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Review of *Principles of Geoarchaeology: A North American Perspective* by Michael R. Waters

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Principles of Geoarchaeology: A North American Perspective. Michael R. Waters. Tucson: University of Arizona Press, 1997. xxiv+398 pp. Figures, tables, references, index. \$41.00 cloth (ISBN 0-81650-989-1), \$24.95 paper (ISBN 0-8165-1770-3).

First published in 1992, this book—now in paper—presents the fundamentals of geoarchaeology, the field of study that applies the concepts and methods of the geosciences to archaeological research. Although a number of good books have been written about this subdiscipline of archaeology, Waters restricts his review to late Quaternary landscapes in North America. Furthermore, he limits his discussion to the field aspects of geoarchaeology. Stratigraphy, site formation processes, and landscape reconstruction are the centerpieces of this study. Readers looking for information about laboratory methods, dating techniques, or the application of geophysics and geochemistry to archaeology must go to other sources. Waters's topical, temporal, and geographical focus is, nonetheless, effective, allowing for detailed discussions of geoarchaeological concepts and field methods that are directly applicable to archaeological research in North America. A broader scope would have diluted his effort.

Waters commences with an overview of geoarchaeology and its major research objectives. The next chapter presents concepts of sedimentology, pedology, stratigraphy, geomorphology, and geochronology relevant to archaeology, laying the foundation for succeeding chapters. This is followed by the heart of the book: four chapters describing the geologic settings of archaeological deposits, including alluvial, lacustrine, glacial, rockshelter, spring, and coastal environments. The author begins each of these with descriptions of the geomorphic processes, landforms, and sediment assemblages associated with the different environments, an approach that sets the stage for such geoarchaeological considerations as site formation processes, the effects of landscape evolution on archaeological deposits, and the relationships between prehistoric people and the landscape. The next chapter focuses on geological and biological processes that modify and sometimes

destroy buried archaeological deposits. These range from catastrophic deformation of soils and sediments by earthquakes to subtle soil mixing by freeze-thaw cycles (cryoturbation) and the burrowing activity of animals (faunalturbation). The final chapter presents a brief review of geoarchaeological methodologies and stresses the need for incorporating geoarchaeological investigations into every stage of an archaeological project.

Geoscientists involved in archaeological studies will find this book useful, though it is aimed primarily at an archaeological audience. Basic geological concepts are reviewed at the beginning of each section; discussions and examples of their applications to archaeology then follow. Geological jargon is kept to a minimum, and the text is supported by numerous diagrams. Hence, prior knowledge of geology is not required to understand the concepts Waters presents. The book is especially well suited for undergraduate and graduate courses in geoarchaeology and environmental archaeology.

For readers wanting a comprehensive account of geoarchaeological research in the Great Plains, *Principles of Geoarchaeology* will be a disappointment. While the Plains are not ignored, Waters draws heavily from his extensive research experience in the western United States, especially California and Arizona. He also uses many examples from the Upper Midwest. He should not be faulted for limiting the geographic scope of his review, however. With a few exceptions, published results of state-of-the-art geoarchaeological research in the Plains post-date 1991, the year this book was completed. Despite this limitation, nearly all of the environmental settings discussed by Waters exist in the Plains. Indeed, the concepts he presents are still applicable to Plains archaeology. In sum, *Principles of Geoarchaeology* should be read by anyone conducting archaeological research in the Great Plains or elsewhere in North America. **Rolfe D. Mandel**, *Department of Geography, University of Kansas*.