ENCYCLOPEDIA of GEOARCHAEOLOGY
Encyclopedia of Earth Sciences Series

ENCYCLOPEDIA OF GEOARCHAEOLOGY

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Dedicated to Rhodes W. Fairbridge

(1914–2006)

with appreciation
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“Geoarchaeology” is the archaeological subfield that uses the methods of geological investigation to gather information and solve problems in the exploration of the human past. Under the label of “archaeological geology,” it is also the subfield of geology that explores geoscience aspects of human antiquity. In its varied manifestations, then, geoarchaeological research attempts to build collaborative links between specialists in archaeology and the Earth sciences and, in so doing, produce new knowledge about past human behavior by merging methods and concepts from the geosciences with those commonly applied by archaeologists.

Archaeological recovery and analysis are already geoarchaeological in the most fundamental sense because the buried remains left by former humans are contained within, and removed from, an essentially geological context, and many of the finds are themselves composed of earthen or rock materials. But geoarchaeology moves beyond this simple relationship to pursue a broad range of questions, many of which address the interactions and influences between humans and the environments in which they once lived. The proximate goals of geoarchaeology might be described as elucidating the processes of site formation, reconstructing ancient environments and the influence of humans on them at the local and regional levels, and learning which environmental factors were significant in the evolutionary emergence of humankind and the cultural changes undergone by the world’s diverse societies over time. Tactically, the toolkit of research techniques, conducted in both field and laboratory contexts, includes analyses of soils, sediments, rocks, and landforms, and a wide range of geophysical, geochemical, and microscopic methods. At a finer scale of resolution, for example, the study of archaeological deposits to infer past human activities and behaviors – such as agriculture, pastoralism, and fire – lies firmly within the scope of geoarchaeology. There is an overlap of geoarchaeological methods covered in this work with techniques also considered to be part of archaeometry: materials analysis, dating, methods of site location and prospecting, and tracing raw and artifactual materials to their sources. The ultimate goal, like many other subfields of archaeology, is the recovery of new information that would permit fresh and more detailed interpretations of human antiquity.

Early studies of the natural world in Europe and America during the eighteenth and nineteenth centuries often included a concern for humans and their place in nature. Much initial prehistoric research in both hemispheres was in fact conducted by geologists, who took an interest in the remains of human activities (and the remains of humans themselves) deposited along with geological materials. In the 1950s and 1960s, a greater emphasis on environmental factors in archaeology led eventually to a “contextual approach” involving “geoarchaeological” investigations proposed by Karl Butzer in the 1970s. The subfield is therefore relatively young compared to archaeology and the geosciences in general. Yet, for archaeologists, the specialized preparation needed in order to understand the geological complexities of their research has made geoarchaeology relatively inaccessible to many. Most geoarchaeologists working today have had some interdisciplinary training in the Earth sciences, or their degrees were earned wholly in the geosciences. Such credentials are necessary for those exploring prehistoric periods, as they must acquire the expertise to obtain accurate dating of sites and finds, understand the depositional history of a site and its contents over long intervals, and reconstruct paleoenvironmental conditions to interpret ancient lifeways in their original settings. Archaeometric research holds a significant place in the archaeology of historical periods, but with some exceptions, field geoarchaeological practice and familiarity with its methods and knowledge base tend to be lesser components of archaeological research conducted on recent cultures and sites. New World historical archaeology tends to
place little emphasis on geoarchaeological matters, while the archaeology of Roman and later periods in Europe is more likely to use it in the analysis of sites. The potential benefit of geoarchaeological applications to all archaeological investigations has prompted the present volume. While specialized treatises on geoarchaeology began to appear in the 1960s and 1970s, it was Rhodes Fairbridge, founding editor of the Earth Science Encyclopedia Series (EEES), who proposed that an encyclopedic work on geoarchaeology be added to the list of published volumes. He enlisted a newly minted Ph.D. in Anthropology at Columbia University, Allan Gilbert, to help with the project, and the first publication contract was signed in 1981. The geoarchaeological landscape 35 years ago was distinctly incipient, with but a limited number of active practitioners engaged in research and publication, and a small body of basic knowledge that had already accumulated. Had that volume been realized, it would have been restricted to only the few geoarchaeological projects and subject areas that had been explored at the time, and much of the rest would have comprised entries on archaeological or geological topics. Sadly, but perhaps luckily, the contract was cancelled in the mid-1980s due to a change in publishers and a realignment of priorities at the new publishing house. The volume then began a lengthy search for a new agreement elsewhere. It did not find solid grounding with a new publisher until Springer offered to contract the project in 2002. Fairbridge passed away in 2006, and in the subsequent years Gilbert enlisted the assistance of four established geoarchaeologists (Paul Goldberg, Vance Holliday, Rolfe Mandel, and Rob Sternberg) to serve as associate editors and help assemble a new entry list that incorporated the advances and discoveries made within the subfield over the preceding two and a half decades. This volume is dedicated to the memory of Rhodes Fairbridge, whose appreciation for archaeology’s contributions to Quaternary geoscience prompted his insistence that a reference work on geoarchaeology belonged within the stable of volumes he guided into print over his 40 years of editing the EEES.

This encyclopedia, appearing so many years after its initial conceptualization, contains data and discussion from a far wider range of practicing geoarchaeologists working within a far more mature discipline than would have been the case at its inception. It defines terms, introduces problems, describes techniques, and discusses theory and strategy, all in a language designed to make specialized details accessible to students and nonspecialists. It covers subjects in environmental archaeology, dating, prospection, materials analysis, soil and sediment investigation, and landforms, among other matters, and it includes a sampling of the most important sites known for their geoarchaeological contributions. The volume does not cover sites, civilizations, and ancient cultures that are less germane to the geoarchaeological focus and better described in other encyclopedias of world archaeology.

As mature as geoarchaeology has become, it is still a young and dynamic area of research. New applications are constantly emerging as the results of novel investigative techniques fill the pages of professional journals (notably Geoarchaeology, An International Journal; Archaeological and Anthropological Sciences; Journal of Archaeological Science; and Archaeometry), and as geoarchaeological approaches are aimed at different archaeological problems in different parts of the world. Original insights emanating from such developments will inevitably require revisions of this volume to keep up with progress, and coupled with the fact that lacunae remain in this book and will always exist in any comprehensive compilation, the Encyclopedia of Geoarchaeology will doubtless grow in detail and inclusiveness once this first edition appears. We look forward to constructive suggestions from readers about what is missing or in need of updating, as no editorial supervision will ever control the enormous diversity of innovation that will surely characterize the near future of geoarchaeology.

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