Book Reviews

A Mesoamerican Site

Fábrica San José and Middle Formative Society in the Valley of Oaxaca. ROBERT D. DRENNAN. University of Michigan Museum of Anthropology, Ann Arbor, 1976. xii, 292 pp., illus. Paper, $8. Memoirs of the Museum of Anthropology, No. 8. Prehistory and Human Ecology of the Valley of Oaxaca, vol. 4.

During the past ten years, Kent Flannery of the University of Michigan and his associates have conducted a well-conceived survey of the prehistory and human ecology of the Valley of Oaxaca, homeland of the civilized Zapotec people of southern Mexico. The excavations described in this volume were carried out by Robert Drennan as part of this project, at a site called Fábrica San José, a settlement of the Middle Formative period (850 to 450 B.C.) located on a tributary stream of the Río Atoyac, about 4½ kilometers northwest of the larger and more ancient site of San José Mogote.

In several important respects Drennan's analysis differs from most past reports on Mesoamerican excavations. For instance, he has taken as his unit of analysis not the more traditional stratigraphic layer uncovered in a narrow trench, but what Marc Winter has called the "household cluster": groups of archeological features which seem to represent the living and working area of a single household. While this may seem old hat to a generation of new archeologists who have been doing exactly the same thing in North America north of the Río Grande, it is a relatively new approach in Mesoamerica, especially in Formative village remains. Studied in this way, the remains yield insights on Formative society lacking in more old-fashioned site reports.

Another innovation in this volume is Drennan's approach to seriation. The standard method of deriving chronology from potsherds has been to construct "battleship curves" based upon percentages of types or wares as they change through time. In recent years, more mathematically sophisticated archeologists have applied computer programs to the ordering of matrices of similarity scores, so that the highest values fall near the diagonal—this is the so-called Brainerd-Robinson technique. According to Drennan, a chronology based upon "battleship curves" is subjective and there are several objections to the Brainerd-Robinson technique, including the possibility that dissimilarities may represent something other than just variation through time, such as class, wealth, or climate.

Using 22 "proveniences" in a pilot study, Drennan was able to arrange his potsherds (classified into "wares") into a convincing chronology, by means of a combination of multidimensional and nonmetric scaling; he thus avoided the assumptions built into the Brainerd-Robinson method. Flannery, in his introduction, favorably compares the six months it took Drennan to carry out this analysis with the six years that a colleague has taken to do the same with *his* ceramics using more standard methods. While I have not counted up all the potsherds from Fábrica San José, six months does seem like a very long time to work out a ceramic chronology for a modest-sized collection, considering that a machine for high-speed computation was involved. I suspect that until more convincing evidence is presented for the time-saving abilities of computer-based seriation, the rest of us are going to continue to float in our subjective "battleships."

Having established his chronology, Drennan was in a position to describe the community for each of the three Middle Formative phases represented at Fábrica San José; he applied the chi-square test to determine whether the distributions of certain artifacts among the household clusters can be attributed to factors other than chance. The community was always small: over a period of four centuries it grew from three to 10 or 11 households, thus never rising above the level of a large hamlet. The cultural poverty of the offerings placed with sub-floor burials calls to mind the Middle Formative hamlets and villages excavated many years ago by the late George Vaillant in the Valley of Mexico—the other end of the wealth spectrum from some of the coeval Olmec centers such as La Venta and Chalcatzingo.

In an interesting appendix, Richard I. Ford describes carbonized plant remains. The inhabitants of Fábrica San José relied heavily on a dyad (no pun intended) of maize and avocados rather than on the supposedly more typical triad of maize, beans, and squash. The avocado, whether cultivated or not, has been generally overlooked as a staple item in Mesoamerican diets, yet it is very early and important in the Tehuacan valley of Puebla and is represented by casts in Early Formative debris at Salinas La Blanca on the Pacific coast of Guatemala.

I must lodge a small complaint about the quality of book production. While the cost of high-quality typesetting and printing is very high in archeology and it would be difficult for a small institution or museum to maintain the lavish standards once set in this field by the Carnegie Institution of Washington, the drab appearance of the text and halftones, as well as the amateurish line drawings, detracts from the worth of this volume. Nevertheless, this is a fine and innovating report which will be most valuable to other Mesoamericanists for the analytical methodology employed.

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Contributions to Archeology

Cultural Change and Continuity. Essays in Honor of James Bennett Griffin. CHARLES E. CLELAND, Academic Press, New York, 1976. lxxviii, 378 pp., illus. $24.50.

James Bennett Griffin has been one of the most influential figures in the study of the prehistory of eastern North America. His career covers most of the era of the growth of that field of study as it expanded and became professionalized, that is, from the late 1920's to the present day. Last year he retired from academic and administrative responsibilities at the University of Michigan. The volume under review is one of two being published in commemoration of his contributions. (The other, entitled "Papers for the Director," is issued by the University of Michigan Museum as part of its series *Anthropological Papers*.)

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