

Special Volume 6 (2016): Space and Knowledge. Topoi Research Group Articles, ed. by Gerd Graßhoff and Michael Meyer, pp. 1–44.

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## Ancient Colonization of Marginal Habitats. A Comparative Analysis of Case Studies from the Old World

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eTopoi ISSN 2192-2608  
<http://journal.topoi.org>



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# Ancient Colonization of Marginal Habitats. A Comparative Analysis of Case Studies from the Old World

The present contribution deals with the concepts of marginal habitats in selected regions of the ancient world, ranging from modern Spain to the Jordanian desert and from Turkey to the Ethiopian highlands. Central to this research is the hypothesis that the occupation of areas beyond the 'normal' settlement patterns corresponds to colonization processes which reflect specific social strategies and may have stimulated the development of new technological skills. A review of 'marginality' research in various disciplines indicates that there is no comprehensive definition of the concept, which can be approached from a multitude of perspectives and with manifold objectives. A survey of the eight case studies and two more in-depth discussions of the sites of Musawwarat (Sudan) and Ayamonte (Spain) highlight the potentials as well as the limits of the archaeological investigation into past marginalities. Patterns of spatial marginalization are the easiest to detect. The studies also show that we must not limit our analysis to the adverse factors connected to different kinds of marginalities. Instead, our analyses suggest that spatially marginal areas were deliberately chosen for settlement – an integration with core-periphery approaches may help us to understand these scenarios, which have received little attention in 'marginality' research in archaeology or elsewhere so far.

Technical knowledge; periphery; marginality; centrality.

## I Introduction

### I.1 Objectives

The relation between the natural environment of settlement spaces, their occupation by human settlers and the development of technical knowledge in order to control the natural environment are of central interest in the evaluation of ancient settlement phases. Central to our research is the hypothesis that in early societies the occupation of settlement spaces that were located beyond the 'regular' settlement areas corresponded to colonization processes and required specific settlement strategies. Settlement spaces beyond the 'regular' settlement areas included, for example, remote areas or ecologically marginal habitats; the settlement of such areas was motivated by religious or to strategic considerations. We assume that the settlement of ecologically marginal habitats would have consequences, e.g. stimulation of the development of new technological skills.

The influence of the character of the colonized areas on settlement strategies that diverged from the 'normal' settlement strategies of a society and the technical knowledge developed to cope with ecological challenges inhabitants encountered will be evaluated in a comparative approach focusing on multiple different ancient societies that established colonies in the Mediterranean and in the Old World drylands. The research is being

conducted by the interdisciplinary research group *Ancient colonization of marginal habitats* (research group A-I within the Excellence Cluster *Topoi – The Formation and Transformation of Space and knowledge in Ancient Civilizations*), in which scholars of prehistory, archaeology and physical geography are investigating the various forms of marginality associated with the different settlement areas and the different settling societies. The research projects build in part on previous studies conducted within the research group *Central places and their environment* of the Excellence Cluster *Topoi*. The eight research projects within the group take the form of case studies ranging geographically from modern Spain to the Jordanian desert and from Turkey to the Ethiopian highlands in order to cover different varieties of colonized areas and colonizing intentions. For each of the settlement sites, we attempt to assess the specific aspects of marginality associated with the area and ascertain how their ancient inhabitants coped with them. The research also investigates the implicit reason for colonizing the specific area chosen. It becomes clear that only an interdisciplinary approach, investing the history and trajectory of the settlement activities, past environmental conditions, social structures and technical skills simultaneously, can yield conclusive results.

## 1.2 Marginality in different disciplinary contexts

‘Marginality’ is a dimension of analysis and a topic of research in a number of disciplines. The aim of this section is to summarize the current scientific approaches to the concept of marginality in ecology, geography and archaeology.

### 1.2.1 Marginality in the ecological context

In ecology, marginality is related to Hutchinson’s concept of ecological niches.<sup>1</sup> This concept characterizes habitats by an area’s physiographic factors (abiotic and biotic), which can influence the survival and reproduction of individuals. Favorable habitat conditions are reflected in positive reproduction rates that make a population independent from immigration. Such habitats are defined as belonging to the ‘ecological niche’ of a species.<sup>2</sup> Correspondingly, unsuitable habitats, in which the reproduction rate is negative, are not part of the niche, and a population is dependent on immigration of individuals from the core habitats to maintain stability. The transition zone between suitable and unsuitable habitats is in general characterized by a fuzzy border. Occupation of these fuzzy border areas tends to be only temporary and their demographical significance for the species is low. Kawecki has defined such areas as marginal habitats.<sup>3</sup> Ecologists divide marginal habitats into a) habitats functioning predominantly as ecological niches in which temporary fluctuations in the system boundaries might have negative effects on the population; b) habitats which achieve only the lower system boundary to fulfill the requirements to function as an ecological niche and c) habitats in which the local population has implemented adaptation strategies enabling it to remain in this transition area between suitable and unsuitable habitats.<sup>4</sup>

Summarizing, from an ecological perspective, the concept of ‘marginality’

[...] has been applied to describe phenomena that occur at biophysical limits of any kind. These may be geophysical boundaries, environmental thresholds, or

1 Hutchinson 1961; Pulliam 2000; Kawecki 2008.

2 Kawecki 2008.

3 Kawecki 2008.

4 Kawecki 2008.

habitats that are not well suited for particular species or populations [...]. Since the diversity of nature provides a great variety of conditions, margins and marginal conditions are innumerable.<sup>5</sup>

### 1.2.2 Marginality in the perspective of human geography

In general, societies are composed of multiple social groups which can be distinguished on the basis of social status and ethnic, religious and cultural identifications. Not all groups participate equally in the socio-cultural, political and economic life of a society as a whole. While some groups enjoy privileged access to education, prosperity, participation in decision-making and natural resources, such access is restricted or denied for other groups.<sup>6</sup> Human geographers investigate communities of the latter type, groups situated at the margin of a society, in order to describe and analyze the socio-cultural, political, economic and environmental factors triggering the societal, economic and spatial segregation which leads to the marginalization of specific groups.

Communities or individuals identified as marginal frequently exhibit enhanced vulnerability, as both phenomena – marginality and vulnerability – are triggered, or characterized by the same boundary conditions, such as disadvantaged setting, lack of access to natural resources and limitations on participation in the ‘normal’ social life of a community (like limited access to education, reduced food security, lack of access to decision making processes, being subject to environmental pollution etc.).<sup>7</sup>

Although no definition of marginality has yet gained widespread acceptance,<sup>8</sup> the two statements that follow can serve as a point of departure for developing an understanding of the concept:

Marginality is a complex condition of disadvantage which individuals and communities experience as a result of vulnerabilities that may arise from unfavorable environmental, cultural, social, political and economic factors.<sup>9</sup>

Socio-economic marginality is a condition of socio-spatial structure and process in which components of society and space in a territorial unit are observed to lag behind an expected level of performance in economic, political and social wellbeing compared with average condition in the territory as a whole.<sup>10</sup>

Taking these definitions into account, we can sum up by stating that the concept of ‘marginality’ in the discipline of human geography i) encompasses a societal, a spatial as well as a temporal dimension<sup>11</sup> and ii) is a relative and a dynamic concept<sup>12</sup>, and by determining that iii) scale must be taken into account when investigating it.<sup>13</sup>

Research on the societal dimension of marginality seeks to understand the causes leading to the marginalization of communities or individuals. The societal factors considered are demography, religion, culture, social structure, economies and politics.<sup>14</sup> Social marginality research investigates how economic and political conditions influence the access of individuals or groups to resources. The societal dimension of marginalization is

5 Callo-Concha and Ewert 2014, 58.

6 Gurung and Kollmair 2005.

7 Mehretu, Pigozzi, and Sommers 1999; Hurni, Wiesmann, and Schertenleib 2004.

8 Cullen and Pretes 2000.

9 Mehretu, Pigozzi, and Sommers 2000, 90.

10 Mehretu, Pigozzi, and Sommers 1999, 7.

11 Winchester and White 1988.

12 Cullen and Pretes 2000.

13 Gurung and Kollmair 2005; Déry, Leimgruber, and Zsilincsar 2012.

14 Gurung and Kollmair 2005.

perceived as a social construct, in which power is identified as a crucial factor triggering marginality.<sup>15</sup>

Since the spatial dimension of marginality is determined by the physical environment, our research focuses in particular on spatial patterns relating to centers (non-marginal) and peripheries (marginal).<sup>16</sup> Spatially marginal areas are located at a distance from the major economic centers and have poor infrastructural connections. In consequence, they are not closely linked to mainstream developments.<sup>17</sup> Another characteristic of spatially marginal places is their location at the edges of social or governmental systems.<sup>18</sup>

In human geography, marginality is considered to be the product of socio-economic and geo-political boundary conditions which change over time. Dimension, scale and degree of marginality are influenced by dynamic processes and their assessment is influenced by the personal biases of the researcher.<sup>19</sup> Thus, marginality needs to be investigated as a dynamic phenomenon with a temporal dimension. Moreover, the frame of reference from which a region, an individual or a community are classified as marginal or as central is essential to an understanding of the system as a whole. Groups or individuals can experience marginality in one sector of their socio-cultural or physical environment, while being well integrated within mainstream developments with regard to other aspects of their existence.<sup>20</sup> Furthermore, the individual perspective of the person defining the frame of reference also affects the distinction between marginal and non-marginal.<sup>21</sup> Thus the definition of marginality depends on the temporal and spatial scale under investigation and on the standpoint from which marginality and non-marginality are defined.<sup>22</sup>

Social and spatial marginality tend to be associated with one another, and the transition between them occurs along fuzzy borders. Enclaves or ghettos are good examples of the fact that social marginalization, in this case religious or ethnic affinities, can result in spatial marginalization as well.<sup>23</sup> Social marginality can be broken down into several subcategories.<sup>24</sup> In practice, though, these categories tend to overlap, and although the distinctions can be helpful, they can also be limiting, preventing a comprehensive understanding of the complex interweaving and the processual nature of marginalization. Marginality can be classified into the following subtypes which differ in terms of the scope and the anchoring of the causes of marginalization:<sup>25</sup>

a) Disadvantages which develop spontaneously as a result of natural or cultural limitations of an area and which affect the economy of a community or individuals are aggregated under the term *contingent marginality*.<sup>26</sup> Environmental factors like low-fertility or unfertile soils, steep topography and a negative water balance might contribute to the development or intensification of contingent marginality.<sup>27</sup>

b) *Systematic marginality* occurs predominantly in hegemonic social systems in which all of the power is concentrated within a single ruling social class, for instance in colonial or neo-colonial societies in countries of the Global South.<sup>28</sup>

15 Cullen and Pretes 2000.

16 Leimgruber 1994; Müller-Böker et al. 2004; Mehretu, Pigozzi, and Sommers 1999.

17 Brodwin 2001; Müller-Böker et al. 2004.

18 Leimgruber 1994.

19 Gurung and Kollmair 2005.

20 Perlman 1975.

21 Cullen and Pretes 2000.

22 Cullen and Pretes 2000; Gurung and Kollmair 2005.

23 Cullen and Pretes 2000.

24 E.g. Blaikie and Brookfield 1987 who speak of 'ecological marginality' when referring to the latter category.

25 Mehretu, Pigozzi, and Sommers 2000.

26 Mehretu, Pigozzi, and Sommers 2000.

27 Mehretu, Pigozzi, and Sommers 2000.

28 Mehretu, Pigozzi, and Sommers 2000.

c) *Collateral marginality* represents a hybrid form of contingent and systematic marginality. It occurs when individuals or communities are marginalized as a consequence of their close relations to communities which are affected by either contingent or systematic marginality.<sup>29</sup>

d) *Leveraged marginality* represents a sub-type of contingent or systemic marginality and describes disadvantaged communities or individuals, who have to face challenges related to the globalized market. Leveraged marginality occurs e.g. when internationally acting companies relocate production locations to a country with a lower wage levels while the communities and individuals left behind experience leveraged marginality.<sup>30</sup>

### 1.2.3 Marginality in the archaeological context

In the discipline of archaeology, the contribution of Young and Simmonds<sup>31</sup> and the perspectives on the topic which they explore represent a milestone in the research on marginality. In their critical examination of earlier (case) studies, Young and Simmonds drew on concepts from human geography, most notably the work of Blaikie and Brookfield<sup>32</sup> on land management processes and land degradation in current Africa. Following them, Young and Simmonds distinguish three dimensions of marginality: the sociopolitical, the economic and the ecological. They see these three dimensions as neither mutually exclusive, nor mutually dependent, e.g. arguing that:

The archaeological implications of ecological marginality for settlement and subsistence are, at one level, dependent on the relationship between human communities and the biota affected by marginal conditions. However, to grasp these implications fully, archaeologists and historians must try to examine the total economic basis of a society and its relationship with its resources. In this context, the overlap between economic, ecological and sociopolitical marginality should be obvious.<sup>33</sup>

In archaeological research ‘marginality’ is often defined exclusively on the basis of environmental criteria. Arguing against this narrow perspective is the recognition that definitions of marginality are relational and that it is important to consider scale and perspective, as well as the processual nature of marginality.<sup>34</sup> The conditions of the respective ‘core’ group or region need to be fully explored before statements about marginality can be made, and it would not be appropriate to consider marginal groups, in conjunction with peripheral regions, and non-marginal groups, in conjunction with core regions as separate entities. Thus an integrated approach is required to address the different phenomena, one that examines sociopolitical, economic and ecological marginality separately.<sup>35</sup> Such an approach can to some extent overcome the limits restricting exploration of the different dimensions of marginality using archaeological sources, allowing a better understanding of the complexity of the interweaving forms of marginality to be obtained.

Although a good deal of methodological thought has been presented in recent years, no approach to marginality has yet been established in archaeology as a clear standard. On the one hand, this is due to the complexity of the subject. One could say that “economic, ecological, social, political, cultural and spatial marginalities may all have different

29 Mehretu, Pigozzi, and Sommers 2000.

30 Mehretu, Pigozzi, and Sommers 2000.

31 Young and Simmonds 1999.

32 Blaikie and Brookfield 1987.

33 Young and Simmonds 1999, 200.

34 Young and Simmonds 1999.

35 Young and Simmonds 1999.

values in different times and places, and might occur together in many different combinations".<sup>36</sup> On the other hand, the fact that archaeological sciences are themselves rather heterogeneous phenomena contributes to the coexistence of multitude of approaches to and uses of marginality in archaeology – or rather archaeologies. To cite just a very few examples, it is interesting to observe how in the classics field, i.e. classical archaeology, ancient history, Greek and Latin philology, the term ‘marginality’, even in recent publications, is used almost exclusively as a synonym for ‘periphery’<sup>37</sup>, while in fields closer to prehistoric archaeology or ethnology, ‘marginality’ tends to be considered more as a relative concept requiring a careful examination of the respective contexts to be defined and understood.<sup>38</sup>

### 1.3 The concept of marginality as addressed in our research

The literature review shows that the concept of ‘marginality’ is applied with a wide range of implications in several disciplinary contexts, which to a certain extent overlap and borrow from one another. Still, each discipline approaches the topic with its own epistemological interest and its own methodologies, which are informed in turn by the data sets with which these disciplines operate. The field of ‘marginalities’ as outlined by geographic research gives the widest possible framework for our investigations. It also highlights the fact that the individual ‘forms’ of marginality overlap and intertwine. The nature of archaeological research is determined by some specific features of its data set, primarily its limitation to material remains, on the basis of which researchers deduce information about aspects of life in the past, including immaterial aspects, and the conditions associated with it. The spatial and chronological distributions of these material remains are primary categories of archaeological analysis. This may account for the fact that marginality that is expressed in spatial patterns is the primary type of ‘marginality’ studied in archaeological contexts.

Within our research group, ‘marginality’ is in most cases defined with regard to spatial distribution, be it in relation to ‘core’ settlement areas i.e. ‘centers’, or in relation to more favorable habitats which have been defined geographically. The two categories can converge but do not necessarily do so. For want of a better term, we call the first phenomenon ‘spatial marginality’, although this form of marginality often has socio-political causes and implications, since settlement centers are often also the centers of political power and social concentration. The second phenomenon comes closest to the standard ecological use of the term, and we therefore call it ‘ecological marginality’. Economic and social marginality do not necessarily possess a spatial dimension and are thus much less readily detectible in archaeological data sets. Still, several indications, such as the presence of deposits of raw materials and the differing degrees and forms of their exploitation can form the basis for assessing changing patterns of economic integration and marginalization. The same goes for social marginality, despite the fact that this may be the least discernable type from an archaeological perspective: detection of social marginality is usually limited to a recognition of its plausibility based on indirect evidence and complex argumentations.

Our working definition of ‘marginality’ implies that there is a condition of disadvantage associated with at least some, but not necessarily all factors determining the setup of communal and individual life in the relevant ‘marginal’ settings. This broad definition hinders the establishment of criteria for detecting ‘marginality’, which cannot be iden-

36 Turner 2010.

37 Vanotti and Perassi 2004.

38 Turner and Young 2007.



tified and characterized in the data sets available in the given (landscape-)archaeological contexts. On the other hand, it allows us to discuss constellations which may not be manifest in modern marginality scenarios or are not in the focus of, e.g. current geographical research, such as the colonization of new settlement areas despite their environmental marginality – a scenario investigated by several case studies in our research group.

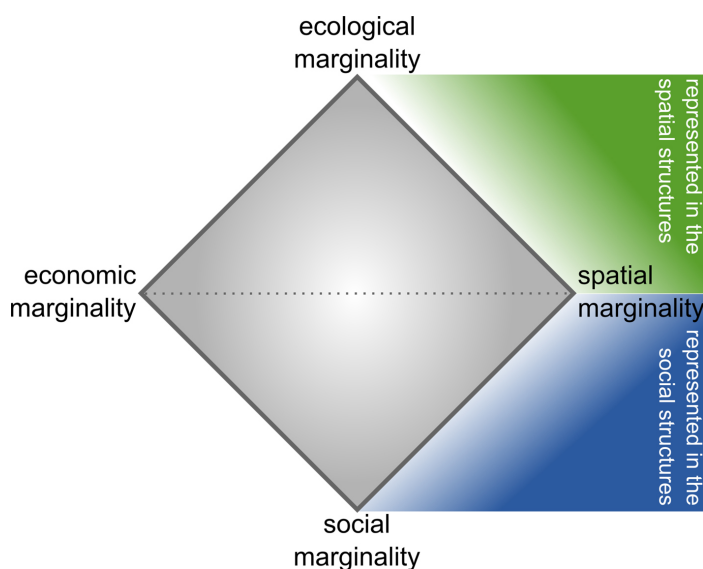


Fig. 1 | The four relevant forms of marginality and their representation, based on the research group Topoi A-1 *Ancient colonization of marginal habitats*.

One result of our open approach to discussing ‘marginality’ in past societies is the insight that marginality can be detected on the basis of very diverse material sources and lines of argument. Paraphrasing Callo-Concha<sup>39</sup> et al., we suggest that the diversity of natural and social conditions provides an innumerable great variety of ‘marginalities’, whose archaeological investigation – methodological as well as empirical – is only just beginning.

## 2 Case studies on ancient spatial marginality

The research group ‘Ancient colonization of marginal habitats’ selected a total of eight different study sites throughout the Mediterranean, northeastern Africa and northwestern Arabia in order to investigate the different aspects of marginality in areas colonized during antiquity (Fig. 1). In the following, the study sites are briefly introduced and discussed with regard to the different types of marginality.

Spatially marginal areas are located at a distance from major economic centers and feature poor infrastructure connections. In consequence, they are not closely linked to mainstream developments.<sup>40</sup> Another characteristic of spatially marginal locations is their proximity to the outer borders of a (political) system.<sup>41</sup> Thus the investigation of spatial marginality focuses on the analysis of spatial patterns of central (in terms of administration, craft/industry and trade)<sup>42</sup> and peripheral (marginal) areas.<sup>43</sup>

39 Callo-Concha and Ewert 2014, 58.

40 Brodwin 2001; Müller-Böker et al. 2004.

41 Leimgruber 1994.

42 Knitter, Blum, et al. 2013.

43 Gurung and Kollmair 2005, 13.

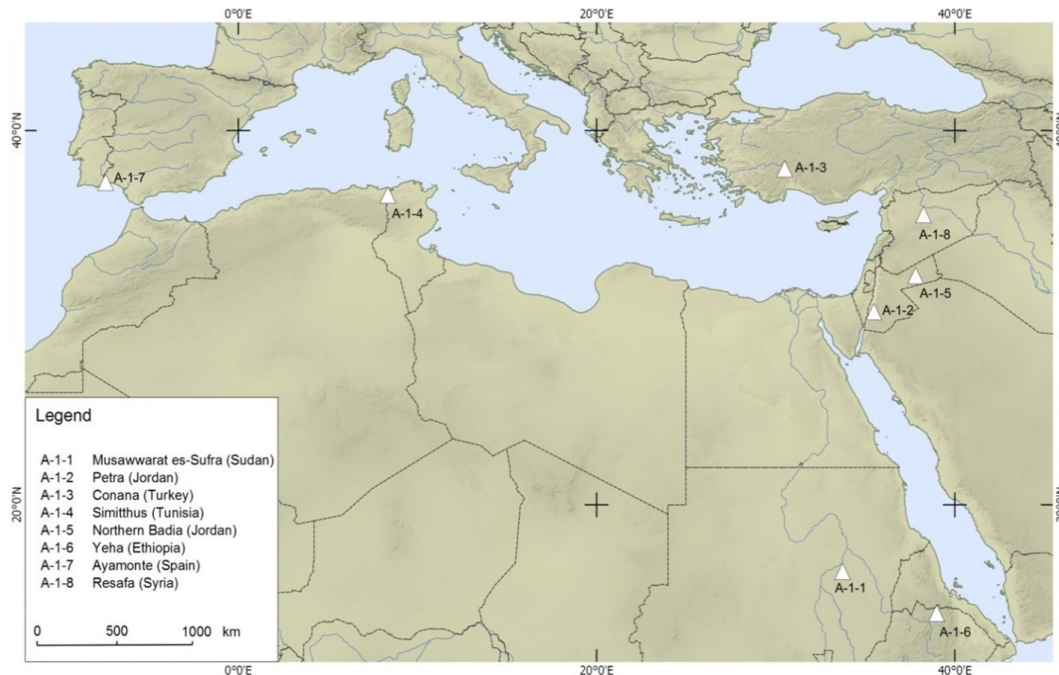


Fig. 2 | Distribution of the study sites of the research group Topoi A-1 *Ancient colonization of marginal habitats*. Triangles mark the center of the region of interest. Alphanumeric codes identify the research projects and are referred to in figures 3–10, below.

Colonization and habitation require conditions which are determined to a great degree by environmental factors. Colonization of unfavorable areas has frequently been accompanied by the development of techniques to overcome natural limitations, such as techniques for storing food and/or water, or, in dry areas in particular, water harvesting and water direction.<sup>44</sup> Natural environments changed in conjunction with colonization: natural landscapes were transformed into cultural landscapes, the sediment balance and water budget as well as the nutrient fluxes were altered. Non-sustainable settlement and land use strategies resulted in land degradation, frequently leading to deterioration of other site-related factors.

The study sites vary greatly with respect to their physical regions, and taken together they encompass a broad time span, ranging from the 5th millennium BC to the 1st millennium AD. At all of the study sites, the research has adhered to a settlement-archaeological approach, encompassing the use of similar methodological approaches. The analysis of the study sites consistently pursues the ultimate aim of a diachronic and geographical comparison.

Due to the location of the study sites in the Mediterranean, northeast Africa and northwestern Arabia, the natural environments at all of the sites had, at least temporarily, dryland character. In consequence, the availability of water plays a major role for all kinds of settlement activities. Moreover, especially in marginal habitats, the exploitation and utilization of building material and the transfer, adaption and advancement of each kind of engineering process are of heightened interest. It is necessary to ascertain which sets of spatial knowledge, such as knowledge on topography, precipitation and runoff patterns or the quality of locally occurring mining resources, the relevant communities had. In addition, the ways in which spatial and technical knowledge were implemented to create a living-friendly environment must be evaluated.

44 Beckers, Berking, and Schütt 2012; Beckers and Schütt 2013.

## 2.1 Musawwarat es-Sufra, Sudan (Topoi A-I-I)

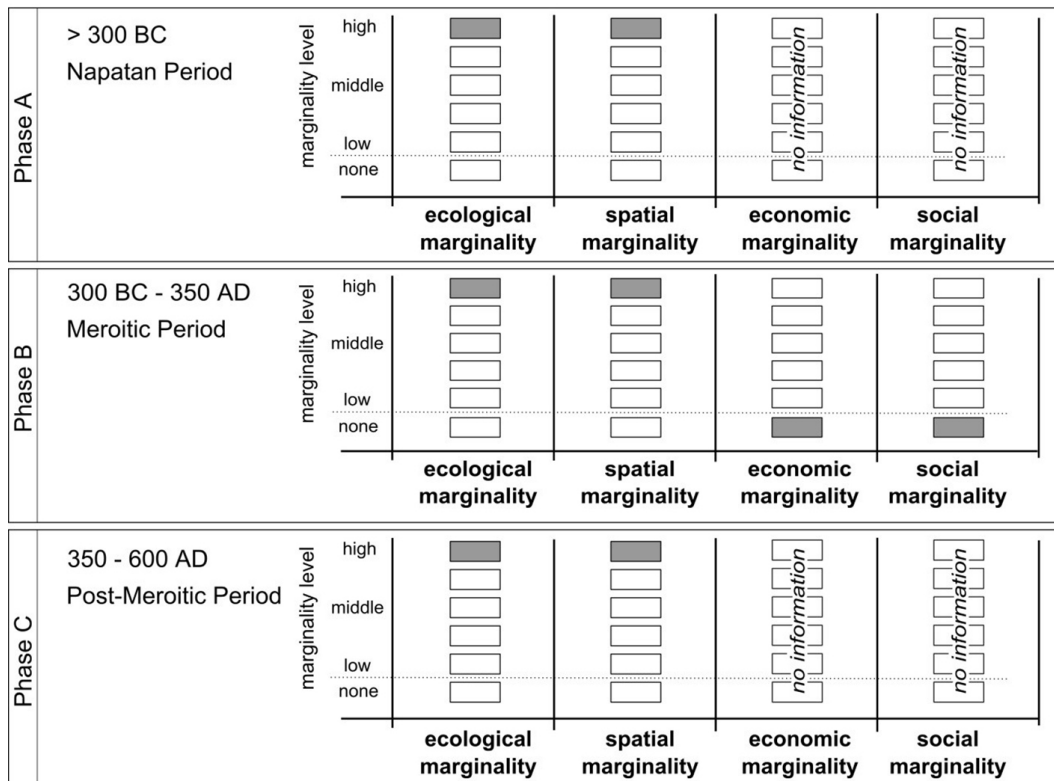


Fig. 3 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Musawwarat (Topoi A-I-I). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; 'no information' indicates the absence of data sources on which to base an estimation.

In the Napatan period (pre 300 BC), Musawwarat is marginal primarily in ecological terms, in relation to the 'core habitat' of the Kushite society i.e. the river oasis of the Nile valley. This ecological marginality translates into a spatial marginality: Musawwarat is the first (and for a long time the only) site colonized by the Kushites outside the Nile valley that featured monumental architecture and a state-supported religious topography. The socio-political position of Musawwarat is far from marginal: although we do not have any historical sources, the trajectory of the site and the input of resources apparent from the archaeological data show that it must have been of central importance to the Kushite rulers. In terms of social marginality we need to consider several groups with a potential presence at the site and their differential views of themselves and each other. We can assume that the Kushite elite, who developed and frequented the site, was not a marginal group. We are not in the position to make any statements about the social, and economic, status of the nomadic population who is thought to have frequented the region prior, during and after the development of Musawwarat as a religious center or about how they were perceived by the Kushite elite and the social majority of the river valley dwellers; similarly the self-perception of this nomadic component is not accessible to us on the basis of the available archaeological data. The economic situation is similarly complex. The technologies used in the development of Musawwarat were very advanced, and the site saw a huge input of resources. At the same time, as an intentional 'outlier', it was dependent on the Kushite 'core area' in the Nile valley. We have no data on the

economic potential of the nomadic population in the area, although it has been assumed that the development of Musawwarat was aimed at controlling them and siphoning off their production.

As far as the resolution of the archaeological and environment data allows an assessment, the parameters discussed remain unchanged in the subsequent Meroitic period (300 BC to 350 AD). The post-Meroitic period (post 350 AD) is not in the focus of the current research; archaeological data from the site are very limited for this era (for a detailed presentation of Musawwarat es-Sufra see section 3.1.)

## 2.2 Petra, Jordan (Topoi A-I-2)

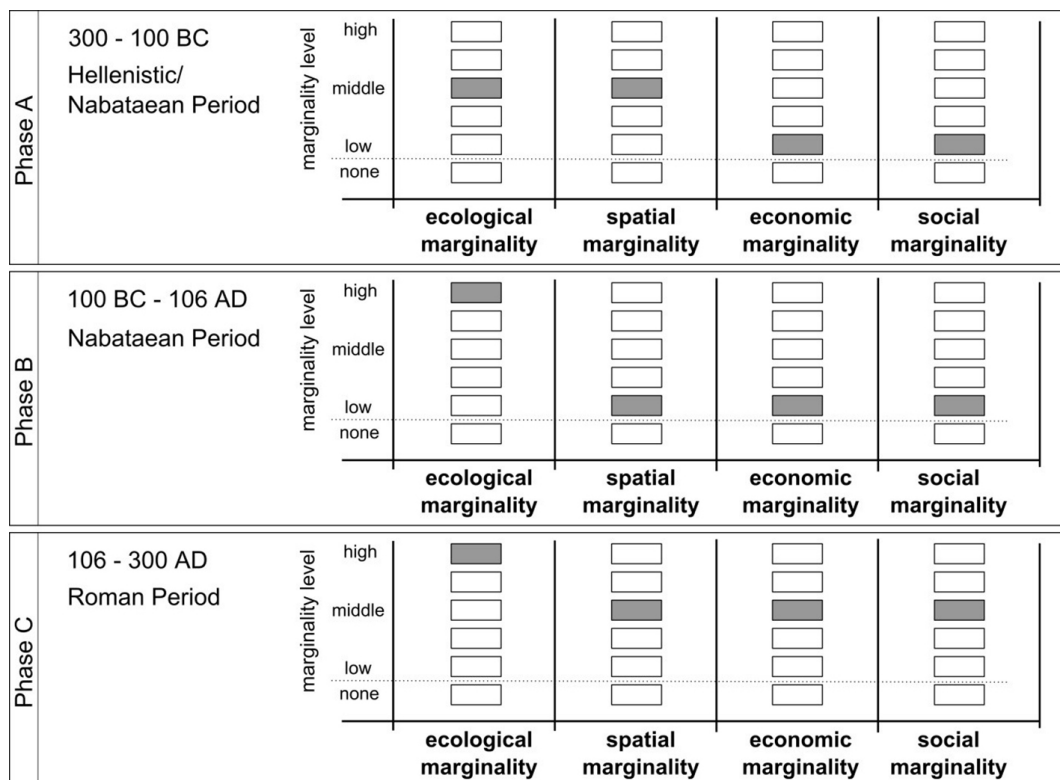


Fig. 4 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Petra (Topoi A-I-2). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; 'no information' indicates the absence of data sources on which to base an estimation.

Petra, in the southern part of modern-day Jordan, is located in a mountainous region within the eastern part of the Jordanian rift, itself part of the highly sensitive tectonic shift between the Arabian and the African continental plates.<sup>45</sup> Due to its situation in a semiarid region whose seasonal rainfall provokes heavy flashfloods, the site of the later city of Petra can be considered ecologically marginal. Petra was apparently once a non-permanent settling place for a group of Bedouins that was slowly transformed into the site of more permanent settlement from c. 400 BC onwards. Since the Bedouin life-style

45 For a recent general overview as well as for more specific approaches to the points briefly mentioned here cf. the various contributions in Mouton and Schmid 2013; van der Meijden, Schmid, and Voegelin 2012.

was adapted to the area's ecological marginality, the marginality percentage for this early phase is not as elevated as is the case in the following periods. On the other hand, the political importance of the site was low. Since the nomadic way of life was adapted to the environmental situation, economic and social marginality can be considered low.

Historical and archaeological sources indicate that the first efforts undertaken towards transforming Petra into a permanently inhabited place were made in the 4th to 2nd centuries BC. The archaeological record clearly indicates how difficult the struggle with the seasonal flashfloods was. Thus the location's ecological marginality increased considerably when the occupants of the site decided to settle there permanently. During the 1st century BC, at the latest, remarkable solutions were found for these problems, solutions which were as expensive and demanding as they were effective. Specifically, they entailed a well-functioning defense against the flashfloods and a well-functioning long-distance fresh water supply, which transformed Petra into an important central location and, as such, into the capital of the Nabataean kingdom. Interestingly, there seems to be no logical reason why the Nabataeans maintained what had once been a non-permanent settling place as a permanently occupied central place, since it would have been possible to find sites much better suited for the establishment of an urban center only a few kilometers away. It would appear, therefore, that some kind of 'illogical' emotional tie to the site was operating.

After the Roman annexation in AD 106, Petra remained a permanently occupied central place but lost its status as a capital of a political entity. Due to the environmental situation, the permanently inhabited settlement still can be considered ecologically marginal, and, due to the loss of its unique status, the new administration had less of an interest in maintaining the immense efforts that had to be undertaken to guarantee a permanently high living standard. This resulted in a slow decline in living quality. Due to the loss of its function as a capital, Petra's political marginality increased, as did its economic marginality since greater emphasis was placed on diversification in long-distance trade in this period than in the previous period. Social marginality probably did not change in general terms. Although one could expect that social changes/shifts did occur within the population living at Petra, these cannot be pinpointed using the evidence presently available.

### 2.3 Conana, Turkey (Topoi A-1-3)

Statements about the aspects of marginality of the fortified settlement (Kale Tepe), discovered in 2008, located high on a mountain near the site of ancient Conana (Gönen) in northwest Pisidia are still highly speculative. Previous study of the site has been limited to surface surveys conducted under the direction of Bilge Hürmüzlü, University of Isparta.<sup>46</sup> Very little in the way of reliable archaeological facts has been established for the surrounding landscape in the late Early Bronze to the Early Iron Ages either.

The hill-top settlement directly borders nomadically used plateaus. Agricultural products were provided by the neighboring lowlands. It has been clearly established that settlement had started by the Early Iron Age; earlier settlement activities are assumed. Presumably, settlement expansion took place on a large scale in the Hellenistic period.

The 'Dark Ages' phenomenon that occurs in parts of south-western Anatolia in the 2nd millennium BC<sup>47</sup> should be reconsidered against the background of the hill-top settlement and its hinterland. Central Anatolian Hittite sources do refer to towns and countries in south-western Anatolia, a report which is contradicted by the absence of

46 Hürmüzlü et al. 2011, 2 with fig. 4.

47 Vanhaverbeke 2003, 197–207.

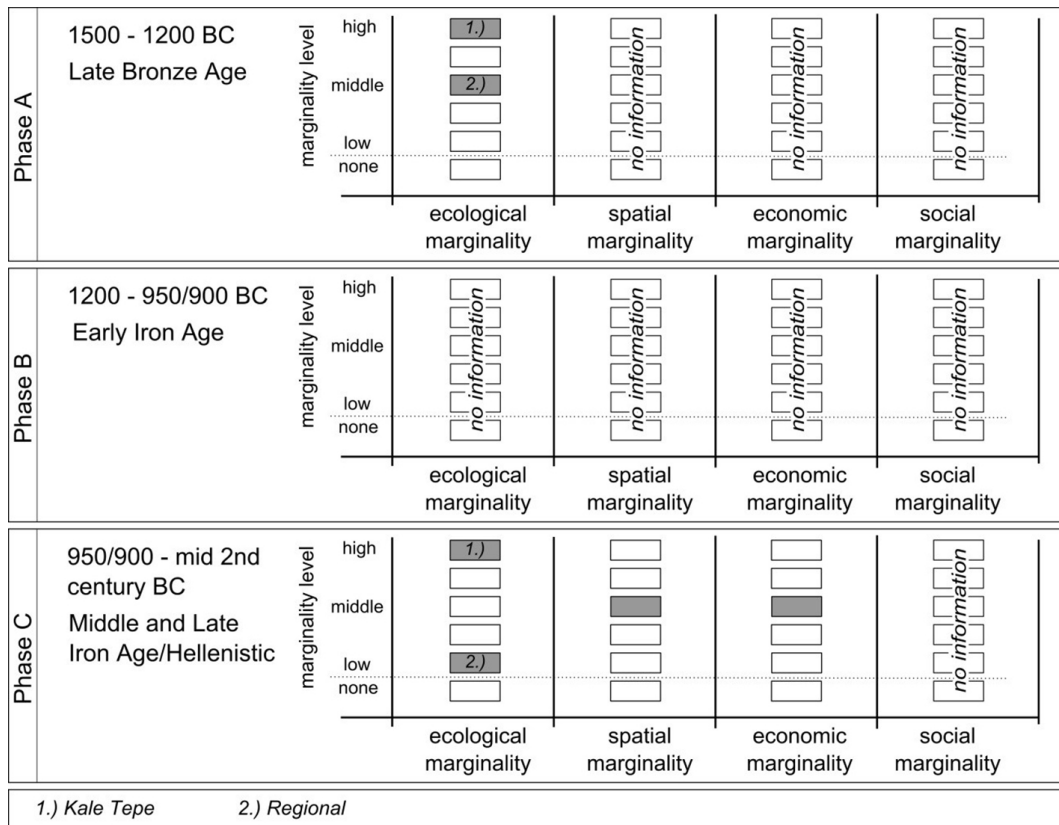


Fig. 5 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Conana (Topoi A-1-3). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; 'no information' indicates the absence of data sources on which to base an estimation.

evidence, or very limited evidence, of Late Bronze Age material culture and settlements in the area in the archaeological record. Based on the published results of a survey further south<sup>48</sup> one could hypothesize that Late Bronze Age settlers preferred hill-top locations for their settlements due to the politically unstable situation between the Hittite Empire and the periphery; i.e., that the marginality is the result of the geopolitical situation. A review of these settlements changes the picture, however: these settlements have been dated to various periods ranging from the Hacilar culture (6th millennium BC) to the early 1st millennium BC, and they are often associated with terrace cultivation. To a limited extent, we expect to find indications of similar terraces on the Kale Tepe.

#### 2.4 Chimtou, Tunisia (Topoi A-1-4)

Recent research has revealed some new evidence about the early inhabitation of *Simitthus* in the first millennium BC in the Medjerda valley of western Tunisia, where a roman colony was later founded under Augustus (Fig. 6). The earliest traces of settlement at the site found so far date to the fifth century BC., although some archaeobotanical evidence has been carbon dated to the eighth century BC<sup>49</sup> The few palaeoenvironmental studies

48 Paulissen, Vanhaverbeke, and Waelkens 2003, 68–73; Vanhaverbeke 2003, 195; Vanhaverbeke 2003, 198.

49 von Rummel, Broisch, and Schöne 2013; Khanoussi and Rummel 2012; see further for the topographic and chronological development of the city and her environment Rakob and Beschouch 1993, 1–16.

which have been conducted<sup>50</sup> indicate highly variable flooding activity during the colo-

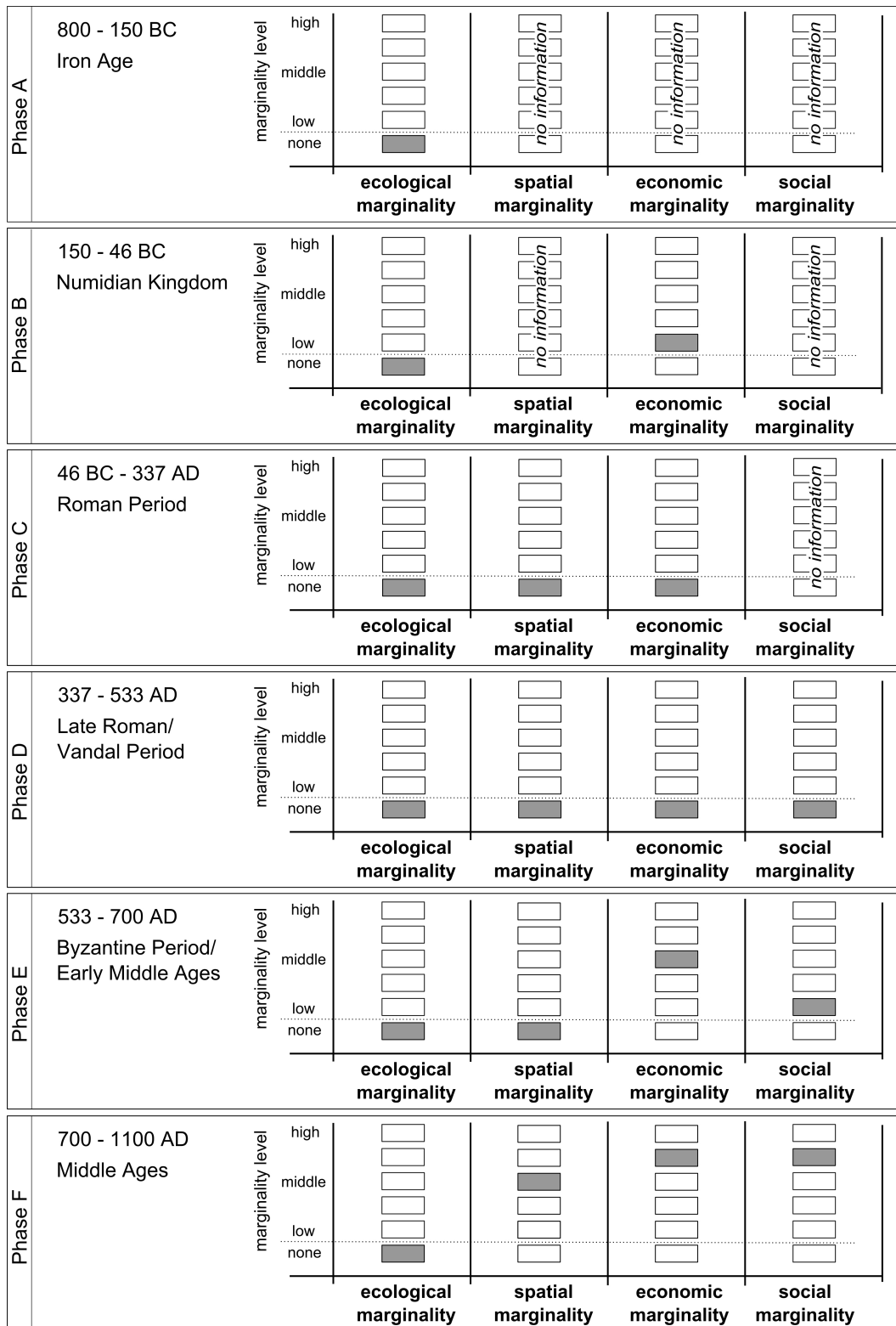


Fig. 6 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Chintou (Topoi A-1-4). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; 'no information' indicates the absence of data sources on which to base an estimation.

50 Zielhofer and Faust 2008; Zielhofer, Faust, et al. 2002.

nization of the site, which has now been verified by the deep excavation area at the later roman forum.

It is assumed that marble quarrying, probably the most important natural resource of Chimtou, started in a later but pre-roman settlement period; quarrying activity definitely occurred from the 2nd century BC onward. The first building entirely constructed of *marmor numidicum* was a large Hellenistic monument on the top of Chimtou's "temple hill", which was probably built by the Numidian king Micipsa<sup>51</sup>. Moreover there are large grave structures that document an increasing wealth of the population by least the end of the Iron Age. In 46 BC, after the defeat of Pompeius and Juba I., Chimtou and its surrounding area probably became part of the Roman province of *Africa*, acquiring the status of a *Colonia* under Augustus in 27 BC<sup>52</sup>. The main hypothesis by F. Rakob and J. Röder was that the quarries were at that point became imperial property and under imperial administration, with a large camp for workmen, prisoners and guards on one side of the "marble hills", whereas the Roman *Colonia Iulia Augusta Numidica Simitthensium* on the other side of the hill remained an independent juridical unit<sup>53</sup>. Dealing with and investigating these hypotheses and furthermore their influences on the landscape and city development are the major tasks of a current dissertation project within TOPOI research area A1.

Marble from Chimtou was in high demand as a luxury good in the Roman Empire from the 1st century BC onward<sup>54</sup>, causing an increase in marble quarrying activities. Parallel to the intensification of quarrying and trading activities, *Simitthus* expanded and gained political importance on a regional level. *Simitthus* prospered during the peak of the Roman Imperial period, especially under the reign of the Antonine and Severan emperors (second half of the 2nd – 3rd century AD), as did most other towns in North Africa<sup>55</sup>. *Giallo antico* was well-known throughout the Roman Empire, a fact which is due to the well-established trade routes<sup>56</sup>. The city benefited from its trading activities and also the agriculture in its territory. The city's prosperity is so far evidenced by many monumental entertainment building types, such as a theatre, an amphitheatre, several baths and the building of huge administrative and political structures around the forum,<sup>57</sup> as well as many temples in the urban area and a major cult centre on the so-called "Tempelberg" in the 2nd – 4th century AD.

Marble quarrying activities were probably disrupted in Late Antiquity, for reasons which are still not well understood. In the 4th century AD pagan places of worship began to be transformed successively into Christian buildings<sup>58</sup>. This and the big basilica from the 6th century AD, which was constructed in the area of the former so-called "Kaiserkulttempel"<sup>59</sup>, indicates that Chimtou maintained some relevance at least on the regional scale. The role of the bishop's seat and the evaluation of the city in the Byzantine period are especially not well documented and investigated. In the 7th century AD, at the latest, urban life at Chimtou diminished and its public buildings were gradually abandoned and suffered spoliation. Traces of the latest settlement at the site date to the 11th century AD.

51 Crawley Quinn 2013, 179–215; Rakob 1994, 1–38; Rakob and Beschaouch 1993, 5–8; Rakob 1979, 119–171.

52 von Rummel, Broisch, and Schöne 2013, 209; Rakob and Beschaouch 1993, 1 with complete bibliography.

53 See von Rummel, Broisch, and Schöne 2013, 209 to the whole discussion; Hirt 2010, 25–27.

54 See Zerres 2009, 272–280 and Schneider 1986, 142–160 with a complete list of the ancient literary sources and their discussion.

55 Jouffroy 1986, 233–237.

56 Most recently Russell 2013; Ward-Perkins 1951; Toutain 1896.

57 von Rummel, Broisch, and Schöne 2013; Khanoussi and Rummel 2012; Rakob and Beschaouch 1993.

58 von Rummel, Broisch, and Schöne 2013; Khanoussi and Rummel 2012; Leone 2007.

59 Scheduling et al. 2012, 192–200.



## 2.5 Northern Badia, Jordan (Topoi A-I-5)

The Northern Badia in northeastern Jordan forms part of the greater steppe desert Badiyat ash-Sham, which is located between the Middle Euphrates (Mesopotamia) and the Southern Levant. Due to the modern climatic conditions, characterized by low and seasonal rainfall, the region can be considered as ecologically marginal.

During the Late Neolithic period (LN) (Phase A, approximately 7000 to 5000 BC) the population of Northern Badia consisted of indigenous hunter-gatherers and incoming pastoralists, or mobile hunter-herders, whose material culture is associated with a vast number of archaeological sites, including traps for hunting animals (known as 'kites') and seasonal camp sites.<sup>60</sup> The LN economy was pursued on a seasonal basis, concentrating mainly on intensive gazelle hunting and pastoralism and perhaps on opportunistic agriculture.<sup>61</sup> These economic activities were primarily subsistence oriented and almost met the demands of the local population. From the local perspective, the economic marginality level can therefore be estimated as low. By contrast, from the external perspective the economic marginality level of a self-supplying population of this kind can be estimated as high (LN centers in the west). However, the existence of exchange contacts between the populations of both regions cannot be ruled out, a factor which would lower automatically this economic marginality. Detailed climate information for this period are unavailable for this entire region. In fact, general palaeoclimate trends in the Old World's desert belt indicate aridization during this time, but these regions were characterized by still pristine landscapes, with intact vegetation covers. Therefore, one would have to assess the Late Neolithic economic valorization of the area by hunting and mobile pastoralism as adapted and sustainable to the habitat, which was characterized by dry climatic conditions on the one hand and an intact physiographic landscape on the other hand. The ecological marginality should therefore be evaluated as lying at mid-level. With respect to the level of spatial marginality of this region in the LN, the marginality can be also be rated as mid-level, since, as stated above, (exchange) contacts to the LN centers in the rain-fed regions to the west cannot be ruled out. Information on the social marginality is not available.

Climate proxies assume temporarily slightly wetter than present-day climate conditions in the (Late) Chalcolithic and the Early Bronze Age (C/EBA) (Phase B, 5000 to 3000 BC).<sup>62</sup> Consequently, environmental changes must have resulted in a decrease in the ecological marginality of the region due to more favorable habitats. However, specific forms of economic activity have been identified for various parts of the Northern Badia that are characterized by different topographic and ecological conditions. As a result, the assessment of the ecological marginality of the entire region must be differentiated according to region: we find an almost high marginality for the mining region in the east, a middle to low marginality for the basalt desert and a low marginality for Jawa, a large fortified C/EBA settlement in the western part of the basalt steppe desert in the Northern Badia. Lacking any information on the sociopolitical structures in Jawa in the C/EBA to date, we must speculate that Jawa's spatial and economic marginality was low since is probably served as a gateway community in the region, involved particularly in trading and exchange activities in local, regional and supra-regional ranges.<sup>63</sup> Recent archaeological and geographical surveys indicate that the C/EBA economic activities in the entire region are characterized by the production and trade of flint tools, pastoralism and agriculture.<sup>64</sup> The basaltic region of the Northern Badia was frequently used as pasture

60 Betts and Colledge 1998; Rollefson, Rowan, and Wasse 2014.

61 Rollefson, Rowan, and Wasse 2014.

62 Issar and Zohar 2004.

63 Müller-Neuhof 2014.

64 Müller-Neuhof 2014.

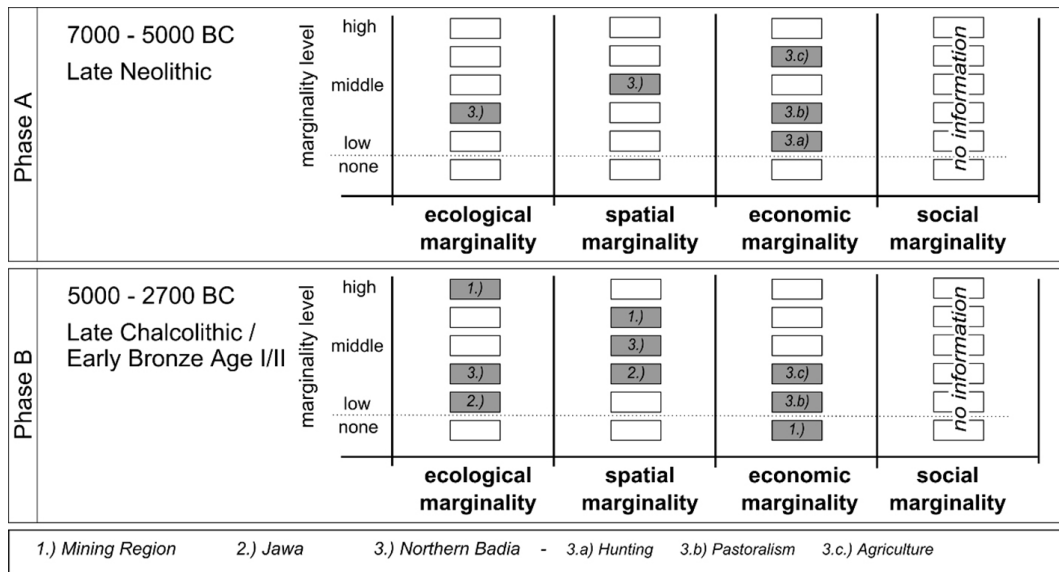


Fig. 7 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Northern Badia (Topoi A-1-5). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; 'no information' indicates the absence of data sources on which to base an estimation.

by mobile pastoralists, as indicated by the remains of numerous camp sites with animal pens. Intensive agricultural activities are indicated by the existence of several presumably agriculturally used terraced gardens in the close vicinity of the C/EBA settlements of Jawa and Tulul al-Ghusayn.<sup>65</sup> A large flint mining region in the eastern part of the Northern Badia shows intensive mining and export-oriented tool blank production activities.<sup>66</sup> Due to its location at a great distance from Jawa, the hypothetical C/EBA central settlement of this region, its spatial marginality seems to have been high. However, the identification of two probably permanently inhabited C/EBA settlements east of Jawa close to the eastern edge of the basalt desert (Tulul al-Ghusayn and especially Khirbet Abu al-Husayn) qualifies the high spatial marginality of the mines, as they were not so remote from these settlements. The economic value of the mines however, was not marginal at all, since the production of characteristic C/EBA flint tools in these mines was clearly supra-regional export-oriented. Thus Northern Badia as a whole, was therefore economically not marginal, but the level of local economic marginality was related to the economic activity. The level of the spatial marginality of the various parts of the region also varied, but it can be considered to fall at mid-range for the entire region on the average. No information on the social marginality is available.

## 2.6 Yeha, Ethiopia (Topoi A-I-6)

There is evidence of intensive cultural and technological transfer between the South Arabian territorial state of Saba and the Horn of Africa starting in the early 1st millennium BC. This transfer is related to the migration of Sabaean populations to the Abyssinian highlands. Economic contacts between the two regions played an important role from the Bronze Age onwards.

<sup>65</sup> Müller-Neuhof 2014.

<sup>66</sup> Müller-Neuhof 2013a; Müller-Neuhof 2013b.

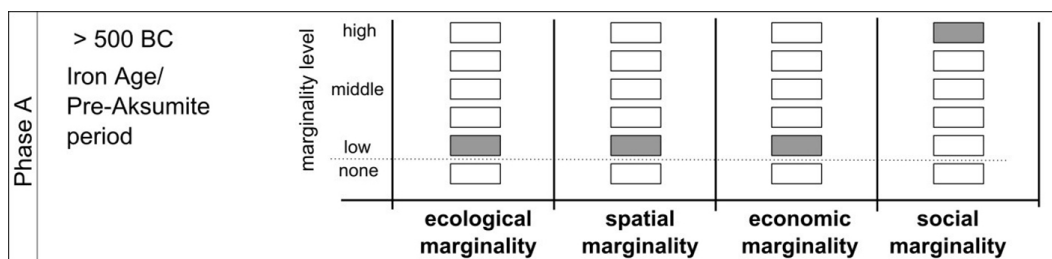


Fig. 8 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Yeha (Topoi A-I-6). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; 'no information' indicates the absence of data sources on which to base an estimation.

The pre-Aksumite site Yeha is located in a fertile basin 35 km east of Aksum in the Abyssinian highlands, in the province of Tigray. The area is surrounded by mountains which are used today with terraced field systems. The steep mountain ranges are intercalated by plateaus, some of which were probably populated at least from the first millennium BC, in association with the agricultural use of the flat areas featuring fertile soils. Compared to the Sabaean cultural homeland in the arid desert fringes of Yemen, almost ideal environmental conditions prevailed in this region: periodic rainfall allowed rainfed agriculture and perennial springs secured the water supply for humans and livestock during the dry season. Based on current findings from Di'amat there was no adaptation of the irrigation practices known from the South Arabian oasis cultures of the desert fringes. These irrigation practices were probably not necessary in Tigray since only small agricultural units were required to the supply of the local population. Based on this, the ecological marginality can be estimated as low.

It is apparent that Yeha played the role of regional center for the community of Di'amat, which could be characterized as a union of various sites, significant for trade, or of strategic, political or ritual importance. Testifying to this role are two inscriptions from other sites which refer to Yeha and the monumentality of its sacral and secular buildings, which have no parallel elsewhere in the region. Therefore Yeha's political and spatial marginality is assessed as low.

It is not yet possible to definitively establish the reasons for the Sabaean migration to the northern Horn of Africa, which started in the 9th century BC at the latest. We do not yet have clear epigraphic and archaeological evidence allowing us to do so. But the use of local natural resources (gold, ivory, incense), the securing of trade routes and the control of incense producing areas could have played a crucial role for the settlement of Sabaean in this region. In consequence, the economic marginality is estimated as low. However, due to the sparse availability of archaeological findings this assessment must be understood as a hypothesis.

In contrast, social marginality in Yeha is estimated as high: As a result of the Sabaean migration process in the regions of present-day southeastern Eritrea (ʾAkkälä Guzay) and northern Ethiopia (Tigray) for the first time a differentiated society with a hierarchical social structure is attested. This Sabaean migration makes itself apparent in the spread of South Arabian cultural forms, which led to a sustainable cultural change in these areas. This affects the spheres of political, social and religious life.

A social gap between the Sabaean settlers, with their differentiated social system and great technical expertise, and the indigenous population must be assumed. This assumption is derived by a generalizing process of elimination: anything that is not characterized as South Arabian could be indigenous or has already undergone a acculturation process. There is as yet no actual evidence of the indigenous culture of the early 1st millennium BC for the area of the Sabaean migration.

Construction of the monumental buildings of Yeha must have entailed a large amount of labor, probably with a workforce recruited from the indigenous population. The so-called Di'amat formula in Ethio-Sabaeen inscriptions, a formula with which the Sabaeen rulers lay their claim to power, reveals a social (“Sabaeans and the native settled population”) and ethnic (“population of red and black skin”) definition of the population.

## 2.7 Ayamonte, Spain (Topoi A-I-7)

The present-day Spanish town Ayamonte is located at the mouth of the Guadiana river. It is built at the site of a Phoenician settlement which was later used by the Romans. The Phoenician settlement was founded as a colony at the western margin of the Phoenician

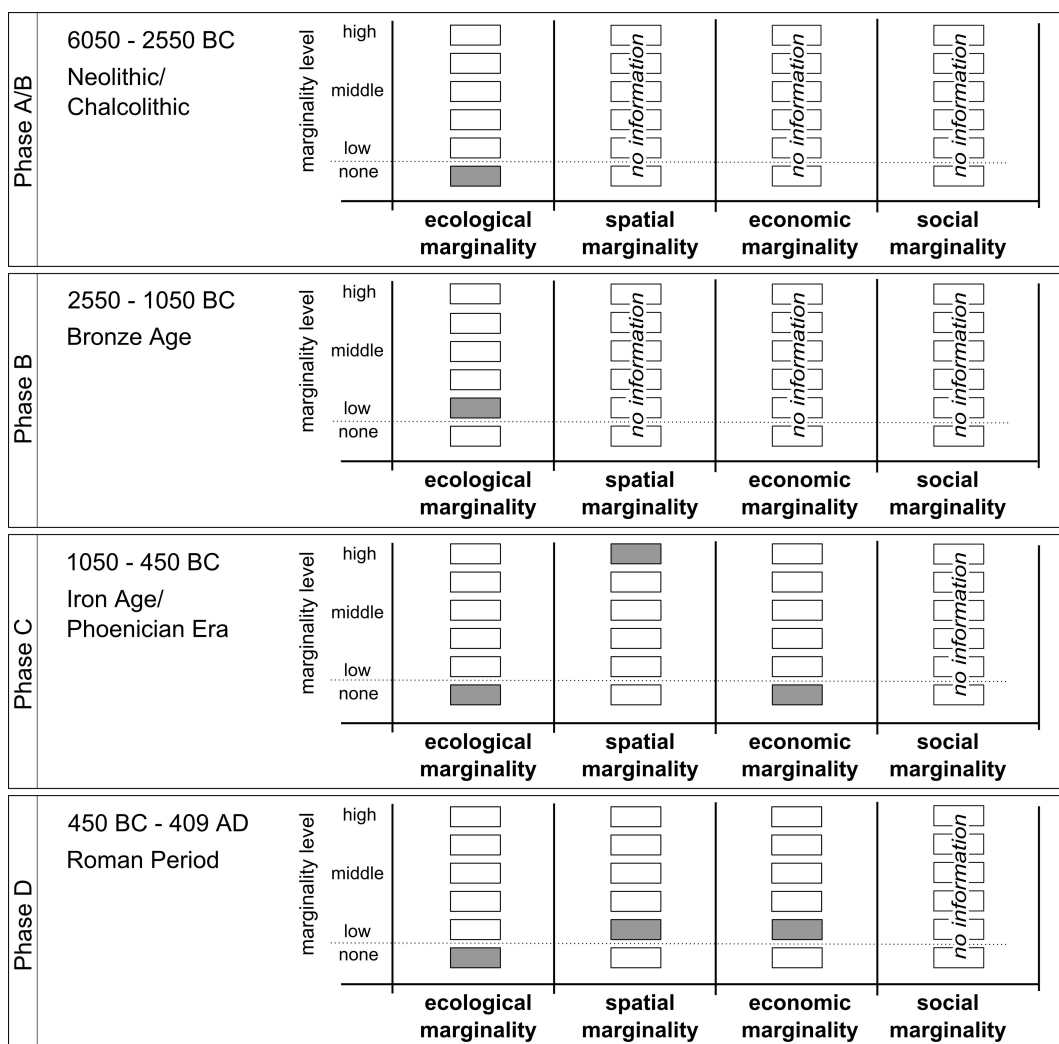


Fig. 9 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Ayamonte (Topoi A-I-7). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; ‘no information’ indicates the absence of data sources on which to base an estimation.

empire. The richness of the natural settings, the topographic suitability for strategic settlement and the availability of ores in the hinterland made the site eligible for coloniza-

tion. Due to the perennial availability of water, access to the ocean, periodical rainfall<sup>67</sup> and nutrient-rich soils, the environmental setting provided ideal settlement conditions; therefore, ecological marginality is assessed as irrelevant during all settlement periods.

During the Neolithic and Chalcolithic periods, the area around Ayamonte was already settled, however the archaeological record for those periods is limited, making it impossible to draw conclusions about any kind of spatial, economic or social marginality.

During mid and late Holocene, the environmental setting changed only slightly, with increasing aridity and increasing temperatures. During the Bronze Age increasing settlement activities caused a deforestation of the area, resulting in land degradation.<sup>68</sup> These changes of the environmental settings caused a slight deterioration of what was, in general, an ecological habitat suitable to human settlement (cf. Fig. 9, Phase B). The archaeological data indicating Bronze Age settlement do not provide information which would permit the characterization of the spatial-, economic- and social marginality.

In the beginning of the Iron Age and at the start of Phoenician colonization, the palaeoclimate exhibits an increasing humidity, causing changes in the environmental setting, and thus producing altogether ideal ecological conditions.<sup>69</sup> The Phoenician colony itself, situated as it was at the western edge of the Phoenician empire, was associated with high spatial marginality due to its remoteness within the Phoenician trading system. Due to the mining and processing of ores and their spread through the Phoenician empire through trade, the colony had an increasing economic impact, resulting in low economic marginality. As above, the archaeological record does not permit any assessment of the social marginality.

Ideal environmental conditions continued during the Roman settlement phase.<sup>70</sup> The overall levels of social and economic marginality also remained unaltered. Ayamonte was located within the border zone of the provinces Lusitania and Baetica. To the south, the Roman province of Mauretania Tingitana linked northern Africa to the Roman Empire. Thus we estimate the spatial marginality of Ayamonte is as low.<sup>71</sup> The spatial marginality fell dramatically with the transition to the medieval times and then again during the Reconquista and the start of the Age of Exploration.

## 2.8 Resafa, Syria (Topoi A-I-8)

Resafa can be considered an ecological marginal place in the 1st century AD, since it lies in the middle of the Syrian desert steppe and has no direct water supply (natural spring or river). Only in the period of spring rains, does runoff water temporarily appear in the wadi, which formed along the edge of a tectonic fracture, running from north to south.<sup>72</sup>

In the late Roman period, Resafa can be considered to have become a geopolitically marginal location within the Roman Empire upon construction of a Roman Limes fort. Sergios, an officer of the Roman army, suffered a martyr's death in front of the fort in AD 312. As a result, the place, now called Sergiupolis, gained importance as a pilgrimage center and underwent substantially expansion starting in the late 5th and going on into the 6th century (city walls, cisterns, five church buildings). Tremendous efforts (building of huge water reservoirs fed by the wadis) were undertaken in order to provide water for the settlement, which had an estimated population of 5000–10 000 persons (figure extrapolated from an estimated storage volume of the cisterns of approximately

67 Pons and Reille 1988; Faust and Diaz del Olmo 1997.

68 Diaz del Olmo and Recio (unpublished).

69 Faust and Diaz del Olmo 1997.

70 Faust and Diaz del Olmo 1997.

71 Tovar 1976; Nony 2001; Bechert 1999.

72 Beckers and Schütt 2013.

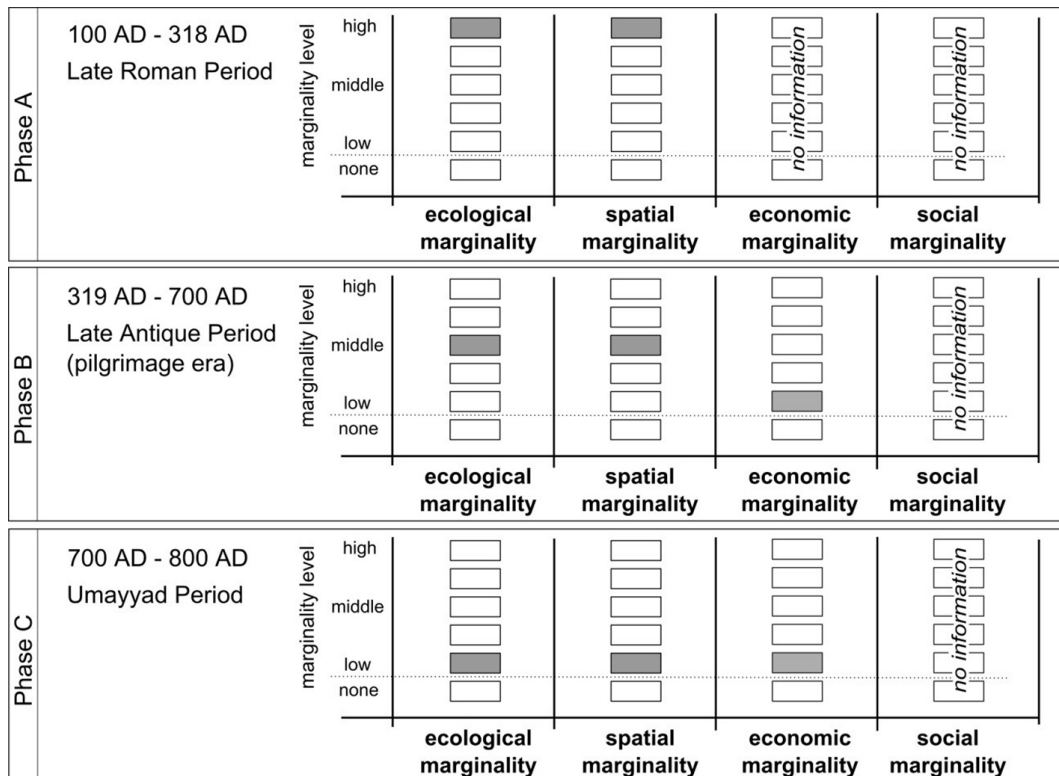


Fig. 10 | Estimation of the marginality levels of the social, spatial, economic and social marginality for the given time slices in the research region of the project Resafa (Topoi A-I-8). The estimation of marginality is linked to the correspondent regional context. The grey boxes indicate the estimated level of marginality; 'no information' indicates the absence of data sources on which to base an estimation.

20 777 m<sup>3</sup>).<sup>73</sup> The hinterland, however, remained an ecologically marginal area due to the lack of water. Rain-fed agriculture was restricted to the springtime and supported by the construction of dams which were designed to collect and store water in enclosed fields.

Starting in the second quarter of the 8th century AD, the fortified city Resafa-Sergiupolis was expanded southwards, with a 3 km<sup>2</sup> area used as a residence of the Umayyad Caliph Hisham b. Abd al-Malik (ruled from AD 723 to 744). This area, located outside the city walls, shows previous traces of settlement activities and underwent expansion during the Umayyad period, involving the construction of palatial buildings. During this period, the settlement, then called Rusafat Hisham, became a residence and place of pilgrimage (the Caliph Hisham is the guardian of this holy place, who is revered by Christian and Muslim believers), which constitutes its role as a central place on the periphery within a marginal environment.

### 3 Selected case studies

In the following, two study sites of the group *Ancient colonization of marginal habitats* are introduced in more detail. These case studies have been selected for their different characters in marginality and the reasons for their colonization.

73 Garbrecht 1991; Brinker 1991.

### 3.1 Musawwarat, Sudan (Topoi A-1-1)

The Kushite Empire (c. 750 BC to 350 AD) was the only one in a long succession of historic societies in the Nile valley which colonized the drylands outside the fluvial oasis of the Nile valley as a monumental arena of religious life. The site of Musawwarat – which was inscribed in the UNESCO World Heritage List in 2011 – is the most important testimony to this unique move, and as such it lends itself to investigate this trajectory in its conditions as well as its consequences.

Musawwarat es-Sufra is located in today Sudan, about 180 km northeast of the modern capital Khartoum, 25 km away from the Nile valley in what is now the semiarid landscape of the Keraba. Its main archaeological remains are distributed over a core zone of c. 1 x 3.5 km within a wide wadi bordered by escarpments of Cretaceous sandstone plateaus (Fig. 11). Archaeological monuments comprise a major sacral complex, several additional temples and shrines, monumental water harvesting installations – the so-called *hafayir* – and some smaller features. In antiquity, as now, the yearly summer rains were the only available source of water in Musawwarat. Today precipitation amounts to c. 100 mm/a.<sup>74</sup> In the first millennium BC it would have been only somewhat higher, but interannual fluctuations were probably lower.<sup>75</sup> Thus, in the Kushite period the environment of Musawwarat corresponded to a dry savannah.<sup>76</sup> The evidence for settlements and burial grounds at the site is very limited and difficult to date. However, its minor extent rules out any sort of permanent occupation in Kushite times or any other period. Despite the lack of direct evidence, we assume that the region was inhabited by a nomadic population – as it still is today. Indeed, a substantial pastoral production has been assumed by some researchers, but is debated by others.<sup>77</sup> In relation to the Nile valley, which formed the core settlement area of the Kushites, the region of Musawwarat can be defined as marginal. The ecological conditions, which did not support settled life or the mixed agricultural production that has been suggested to have formed the subsistence basis of the Kushite society, constituted the main factor responsible for Musawwarat's marginality.<sup>78</sup>

One of the earliest archaeologically testified events in Musawwarat is the establishment of a sacral complex in the Napatan era. Its early stages are poorly known, as the buildings of the first phases were completely torn down to make way for later rebuilding and enlargements. Eventually, the complex developed into an architecturally unique assemblage, the so-called Great Enclosure (Figs. 11–12: I A), which covers an area of c. 43 000 m<sup>2</sup> and comprises three temples, partly erected on artificial terraces, connected by ramps, corridors and passages, and surrounded by huge walled courtyards. The exact function of the Great Enclosure is still debated, not least because of the almost complete absence of formal decoration i.e., reliefs and related inscriptions, which could aid interpretation. Its first excavator suggested that the structure was a religious site and pilgrimage centre, whose central temple was dedicated to Amun-Re, while the courtyards may have served as gathering and sheltering places for the large crowds coming from the Nile valley during religious festivals.<sup>79</sup> Later researchers interpreted the Great Enclosure as the Meroitic 'National Shrine', as the main place of worship of the Meroitic lion

74 Berking, Cubasch, et al. 2012.

75 Scheibner 2004; Scheibner 2005; Scheibner 2014; cf. also Berking and Schütt 2011; Berking, Cubasch, et al. 2012.

76 Scheibner 2004; Scheibner 2005. Detailed geoarchaeological investigations have been conducted at the Meroitic site of Naga, 17 km southeast of Musawwarat; see e.g. Berking and Schütt 2011; Berking, Kaufman, et al. 2011.

77 See Edwards 2004, 166 with further references; cf. also Weschenfelder 2014.

78 Again, direct archaeological or historical data are missing, at least for the first part of the Kushite period i.e. the Napatan era (Edwards 2004, 136). For the subsequent Meroitic era see Edwards 1996, 20–27; Edwards 2004, 164–167.

79 Hintze 1984, 337–338.



Fig. 11 | The core zone of the site of Musawwarat es-Sufra.

god Apedemak, as a palace and a place of investiture of the Meroitic kings or even as an elephant training camp.<sup>80</sup> Today, it is widely accepted that the three main building complexes of the Great Enclosure represent temples; many of the ancillary rooms have been interpreted in relation to cult activities and the presence of the king during religious ceremonies.<sup>81</sup> Recent 14-C dates confirm older investigations which suggest that most of the extant parts of the monument – which total c. 5 km of running walls – belong to what is conventionally considered the sixth major building phase, dating to the early Meroitic period, i.e. the 3rd to 2nd centuries BC.<sup>82</sup>

While many details regarding the early development of the Great Enclosure are still debated, important progress has been made towards understanding the technological and logistic requirements which had to be met in order to establish Musawwarat as a religious center. These requirements included not only building materials in vast quantities – most of it came from quarries within the valley of Musawwarat –, but also appropriate transport technologies, the organization and the sustenance of the workforce to construct and maintain the monuments at the site, and first and foremost a continuous availability of substantial amounts of water throughout, or at least during major parts of, the year. The allocation of water was secured by the construction of *hafayir*, monumental water-harvesting installations, four of which have been found at Musawwarat and its immediate surroundings (Fig. 11).<sup>83</sup> *Hafayir* were built to collect and store the surface runoff during

80 For a synopsis of the history of these interpretations see Wolf 2001.

81 Eigner 1999; Eigner 2010.

82 Scheibner 2011; Näser 2013; contra Näser 2011.

83 Scheibner 2004.



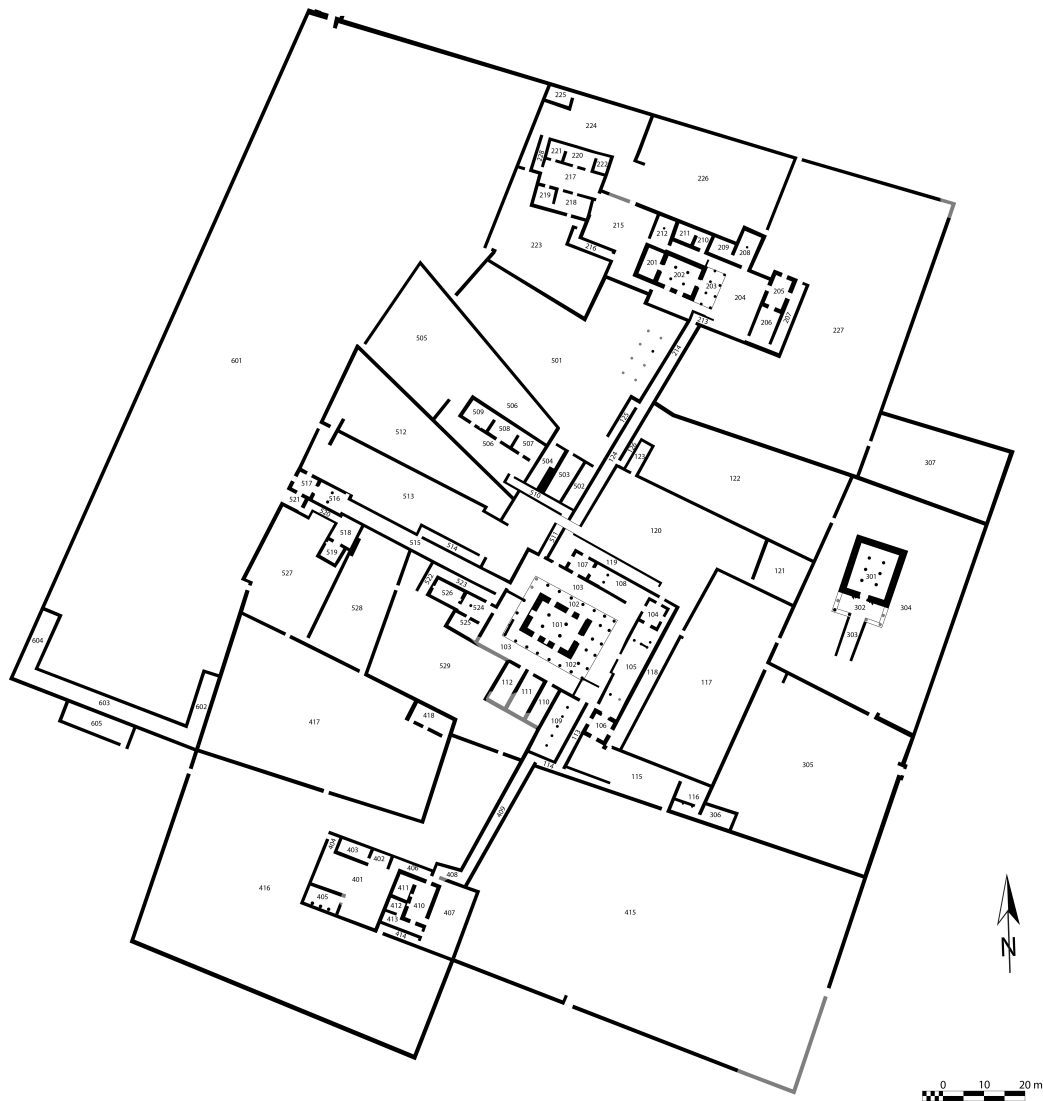


Fig. 12 | The Great Enclosure of Musawwarat es-Sufra.

the rainy season.<sup>84</sup> They consist of two main components: a reservoir basin surrounded by an embankment, built of the excavated material from the digging of the basin, and varying installations in the inlet area, designed to channel, direct and clear the incoming water. The basin of the Great Hafir at Musawwarat has a diameter of c. 210–230 m; its storage capacity is calculated to 262 000 m<sup>3</sup>.<sup>85</sup> In terms of its position and alignment the *hafayir* is orientated towards the drainage system in the valley of Musawwarat, but as it is built outside the main runoff zone of the wadi, it is also effectively protected from damage by fluvial erosion and overflowing. While earlier research has connected the construction of the *hafayir* in Musawwarat and other sites to the Meroitic era, current 14-C dates from the Great Hafir indicate that it was already built in Napatan times, probably prior to the other monumental structures at the site.<sup>86</sup> It impressively illustrates how advanced

84 For the structure and the functioning of these installations see Scheibner 2004, Scheibner 2005 and Näser 2010. For a modeling of the hydrological conditions at Naga see Beckers, Berking, and Schütt 2010.

85 Cf. Scheibner 2004.

86 Näser 2011; Scheibner 2011.

infrastructural measures were used to compensate for the unsuitable natural water supply of the area – underlining the nexus between the colonization of the region by the Kushite society and the development and application of technological knowledge.

As Marijke van der Veen has remarked, a propos the settlement of the Egyptian oases, “the concept of ‘marginality’ is, in fact, often used in contexts where a certain inferiority is implied”.<sup>87</sup> She argues that this may be a limiting perspective, and the case of Musawwarat indeed opens up a whole range of questions regarding the status of its marginality. Undoubtedly the site represented a marginal habitat from the perspective of and in relation to the Kushite core ‘habitat’ i.e. the Middle Nile valley. Nonetheless Musawwarat was singled out for the establishment of a sacral complex which eventually grew into one of the main religious centers of the Meroitic era – despite its ecologically and environmentally suboptimal conditions. Paradoxically, it is precisely the marginality of Musawwarat which aids in its understanding: it shows that the development of the site was not a ‘self-propelling’ process, but must have been initialized and controlled by specific socio-political motivations and interests.

Several researchers suggest that the foundation of Musawwarat should be connected to a shift in the Kushite economic system, its territorial organization and its socio-political structure.<sup>88</sup> They read the sacral colonization of the Keraba as an attempt by the Kushite rulers to establish a more direct influence in the regions outside the Nile valley in order to control and integrate the nomadic population and siphon off their pastoral production. Recently, another interpretation has been put forward: it suggests that the ancestors of the Kushite rulers came from the regions southeast of the Keraba and that with the return into the savannah outside the river valley they ‘revived’ traits of their cultural repertoire.<sup>89</sup>

At the present state of our knowledge, these assumptions remain speculative. Still, the efforts undertaken by the Kushites to establish Musawwarat as a religious center prove that the colonization of the site must have been founded in a firm political interest, which resulted in the mobilization of substantial resources. These resources included not only material input and the workforce, but also ideational investments, i.e. the creation and widening of topographic knowledge, knowledge of the range and the appropriateness of specific transport techniques, and above all advanced skills in the site’s water management. Moreover, they also comprised the establishment of new forms of sacral architecture and of a new sacral topography, centering around the lion god Apedemak, whose earliest known temple was erected by the early Meroitic ruler Arnakhamani next to the Great Hafir at Musawwarat (Fig. 11).<sup>90</sup> The archaeologically explored trajectory of Musawwarat thus widens our perspective in investigating marginality, suggesting that the marginality of the site in this case was the qualifying, rather than a adverse factor. This shows that we must not limit our analytical frame of reference to scenarios in which marginality is connected to inferiority or disadvantage. This realization resonates with a phrase by Irving Chan Johnson, who explores images and social practices which “centre marginality as an important component of cultural and ethnic identity.”<sup>91</sup>

### 3.2 Ayamonte, southwest Spain (Topoi A-1-7)

Ayamonte is situated at the mouth of the Guadiana river located in the southwestern Iberian Peninsula. The project aims to develop an understanding of the Late-Holocene estuarine landscape changes within the Guadiana river mouth and is associated to the

87 Van der Veen 1998, 221.

88 See Edwards 2004; Weschenfelder 2014 with a survey of older contributions.

89 Scheibner 2014; Wolf 2014.

90 See Näser 2011 with further references.

91 Johnson 2011, 116.

excavation of a Phoenician settlement in the modern city of Ayamonte. Part of the geoarchaeological research undertaken within this project is intended to verify the existence of a lagoon harbor in the lee of a weather-exposed ridge close to the settlement. Moreover, the research is assessing the human impact during Phoenician colonization, emphasizing deforestation and soil erosion processes. The primary goal is to gain information about the relations between the colonizing Phoenician society and its environment.

Ayamonte is located in the lower Guadiana basin, in the western margin of the Spanish province of Huelva near the western border with Portugal (Fig. 13B). The local bedrock is very heterogeneous and consists of Carboniferous shales, fossil-rich Paleozoic greywackes, volcanic dolerites, Triassic limestones and red sandstones as well as Quaternary sand- and silt deposits.<sup>92</sup> The relief is characterized by steep slopes and deep incised rivers. The climate is of Mediterranean-type, with hot, dry summers with at least two months of drought, and mild winters during which the majority of rain falls.<sup>93</sup>

Prior to the discovery of the Phoenician settlement and necropolis in the modern town of Ayamonte, the Guadiana estuary was a *Terra Incognita* in terms of Phoenician settlement activity.<sup>94</sup>

The Phoenician period on the Iberian Peninsula started around the 1st millennium BC and was characterized by an apparently systematic colonization of the coastal strips of modern Spain.<sup>95</sup> The Phoenician colony in modern Ayamonte was located in the

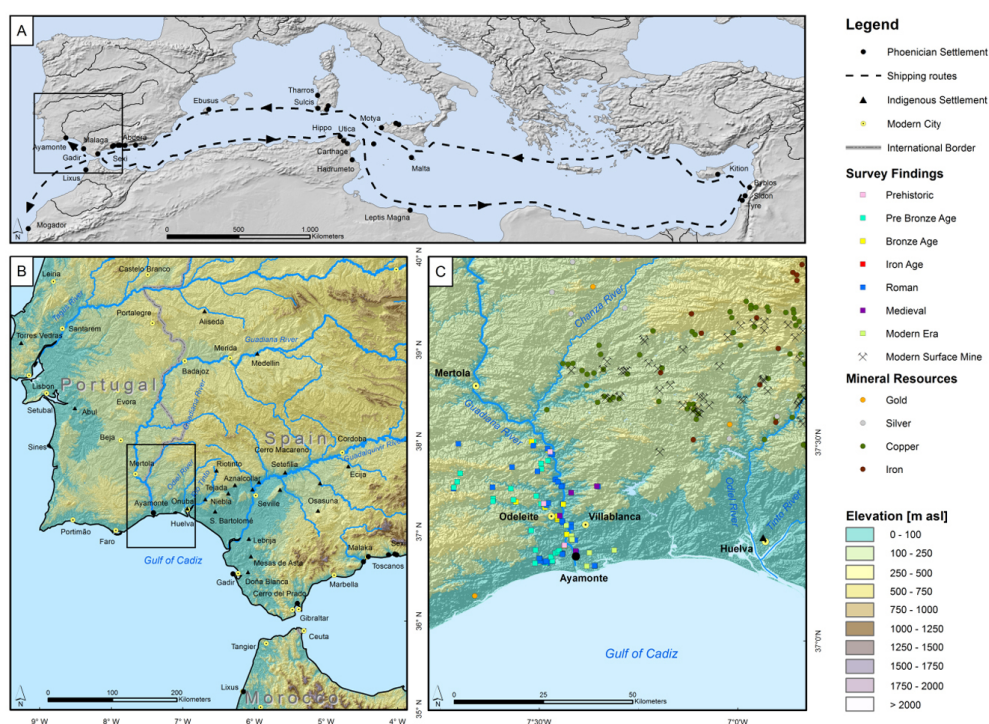


Fig. 13 | Supraregional distribution of Phoenician settlements in the Mediterranean. (A) Phoenician settlements and trading routes of the Mediterranean; (B) Phoenician and Indigenous settlements of Southwest Iberia; (C) Locations of Archaeological Survey Findings and Mineral Resources in the wider area of the two prehistoric settlements Ayamonte and Onuba.

92 Instituto Geológico y Minero de España 1983.

93 Rivas-Martínez et al. 1990.

94 Garcia Teyssandier 2013.

95 Schubart and Maaß-Lindemann 2004; Niemeyer 1982.

most western part of the Phoenician diaspora (Fig. 13A). The Phoenician colonies were exclusively located along the coastal strip of the Mediterranean Sea and Gulf of Cadiz, preferably located on a ridge or peninsula close to river mouths which guaranteed protection and access to the hinterland.<sup>96</sup>

The motivation of the Phoenicians to colonize this area, and their modes of contact with the indigenous community remain uncertain and are subject of a controversial debate.<sup>97</sup> However, although not located in close proximity to the coastline, numerous ore deposits in the hinterland of the Phoenician settlements along the coastal strip of the southwestern Iberian Peninsula are considered to be one of the main reasons for the colonization (Fig. 13C).<sup>98</sup> Although evidence of an export-oriented quarrying is missing, it is assumed that in particular the iron-, copper- and silver deposits were of economic importance.<sup>99</sup> Next to the accessible ore deposits, available agricultural and marine resources as well as the availability of timber and slaves (indigenous Iberians) could have acted as important pull-factors.<sup>100</sup> Thus, due to its wealth in natural resources and physiographical prerequisites the economic and ecological marginality for Ayamonte must be estimated as low.

The settlement history of the Guadiana estuary starts around 7 kyr BP at which time the mean-sea-level reached, after sea-level decline from the last glacial maximums, approximately the position it holds today.<sup>101</sup> Within the greater research area, Neolithic finds are known for the dunes close to modern city of Cadiz.<sup>102</sup> Some lithic tools ascribed to Neolithic times document the settlement activities. The megalithic tomb in Villablanca, 10 km northeast of Ayamonte, indicates an advanced stage of Neolithic culture.<sup>103</sup>

Remains of Chalcolithic fortifications are located in the hinterland of the Guadiana estuary and in the vicinity of the city of Huelva.<sup>104</sup> Other than at the rivers Odiel and Tinto, there is almost no direct evidence for Chalcolithic mining activities at the Iberian Peninsula.<sup>105</sup> However, there is a noticeable concentration of Chalcolithic settlements by the rivers upstream close to numerous copper deposits of the region.<sup>106</sup>

The Bronze Age settlements of the lower Guadiana river are characterized by a wide range of stone box graves. In contrast to this richness, archaeologists face an almost complete lack of settlement sites.<sup>107</sup> The only Bronze Age-settlement in the vicinity of Ayamonte was discovered close to the modern town of Odeleite, located 10 km northwest of the Guadiana estuary. Compared with the fairly scattered pre-Bronze Age sites, the locations of Bronze Age settlements seem to be concentrated along the Guadiana river.<sup>108</sup>

Findings in Castro Marim (ancient Baesuris), a settlement on top of a hill right of the Guadiana river about 3 km away from Ayamonte, date back to the transition of the Late Bronze Age to the Iron Age and give some hints indicating an indigenous population that was clearly in contact with Phoenician traders.<sup>109</sup> The Phoenician findings in Ayamonte are manifold and include ceramics, remains of metallurgical furnaces, building structures

96 Arteaga 1988a; Schubart 1982; Aubet 2001; Koch 2001; Arruda 2009.

97 Arruda 2009; Koch 2001.

98 Mulhy 1998.

99 Schubart and Maaß-Lindemann 2004.

100 Arruda 2009; Treumann 2009; Wagner and Alvar 1989.

101 Hoffmann 1987; Arteaga 1988a; Arteaga 1988b; Jurado, Sanz, and Tomico 1997.

102 Kunst 2001a.

103 Kunst 1988.

104 Kunst 1988.

105 Kunst 2001b.

106 Kunst 1988.

107 Schubart 1975.

108 Kunst 1988.

109 Arruda 2000; Kunst 1988.

and remains of a metal workshop.<sup>110</sup> Based on these archaeological finds, one can deduce a relatively large extent and significance of this Phoenician settlement during the 8th and 7th century BC. Both, the necropolis and the settlement are the most westerly evidences of Phoenician colonization and are therefore unique in their character.<sup>111</sup> Although the archaeological objects found within the settlement and necropolis are very revealing, social marginality for the Phoenician community in modern-day Ayamonte cannot be evaluated.

Archaeological findings of Roman times are abundant within the research area.<sup>112</sup> The majority of the sites are located directly along the Guadiana river, or in the vicinity of the modern sand and barrier beaches and dunes. This indicates that the dune system and beach barriers of Isla Canela left of the Guadiana river mouth already existed during Late Roman times.<sup>113</sup> The densely settled areas along the banks of the Guadiana river, as well as along the banks of its major tributaries indicate that stable fluvial dynamics existed at least by Roman times.<sup>114</sup>

## 4 Conclusions

During their history, the settlement areas investigated within this research group undergo changes with respect to types of social, political and spatial marginalities. In contrast, ecological factors related to the settlement areas changed only slightly during the periods under consideration. However, deforestation and unsuitable land use frequently caused land degradation and deterioration of site conditions – especially in ecologically favored regions – and thereby caused an increase of ecological marginality in the sense of an ‘ecological marginalization’ (from *lat.* *margo* – *en.* brink, border, *lat.* *facere* – *en.* produce, compose). By contrast, the utilization of settlement areas characterized by unsuitable natural settlement conditions was frequently made possible through the implementation of technical measures such as water harvesting measures in drylands or terrace constructions in mountainous areas. This often resulted in an improvement of the natural settlement conditions and, thus, in a decrease in ecological marginality.

During early phase of colonization settlement spaces outside of regular settlement areas were characterized by a high degree of spatial marginality. The degree of spatial marginality tended to decrease with continuing exploitation of the hinterland and the ongoing colonization process. Whether the colonies are characterized by a high or a low degree of economical marginality is determined by the intention behind the colonization: Was colonization undertaken for political or strategic reasons? Or was the colonization a result of the exploitation of natural resources? Where natural resources, especially ores or rare building materials, were available and were mined, the importance of a colony as a marketplace increased, at least temporarily, resulting in low economical marginality during these periods. This is clearly demonstrated by the examples of the settlement sites of Chimtou, Tunisia (chapter 2.4) and Ayamonte, Spain (chapter 2.7). Colonies that were established due to cultic reasons could also take on great importance as a marketplace, which could develop even if it was not rich in natural resources if the presence of political or spiritual power contributed to that importance.<sup>115</sup> However, even considering spiritual motivations, it remains a challenge to understand why societies were willing to make enormous efforts to establish permanent settlements with sophisticated infrastructure in

110 Garcia Teyssandier 2013.

111 Garcia Teyssandier 2013.

112 Kunst 1988.

113 Kunst 1988.

114 Kunst 1988.

115 Knitter, Blum, et al. 2013.

inaccessible valleys with high flood risks (Petra, Jordan, chapter 2.2) or in semiarid regions without sufficient water resources (Musawwarat es-Sufra, Sudan, chapters 2.1, 3.1; Resafa, Syria, chapter 2.8; and again Petra, Jordan, chapter 2.2). In prehistoric contexts, very few conclusions can be drawn on social marginality. This is frequently due to problematic data sets and problems associated with data acquisition. The settlement site of Yeha, Ethiopia (chapter 2.6) is an exception; it did constitute the center of the community of Di'amat with its strong Sabaean influence.

The analysis of the case study of Musawwarat, Sudan (above, chapters 2.1, 3.1) quotes Irving Chan Johnson's call to "centre marginality as an important component of cultural and ethnic identity".<sup>116</sup> Though it sounds paradoxical, Johnson illustrates the potential of integrating ideas of centrality and marginality. Recent research on centrality<sup>117</sup> has introduced a simplified and at the same time more abstract concept of centrality, defining it as relative concentration of interactions.<sup>118</sup> Accordingly, a central place corresponds to a culmination point of interaction. This notion of centrality offers the potential to assess semi-quantitatively the importance of a place based on the central functions<sup>119</sup> it provided. Hence, based on centrality we are able to reconstruct the interaction patterns of certain places. The concept of marginality as outlined in this paper supplies a framework for characterizing the space a settlement is located in. Spatial marginality is the basis upon which to understand Johnson's request to "centre marginality". Ecological marginality is the crucial factor in Musawwarat's, Resafa's and Petra's location and at the same time in establishing the extraordinary character of these central places during their heydays. Centrality measures the causes for this importance, marginality defines its basis. In the same light, it is possible to 'read' their decline as a function of centrality's decreased pull factors, leading to a decreased ability – or interest – to counteract the causes of marginality.

Centrality helps us explain why a place is important and how it functions, while marginality informs us about the preconditions and society's assessment of the place's space; marginality shows us the relativity of suitability and unsuitability, centrality measures the consequences. Viewed in this way, both concepts are complementary, illustrating the value and necessity of integrated research and holistically oriented hypotheses. The insights gained by Topoi's previous research on centrality and the current research on marginality helps to draw a more comprehensive picture about the spatial and social organization of ancient societies.

116 Johnson 2011, 216.

117 Knitter, Nakoinz, et al. 2014, Nakoinz 2009; Nakoinz 2012; Nakoinz 2013.

118 Nakoinz 2012.

119 Gringmuth-Dallmer 1996.

## References

### Arruda 2000

Ana Margarida Arruda. *Los Fenicios En Portugal: Fenicios Y Mundo Indígena En El Centro y Sur De Portugal: Siglos VIII–VI a.C.* Cuadernos de Arqueología Mediterránea 5–6. Barcelona: Carrera Edició: Publicaciones Del Laboratorio De Arqueología, Universidad Pompeu Fabra de Barcelona, 2000.

### Arruda 2009

Ana Margarida Arruda. “Phoenician Colonization on the Atlantic Coast of the Iberian Peninsula.” In *Colonial Encounters in Ancient Iberia. Phoenician, Greek and Indigenous Relations*. Ed. by M. Dietler and C. López-Ruiz. Chicago and London: The University of Chicago Press, 2009, 113–130.

### Arteaga 1988a

Oswaldo Arteaga. “Geologisch-Archäologische Forschungen zum Verlauf der andalusischen Mittelmeerküste.” In *Forschungen zur Archäologie und Geologie im Raum von Torre del Mar 1983/1984*. Ed. by O. Arteaga. Madrider Beiträge 14. Mainz: Philipp von Zabern, 1988, 107–126.

### Arteaga 1988b

Oswaldo Arteaga. “Zur Phönizischen Hafensituation von Toscanos.” In *Forschungen zur Archäologie und Geologie im Raum von Torre del Mar 1983/1984*. Ed. by O. Arteaga. Madrider Beiträge 14. Mainz: Philipp von Zabern, 1988, 127–141.

### Aubet 2001

María Eugenia Aubet. *The Phoenicians and the West: Politics, Colonies and Trade*. Cambridge: Cambridge University Press, 2001.

### Bechert 1999

Tilmann Bechert. *Die Provinzen des Römischen Reiches. Einführung und Überblick*. Mainz: Philipp von Zabern, 1999.

### Beckers, Berking, and Schütt 2010

Brian Beckers, Jonas Berking, and Brigitta Schütt. “Runoff in Two Semi-Arid Watersheds in a Geoarcheological Context. A Case Study of Naga (Sudan) and Resafa (Syria).” *Geoarchaeology* 25.6 (2010), 815–836.

### Beckers, Berking, and Schütt 2012

Brian Beckers, Jonas Berking, and Brigitta Schütt. “The Elaborated Ancient Water Supply System Of Resafa. Risk And Uncertainty Of Water Harvesting In the Syrian Desert Steppe.” *eTopoi. Journal for Ancient Studies Special Volume* 3 (2012), 149–153. <http://journal.topoi.org/index.php/etopoi/article/view/100/171> (visited on 04/05/2016).

### Beckers and Schütt 2013

Brian Beckers and Brigitta Schütt. “The Elaborate Floodwater Harvesting System of Ancient Resafa in Syria. Construction and Reliability.” *Journal of Arid Environments* 96 (2013), 31–47.

### Berking, Cubasch, et al. 2012

Jonas Berking, Ulrich Cubasch, Janina Körper, Brigitta Schütt, and Sebastian Wagner. “Heavy Rainfalls in a Desert(ed) City. A Climate-archeological Case Study from Central Sudan.” In *Climates, Landscapes, and Civilizations*. Ed. by L. Giosan, D. Q. Fuller, K.

Nicoll, R. K. Flad, and P. D. Clift. *Geophysical Monographs* 198. Washington, D.C.: GeoPress/American Geophysical Union, 2012, 163–168.

**Berking, Kaufman, et al. 2011**

Jonas Berking, Georg Kaufman, Julia Meister, Michael Schott, Brigitta Schütt, and Burkart Ullrich. “Geoarcheological Methods for Landscape Reconstruction at the Excavation Site of Naga, Central Sudan.” *Die Erde* 142.143 (2011), 289–313.

**Berking and Schütt 2011**

Jonas Berking and Brigitta Schütt. “Geoarcheology and Chronostratigraphy in the Vicinity of Meroitic Naga in Northern Sudan. A Review.” *eTopoi. Journal for Ancient Studies* 1 (2011), 23–43. <http://journal.topoi.org/index.php/etopoi/article/view/32/188> (visited on 04/05/2016).

**Betts and Colledge 1998**

Alison V. G. Betts and Sue Colledge. *The Harra and the Hamad. Excavations and Surveys in Eastern Jordan*. Vol. 1. Sheffield Archaeological Monographs 9. Sheffield: Sheffield Academic Press, 1998.

**Blaikie and Brookfield 1987**

Piers Blaikie and Harold Brookfield. *Land Degradation and Society*. London and New York: Methuen, 1987.

**Brinker 1991**

Werner Brinker. “Zur Wasserversorgung von Resafa-Sergiupolis.” *Damaszener Mitteilungen* 5 (1991), 119–146.

**Brodwin 2001**

Paul Brodwin. “Marginality and Cultural Intimacy in a Transnational Haitian Community.” *Occasional Paper* 91, October (2001). <http://www4.uwm.edu/clacs/resources/pubs/pdf/brodwin91.pdf> (visited on 04/05/2016).

**Callo-Concha and Ewert 2014**

Daniel Callo-Concha and Frank Ewert. “Using the Concepts of Resilience, Vulnerability and Adaptability for the Assessment and Analysis of Agricultural Systems.” *Change and Adaptation in Socio-Ecological Systems* 1.1 (2014), 1–11.

**Cullen and Pretes 2000**

Bradley T. Cullen and Michael Pretes. “The Meaning of Marginality: Interpretations and Perceptions in Social Science.” *The Social Science Journal* 37.2 (2000), 215–229.

**Déry, Leimgruber, and Zsilincsar 2012**

Steve Déry, Walter Leimgruber, and Walter Zsilincsar. “Understanding Marginality: Recent Insights from a Geographical Perspective.” *Hrvatski Geografski Glasnik (Croatian Geographical Bulletin)* 74.1 (2012), 5–18.

**Diaz del Olmo and Recio (unpublished)**

Fernando Diaz del Olmo and José Manuel Espejo Recio. *Tierras Negras y Cambio Climático en Andalucía: Edafogénesis durante el Fin del Pleistoceno y el Holoceno*. PhD thesis. Westandalusien-Workshop: Umweltveränderungen im Holozän und aktuelle Dynamik. 7–8/Juli/1994 Katholische Universität Eichstätt, 1994. Unpublished.



**Edwards 1996**

David N. Edwards. *The Archaeology of the Meroitic State. New Perspectives on Its Social and Political Organisation*. British Archaeological Reports International Series 640. Cambridge Monographs in African Archaeology 38. Oxford: Tempus Reparatum, 1996.

**Edwards 2004**

David N. Edwards. *The Nubian Past: An Archaeology of the Sudan*. London and New York: Taylor & Francis, 2004.

**Eigner 1999**

Dieter Eigner. "Bemerkungen zu den 'nicht-sakralen' Teilen der Großen Anlage". In *Sudan. Festschrift für Steffen Wenig zum 65. Geburtstag*. Ed. by K. Dornisch. Nürnberger Blätter zur Archäologie, Sonderheft. Nürnberg: Bildungszentrum der Stadt, 1999, 45–46.

**Eigner 2010**

Dieter Eigner. "Where Kings Met Gods. The Great Enclosure at Musawwarat es Sufra". *Der Antike Sudan. Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V.* 21 (2010), 7–22.

**Faust and Diaz del Olmo 1997**

Dominik Faust and Fernando Diaz del Olmo. "Paläogeographie Südspaniens in den letzten 30,000 Jahren: Eine Zusammenstellung". *Petermanns Geographische Mitteilungen* 141 (1997), 279–285.

**Garbrecht 1991**

Günther Garbrecht. "Der Staudamm von Resafa-Sergiupolis". In *Historische Talsperren*. Ed. by Deutscher Verband für Wasserwirtschaft und Kulturbau. 2. Stuttgart: K. Wittwer, 1991, 456–457.

**Garcia Teyssandier 2013**

Elisabet Garcia Teyssandier. *Phönizische Gräber in Ayamonte. Ein Vorbericht*. Madrider Mitteilungen 54. 2013.

**Gringmuth-Dallmer 1996**

Eike Gringmuth-Dallmer. "Kulturlandschaftsmuster und Siedlungssysteme". *Siedlungsforschung: Archäologie, Geschichte, Geographie* 14 (1996), 7–31.

**Gurung and Kollmair 2005**

Ghana S. Gurung and Michael Kollmair. *Marginality. Concepts and their Limitations*. IP6 Working Paper Series 4. Zürich: NCCR North-South, 2005. [http://www.nccr-pakistan.org/publications\\_pdf/General/Marginality.pdf](http://www.nccr-pakistan.org/publications_pdf/General/Marginality.pdf) (visited on 04/05/2015).

**Hintze 1984**

Fritz Hintze. "Diskussionsbeitrag zum Thema Meroitische Architektur". In *Meroitische Forschungen 1980: Akten der 4. Internationalen Tagung für meroitische Forschungen vom 24. bis 20. November in Berlin*. Ed. by F. Hintze. Meroitica 7. Berlin: Akademie Verlag, 1984, 332–346.

**Hirt 2010**

Alfred Hirt. *Imperial Mines and Quarries in the Roman World*. Oxford: Oxford University Press, 2010.

**Hoffmann 1987**

Gerd Hoffmann. *Holozänstratigraphie und Küstenlinienverlagerung an der andalusischen Mittelmeerküste*. PhD Thesis. Berichte aus dem Fachbereich Geowissenschaften der Universität Bremen 2. Bremen: Universität Bremen, 1987. <http://oceanrep.geomar.de/11840/> (visited on 04/05/2016).

**Hürmüzlü et al. 2011**

Bilge Hürmüzlü, Kay Kohlmeyer, Andrea De Giorgi, Paul Iversen, Asuman Coşkun Abuagla, Arzu İnan, and Uygur Hecebil. "Isparta Arkeolojik Surveyi 2010 Yılı Çalışmaları: Konane (Conana)". *Araştırma Sonuçları Toplantısı* 29.1 (2011), 1–10. <http://www.kulturvarliklari.gov.tr/Eklenti/4648,29arastirma1.pdf?0> (visited on 05/04/2016).

**Hurni, Wiesmann, and Schertenleib 2004**

Hans Hurni, Urs Wiesmann, and Roland Schertenleib, eds. *Marginal Regions of South Asia, Research for Mitigating Syndromes of Global Change. A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-Oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South 8. Bern: Geographica Bernensia, 2004.

**Hutchinson 1961**

George Evelyn Hutchinson. "The Paradox of Plankton". *The American Naturalist* 95:882 (1961), 137–145.

**Instituto Geológico y Minero de España 1983**

Instituto Geológico y Minero de España. *Mapa Geológico de España*. 1983.

**Issar and Zohar 2004**

Aryë S. Issar and Mattanyah Zohar. *Climate Change: Environment and Civilization in the Middle East*. Berlin: Springer, 2004.

**Johnson 2011**

Irving Chan Johnson. "Size Matters: History, Marginality, and the Politics of Building Big in a Small Community". *Journal of the Royal Anthropological Institute* 17.1 (2011), 116–134.

**Jouffroy 1986**

Hélène Jouffroy. *La construction publique en Italie et dans l'Afrique romaine*. Straßburg: AECR, 1986.

**Jurado, Sanz, and Tomico 1997**

Jesús Fernández Jurado, Carmen García Sanz, and Pilar Rufete Tomico. *De Tartessos a Onuba: 15 años de arqueología en Huelva*. Huelva: Diputación de Huelva. Sección de Arqueología, 1997.

**Kawecki 2008**

Tadeusz. J. Kawecki. "Adaptation to Marginal Habitats". *Annual Review of Ecology, Evolution and Systematics* 39 (2008), 321–342.

**Khanoussi and Rummel 2012**

Mustapha Khanoussi and Philipp von Rummel. "Simitthus (Chimtuou, Tunesien). Vorbericht über die Aktivitäten 2009–2012". *Mitteilungen des Deutschen Archäologischen Instituts, Römische Abteilung* 118 (2012), 179–222.

**Knitter, Blum, et al. 2013**

Daniel Knitter, Hartmut Blum, Barbara Horejs, Oliver Nakoinz, Brigitta Schütt, and Michael Meyer. "Integrated Centrality Analysis: A Diachronic Comparison of Selected Western Anatolian Locations." *Quaternary International* 132 (2013), 45–56.

**Knitter, Nakoinz, et al. 2014**

Daniel Knitter, Oliver Nakoinz, Roswitha Del Fabbro, Kay Kohlmeyer, Michael Meyer, and Brigitta Schütt. "The Centrality of Aleppo and its Environs." *eTopoi. Journal for Ancient Studies* 3 (2014), 107–127.

**Koch 2001**

Michael Koch. "Überlegungen zur Geschichte der Iberischen Halbinsel im 1. Jahrtausend v. Chr." In *Denkmäler der Frühzeit*. Ed. by T. Ulbert. Hispania Antiqua. Mainz: Philipp von Zabern, 2001, 235–274.

**Kunst 1988**

Michael Kunst. *Zur Besiedlungsgeschichte des Guadiana-Mündungsgebietes*. PhD thesis. Deutsches Archäologisches Institut (Madrid), 1988.

**Kunst 2001a**

Michael Kunst. "Das Neolithikum der Iberischen Halbinsel." In *Denkmäler der Frühzeit*. Ed. by T. Ulbert. Hispania Antiqua. Mainz: Philipp von Zabern, 2001, 37–66.

**Kunst 2001b**

Michael Kunst. "Die Kupferzeit der Iberischen Halbinsel." In *Denkmäler der Frühzeit*. Ed. by T. Ulbert. Hispania Antiqua. Mainz: Philipp von Zabern, 2001, 67–100.

**Leimgruber 1994**

Walter Leimgruber. "Marginality and Development Issues in Marginal Regions. Proceedings of the IGU Study Group 'Development Issues in Marginal Regions' 01.–07. August 1993, Taiwan." In *Marginality and Development Issues in Marginal Regions. Proceedings of the IGU Study Group 'Development Issues in Marginal Regions' 01.–07. August 1993, Taiwan*. Ed. by C. D. Chang and Y. Lu. Taipei: National Taiwan University, 1994, 1–18.

**Leone 2007**

Anna Leone. *Changing Townscapes in North Africa from Late Antiquity to the Arab Conquest*. Munera. Studi storici sulla Tarda Antichità 28. Edipuglia: Bari, 2007.

**Mehretu, Pigozzi, and Sommers 1999**

Assefa Mehretu, Bruce William Pigozzi, and Lawrence M. Sommers. "Towards Typologies of Socio-Economic Marginality: North/South Comparisons." In *Marginality in Space – Past, Present and Future: Theoretical and Methodological Aspects of Cultural, Social and Economical Parameters of Marginal and Critical Regions*. Ed. by H. Jussila, R. Majoral, and C. Mutambirwa. Dynamics of Marginal and Critical Regions. Aldershot, Hants, and Brookfield: Ashgate Publishing Ltd, 1999, 7–24.

**Mehretu, Pigozzi, and Sommers 2000**

Assefa Mehretu, Bruce William Pigozzi, and Lawrence M. Sommers. "Concepts in Social and Spatial Marginality." *Geografiska Annaler: Series B, Human Geography* 82.2 (2000), 89–101.

**van der Meijden, Schmid, and Voegelin 2012**

Ella van der Meijden, Stephan G. Schmid, and Andreas F. Voegelin, eds. *Petra. Begleitbuch zur Ausstellung Petra – Wunder in der Wüste. Auf den Spuren von J. L. Burckhardt alias Scheich Ibrahim: Eine Ausstellung des Antikenmuseums Basel und der Sammlung Ludwig in Zusammenarbeit mit dem Ministry of Tourism and Antiquities/Department of Antiquities of Jordan und dem Jordan Museum, Amman, Antikenmuseum Basel und Sammlung Ludwig*, 23. Oktober 2012 bis 17. März 2013. Basel: Schwabe, 2012.

**Mouton and Schmid 2013**

Michel Mouton and Stephan G. Schmid, eds. *Men on the Rocks. The Formation of Nabataean Petra: Proceedings of a Conference held in Berlin, 2–4 Dezember 2011*. Supplement to the Bulletin of Nabataean Studies 1. Berlin: Logos, 2013.

**Mulhy 1998**

James D. Mulhy. “Copper, Tin, Silver, and Iron: The Search of Metallic Ores as an Incentive for Foreign Expansion?”. In *Mediterranean Peoples in Transition: Thirteenth to Early Tenth Centuries BCE*. Ed. by S. Gitin, E. Stern, and A. Mazar. Jerusalem: Israel Exploration Society, 1998, 314–329.

**Müller-Böker et al. 2004**

Ulrike Müller-Böker, Danilo Geiger, Urs Geiser, Vidya Kansakar, Michael Kollmair, Kate Molesworth, and Abid Suleri. “Sustainable Development in Marginal Regions of South Asia”. In *Marginal Regions of South Asia, Research for Mitigating Syndromes of Global Change. A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-Oriented Research Partnerships*. Ed. by H. Hurni, U. Wiesmann, and R. Schertenleib. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South 8. Bern: Geographica Bernensia, 2004, 225–261.

**Müller-Neuhof 2013a**

Bernd Müller-Neuhof. “Chalcolithic/Early Bronze Age Flint Mines in the Northern Badia”. *Syria. Revue d’art oriental et d’archéologie* 90 (2013), 177–188.

**Müller-Neuhof 2013b**

Bernd Müller-Neuhof. “Flint Mining and Blank Production in the Chalcolithic/Early Bronze Age Period: The Greater Wadi al-Ruwayshid Region”. *Bulletin of the Council of British Research in the Levant* 8.1 (2013), 66–68.

**Müller-Neuhof 2014**

Bernd Müller-Neuhof. “A ‘Marginal Region’ with Many Options: The Diversity of Chalcolithic/Early Bronze Age Socioeconomic Activities in the Hinterland of Jawa”. *Levant* 46.2 (2014), 230–248.

**Nakoinz 2009**

Oliver Nakoinz. “Zentralortforschung und zentralörtliche Theorie”. *Archäologisches Korrespondenzblatt* 39.3 (2009), 361–380.

**Nakoinz 2012**

Oliver Nakoinz. “Models of Centrality”. *eTopoi. Journal for Ancient Studies Special Volume* 3 (2012), 217–223. <http://journal.topoi.org/index.php/etopoi/article/view/109/139> (visited on 04/05/2016).

**Nakoinz 2013**

Oliver Nakoinz. "Zentralorte in parallelen Raumstrukturen". In *Parallele Raumkonzepte*. Ed. by S. Hansen and M. Meyer. Topoi. Berlin Studies of the Ancient World 16. Berlin and New York: De Gruyter, 2013, 83–104.

**Näser 2010**

Claudia Näser. "The Great Hafir at Musawwarat es-Sufra: Fieldwork of the Archaeological Mission of Humboldt University Berlin in 2005 and 2006". In *Between the Cataracts: Proceedings of the 11th International Conference for Nubian Studies, Warsaw University, 27 August–2 September 2006*. Ed. by W. Godlewski and A. Łajtar. Polish Archaeology in the Mediterranean 2.1. Warschau: University of Warsaw Press, 2010, 39–46.

**Näser 2011**

Claudia Näser. "Early Musawwarat". In *La pioche et la plume. Autour du Soudan, du Liban et de la Jordanie. Hommag-es archéologiques à Patrice Lenoble*. Ed. by V. Rondot, F. Alpi, and F. Villeneuve. Passé présent. Paris: Presses de l'Université de Paris-Sorbonne, 2011, 317–338.

**Näser 2013**

Claudia Näser. "Die Feldkampagne der Archaeological Mission to Musawwarat im Frühjahr 2013". *Der Antike Sudan. Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V.* 24 (2013), 7–14.

**Niemeyer 1982**

Hans Georg Niemeyer, ed. *Phönizier im Westen. Die Beiträge des Internationalen Symposiums über 'Die phönizische Expansion im westlichen Mittelmeerraum' in Köln vom 24. bis 27. April 1979*. Madrider Beiträge 8. Mainz: Philipp von Zabern, 1982.

**Nony 2001**

Daniel Nony. "Die spanischen Provinzen". In *Rom und das Reich in der Hohen Kaiserzeit, 44 v. Chr.–260 n. Chr. Band II: Die Regionen des Reiches*. Ed. by C. Lepelley, P. Cabanes, and P. Riedlberger. München and Leipzig: K. G. Saur, 2001, 121–150.

**Paulissen, Vanhaverbeke, and Waelkens 2003**

Etienne Paulissen, Hannelore Vanhaverbeke, and Marc Waelkens. "The Physical Setting: Topographical Units within the Territory of Sagalassos". In *The Chora of Sagalassos. The Evolution of the Settlement Pattern from Prehistoric until Recent Times*. Ed. by H. Vanhaverbeke and M. Waelkens. Studies in Eastern Mediterranean Archaeology 5. Turnhout: Brepols, 2003, 60–87.

**Perlman 1975**

Janice Elaine Perlman. "Rio's Favelas and the Myth of Marginality". *Politics and Society* 5.2 (1975), 131–160.

**Pons and Reille 1988**

Armand Pons and Maurice Reille. "The Holocene and Upper Pleistocene Pollen Record from Padul (Granada, Spain): A New Study". *Palaeogeography, Palaeoclimatology, Palaeoecology* 66.3–4 (1988), 243–263.

**Pulliam 2000**

Howard Ronald Pulliam. "On the Relationship Between Niche and Distribution". *Ecology Letters* 3 (2000), 349–361.

**Rakob 1979**

Friedrich Rakob. "Numidische Königsarchitektur in Nordafrika". In *Die Numider. Reiter und Könige nördlich der Sahara*. Ed. by G. Horn and C. B. Rüger. Bonn: Rheinland Verlag- und Betriebsgesellschaft, 1979, 119–171.

**Rakob 1994**

Friedrich Rakob. "Der Tempelberg und seine Heiligtümer". In *Simitthus II, Der Tempelberg und das römische Lager*. Ed. by F. Rakob. Mainz: Phillip von Zabern, 1994, 1–50.

**Rakob and Beschouch 1993**

Friedrich Rakob and Azedine Beschouch. *Die Steinbrüche und die antike Stadt. Simitthus I*. Mainz: Philipp von Zabern, 1993.

**Rivas-Martínez et al. 1990**

Salvador Rivas-Martínez, Mário Lousã, Tomás Emilio Díaz González, Federico Fernández-González, and José Carlos Augusta da Costa. "La Vegetación del Sur de Portugal (Sado, Alentejo y Algarve)". *Itinera Geobotanica* 3 (1990), 5–126.

**Rollefson, Rowan, and Wasse 2014**

Gary Orin Rollefson, York M. Rowan, and Alexander Michael Richard Wasse. "The Late Neolithic of the Eastern Badia of Jordan". *Levant. The Journal of the Council for British Research in the Levant* 46.2 (2014), 285–301.

**von Rummel, Broisch, and Schöne 2013**

Philipp von Rummel, Manuela Broisch, and Christian Schöne. *Geophysikalische Prospektionen in Simitthus (Chimtu, Tunesien). Vorbericht zu den Kampagnen 2010–2013*. Ed. by M. Bentz, D. Boschung, T. Fischer, M. Heinzemann, and F. Rumscheid. Kölner und Bonner Archaeologica 3. Münster: LIT Verlag, 2013, 203–216.

**Russell 2013**

Ben Russell. *The Economics of the Roman Stone Trade*. Oxford: Oxford University Press, 2013.

**Scheding et al. 2012**

Paul Scheding, Stefan Arnold, Khadija Abbés, Haythem Abidi, and Khansa Hannachi. "Der sog. Kaiserkultbau, in Simitthus (Chimtu, Tunesien). Vorbericht über die Aktivitäten 2009–2012". In *Mitteilungen des Deutschen Archäologischen Instituts, Römische Abteilung* 118. Ed. by H. von Hesberg and K.-S. Freyberger. Regensburg: Verlag Schnell und Steiner GmbH, 2012, 192–200.

**Scheibner 2004**

Thomas Scheibner. "Neue Erkenntnisse zur Wasserversorgung von Musawwarat es Sufra (I). Das übergeordnete Wasserversorgungssystem – Teil I: Wassergewinnung und -speicherung". *Der Antike Sudan. Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V.* 15 (2004), 39–64, 199–200.

**Scheibner 2005**

Thomas Scheibner. "Archäologie, Verantwortung und Kulturerhalt – Die Rettungskampagne am Großen Hafir von Musawwarat 2005". *Der Antike Sudan. Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V.* 16 (2005), 15–33.

**Scheibner 2011**

Thomas Scheibner. “Neue und alte 14C-Daten aus Musawwarat es-Sufra und ihre Aussagemöglichkeiten zur absoluten und relativen Chronologie des Fundplatzes”. *Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V.* 22 (2011), 7–40.

**Scheibner 2014**

Thomas Scheibner. “Entstehung, Ursprung und Nutzung. Die Hafire in Musawwarat es-Sufra und in der Keraba als Wirtschaftsbauten”. In *Ein Forscherleben zwischen den Welten. Zum 80. Geburtstag von Steffen Wenig*. Ed. by A. Lohwasser and P. Wolf. Der Antike Sudan. Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V., Sonderheft. Berlin: Sudanarchäologische Gesellschaft, 2014, 299–322.

**Schubart 1975**

Hermannfrid Schubart, ed. *Die Kultur der Bronzezeit im Südwesten der Iberischen Halbinsel*. Madrider Forschungen 9. Berlin: De Gruyter, 1975.

**Schubart 1982**

Hermannfrid Schubart. “Phönizische Niederlassungen an der Iberischen Südküste”. In *Phönizier im Westen. Die Beiträge des Internationalen Symposiums über Die phönizische Expansion im westlichen Mittelmeerraum in Köln vom 24. bis 27. April 1979*. Ed. by H. G. Niemeyer. Madrider Beiträge 8. Mainz: Philipp von Zabern, 1982, 207–230.

**Schubart and Maaß-Lindemann 2004**

Hermannfrid Schubart and Gerta Maaß-Lindemann. “Die Phönizier an den Küsten der Iberischen Halbinsel”. In *Hannibal ad portas. Macht und Reichtum Karthagos*. Ed. by S. Peters. Stuttgart: Konrad Theiss, 2004, 126–141.

**Toutain 1896**

Jules Toutain, ed. *Sur l'histoire des carrières de marbre de Simitthu: Congrès de Carthage, 1896*. Paris: Secrétariat de l'Association française pour l'avancement des sciences, 1896.

**Tovar 1976**

Antonio Tovar, ed. *Iberische Landeskunde. Die Völker und die Städte des antiken Hispanien*. Vol. 2.2. Baden-Baden: Valentin Koerner, 1976.

**Treumann 2009**

Brigitte Treumann. “Lumbermen and Shipwrights: Phoenicians on the Mediterranean Coast of Southern Spain”. In *Colonial Encounters in Ancient Iberia. Phoenician, Greek and Indigenous Relations*. Ed. by M. Dietler and C. Lopez-Ruiz. Chicago and London: The University of Chicago Press, 2009, 169–190.

**Turner 2010**

Sam Turner. “Review: Ingunn Holm – Kathrine Steene – Eva Svensson (eds.), *Liminal Landscapes: Beyond the Concepts of ‘Marginality’ and ‘Periphery’*”. *European Journal of Archaeology* 13 (2010), 275–276.

**Turner and Young 2007**

Sam Turner and Rob Young. “Concealed Communities: The People at the Margins”. *International Journal of Historical Archaeology* 11 (2007), 297–303.

**Vanhaverbeke 2003**

Hannelore Vanhaverbeke. "The Evolution of the Settlement Pattern". In *The Chora of Sagalassos. The Evolution of the Settlement Pattern from Prehistoric until Recent Times*. Ed. by H. Vanhaverbeke and M. Waelkens. Studies in Eastern Mediterranean Archaeology 5. Turnhout: Brepols, 2003, 149–326.

**Vanotti and Perassi 2004**

Gabriella Vanotti and Claudia Perassi, eds. *In Limine. Ricerche su Marginalità e Periferia nel Mondo Antico*. Milano: Vita e Pensiero, 2004.

**van der Veen 1998**

Marijke van der Veen. "Garden in the Desert". In *Life on the Fringe. Living in the Southern Egyptian Deserts During the Roman and Early-Byzantine Periods: Proceedings of a Colloquium Held on the Occasion of the 25th Anniversary of the Netherlands Institute for Archaeology and Arabic Studies in Cairo 9–12 December 1996*. Ed. by O. E. Kaper. CNWS Publications 71 = Contributions by the Nederlands-Vlaams Instituut in Cairo 2. Leiden: Research School CNWS, 1998, 221–242.

**Wagner and Alvar 1989**

Carlos González Wagner and Jaime Alvar. "Fenicios en Occidente: La colonización agrícola". *Rivista die Studi Fenici* 17.1 (1989), 61–102.

**Ward-Perkins 1951**

John Briand Ward-Perkins. "Tripolitania and the Marble Trade". *Journal of Roman Studies* 41 (1951), 89–104.

**Weschenfelder 2014**

Petra Weschenfelder. "Who Gets the Lion's Share? Thoughts on Meroitic Water Management and its Role in Royal Legitimization". In *Ein Forscherleben zwischen den Welten. Zum 80. Geburtstag von Steffen Wenig*. Ed. by A. Lohwasser and P. Wolf. Der Antike Sudan. Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V. Sonderheft. Berlin: Sudanarchäologische Gesellschaft, 2014, 335–350.

**Winchester and White 1988**

Hillary Patience Mary Winchester and Paul E. White. "The Location of Marginalised Groups in the Inner City". *Environment and Planning D: Society and Space* 6.1 (1988), 37–54.

**Wolf 2001**

Pavel Wolf. "Die Höhle des Löwen. Zur Deutung der Großen Anlage von Musawwarat es Sufra". In *Begegnungen; Antike Kulturen im Niltal: Festgabe für Erika Endesfelder, Karl-Heinz Priese, Walter Friedrich Reineke, Steffen Wenig*. Ed. by C.-B. Arnst, I. Hafemann, A. Lohwasser, E. Endesfelder, K.-H. Priese, W. F. Reineke, and S. Wenig. Leipzig: Wodtke und Stegbauer, 2001, 473–508.

**Wolf 2014**

Pawel Wolf. "Essay über den meroitischen Eklektizismus in Musawwarat es-Sufra, oder: Woher stammt der meroitische Einraumtempel?" In *Ein Forscherleben zwischen den Welten. Zum 80. Geburtstag von Steffen Wenig*. Ed. by A. Lohwasser and P. Wolf. Der Antike Sudan. Mitteilungen der Sudanarchäologischen Gesellschaft zu Berlin e. V., Sonderheft. Berlin: Sudanarchäologische Gesellschaft, 2014, 351–394.



**Young and Simmonds 1999**

Robert Young and Trevor Simmonds. "Debating Marginality: Archaeologists on the Edge?" In *Making Places in the Prehistoric World: Themes in Settlement Archaeology*. Ed. by J. Brück and M. Goodman. London: University College London Press, 1999, 198–211.

**Zielhofer and Faust 2008**

Christopher Zielhofer and Dominik Faust. "Mid- and Late Holocene Fluvial Chronology of Tunisia?" *Quaternary Science Reviews* 27.5–6 (2008), 580–588.

**Zielhofer, Faust, et al. 2002**

Christopher Zielhofer, Dominik Faust, Fernando Diaz del Olmo, and Rafael Baena Escudero. "Sedimentation and Soil Formation Phases in the Ghardimaou Basin (northern Tunisia) during the Holocene?" *Quaternary International* 93–94 (2002), 109–125.

**Illustration credits**

1 Jan Krause. 2 Jan Krause, using GMTED2010 of Earth Explorer/USGS. 3 Wiebke Bebermeier et al. 4 Wiebke Bebermeier et al. 5 Wiebke Bebermeier et al. 6 Wiebke Bebermeier et al. 7 Wiebke Bebermeier et al. 8 Wiebke Bebermeier et al. 9 Wiebke Bebermeier et al. 10 Wiebke Bebermeier et al. 11 Image: Jens Weschenfelder, adapted from: Scheibner 2011, plan 1, updated: Archaeological Mission to Musawwarat es-Sufra 2015. 12 Image: Christiane Dorstewitz, adapted from: P-IA/11, updated: Archaeological Mission to Musawwarat es-Sufra 2015. 13 Kunst 1988.

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