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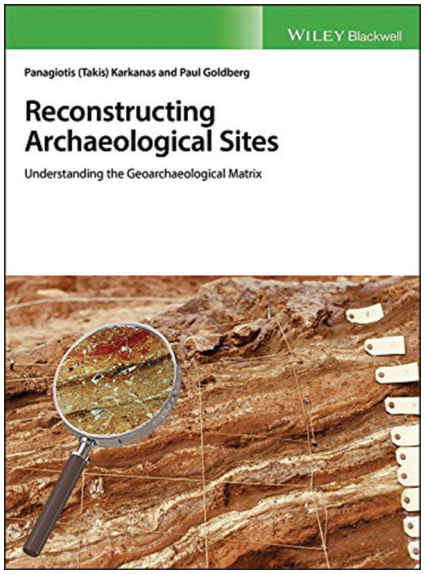
Book reviews

Reconstructing Archaeological Sites: Understanding the Geoarchaeological Matrix
Panagiotis Karkanas, Paul Goldberg
Wiley-Blackwell, Oxford (2019), 296 pp., ISBN 9781119016403.



The book "Reconstructing Archaeological Sites" by P. Karkanas and Paul Goldberg is an attempt to show to the reader another way of how to understand and interpret archaeological deposits. Most of the geoarchaeology books introduce geoarchaeology as an attempt to understand the various formation processes of natural sediments, which are in some way linked to the archaeological context (French, 2012; Rapp and Hill, 2006; Goldberg and Macphail, 2006; Macphail and Goldberg, 2017). In stark contrast to this, Karkanas and Goldberg introduce all sediments linked to the archaeological context as archaeological sediments. These sediments are generally divided into: (a) those deposited by natural processes, but without materials produced, modified, or re-organized by humans; (b) those deposited by natural processes, but also containing anthropogenic materials; and (c) materials (natural or anthropogenic) deposited only by anthropogenic activities and processes. They also make an attempt to throw light on the various phases of soil formation and post-depositional processes found at archaeological sites, and particularly concerning the methodology of its study. The attempt to include and understand postdepositional processes in their final interpretation is quite rare in textbooks presently available: readers usually have to combine geoarchaeology with soil science. On the other hand, Karkanas and Goldberg (2019) is not the first book pointing out the importance of the connection between primary formation processes and soil-forming processes macroscopically (Holliday, 1992), or by a micromorphological approach (Stoops *et al.*, 2010), or by both (Macphail and Goldberg, 2017).

In contrast to the above-mentioned books on geoarchaeology where the description of basic natural formation processes is the key part of the introduction, Karkanas and Goldberg focus on the most widespread type of formation process – mass movement. They first published this concept when introducing a different type of colluvial deposits by way of micromorphology (Karkanas and Goldberg, 2008). This has also been successfully applied in studies from the Czech Republic concerning the type of slope deposits inside a rondel structure (Lisá *et al.*, 2015), or the formation processes of cave infills (Nejman *et al.*, 2018; Lisá *et al.*, 2013). The reader might find it a little confusing that some of the basic formation process descriptions are relatively short (*e.g.* fluvial or aeolian processes) or even missing (glacial processes), but on the other hand, when we take into consideration the fact that most archaeological situations are covered by various types of colluvial deposits, than such a distinction makes sense.

The basic colluvial deposit descriptions mentioned in this book are followed by their recognition in the field, by micromorphological observations, and also their effect on the archaeological material under discussion. They are divided into: (1) slides and slumps; (2) rock debris falls and avalanches and grain flows; (3) solifluction; (4) debris flows and mudflows; (5) hyperconcentrated flows; (6) high-energy flows; and, they more or less connect the fluvial process with the colluvial one in the sense of (7) water flows in sites, and (8) shallow water flows. The set of presented processes is completed by aeolian processes and by a set of biological processes. The description of post-sedimentary processes, including bioturbation, erosion, diagenesis, or soil-forming processes, is presented in the same way, *i.e.* firstly a description of their appearance, followed by their recognition in the field, micromorphology, and their effect on the archaeological material. Thus, this book is theoretically grounded and methodologically clear – and yet remains innovative. Such a guide book provides a perfect framework for the interpretation of both natural and anthropogenic sediments, and the reconstruction of the history of a site's deposits along with the formation of a site. It also tries to be a practical guide: through its various "boxes" of information, diagrams, and photos that provide guidelines for both field and laboratory methodology. In our view, an understanding of all the described processes is necessary for a clarification of the development of anthropogenic sites and site stratigraphy (*cf.* Butzer, 1982; Renfrew, 1976; Shackley, 1976).

In this short review, we would like to refrain from commenting on specific chapters, which differ in their quality and depth. Chapter 1 presents guidelines for site formation processes. It introduces the many types of diverse processes that can affect an archaeological site before, during, and after its occupation. These may be, for example, soil formation, developmental processes, and post-depositional events. This first chapter gives us a context for understanding the history of a site and helps us answer the question of a site's formation by way of its three-dimensional stratigraphy (*cf.* Weiner, 2010). By defining the stratigraphy, we can then envision some aspects of the dynamic three-dimensional

enigma of a site, and its complex and diverse interlocking pieces that must be put together in an appropriate order. An important aspect of this chapter which we found important on the one hand, but also sometimes a little bit confusing on the other, is the definition of archaeological deposits and anthropogenic sediments. The differences between these two groups of sediments are often not well understood by archaeologists as well as by geologists/pedologists, and, in fact, for us it is difficult to agree with the authors in some parts. The definition of archaeological deposits is mentioned at the beginning of this review: But how to understand the term anthropogenic sediments? It is not always clear.

According to Karkanas and Goldberg, anthropogenic sediments are those which are the product of human activity. Taking into account the landscape around us, there is then the question of what exactly fits or does not fit into this definition. Here, Karkanas and Goldberg are more specific and they say that: (I) anthropogenic sediments can be integrated with naturally-deposited sediments; for example, the discard of artifacts in the street that are affected by natural sedimentary processes after the abandonment and destruction of a site. In our opinion, this would only make sense in the case of all the circumstances of the formations would be 100 % natural. This, on the other hand, is hardly possible in a landscape affected by humans. For example, the energy of slope processes would be probably lower if humans would not have already influenced the vegetation cover. So, it is a question of whether these "natural" processes are fully natural.

The anthropogenic deposits according to Karkanas and Goldberg can also be (II) the result of the transient reorganization of natural sediments by humans and are inseparable from the excavated deposits (mud floors, earthen mounds, backfilling of tombs, *etc.*). One has to think: At precisely what moment did the anthropogenic deposit (for example, an earthen wall) become a naturally-deposited sediment? Are we able to recognize what is the trigger for the colluviation? If it is human, can we call these deposits naturally deposited? It is difficult to understand why Karkanas and Goldberg do not include the archaeological construction itself as an archaeological deposit. Even more striking is to read that earthen mounds or earthen floors can be termed as anthropogenic sediment, but mud walls or pavements cannot, despite the fact that these are also the product of anthropogenic activity. They explain this discrepancy by the fact that they can be treated as continuous non-movable elements of anthropogenic construction, and as such, they have their internal stratigraphy that is based on architectural attributes and typology and not on depositional stratigraphic principles. The next two divided types of anthropogenic sediments by Karkanas and Goldberg are much clearer in origin. One of these (III) includes those sediments which are transformed into permanent artificial materials, such as pottery, brick, mortar, glass, and metals, and the other (IV), those that can involve permanent chemical transformations, such as ashes. In our opinion, many natural scientists will agree with this division, but for some archaeologists it may be difficult to agree that artifacts are anthropogenic sediments.

Chapter 2 introduces the study of the natural sedimentary processes that take place at sites: their structure, mass movement, bioturbation, *etc.* Specific aspects of this chapter have already been described above; however, this chapter's main aim is to provide readers with the initial characteristics of soils and naturally-deposited sediments – and to draw up a scheme of how they form and how we can recognize them in the field and under the microscope (*cf.* Rapp and Hill, 2006). Chapter 3 focuses on various types of anthropogenic sediments (burnt and organic remains, construction material, *etc.*), which the authors use to demonstrate the richness of archaeological deposits as significant records of human history and activity (*cf.* Goldberg and McPhail, 2006). This part of the book is very important and its usefulness in practice methodologically inseparable from the micromorphological approach. A particularly good additional reference for this approach is the micromorphological atlas published by Nicosia *et al.* (2017). It is in this vein that we find the thematic and visual organization of the chapters, consisting of both substantial text and object-based narration, so appealing and productive. In Chapter 4, the authors concentrate on the principles and methods for defining stratigraphic units and their context (*cf.* Berggren, 2009).

The next two chapters readily show how the authors make the respective topic under scrutiny resonate with their given concrete examples, which are used to show how to study the different types of archaeological sites. In Chapter 5, Karkanas and Goldberg focus on open-air sites – and caves that have been occupied by hunter-gatherers. In this chapter, the reader finds out how to recognize the distinctive traits that reveal the framework of natural geological agents at work – such agents that can bury, erode, or materially transform the markers of human presence, either physically or chemically (*cf.* Goldberg and McPhail, 2006).

In Chapter 6, the authors give a poignant narrative on the geoarchaeology of roofs, streets, and house pits to help with the recognition of human activities in complex stratigraphies and a site's depositional history. Finally, Chapter 7 considers relatively new approaches for identifying human-affected sites (*cf.* Butzer, 1982). This chapter provides more practical information about micromorphological and archaeological sampling techniques. Micromorphology in human-affected sites has become commonly applied during recent years, mainly due to the existence of the Geoarchaeology lab of the Institute of Geology CAS (Lisa *et al.*, 2020a). Czech researchers have applied this method to a number of prehistoric sites (Lisá *et al.*, 2013; Novák *et al.*, 2012, Lisá *et al.*, 2020c), as well as some medieval sites (Dejmal *et al.*, 2014; Goláňová *et al.*, 2020; Lisá *et al.*, 2020b).

Overall, the book provides a valuable and absorbing look into the science that guides us through the theory and practical use of stratigraphy and helps us organize the deposits at an archaeological site. The book explores this science that can provide a theoretical and practical archaeological approach below the surface of the ground: enabling archaeologists to discover the nature and date of occupation of sites. In the reviewer's opinion, this book should prove invaluable and helpful to archaeologists in their attempts to discover existing contexts and understand their formation. The book gives complete information on archaeological deposits and provides a range of sophisticated methods that offer a holistic approach to the study of a site: from its outer fundamentals to its innermost details (*cf.* Prentiss *et al.*, 2007).

Karkanas and Goldberg's book maintains a non-judgmental view in describing their experiences in archaeology. It is based on their vision that stratigraphy could be the jugular vein of archaeological practice. Other contributions in the book are also well worth a mention. This book should be an essential scientific textbook for the training of archaeologists and scientists.

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