

Series Editors' Foreword

Paleoethnobotany refers to the analysis and interpretation of archeobotanical remains to elucidate the interaction between human populations and plants. The papers assembled here by Christine Hastorf and Virginia Popper were originally presented at a special symposium on the occasion of the 1985 meetings of the Society for American Archaeology. In the interim, this nucleus of manuscripts has been transformed into a coherent whole, the chapters of which complement each other well, share a common theme, yet avoid redundancy. The resulting effort is a state-of-the-art volume about analytical methods and the cultural interpretations of archeological plant remains.

General works on archeobotanical research go back to Geoffrey Dimbleby's 1967 *Plants and Archeology* and Jane Renfrew's 1973 *Paleoethnobotany*, but flotation techniques have yielded vast samples for innumerable sites during the last fifteen years. As a result, the study of what have euphemistically been called macrobotanical remains has moved from qualitative or semiquantitative lists of species, into a truly quantitative realm where statistical concerns can be seriously discussed, and where far more detailed matters of interpretation can finally be raised. This is a particularly active research frontier, represented in Britain by Renfrew and Robin Dennell, and in the Netherlands by Willem Van Zeist. The contributors to this volume represent another strong group, of United States scholars, who have primarily been engaged in research in the Midwest, the Southwest, as well as Latin

America. Richard Ford, in 1985, assembled a volume entitled *Prehistoric Food Production in North America*,* that marked a quantum jump in our understanding of food-gathering and agricultural activities in different American regions and time ranges. *Current Paleoethnobotany* complements Ford's monograph by focusing on methodologies and problems of interpretation.

The introduction, by the volume editors, reviews the subfield and discusses the role of cultural and noncultural patterning of archeobotanical data, and the attendant questions of accumulation and preservation. The various contributions are then discussed according to the primary thematic concerns of the book: sample collecting and processing, classification of the materials, quantification and statistical manipulating of the results, and interpretation of their significance. Gail Wagner's chapter (chap. 2) is directed to the problems of comparability of results generated by different recovery techniques—dry or water screening, hand or machine-operated flotation. In chapter 3, Mollie Toll addresses this issue with specific flotation results from southwestern sites, to argue that excavation resources should not be exclusively expended on the most productive sites. Low-frequency or negative data from a broad regional cross-section of sites, many of them eroded or structureless, help identify levels of uncertainty and also illuminate the horizontal variability essential to understanding a regional site complex.

Popper's specific paper (chap. 4) turns to measures that illustrate cultural and noncultural patterning, namely the different insights provided by absolute counts, "ubiquity" (presence analyses), ranking techniques, and diversity indices. Each method yields different insights, and its suitability varies according to the nature of the sample. There is then no ideal technique; the research question itself determines the most appropriate measures. The matter of ubiquity is explored in greater detail in chapter 5, by Naomi Miller, who evaluates different types of ratios, based on proportions, percentages, or densities, as means to effectively characterize an archeobotanical assemblage. David Asch and Nancy Sidell (chap. 6) show how botanical, faunal, and geochemical criteria can (and should) complement the use of diagnostic lithics in establishing site microstratigraphies.

The range of problems encountered within a single Peruvian cave site and its external slope is explored in chapter 7, by Deborah Pearsall. Plant matter was introduced as food, fuel, camelid dung, or matting; most was charred in cooking fires, and much was eventually cleared out onto the

*University of Michigan, Museum of Anthropology, Anthropological Paper no. 75.

slope. Although there was less difference in micropatterning across the site than there was change through time (related to varying intensity of site use), Pearsall's analyses allow useful inferences as to microactivities. Hastorf (chap. 8) follows up these questions in a Peruvian regional study, including a larger number of sites; she applies ethnographic evidence on plant production, processing, and consumption to the botanical results, to explore how well specific economic activities can be inferred from macrobotanical remains. Stable carbon isotope ratios on human bone, in comparison with isotopic values for available foods, suggest a need for an alternative statistical organization of plant results.

Chapter 9, by Sissel Johannessen, covers a large range of botanical data from some eighty sites that span 4,000 years in the American Bottom of Illinois. This is one of the most impressive quantitative studies yet provided for subsistence change over time. During the Early and Middle Woodland periods, starchy seeds replaced nuts as major plant foods, while maize, long present in minor quantities, became the major staple during the Woodland-Mississippian transition (a span of about 200 calibrated radiocarbon years). Settlement had switched from floodplain to upland sites during the Middle Woodland but, not long after the maize "revolution," began to concentrate once again on the more fertile floodplain soils. It is an unusually strong, standardized data base emerging from a comprehensive research plan. The results provide remarkably good information on how this important agricultural transition took place.

The final substantive chapter, by Tristine Smart and Ellen Hoffman (chap. 10), deals with charcoal of woody taxa as a source of information on local vegetation. The discussion ranges from wood uses, natural means of introduction, burning and preservation, recovery techniques, sampling and identification, to presentation methods that elucidate plant diversity, habitats, probable locations, and vegetation change over time.

The volume is concluded by three evaluations offering very different perspectives (chaps. 11-13). The first, by Joseph Kadane, a statistician, raises some thoughtful questions about ubiquity measures and ratios that suggest that paleobotanical data have become sufficiently rich and diversified to allow serious statistical manipulation. The second is by Richard Ford, one of the most influential proponents of paleoethnobotany. His thoughtful comments sketch a conceptual overview that pulls together ideas, suggests stimulating new points, and notes issues that require more attention, as for example, the geochemical and other processes that control preservation. The third evaluation is by an archeologist, William Marquart, who draws more specific attention to the linkages between paleoethnobotany and archeology,

in terms of problem formulation, research design, and comprehensive interpretation.

Hastorf and Popper's volume exemplifies the wealth of information and unexpected insights that botanical studies can provide. But although some projects have had the foresight to emphasize such work, the majority of well-funded excavations include research by archeobotanists, zooarcheologists, and geoarcheologists as no more than adjunct components, insofar as they incorporate them at all.

Current Paleoethnobotany fills a yawning void in the literature. There is no single source where students or professional archeologists can find such a comprehensive overview of sampling, collection methods, analysis, and interpretation. The materials are presented with adequate explanations and good examples or illustrations, that can serve the nonspecialist well. But the book is far more than a compendium of tried and true methods. It both challenges and stimulates the reader by constantly questioning traditional assumptions.

Among earlier volumes of the Prehistoric Archeology and Ecology series, Anna Behrensmeyer and Andrew Hill provided a timely overview of taphonomy with their *Fossils in the Making*, and Richard Klein and Kathryn Cruz-Urbe contributed a solid framework for zooarcheological research with *The Analysis of Animal Bones from Archeological Sites*. We believe that Christine Hastorf and Virginia Popper's *Current Paleoethnobotany* represents another such volume of major methodological and theoretical significance for a rapidly developing subfield of archeology.

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