem relates to the large part *Thraustochytrium* plays in the literature on aquatic fungi (in this book it has more entries in the index than any other organism except *Saprolegnia*) despite the considerable evidence that it is not a fungus at all (see F. O. Perkins's chapter, "Fine structure of lower marine and estuarine fungi").

Among the interesting subjects dealt with in the book are distribution patterns (in "Lignicolous and algicolous fungi" by E. B. Gareth Jones, "Yeasts in oceanic regions" by J. W. Fell, "The ecology of marine lower fungi" by G. B. Bremer, "Fungi in sewage" by W. B. Cooke, and "The ecology of aquatic phycomycetes" by M. W. Dick), succession (especially in Newell's paper), and models to explain the distribution of aquatic fungi (see the paper by Dick). An especially interesting but preliminary report on Hyphomycetes as a source of food—and energy—in streams is presented by F. Bärlocher and B. Kendrick. The systematics and evolution of certain groups of aquatic fungi are reviewed authoritatively, but briefly, by F. K. Sparrow, T. W. Johnson, Jr., and R. W. Lichtwardt. Except for F. Gleason's paper on lower freshwater fungi, physiology is covered superficially and without the drawing together of concepts from which future work will evolve. In addition, there are papers on the degradation of oil and effects of DDT in aquatic systems, cytochemistry, morphology, diseases and immune responses to them, and freshwater *Actinomyces*. There is even a list of films on aquatic fungi.

While the broad and often critical coverage of the field makes perusal of it worthwhile, the book is marred by redundancies, for example, in the discussions of fungal parasites of algae, the nutrition of lower fungi, and ultrastructure. Moreover, the reproduction of illustrations in the chapters on ultrastructure, and elsewhere, is substandard. The cost of the book is increased by the inclusion in several chapters of space-consuming lists of fungi, much of the information in which could have been presented in the text, and it is not clear to me why a few of the chapters, such as that on *Actinomyces*, belong in the book at all.

Some of the difficulties with the book are attributable to the lack of circumscription of disciplines that characterizes developing fields. Another difficulty is the lack of reliable quantitative and analytical techniques in the field. Nevertheless, the excitement and potential of research on aquatic fungi are communicated in this book, along with much information.

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