

# Formation Processes Of The Archaeological Record

Since the early 1960s archaeologists have realised the importance of understanding the effects of natural site formation processes on archaeological sites and material. Of the many processes that exist, this study looks at sedimentation with regard to lake margins and its impact on the archaeological record.

This volume brings together contributions from an experienced group of archaeologists and geologists whose common objective is to present thorough and current reviews of the diverse ways in which methods from the earth sciences can contribute to archaeological research. Many areas of research are addressed here, including artifact analysis and sourcing, landscape reconstruction and site formation analysis, soil micromorphology and geophysical exploration of buried sites.

This pioneering collection engages with recent research in different areas of the archaeological discipline to bring together case-studies of the household material culture from later prehistoric and classical periods. The book provides a comprehensive and accessible study for students into the material records of past households, aiding wider understanding of our own domestic development.

Archaeologists have long labored under the implicit assumption that the archaeological record is a direct reflection of past human behaviors. However, numerous cultural and environmental processes intervene between past behaviors and their reconstruction through archaeological inference. This study examines the interface between household archaeology and formation processes through the study of domestic materials from two contemporaneous sites in the

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Zapotitlán Valley of El Salvador that were occupied by people who spoke the same language and belonged to the same regional political system. Cerro was a small village that was occupied for several decades before it was deeply buried by the eruption of Loma Caldera volcano. San Andrés was a much larger center that also was affected by several eruptions, but did not experience long-term catastrophic abandonment or exceptional preservation. The research examines the effects of cultural formation processes, including reuse, discard, abandonment, and post-abandonment disturbance processes, and non-cultural formation processes, such as effects of catastrophic volcanic burial, and the effects of plants and animals. It compares the de facto refuse from Cerro with discarded materials from Cerro, and San Andrés using the discard equation and methods developed in accumulations research to build a foundation for more generally applicable models to interpret household remains in western El Salvador and throughout Mesoamerica.

Research into the anthropogenic and taphonomic processes that affect the formation of maritime archaeological resources has grown significantly over the last decade in both theory and the analysis of specific sites and associated material culture. The addition of interdisciplinary inquiry, investigative techniques, and analytical modeling, from fields such as engineering, oceanography, and marine biology have increased our ability to trace the unique pathways through which archaeological sites progress from initial deposition to the present, yet can also link individual sites into an integrated socio-environmental maritime landscape. This edited volume presents a global perspective of current research in maritime archaeological landscape formation processes. In addition

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to “classically” considered submerged material culture and geography, or those that can be accessed by traditional underwater methodology, case studies include less-often considered sites and landscapes. These landscapes, for example, require archaeologists to use geophysical marine survey equipment to characterize extensive areas of the seafloor or go above the surface to access maritime archaeological resources that have received less scholarly attention.

Geoarchaeological studies can significantly enhance interpretations of human prehistory by allowing archaeologists to decipher from sediments and soils the effects of earth processes on the evidence of human activity. While a number of previous books have provided broad geographic and temporal treatments of geoarchaeology, this new volume presents a single author's view intended for North American archaeologists. Waters deals with those aspects of geoarchaeology—stratigraphy, site formation processes, and landscape reconstruction—most fundamental to archaeology, and he focuses on the late Quaternary of North America, permitting in-depth discussions of the concepts directly applicable to that research. Assuming no prior geologic knowledge on the part of the reader, Waters provides a background in fundamental geological processes and the basic tools of geoarchaeology. He then proceeds to relate specific physical processes, microenvironments, deposits, and landforms associated with riverine, desert, lake, glacial, cave, coastal, and other environments to archaeological site formation, location, and context. This practical

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volume illustrates the contributions of geoarchaeological investigations and demonstrates the need to make such studies an integral part of archaeological research. The text is enhanced by more than a hundred line drawings and photographs.

CONTENTS 1. Research Objectives of Geoarchaeology 2. Geoarchaeological Foundations: The Archaeological Site Matrix: Sediments and Soils / Stratigraphy / The Geoarchaeological Interpretation of Sediments, Soils, and Stratigraphy 3. Alluvial Environments: Streamflow / Sediment Erosion, Transport, and Deposition / Alluvial Environments: Rivers, Arroyos, Terraces, and Fans / Alluvial Landscapes Evolution and the Archaeological Record / Alluvial Landscape Reconstruction 4. Eolian Environments: Sediment Erosion, Transport, and Deposition / Sand Dunes / Loess and Dust / Stone Pavements / Eolian Erosion / Volcanic Ash (Tephra) 5. Springs, Lakes, Rockshelters, and Other Terrestrial Environments: Springs / Lakes / Slopes / Glaciers / Rockshelters and Caves 6. Coastal Environments: Coastal Processes / Late Quaternary Sea Level Changes / Coastal Environments / Coastal Landscape Evolution and the Archaeological Record / Coastal Landscape Reconstruction 7. The Postburial Disturbance of Archaeological Site Contexts: Cryoturbation / Argilliturbation / Graviturbation / Deformation / Other Physical Disturbances / Floralturbation / Faunalturbation 8. Geoarchaeological Research Appendix A: Geoarchaeological Studies Illustrating the Effects of Fluvial Landscape Evolution on the Archaeological Record Appendix B: Geoarchaeological Studies Illustrating Site-Specific Synchronic

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and Diachronic Alluvial Landscape Reconstructions Appendix C: Geoarchaeological Studies Illustrating Regional Synchronic and Diachronic Alluvial Landscape Reconstructions

"The polygenetic origins of archaeological sediments create formidable interpretive challenges. Cultural and natural mechanisms operate in tandem to form and transform the archaeological record. While natural formation processes can be complicated in their own right, anthropogenic agents substantially increase the level of ambiguity in interpreting these sediments. In this thesis I cultivate methods first developed by practitioners of the earth sciences to provide insight into formation concepts that otherwise prove elusive. Fieldwork was conducted in coastal zones of southwestern Alaska over a period of four years. The region is characterized by a dynamic natural and cultural history, and the location provides an ideal setting for a study of this nature. Archaeologists regularly cite frost-related mechanisms (cryoturbation) as potential disturbance agents. Actual field data demonstrating the phenomenon, however, are few. In 1999, I established a long-term experiment designed to measure frost-induced displacement of the archaeological record. Objects buried in experimental plots demonstrated little movement after the first year. Objects positioned in one surface plot, configured to minimize the effects of all mechanisms except cryoturbation, moved an average of 4.7 cm during the same period. Objects in a second surface plot, which lacked restraints on wind and other variables, shifted an average of 18 cm, rendering

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their original arrangement unintelligible. Extrapolated over periods of decades or centuries, the data show that spatial patterning in the archaeological record is subject to substantial postdepositional reworking by frost., wind, and biological agents. I use thin-section micromorphology to assess whether a 6000 year-old living surface at the Mink Island site on Katmai National Park was abandoned due to a volcanic eruption. I also show that thin, dark lenses visible in lithostratigraphic sequences at the site represent the decomposing remains of vegetal fiber rather than charcoal. I further demonstrate that the microfabric of living surfaces at this coastal Alaska site does not resemble the composition of living surfaces identified elsewhere. The differentiation of floor deposits in this sociocultural and environmental context is more complex than in regions where plaster floors were common. Thin-section micromorphology illuminates site formation processes at a resolution unachievable using standard excavation techniques"--Leaves xix-xx.

Papers of a symposium held at the 51st annual meeting of the Society for American Archaeology in New Orleans, Louisiana on Apr. 27, 1986.

The last 20 years have witnessed a proliferation of new approaches in archaeological data recovery, analysis, and theory building that incorporate both new forms of information and new methods for investigating them. The growing importance of survey has meant an expansion of the spatial realm of traditional archaeological data recovery and analysis from its traditional focus on specific

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locations on the landscape-archaeological sites-to the incorporation of data both on-site and off-site from across extensive regions. Evolving survey methods have led to experiments with nonsite and distributional data recovery as well as the critical evaluation of the definition and role of archaeological sites in data recovery and analysis. In both survey and excavation, the geomorphological analysis of land scapes has become increasingly important in the analysis of archaeological materials. Ethnoarchaeology-the use of ethnography to sharpen archaeological understanding of cultural and natural formation processes-has concentrated study on the formation processes underlying the content and structure of archaeological deposits. These actualistic studies consider patterns of deposition at the site level and the material results of human organization at the regional scale. Ethnoarchaeological approaches have also affected research in theoretical ways by expanding investigation into the nature and organization of systems of land use per se, thus providing direction for further study of the material results of those systems.

Since the dawn of their discipline, archaeologists have used surface data to assess the information potential of archaeological sites. Excavation and surface assemblages are used as the foundation for the reconstruction of past histories. Given the importance of surface assemblages in archaeology, it is necessary to

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examine their reliability. One way of determining the reliability of inferences made by using surface assemblages is through repeated examinations of the same archaeological site over a period of time. The information gathered with each examination of MU 125, south of the Grand Canyon, Arizona, provides such an opportunity. Three years' of surface ceramic data was in order to determine if MU 125 was indeed a Kayenta Anasazi site. The final results of this analysis involve a comparison of four wares that were found within all three surface ceramic assemblages. Tusayan Grayware exhibited a higher number of sherds than all others. Of the 5,498 surface sherds located on MU 125, about 50 percent were assigned to Tusayan Grayware. In this case, the predominant of Tusayan Grayware at MU 125 associates it with the Kayenta Anasazi culture. To gain a better idea of surface data reliability, it is the task of archaeologists to understand the processes that affect the surface material and how they impact the archaeological record. Numerous agents transform artifacts from one state to another within the archaeological context. The formation processes themselves display patterns that can distort the archaeological record. It is important to understand these processes and their disturbances on the archaeological record. Without acknowledging these processes, poor inferences may be made in archaeological interpretations. However, in the case of MU 125 one can conclude

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that these processes did not affect the reliability of the surface ceramic data. Thus, inferences made from the data can be deemed reliable.

The archaeological site of Pirque Alto (CP-11), located in the Parotani valley region of Cochabamba, Bolivia, is a multicomponent site with components dating back as far as the Formative Period up until Inca times. Previous archaeological work done at this site shows that this site has been impacted by both natural and cultural formation processes. This report examines ceramic artifact remains collected from a systematic surface survey of the whole site from 2005 and subsequent excavations conducted during 2007, both of which were done as a part of the Prehistoric Parotani Settlement Project. Comparisons are made between the surface and subsurface ceramic densities and from these comparisons, I determine the extent to which surface and subsurface artifact densities reflect formation processes active at this site. This research seeks to add to our understanding of how difference processes impact the archaeological record from which interpretations are made.

Synthesizes the most important principles of cultural and environmental formation processes for both students and practicing archaeologists.

This work takes as its starting point the role of fieldwork and how this has changed over the past 150 years. The author argues against progressive accounts of fieldwork and instead

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places it in its broader intellectual context to critically examine the relationship between theoretical paradigms and everyday archaeological practice. In providing a much-needed historical and critical evaluation of current practice in archaeology, this book opens up a topic of debate which affects all archaeologists, whatever their particular interests.

Accurate interpretation of the archaeological record depends largely on detailed reconstruction of site formation processes. The microscopic and chemical study of archaeological deposits (i.e., the microstratigraphic approach) is effective at reconstructing cultural and natural processes that occurred at any archaeological site. The major focus of my thesis is to test the effectiveness of soil micromorphology and FTIR, two methodological pillars of the microstratigraphic approach, to study site formation processes at EjTa-4, a large shell-matrix site on the central coast of British Columbia. Results indicate well-preserved evidence for activities dating back to 3300 years ago, including built environments, and food processing in the forest. These findings contribute important new information to our knowledge of pre-contact Northwest Coast societies, and to deciphering large shell-matrix sites such as EjTa-4.

One of the most significant developments in archaeology in recent years is the emergence of its environmental branch: the study of humans' interactions with their natural surroundings over long periods and of organic remains instead of the artifacts and household items generally associated with sites. With the current attention paid to human responsibility for environmental change, this innovative field is recognized by scientists, conservation and heritage managers and policymakers worldwide. In this context comes *Environmental Archaeology* by Elizabeth Reitz and Myra Shackley, updating the seminal 1981 text *Environmental Archaeology* by Myra Shackley. Rigorously detailed yet concise and accessible, this volume surveys the complex

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and technical field of environmental archaeology for researchers interested in the causes, consequences and potential future impact of environmental change and archaeology. Its coverage acknowledges the multiple disciplines involved in the field, expanding the possibilities for using environmental data from archaeological sites in enriching related disciplines and improving communication among them. Introductory chapters explain the processes involved in the formation of sites, introduce research designs and field methods and walk the reader through biological classifications before focusing on the various levels of biotic and abiotic materials found at sites, including: Sediments and soils. Viruses, bacteria, archaea, protists and fungi. Bryophytes and vascular plants. Wood, charcoal, stems, leaves and roots. Spores, pollen and other microbotanical remains. Arthropods, molluscs, echinoderms and vertebrates. Stable isotopes, elements and biomolecules. The updated Environmental Archaeology is a major addition to the resource library of archaeologists, environmentalists, historians, researchers, policymakers—anyone involved in studying, managing or preserving historical sites. The updated Environmental Archaeology is a major addition to the resource library of archaeologists, environmentalists, historians, researchers, policymakers—anyone involved in studying, managing, or preserving historical sites.

Behavioral archaeology offers a way of examining the past by highlighting human engagement with the material culture of the time. 'Behavioral Archaeology: Principles and Practice' offers a broad overview of the methods and theories used in this approach to archaeology. Opening with an overview of the history and key concepts, the book goes on to systematically cover both principles and practice: the philosophy of science and the scientific method; artifacts and human behavior; archaeological inference; formation processes of the archaeological record;

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technological change; behavioral change; and ritual and religion. Detailed case studies show the relevance of behavioral method and theory to the wider field of archaeological studies. The book will be invaluable to students of archaeology and anthropology.

From two of the best-known archaeological writers in the trade, this outstanding resource provides a thorough survey of the key ideas in archaeology, and how they impact on archaeological thinking and method. Clearly written, and easy to follow, *Archaeology: The Key Concepts* collates entries written specifically by field specialists, and each entry offers a definition of the term, its origins and development, and all the major figures involved in the area. The entries include: thinking about landscape archaeology of cult and religion cultural evolution concepts of time urban societies the antiquity of humankind archaeology of gender feminist archaeology experimental archaeology multiregional evolution. With guides to further reading, extensive cross-referencing, and accessibly written for even beginner students, this book is a superb guide for anyone studying, teaching, or with any interest in this fascinating subject.

A guide to the systematic understanding of the geoarchaeological matrix *Reconstructing Archaeological Sites* offers an important text that puts the focus on basic theoretical and practical aspects of depositional processes in an archaeological site. It contains an in-depth discussion on the role of stratigraphy

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that helps determine how deposits are organised in time and space. The authors — two experts in the field — include the information needed to help recognise depositional systems, processes and stratigraphic units that aid in the interpreting the stratigraphy and deposits of a site in the field. The book is filled with practical tools, numerous illustrative examples, drawings and photos as well as compelling descriptions that help visualise depositional processes and clarify how these build the stratigraphy of a site. Based on the authors' years of experience, the book offers a holistic approach to the study of archaeological deposits that spans the broad fundamental aspects to the smallest details. This important guide:

- Offers information and principles for interpreting natural and anthropogenic sediments and physical processes in sites
- Provides a framework for reconstructing the history of a deposit and the site
- Outlines the fundamental principles of site formation processes
- Explores common misconceptions about what constitutes a deposit
- Presents a different approach for investigating archaeological stratigraphy based on sedimentary principles

Written for archaeologists and geoarchaeologists at all levels of expertise as well as senior level researchers, *Reconstructing Archaeological Sites* offers a guide to the theory and practice of how stratigraphy is produced and how deposits can be organised in time and space.

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Eighteen papers devoted to discussion of the 'representativity of archaeological remains from Danish Prehistory'. The volume is obviously an important one for Denmark, but is widely referred to for its method of approach that is applicable elsewhere.

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