Mobile Peoples – Permanent Places

Nomadic landscapes and stone architecture from the Hellenistic to Early Islamic periods in north-eastern Jordan

Harmen O. Huigens

Access Archaeology

Archaeopress Access Archaeology

Archaeopress Publishing Ltd
Summertown Pavilion
18-24 Middle Way
Summertown
Oxford OX2 7LG

www.archaeopress.com

ISBN 978-1-78969-313-3
ISBN 978-1-78969-314-0 (e-Pdf)

This book is available direct from Archaeopress or from our website www.archaeopress.com

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APAAME	Aerial Photographic Archive for Archaeology in the Middle East
ASTER GDEM	Advanced Spaceborne Thermal Emission and Reflection Radiometer Global Digital Elevation Model
DEM	Digital Elevation Model
(D)GPS	(Differential) Global Positioning System
GIS	Geographic Information System
HPC	Hillslope Position Classification
HydroSHEDs	Hydrological data and maps based on Shuttle Elevation Derivatives at multiple Scales
JOSCO	Jordan Oil Shale Company
ka	kilo-annum
m.a.s.l.	meters above sea level
mya	million years ago
OSL	Optically Stimulated Luminescence
SCC	Surface Cover Classification
SRTM	Shuttle Radar Topography Mission
USGS	United States Geological Survey
VPC	Visual Prominence Classification

Preface

This book is the principal output of my doctoral research, which I carried out between 2014 and 2018 at Leiden University. My PhD dissertation, which I completed and defended in 2018, has been the foundation of this book. It is intended as an archaeological perspective on a topic that, until recently, had largely been studied through textual sources: nomadic communities who inhabited the Black Desert of north-eastern Jordan some two thousand years ago. Although they were best known for the remarkable inscriptions they have left behind on the dark basalt rocks of the Black Desert, they also modified their living space in various other ways. The landscapes they have left behind consist of campsites, rock art, various kinds of artefacts, including ceramics, paths winding through the hills, and numerous stone-built structures such as burial cairns and enclosures, all of which had received little attention until recently. This book sheds more light on the constitution of these archaeological landscapes, driven by a fascination for the seeming contradiction between, on the one hand, the mobile character of its past inhabitants and, on the other hand, the long-lasting imprint of what they created in the landscape. It provides new information about these nomadic communities, their lifeways, and their position in the wider region and its dynamic history in Classical and Late Antiquity. This book may furthermore be consulted for its primary datasets on excavations and field surveys in the Jebel Qurma region of the Black Desert, which should be useful for scholars working in northern Arabia and other desert environments or nomadic landscapes. I am therefore grateful to Archaeopress for publishing this book, and for disseminating it as an 'open access' publication.

The research presented in this book is part of the *Landscapes of Survival* research project, based at the Faculty of Archaeology, Leiden University. The principal investigator of this project is Prof. Dr Peter Akkermans. I would like to thank him for supporting and supervising my doctoral research, and for the many years of fruitful collaboration and discussion. Financial support for this research, and the *Landscapes of Survival* project it is part of, was given by The Netherlands Organisation for Scientific Research (project number 360-63-100). I also thank the Leiden University Fund for a personal LISF-grant which made it possible to do additional fieldwork. I am grateful to the School of Geography and Environmental Sciences, Ulster University, for giving me the opportunity to publish my dissertation in the book at hand.

The *Landscapes of Survival* project was set out as a collaboration between various Leiden-based senior staff members, PhD students, and assistants. This collaboration has significantly added to the quality of my research through discussion, sharing information, and providing a professional and pleasant working environment. I am grateful in this respect to Nathalie Brusgaard, Chiara Della Puppa, Ahmad Al-Jallad, Koen Berghuijs, Monique Arntz, and Merel Brüning. I am also grateful to have been part of the Faculty of Archaeology, which has been a lively and stimulating place to work. Its Graduate School has provided the opportunity to engage with peers having different yet sometimes surprisingly related fields of expertise.

This research has benefited from collaboration with several researchers and research institutions at Leiden University and beyond, for which I am very grateful. Radiocarbon dates have been provided by the Groningen Institute for Isotope Studies, directed at the time by Prof. Dr Hans van der Plicht. The Netherlands Centre for Luminescence, based at Wageningen University & Research and directed by Prof. Dr Jakob Wallinga, helped with obtaining and dating OSL samples. Various people contributed to the documentation and study of ceramics: Dr Olivier Nieuwenhuyse, Dean Peeters, Akemi Kaneda, Thomas Vijgen, Giacomo Fontana (all Leiden University), and Pamela Koulianos (North Carolina State University).

I would also like to extend my gratitude to Dr Sarah Inskip (Leiden University/Cambridge University) for providing information on human skeletal remains; to Federica Fantone (Leiden University) for her study of botanical remains; and to Dr Canan Çakırlar, Francesca Slim and Francis Kootstra (Groningen Institute of Archaeology) for information on faunal remains. I would also like to thank Mikko Kriek for providing some of the drawings used in this book, Dr Mark Locicero for proofreading the manuscript, and Merel Brüning for providing some of the excavation documentation used in Chapters 4 and 5.

The research presented in this book is to a large degree based on results of the Jebel Qurma archaeological field project, carried out in Jordan. This fieldwork was supported by the Department of Antiquities of Jordan and its director general, Dr Monther Jamhawi. Other support was given by Shell B.V./Jordan Oil Shale company in Amman, who kindly provided pan-sharpened and georeferenced Ikonos satellite imagery for research purposes. Various types of satellite imagery were obtained through the United States Geological Survey. I also thank the APAAME project and its director, Prof. Dr David Kennedy (University of Western Australia) for providing valuable aerial photographs. Finally, I would like to thank the large number of students and volunteers who helped with carrying out surveys and excavations in the Jebel Qurma region, as much of their work has been essential for the study at hand.

Chapter 1 - Introduction

In terms of archaeological research, there are few regions in the world that remain as poorly known as the Arabian deserts. Recent discoveries made through the study of satellite imagery and aerial photographs have brought to light previously unthinkable numbers of ancient stone-built features in the Arabian deserts (Kennedy 2011; Kennedy and Bishop 2011). Such features were composed of the basalt rocks lying on the surfaces of the volcanic regions of Arabia, the so-called harra (Figure 1.1). The large majority of these features, whose quantity has been estimated to be over a million (Kennedy 2011), remain poorly documented and subsequently, are poorly understood. Considering this vast amount of virtually unexamined material, one immediately realizes how little is actually known about the societies that once lived in these desert regions and, consequently, how revealing this material might be if properly studied. This fascination with the material of the Arabian deserts lies at the foundation of this study, together with several other motivations which will be outlined in this introductory chapter. Obtaining a comprehensive understanding of the archaeological remains of the Arabian deserts extends far beyond the scope of a single study. Therefore, this book focuses on a region in north-eastern Jordan known as the Black Desert (Helms 1981), and is confined to the archaeological remains that date between the Hellenistic and Early Islamic periods. During these periods, the Black Desert was inhabited

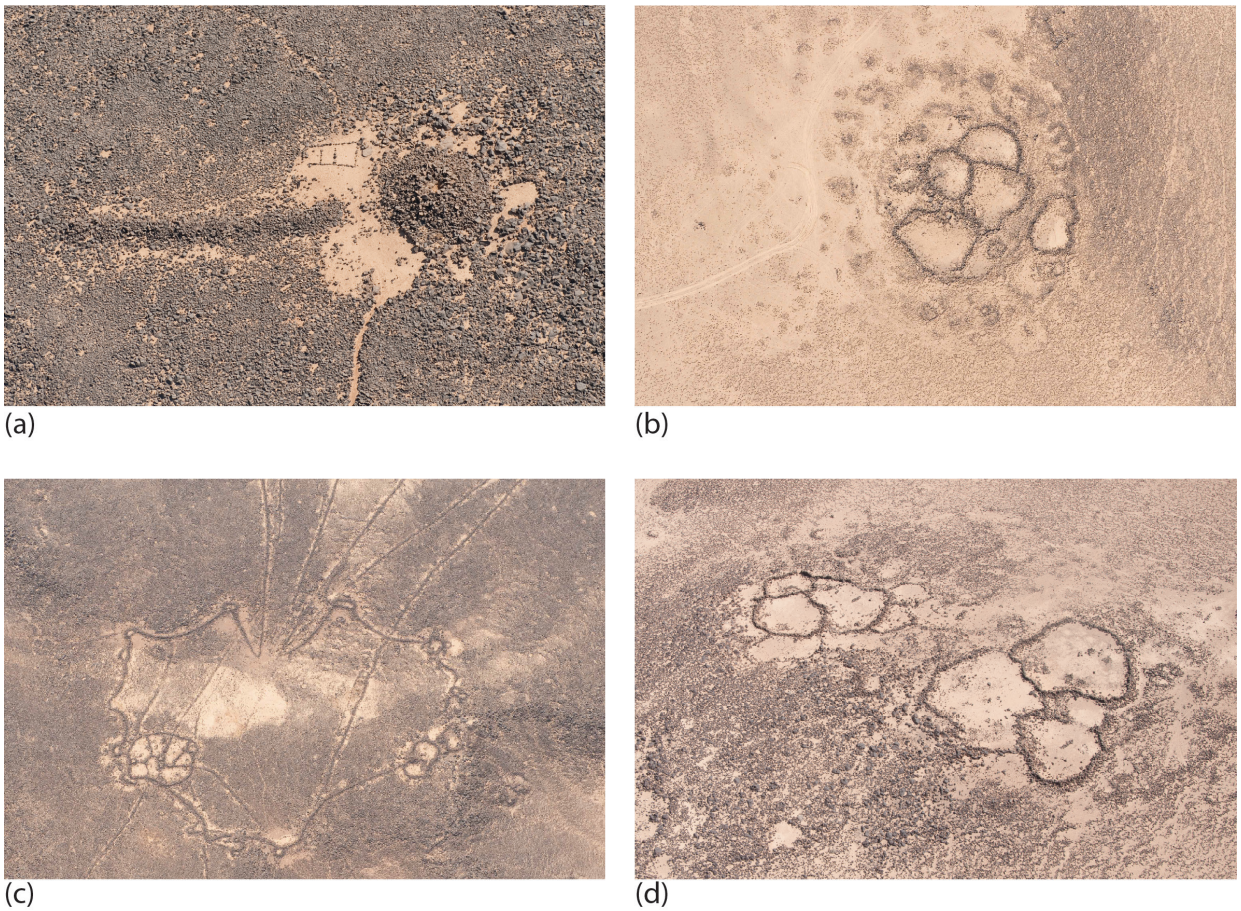

Figure 1.1 Examples of stone-built features from *harra* landscapes in north-eastern Jordan, including (a) a cairn with a pendant tail extending towards the left, (b) a wheel or jellyfish, (c) a desert kite, and (d) a series of enclosures. Aerial photos by D. Kennedy (a-c) and M. Dalton (d), courtesy of APAAME.

by communities of nomads. Arid conditions in parts of this region made fixed settlement untenable for certain times of the year and these communities had a migratory lifestyle: households moved in accordance with fluctuations in the availability of natural resources. Evidence for these nomadic communities has traditionally come from the inscriptions and pictorial carvings they left behind on the desert rocks. While these have provided important insights into the communities who created them, there is a serious scarcity of archaeological studies that have focused on nomadism in the Black Desert during historical times. As a result, there remains a poor understanding of how nomadic communities survived in an environment that appears bleak and uninviting to modern eyes. This book sheds light on some of the strategies employed by these nomadic communities by investigating the desert landscapes they inhabited and modified.

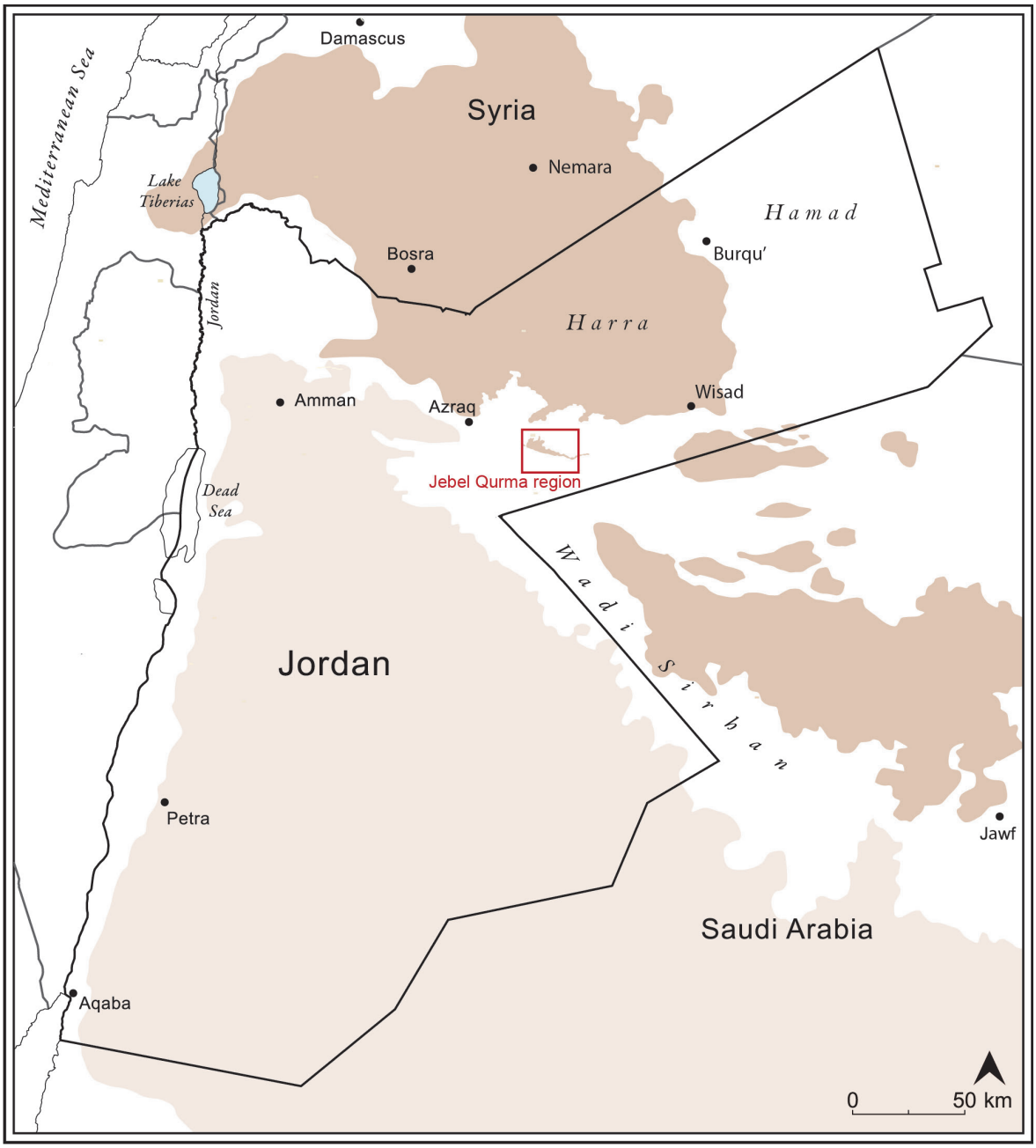

Figure 1.2 Map of modern Jordan indicating the extent of the Harrat al-Sham basalt field. Drawn by M. Kriek.

1.1 The Black Desert: a harsh and inhospitable environment?

1.1.1 Physical geography

The Black Desert of Jordan is a vast and seemingly inhospitable environment that today supports little permanent inhabitation. The name of the region derives from the dominant surface cover, comprising a blanket of sharp and darkly coloured basalt rocks, which originated from volcanic eruptions occurring more than a hundred-thousand year ago (Bender 1968). The area, known in Arabic as the Harrat al-Sham, stretches from the slopes of Jebel Druze in southern Syria (the Hauran region) towards the southeast into the desert regions of north-eastern Jordan and northern Saudi Arabia, where it terminates at the oasis of Jawf (Figure 1.2). These *harra* landscapes are surrounded by rolling plains and hillocks that are largely covered by gravels and desert pavements, and are often referred to as *hamad* landscapes. In Jordan, the *harra* and *hamad* landscapes are together known as the Black Desert (Figure 1.3). Today the Black Desert receives less than 200 mm of average annual precipitation, although there may be years when no rainfall occurs at all, leaving the region extremely arid and without substantial vegetation (Al-Homoud et al. 1995: 58). The Black Desert is largely treeless, and hosts only a few permanent sources of water, including at Azraq, Wisad, Burqu' and Nemara. Except for a few small towns, most of the Black Desert is uncultivated and only occasionally visited by Bedouin families with their herds of goat, sheep, and camel (Rowe 1999). It is perhaps not surprising, therefore, that many parts of the Black Desert remain uninhabited – unfrequented even – for large parts of the year, if not altogether.

1.1.2 Archaeological and epigraphic remains

In stark contrast to its seemingly harsh and uninviting environments, the Black Desert manifests an unusually rich archaeological and epigraphic record, which has been known since the middle of the 19th century, although the material was not widely disseminated. The first Safaitic inscriptions were discovered upon the basalt rocks of the Black Desert in this early period, and subsequently deciphered in 1901. Safaitic is conventionally dated between the 1st century BC and the 4th century AD, but this date is highly insecure, and a broader or more narrow date range is entirely possible (Al-Jallad 2015: 1-25; Macdonald 2010). Over 30,000 Safaitic inscriptions have been documented since, and there are likely an equal number of pictorial carvings (i.e. petroglyphs), which are often found in association with the inscriptions. Indeed, many of the inscriptions actually refer to these petroglyphs. The inscriptions and petroglyphs provide a unique testimony of the nomadic communities who carved them onto the basalt rocks of the Black Desert.

Equally spectacular is the large amount of ancient stone-built architecture that is preserved on the surface of the Black Desert. The presence of such features was first vividly illustrated by British pilots flying over the Black Desert during the British Mandate period in Jordan, who took photographs of the surface features from their planes (e.g. Maitland 1927; Rees 1929). Today, tens-of-thousands of stone-built features of various types have been documented through more advanced methods of aerial imagery, such as the study of high-resolution satellite imagery (e.g. Kempe and Al-Malabeh 2010; Kennedy 2011; Kennedy and Bishop 2011; Meister *et al.* 2019). These features are also known collectively as the "Works of the Old Men" (Maitland 1927). They have been given enigmatic names such as *kites*, *pendants*, *wheels* or *jellyfish* (Figure 1.1), which is illustrative of the fascination they evoked and, at the same time, the uncertainty about their exact purpose and date of construction.

Many of these fundamental questions remain largely unresolved today. In part, this is the result of the relatively short history of archaeological research in the Black Desert. The initial discovery of the "Works of the Old Men" in the early 20th century was not immediately followed by an increase of archaeological research in the Black Desert. With few exceptions (see Müller-Neuhof 2014a), the Black Desert remained almost completely unexplored until the 1980s, when a number of archaeological field projects were initiated (e.g. Betts *et al.* 1998, 2013; Garrard and Byrd 2013; Helms 1981). The most significant contribution in this respect was made by Betts, whose extensive survey and excavation

programme covered large parts of the *harra* and *hamad*. These pioneering studies were followed up in the 21st century by a number of field projects (Müller-Neuhof 2014a).

However, the archaeology of the Black Desert is still in its infancy in many ways. Most of the research carried out since the 1980s has focused on the region's prehistoric remains (e.g. Betts *et al.* 1998, 2013; Müller-Neuhof 2012, 2014b; Richter 2014; Rollefson *et al.* 2014; Rowan *et al.* 2015). Little focus has been directed towards the investigation of the inhabitation of the Black Desert in historic times or, more generally, developments over the *longue durée*. Exceptional in this respect is the *Jebel Qurma Archaeological Landscape Project*, as it studies the development of settlements from the Palaeolithic until the modern period (Akkermans and Huigens 2018; Huigens 2015). However, without comparable research in other parts of the Black Desert, the long-term cultural and ecological history of the Black Desert largely remains to be written.

The relatively short history of archaeological research in the Black Desert, and its strong focus on prehistoric remains, has resulted in a fragmentary understanding of the various types of stone-built architecture that are found in the *harra* and *hamad* landscapes. An apt example comes from the interpretation of the *desert kites*: some scholars suggest that these stone-built features were constructed already in prehistory for the purpose of hunting wild animals such as gazelle (Betts and Burke 2015); others argue that at least some of the kites may have been constructed more recently (Macdonald 2005; Maraqten 2015); other scholars state that some of them were used for penning herd animals rather than hunting (e.g. Echallier and Braemer 1995). Given the vast amount of desert kites of various different types, these issues remain to be further investigated (Crassard *et al.* 2015). Even more poorly understood is the chronology and function of *cairns*, which are thousands of stone heaps of varying configurations present in the Black Desert (Kennedy 2011). Some of these have proved to be prehistoric tombs (Akkermans and Brüning 2017); others appeared to contain graves associated with Safaitic inscriptions (Akkermans and Brüning 2017; Harding 1953, 1978; Rollefson 2013); and some cairns may have served an entirely different purpose (Kennedy 2012a: 493). It appears that there may be many different types of cairns used for different purposes in different periods. However, due to the scarcity of archaeological research conducted at this point, a clear understanding of the use and chronology of cairns is lacking. Equally enigmatic are *pendants*, which are often found in association with cairns (Kennedy 2011). The function and chronology of these features is completely unknown at this point. Although some of the pendants seem to contain small chamber-like features (Rowan *et al.* 2015), no evidence for their function as a tomb has been found so far.

These examples serve to illustrate that much remains unclear about the function and chronology of stone-built architecture in the *harra* and *hamad* landscapes of the Black Desert. This is important to acknowledge especially because of the remarkable context in which these landscapes developed, as is outlined below.

1.1.3 The Black Desert as a zone of nomadism

Much of the Black Desert's history of inhabitation is characterised by nomadism, which is defined here as a mode of existence in which communities engage in residential mobility on a regular basis (following Honeychurch and Makarewicz 2016: 347-348; Salzman 2002: 246). Others would reserve the term nomadism to define an economic system based primarily on pastoral production in marginal environments that is facilitated through the cyclical mobility of herds and households (e.g. Khazanov 1984; Spooner 1971: 199). This study primarily engages with the relationship between mobile communities and the organisation of space; this may have related to a multitude of social and economic dimensions, only one of which may have been pastoral production. Therefore, a broader definition of nomadism seems to be in order, namely one that highlights the mobile character of the communities classified as nomadic rather than defining them by a specific system of production.

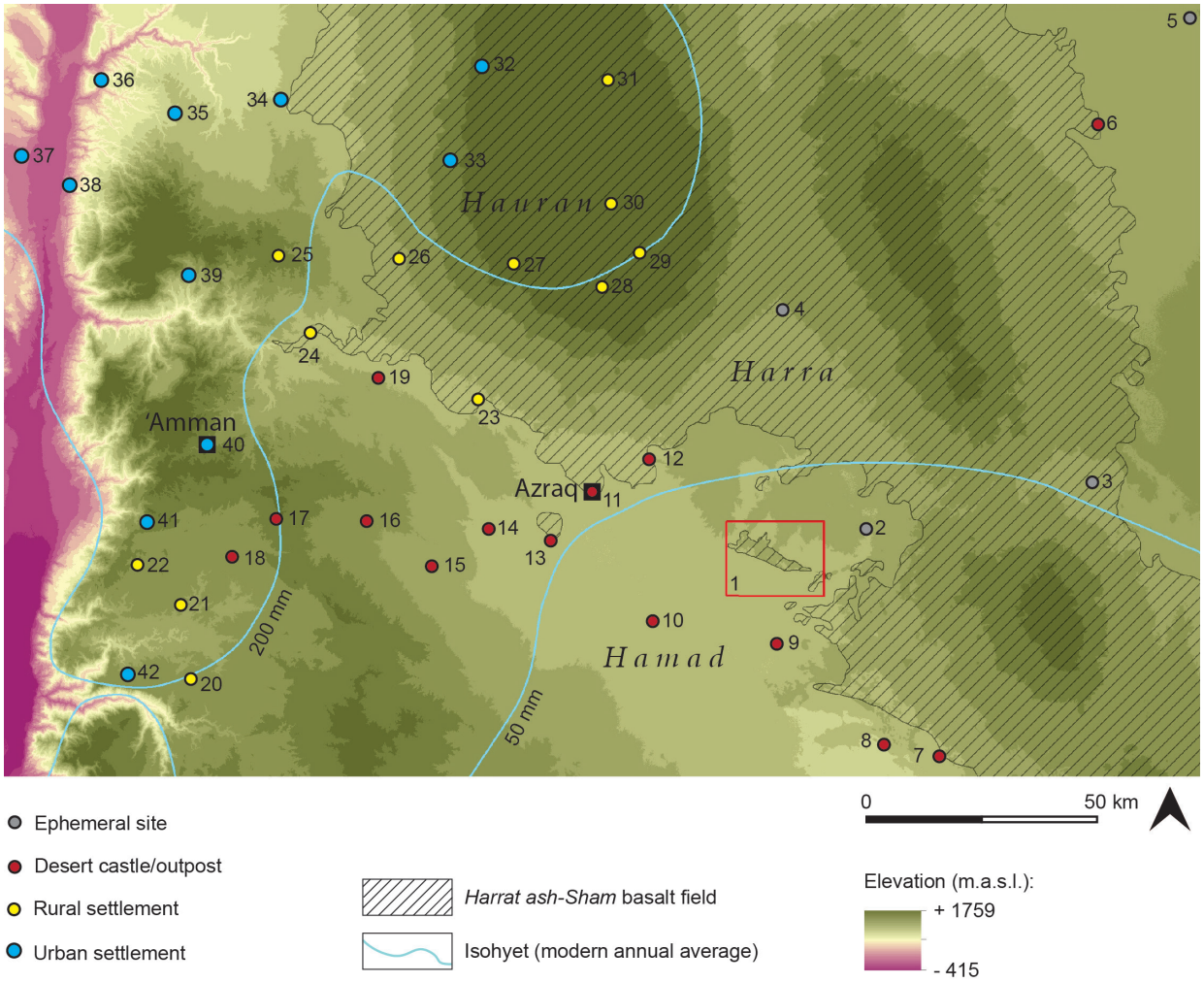

Figure 1.3 Map of the Black Desert and its surrounding, indicating the Jebel Qurma region (1) and sites referred to in this book: 2) Maitland's Mesa; 3) Wisad Pools; 4) Cairn of Hani'; 5) al-Risha; 6) Burqu'; 7) Ithra; 8) Kaf; 9) Hazim; 10) Khirbet 'Umari; 11) Arzaq; 12) Usaikhim; 13) Uweinid; 14) 'Amra; 15) Kharaneh; 16) Mshash; 17) Muwaqqar; 18) Mshatta; 19) Hallabat; 20) Umm al-Rasas; 21) Nitl; 22) Madaba; 23) Hibabiya; 24) Khirbet al-Samra; 25) Rihab; 26) Umm al-Jimal; 27) Umm al-Quttein; 28) Deir al-Kahf; 29) Deir al-Qinn; 30) Imtan; 31) Sa'neh; 32) Suweida; 33) Bostra; 34) Deraa; 35) Capitolas; 36) Umm Qais; 37) Beth She'an; 38) Pella; 39) Jerash; 40) 'Amman; 41) Hesban; 42) Dhiban. Based on Ababsa (2013) and HydroSHEDs elevation data.

Archaeological research has indicated that already in early prehistory (i.e. during the (Epi)Palaeolithic and Early Neolithic periods), the Black Desert was frequented by mobile hunter-gatherer communities. In fact, some of the stone structures visible on the *harra* surfaces today date back to this earliest period of inhabitation (Betts *et al.* 1998; Richter 2014, 2017). It was probably during the 7th millennium BC (i.e. the Late Neolithic), that the herding of sheep or goat was added to the subsistence activities of these nomadic communities, who continued to inhabit the Black Desert at least until the end of the Early Bronze Age, in the 3rd millennium BC (Müller-Neuhof 2014a; Rosen 2017). Permanent architecture that was constructed in this period includes the *wheels* or *jellyfish* (Rollefson *et al.* 2016), but probably also some of the other stone enclosures (Akkermans *et al.* 2014; Huigens 2015) ubiquitous in the Black Desert. Although more elaborate residential architecture has also been dated to this 'late prehistoric' phase of inhabitation – for example at Maitland's Mesa – these dwellings were probably inhabited on a seasonal base rather than year-round. While the environment was probably not as arid as today, there is no evidence that it supported year-round inhabitation (Rowan *et al.* 2015, 2017).

There is some uncertainty as to what happened to the environment of the Black Desert and its nomadic communities after the Early Bronze Age. Except for a few isolated finds there is hardly any archaeological evidence for significant inhabitation during the 2nd millennium BC until the Hellenistic period (Adams *et al.* 1977). This is remarkable as it is generally believed that the Arabian deserts opened up during the 1st millennium BC following the domestication of the (dromedary) camel and the development of both camel nomadism and camel-based caravan trade (Magee 2014: 259-274; Magee 2015). More specifically, a number of Assyrian sources of the early 1st millennium BC refer to violent conflict with both settled and nomadic populations of northern Arabia (Hoyland 2001). One of these settlements is Jawf (ancient *Adummatu*), but even here there is still no archaeological evidence for significant Iron Age occupation, despite serious attempts to locate them through excavations (Charloux and Loreto 2014, 2015). This strong discrepancy between textual sources and archaeological material calls for further investigation. With respect to the Black Desert, an important question is whether the absence of archaeological remains from the 2nd and much of the 1st millennium BC reflects a period of abandonment or methodological biases, such as poor visibility, or simply a lack of research attention.

What is certain is that by the end of the 1st millennium BC and the beginning of the 1st millennium AD (i.e. during the Late Hellenistic and Roman periods), the Black Desert was inhabited by nomadic communities. The clearest and most direct evidence for their presence comes from the Safaitic inscriptions and associated pictorial carvings, as mentioned above. Such rock art was carved out by communities migrating through the *harra* and *hamad* regions on a seasonal basis (Macdonald 1992a). Although some Safaitic texts have been recorded in Nabataean and Roman towns to the west of the Black Desert, the overwhelming majority of the inscriptions are situated in desert regions, and much of their content deals with nomadic activities rather than sedentary life. There are numerous references to people camping in different places and to pasturing livestock, such as camels, but also sheep and goat and, incidentally, cattle (Al-Jallad 2015: 1-25; Macdonald 1993). These nomads, however, did not solely rely on pastoralism, as there are also references to other economic activities such as hunting, raiding, military services, and possibly small-scale and opportunistic farming (Macdonald 1993).

The nomads who carved the Safaitic inscriptions sometimes identified themselves as belonging to a specific social group. To a certain degree, but probably not exclusively, these social groups were organised through kinship affiliations, which are sometimes listed in the inscriptions as long genealogies (Al-Jallad 2015: 56-60). These lineage groups sometimes competed with each other, such as through the raiding of livestock, although there is no evidence for large-scale warfare between different nomadic groups (Macdonald 1993: 314). The nature of relations with communities beyond the Black Desert has been heavily debated. From the Late Hellenistic period onwards, the western fringes of the Black Desert were increasingly populated by sedentary farming communities as well as military forces. Agricultural exploitation in the southern Hauran region developed rapidly under the Nabataeans, who greatly invested in the region in the 1st century BC and the 1st century AD. This practice was continued by the Romans, who annexed the Nabataean kingdom by AD 106; many towns, agricultural villages and *villae* emerged during this period in the Hauran (Villeneuve 1985), and the nature of the relations between these farming communities and nomads in the Black Desert has proved relevant. It has been suggested that in the wave of agricultural development, nomadic communities were slowly pushed out of the Hauran region, as former pasture grounds were transformed into agricultural plots (Villeneuve 1985: 116). Whether the nomads subsequently settled in the newly emerging towns and villages, or shifted their migratory routes into the Black Desert, remains unknown. It has also been suggested that pastoralism remained an important economic activity for the newly emerging towns in the Hauran (Rohmer 2011). Less clear is the nature of pastoralist production: was it based on nomadic pastoralism, in which herds and households resided in the Black Desert for certain times of the year, or was it restricted to the immediate outskirts of settlements?

During the same period, the Roman empire invested in the military infrastructure of this area. Perhaps building partly on earlier Nabataean military works (Bowersock 1983: 154-158), numerous fortifications and watchtowers were constructed on the western fringes of the Black Desert under Roman rule, and were connected by roads (Kennedy 1982, 1997). Various suggestions have been made as to the purpose of this roughly north-south line of defence. These include, firstly, the protection of trade routes between the empire and the Arabian Peninsula through the Wadi Sirhan, which connected the Hauran to the oases of Azraq and Jawf (Bowersock 1983: 154-158). Secondly, it has been proposed that they defended the agriculturally important Hauran region from enemy forces (Sartre 2005). While both suggestions seem plausible, different views on who 'the enemy' was in this respect have been advanced. While some have proposed the rival Sassanian empire as a likely candidate, others have suggested that Roman territories and activities needed to be defended against a 'nomadic menace' (Bowersock 1983; Millar 1993: 435-436; Parker 1986, 1987). The latter view seems to be based largely on ancient literary sources, in which nomads are portrayed not only as uncivilised and unreliable but, also, as characteristically hostile (Hoyland 2001: 96-97). Most scholars now acknowledge that such descriptions are most likely rhetorical rather than an accurate account of nomadic–sedentary relations in the Hellenistic and Roman periods. Although violent conflict may have occurred from time to time, these were probably exceptions to a much more harmonious relation, defined by mutual benefits or even a mutual dependency (Banning 1986; Fisher 2011: 108-109; Hoyland 2001; Macdonald 1993, 2014: 162).

The tradition of writing among nomads in the Black Desert seems to have come to an end sometime between the 4th century AD and the Late Antique period, as there are no clear indications that Safaitic or any other nomadic script was used afterwards. Given the equally scarce archaeological data, direct information on nomadism during the Byzantine and Early Islamic periods is largely absent. On this basis, it has been argued by some scholars that many of the nomads settled down in this post-Roman period, abandoning the Black Desert and their nomadic lifestyle for life in the villages and towns on the desert fringes (e.g. Kennedy 2014; Villeneuve 1985; Walmsley 2005, 2007a; Zerbini 2013). It is indeed the case that the encroachment of sedentary farming communities begun in the Hellenistic and Roman period continued well into Late Antiquity. Towns and villages in the Hauran region reached a peak in prosperity between the 6th and 8th centuries AD, with clear evidence for general demographic growth as well as an increase in the number of villages (Villeneuve 1985; Walmsley 2005).

However, others have suggested that this period of prosperity in village-life may not have come at the expense of nomads, and that they continued to roam the steppe and desert regions of eastern Jordan. In the Byzantine period, the defence of the eastern desert frontier increasingly depended on vassal rulers (*phylarchs*) and the local tribes they united. In Jordan, this role was fulfilled by the client kingdom of Ghassan, which was ruled by the Jafnids. Based in the Golan region, the hegemony of the Jafnid dynasty probably extended over southern Syria and northern Jordan (Fisher 2011: 95-102; Hoyland 2001: 78-79). It has been argued that nomadic tribes were also included in this kingdom (Fisher 2011: 110), and that some of the Roman forts in the desert adapted during the Byzantine period may have been used by local elites to meet with nomadic groups to secure their loyalty (Arce 2009, 2012). Furthermore, it has been suggested that this strategy was continued during the early caliphal period, when numerous old forts were refurbished and others were newly constructed (Arce 2009).

The archaeological evidence for the presence of nomads in the Black Desert is very scarce at this point. This may largely be the result of limited archaeological research rather than limited inhabitation in the past. The degree of nomadic continuation in the region after the disappearance of the Safaitic writing tradition thus requires further investigation. Only then will it be possible to further investigate possible processes of sedentarisation, or the role of nomadic communities in imperial border policies.

1.2 Landscapes of survival

What has so far become clear is that during the Hellenistic and Roman period, the Black Desert supported communities of nomads in an unprecedented way. After a period of seemingly very limited inhabitation, if not sheer abandonment, nomads were able to make a successful living in the desert once again. This trend can be observed in inscriptions and petroglyphs, historical references and, to a lesser extent, archaeological remains. It remains difficult to explain this story of relative success, as much remains unclear about the nature of these nomadic communities and how they developed through time. The mechanisms through which nomads were able to inhabit a region that appears to have seen very little activity during the preceding millennia remains poorly understood. To shed further light on nomadism in the Black Desert, new research is required that is more directly informed, and that combines the epigraphic remains and pictorial rock art carved out by nomads themselves together with archaeological material left behind by these communities.

This has been the aim of the *Landscapes of Survival* project, a four-year interdisciplinary research project (2014-2018) that investigated the archaeology, epigraphy, and pictorial rock art of the nomadic communities that inhabited the Black Desert in Classical and Late Antiquity. Its geographic research area is the Jebel Qurma region. This area is situated on the western fringe of the Black Desert, about 30 km east of the oasis and modern town of Azraq. The research area covers about 300 km^2, and comprises *harra* and *hamad* landscapes. Except for a few brief visits by earlier scholars (e.g. Abbadi 1986; Betts *et al.* 2013: 33-38; Knauf 1991), the region remained almost entirely unexplored until 2012. Since then, annual fieldwork has been carried out in the region by the *Jebel Qurma Archaeological Landscape Project*, out of which the *Landscapes of Survival* project developed. Over the course of five two-month field campaigns, part of the Jebel Qurma region was systematically and intensively surveyed, and excavations were carried out at a number of archaeological sites (Akkermans *et al.* 2014; Akkermans and Brüning 2017; Akkermans and Huigens 2018; Huigens 2015). While the history of the Jebel Qurma region extends from the Paleaolithic until the present day, a distinct peak in the occurrence of archaeological and epigraphic remains was observed between the late 1st millennium BC and the 1st millennium AD. These remains include about 5000 pre-Islamic inscriptions (mostly Safaitic) and an equal number of pictorial carvings. Additionally, there are hundreds of sites that can be dated to this phase of inhabitation and have archaeological remains, including ceramics and other artefacts, and stone-built features such as enclosures, clearings, and burial cairns. In the *Landscapes of Survival* programme these remains were further studied to shed light on the nomadic communities from which this material derived. A study of the epigraphic remains will be published in a separate book (Della Puppa forthcoming), as will the study of pictorial rock art (Brusgaard in press). The present book discusses and analyses the archaeological remains documented in the Jebel Qurma region.

1.3 Towards an archaeological perspective

Within the framework of the *Landscapes of Survival* project, the aim of the present study is to provide an archaeological perspective on nomadic communities who resided in the Jebel Qurma region between the Hellenistic and Early Islamic periods. In this section, the importance of such a perspective is further outlined. Several problems in text-based approaches to nomadism will be exposed, and a proposal is advanced concerning how archaeological research may contribute to solving these problems.

As was argued above, through much of antiquity the Black Desert was inhabited by nomadic communities whose importance in broader culture-historical developments should not be underestimated. Nomads of the Black Desert have sometimes featured prominently in discussions related to the development of settlement and the organisation of defence in the eastern parts of the empire in the Classical and Late Antique periods. For this reason, it is imperative to have a better understanding of the nature and development of nomadic peoples in the Black Desert. For some of the periods under discussion

there is hardly any direct evidence available about nomads. Other periods only have textual sources, which have their own set of limitations. As was highlighted above, external historical references to nomadic communities can give a biased and therefore distorted view of such communities. Moreover, they often lack detailed information on basic issues such as subsistence practices and cycles of migration. Furthermore, although the inscriptions and pictorial rock carvings created by nomads themselves provide an invaluable source of information, they are equally problematic in various ways. For example, these sources lack detailed chronological control and, as a result, tend to be studied as one contemporaneous corpus. Therefore, it remains highly problematic to study the way in which communities who carved the Safaitic inscriptions developed over time.

Additionally, to reconstruct nomadic communities on the basis of the Safaitic inscriptions alone comes with certain biases as well. For example, it has been suggested that the content of the Safaitic inscriptions does not fully represent the range of activities and phenomena that were considered to be a part of normal life. In some cases, there would have been little purpose to write about something unless it was considered exceptional (Macdonald 1993: 351). If this is indeed the case, cultural reconstructions based on the carvings alone risk interpreting the inscriptions on anomalous rather than common phenomena. Another bias is found in the fact that the inscriptions and petroglyphs seem to follow a set of informal rules and regulations. There were certain constraints on how to write and, more importantly, what to write about (Al-Jallad 2015: 6-7). In this respect, it is important to note that there are certain topics that people did *not* cover in their texts or depictions. Very little information is found in the texts or depictions about, for example, the nature of residential spaces, including: the types of tents or huts used and where they were pitched; the composition of herds and their variation across different regions; the nature of relations with nearby settlements and its populations. Lastly, the notion that literacy was widespread among nomadic communities and, in effect, that nearly everyone knew how to read and write (e.g. Macdonald 2010: 16) seems to be an unfounded assumption as there are no means to asses this. It is equally possible that there were nomadic peoples in the Black Desert whose lifeways are not reflected in the Safaitic inscriptions. These may include people that were living alongside literate nomads but, for one reason or another, did not engage in the creation of inscriptions, or people that resided in the Black Desert before or after the Safaitic writing tradition. If this is the case, archaeological remains rather than texts are a more suitable source of information.

In addition to the incomplete character of the textual sources, the way in which these texts have been interpreted can also be criticised. Greatly influential in this respect and, at the same time, highly problematic, are interpretive schemes based on descriptions of nomadic Bedouin communities published by European travellers who visited the Near East in the 19th and early 20th century (e.g. Bell [1907] 1919; Blunt 1879; Musil 1928; Raswan 1930). Models based on these ethnographic accounts have often been uncritically applied to the past. This is problematic as it assumes a kind of cultural rigidity or stasis that is completely untenable. Like any society, nomadic societies change over time as a result of social, political, technological, environmental, religious, and other developments. There is no reason to assume that nomadic communities two millennia ago were similar to Bedouin communities of the last 150 years or so, except perhaps for very generic characteristics like a certain degree of mobility and a reliance on herd animals (cf. Magee 2014; Rosen 2017). Instead, one of the key characteristics of nomadic societies is the enormous variability that exists *between* such societies, in terms of the degree of mobility, economic activities, and social organisation. Such societies have a high degree of fluidity, and can quickly adapt, either collectively or individually, to changing socio-political or environmental circumstances (e.g. Bacon 1954; Barfield 1993; Barth 1961; Biagetti and Howe 2017; Dyson-Hudson and Dyson-Hudson 1980; Finkelstein and Perevolotsky 1990; Khazanov 1984; LaBianca 1993; Salzman 1996a, 1996b, 2002).

The assumption that the modern Bedouin are 'timeless' has had a profound impact on how scholars have regarded the nomads of ancient Arabia in general (Magee 2014: 8-10), and the ancient inhabitants of the Black Desert in particular. For example, in an early study of nomad-sedentary interaction in the Hauran, Peters (1977) uncritically transposed Bedouin migration patterns recorded in the 19th century onto nomads residing in the Black Desert some 2000 years ago. Similarly, in his reconstruction of "The Role of Nomads in the Near East in Late Antiquity", Donner (1989) based his conclusions almost entirely on 19th and 20th-century ethnographies, and on hardly any ancient evidence. Donner's support of the 'timeless' nomad is further illuminated by his contention that *"nomadic groups, despite their almost constant movement and their periodic contact with "outsiders," tended to be socially and culturally isolated"* (Donner 1989: 78) and that this social and cultural isolation *"helped make nomads culturally conservative, that is, slow to change their ways"* (Donner 1989: 79).

Uncritical use of ethnographic analogies has also been influential in the reconstruction of nomadic societies based on the content of the Safaitic inscriptions. The term 'Safaitic Bedouin' has long been used by epigraphists to describe the nomads who carved out inscriptions and rock art in the Black Desert (e.g. Alzoubi *et al.* 2016; King 1990; Knauf 1991; Oxtoby 1968), as if these carvings were the only thing that set them apart from ethnographically known nomads. More specifically, Macdonald has argued on several occasions (Macdonald 2010: 15-16; Macdonald 2014: 146) that the Safaitic inscriptions and pictorial carvings represent a meaningless form of amusement, used to pass the time while watching over herds. This interpretation seems largely based on a single ethnographic case – the Tuareg of North Africa (see Macdonald 2010: 7). Although it may be true that the inscriptions seem to lack a direct communicative function, this does not imply that the inscriptions were meaningless. In fact, Al-Jallad argues that many of the inscriptions were created with the purpose of being read by others, and that their meaning would depend on the context in which they were read (Al-Jallad 2015: 7-9). Furthermore, he argues that "*writing in the Safaitic context was not a practice of unstructured self-expression, but a genre of rock art restricted by stylistic and thematic formulae.*" (Al-Jallad 2015: 7). The potential social significance of rock art in the context of mobile societies is well attested in anthropological literature and requires further scrutiny with regard to the Safaitic inscriptions and petroglyphs (cf. Brusgaard in press).

Regarding nomadic societies as 'timeless' is, as explained above, theoretically untenable. Moreover, it is also unsound from an empirical point of view. The desert regions of Arabia host an enormous amount of archaeological evidence, much of which was left behind by nomadic peoples. The archaeological landscapes they comprise are being revealed at an increasing rate, thanks to the increased use of satellite imagery in archaeological prospection, but also because of a general increase in archaeological interest in ancient nomadism (cf. Honeychurch and Makarewicz 2016). Many of these landscapes provide hints that the history of nomadic inhabitation of these desert regions is far more diverse and complex than has been previously assumed (Rosen 2017). In many cases, these remains are hardly consistent with models of nomadic land-use based on ethnographic accounts. In these traditional models, nomadic landscapes are largely regarded as wild, natural spaces that remain almost completely unmodified, except with the temporary pitching of camps. Related to such models is the enduring 'myth' (Rosen 2017) that archaeological remains of nomadic communities are very poorly tangible. Such views starkly contrast the tens-of-thousands, if not millions, of stone-built features that can be found across the diverse landscapes of the Arabian deserts. These features may suggest that nomads invested in their landscapes much more profoundly than previously assumed.

Archaeological research is therefore a necessity to better understand these features, the landscapes they are part of, and their role in ancient nomadic societies. Moreover, the study of these rich archaeological landscapes provides the means to overcome some of the problems inherent to the textual sources through which nomads have thus far been mostly studied.

1.4 Research aims and questions

As introduced above, the *Landscapes of Survival* project aims to come to a better understanding of some of the economic and social strategies that allowed nomadic communities to successfully inhabit the Black Desert. It does so by investigating the archaeology, epigraphy, and rock art of the Jebel Qurma region. The archaeological aspect to this objective, presented in this book, aims to shed light on how the organisation of space contributed to such strategies. As outlined above, the role of stone-built architecture in the use and organisation of space are not well understood, and this study aims to contribute to solving this problem. With this aim in mind, it intends to answer the following question:

To what degree and for which purposes did the nomadic communities who inhabited the Jebel Qurma region between the Hellenistic and Early Islamic periods physically modify their landscapes through the construction of stone-built features?

This question is essentially two-tiered, as it includes a descriptive element – *to what degree were landscapes physically modified?* – and an interpretive one – *why were these landscapes modified?* How these questions may be answered will be further outlined in the next section, which provides the justification for the research methods used in this study.

1.5 Investigating a nomadic landscape

1.5.1 Revealing the 'invisible nomad'

This study attempts to investigate the way in which nomads engaged with their environment, specifically through the construction and use of permanent architectural features that characterize the archaeological landscapes of the Black Desert. The way in which these landscapes can be studied is by no means self-evident, as the remains of nomadic communities have long been regarded as poorly tangible. Although prehistorians have long been able to locate a wide array of material traces of mobile peoples, archaeologists primarily interested in historical periods have not picked up on this for a long time (Rosen 2017: 3). The notion of the 'invisible nomad' has persisted through much of the 20th century, and has been fed by a number of assumptions. These include, firstly, the assumption that the material culture of nomads is in itself limited and comprised almost entirely of perishable materials (e.g. Finkelstein 1995; Macdonald 1993: 382; Villeneuve 1985: 116). The second assumption is that if such materials do enter the archaeological record they do not accumulate in dense enough clusters to form sites visible to archaeologists, given the highly mobile character of nomadic communities (e.g. Finkelstein and Perevolotsky 1990). The argumentation behind these assumptions, and the way in which they have negatively influenced the search for archaeological remains of nomads, is illustrated in the following quote from a book by Finkelstein (1995), related to the archaeological remains of nomads from the Negev and Sinai deserts:

'The nature of nomadism accounts for the dearth of material remains. Generally, nomadic societies do not establish permanent dwellings, and constant migration permits them to move only minimal belongings. Moreover, their limited resources do not facilitate the creation of a flourishing material culture that could leave rich archaeological finds. The limited resources also preclude development of complex social structures, in which part of the population would be free to engage in crafts that enrich material culture. The ability of pastoralists to obtain 'out-of-the-desert' goods through barter or trade may also be limited. Grain could be obtained from sedentary people in exchange for animal products, but they generally do not have sufficient surplus to serve as a basis for regular trade, and most of their resources are reinvested in the flocks.' (Finkelstein 1995: 25).

On the basis of these assumptions, Finkelstein argued for a text-based approach to ancient nomadism:

'We have to be aware of the limitations of our discipline: [...] *until more sophisticated methods are invented, more exhaustive fieldwork will not solve the problem of the invisible nomads, the comfortable library would.'* (Finkelstein 1995: 30).

What Finkelstein did not acknowledge, however, is that contemporary with the publication of his 1995 book, solutions had already been developed to many of the methodological problems he envisioned. Many of the assumptions that lie at the foundation of the 'invisible nomad' model are flawed to a considerable degree, as will be explored in the following discussion.

From about the 1980s onwards, much research has been done to provide a more positive view on the archaeological visibility of nomads. This was done firstly through ethno-archaeological research, followed by archaeological field projects specifically aimed at sites and landscapes of nomadic pastoralists. During the 1980s and 90s, following an increased interest in the anthropology of mobile peoples (e.g. Binford 1980, 1990; Kelly 1983, 1992; Khazanov 1984), numerous ethno-archaeological studies on pastoral nomads were carried out in the Near East (e.g. Avni 1992; Banning and Köhler-Rollefson 1992; Cribb 1991; Eldar *et al.* 1992; Simms 1988; Zarins 1992) and beyond (Bartosiewicz and Greenfeld 1999; Bradley 1992; Smith 1978). The general aim of these studies was to shed light on the potential archaeological footprint of nomadic peoples and to better understand these from an anthropological perspective. Cribb's *Nomads in Archaeology* (1991) is probably the most influential of these works. In this book, Cribb questions and successfully deconstructs the notion of the invisible nomad, by exploring the material culture and the nature of settlement among contemporary pastoral nomads, and the ways in which they may form archaeological sites. Thus, he developed an ethnographically informed methodological framework for comparable archaeological contexts.

While Cribb's study largely dealt with residential sites, other ethno-archaeological studies have highlighted the formation of an archaeological record of nomads on a landscape level. The ethno-archaeological study of nomadic pastoralists in northern Sudan by Bradley (1992) illustrated the nature of such landscapes. In addition to nomadic campsites she also studied the landscape beyond the site, recording material features such as wells and cemeteries. In her subsequent archaeological survey of the same region Bradley identified a number of residential and non-residential sites of ancient nomads, based on comparisons with her ethnographic data.

Such ethno-archaeological studies have greatly fostered a more positive attitude towards studying the archaeology of nomads. This is reflected in an upsurge in archaeological field projects with an explicit focus on nomads during the past decades, including in the Near East (cf. Honeychurch and Makarewicz 2016). The arid to hyper-arid environments of the Near East have proved to be beneficial for the preservation and visibility of nomadic sites, characterised by low artefact densities and limited stratigraphy. While such remains would quickly be obscured in more dynamic environments (e.g. buried by later sedimentation), the relatively stable nature of desert environments often leads to well-preserved archaeological landscapes (cf. Wilkinson 2003). This potential has been successfully exploited in several areas, including the Negev desert of Israel (Rosen 1987, 1993, 2007, 2017; Rosen and Avni 1993), the Transjordan region (e.g. Al-Salameen and Falahat 2009; Banning 1993; Macdonald *et al.* 2012), the Syrian Desert (e.g. Morandi Bonacossi and Iamoni 2012), and the Taurus hills of Turkey (e.g. Hammer 2012), where extensive nomadic landscapes were preserved largely above ground. Many of these landscapes consisted of a broad spectrum of features, including different kinds of residential sites, funerary monuments, rock art, sanctuaries, cisterns, and epigraphic remains.

Various field methods contributed to the successful identification of these ancient nomadic landscapes. What these studies consistently show is the importance of combining a number of different methods, including remote sensing, pedestrian surveys, excavations, and laboratory studies. Some of the

archaeological remains of nomads are poorly visible, such as short-lived campsites and rock art as these remains are scattered over various parts of the landscapes rather than accumulated in one place. In this respect, investigating the archaeological remains of nomads requires a focus not only on the large, visible sites, but also on the landscape beyond these sites (Wendrich and Barnard 2008) using relatively intensive survey methods (Hammer 2012). The use of high-resolution satellite imagery has proved a useful tool to obtain an initial insight into the nature of nomadic landscapes of the Black Desert (e.g. Kempe and Al-Malabeh 2010; Kennedy 2011). However, it lacks chronological control and, moreover, is likely to miss a vast amount of poorly visible archaeological features, inscriptions, and rock art that pervade these landscapes. Pedestrian surveys are therefore required to be able to come to a more complete reconstruction of the nature of the archaeological landscape and its past inhabitants.

Methodologically, these surveys need to be of an intensity high enough to document the archaeological remains, which may be poorly visible and highly scattered. While pedestrian surveys have been carried out on a large geographic scale by Betts, these surveys were highly extensive and selective in nature (Betts *et al.* 2013: 7), and often documented the most visible and, therefore, the largest archaeological sites. Telling in this respect is Betts' identification of only three sites in the Jebel Qurma area. This represents a fraction of the number of sites documented so far by the Jebel Qurma project, some of which comprise a few pieces of rock art or a handful of pottery sherds (Akkermans and Huigens 2018; Huigens 2015). What is required instead is a survey strategy that aims to document the diversity of archaeological remains in a broad sense, taking into account different environments and topographic locales that nomads may have visited in the region. Such intensive survey methods were effectively used to document nomadic landscapes in other desert regions of the Near East, such as the Negev (e.g. Rosen 1987) and the Transjordan area (e.g. Banning 1986; Barker *et al.* 2007).

Although nomadic landscapes may thus be documented through intensive survey methods, these datasets are not without problems either. Paradoxically, the relatively stable nature of arid environments that have often resulted in well-preserved nomadic landscapes pose, at the same time, a major methodological challenge: a palimpsest situation, in which features and artefacts with different temporal origins are found on the same level. Although this is arguably inherent to all archaeological surface remains (Wilkinson 2003: 7-8), in desert landscapes this situation becomes more problematic as a result of the limited availability of substantial and well-defined stratified remains on the site-level (e.g. Banning 1993; Davidovich *et al.* 2014; Rosen 1993). This difficulty is increased by the fact that stone features – both architecture and rock art – are often difficult to date. In some studies, this problem is evaded by simply assuming a chronological correlation between features within such landscapes on the basis of spatial association alone (e.g. Avner 1984; Avner *et al.* 2014). It is instead necessary to establish, rather than assume, chronological relationships between materials and features within such palimpsest contexts by using dating methods that can determine the actual construction date of such features. An important development in this respect is the use of Optically Stimulated Luminescence (OSL) dating, which has been successfully used to date stone-built features in the desert which were impossible to date on relative terms (e.g. Athanassas *et al.* 2015; Davidovich *et al.* 2014; Junge *et al.* 2016; Porat *et al.* 2006, 2013).

Another implication of these palimpsest situations is that features may persist in the landscape for hundreds if not thousands of years, and that such features can be reused or reworked multiple times. There are numerous examples of archaeological studies in desert landscapes of the Near East in which, for example, prehistoric features have been reused and altered in more recent periods (e.g. Crassard *et al.* 2010; McCorriston *et al.* 2011; Rosen *et al.* 2007). Therefore, it cannot be assumed that materials encountered in spatial association with such features are related to the original date of construction or use of that features. Again, reliable dating methods that provide a relatively fine chronological resolution need to be consulted.

In summary, important advances have been made in the archaeological study of nomadic communities of the ancient Near East over the past few decades. As a result, the notion of the 'invisible nomad' can no longer be substantiated (Cribb 1991; Rosen 2017; Wendrich and Barnard 2008). The archaeological record of arid environments of the Near East is rich in remains of ancient nomads, and this material can be retrieved by combining various archaeological methods that provide information on different geographic scales, and with different chronological resolutions. In this study, data from remote sensing and intensive pedestrian surveys will be integrated to document architectural features in the landscapes of the Jebel Qurma region. More detailed information on the chronology of such features will be obtained from excavations at a number of these features, in an attempt to reconstruct the degree to which nomads modified these landscapes in the Classical and Late Antique periods.

1.5.2 Understanding the constitution of the nomadic landscape

The second aim of this study is to understand the underlying motivations for the construction and use of stone-built architecture in the Jebel Qurma region, and the ways in which they may have been perceived by those who engaged with them. These issues relate to the intentions of the inhabitants of the region: Why did they create stone-built features in a certain way? What was their intended use? How were these features to be perceived, both by those who constructed them and by others? And how did they contribute to certain economic or social strategies? In this section I will present how such questions are approached in this study.

As described above, the discovery of archaeological landscapes of nomads in various desert environments of the Near East has led scholars to realise that the history of nomadic societies is far more complex than previously thought. It is unwarranted to assume that ancient nomads were in any way similar to the Bedouin communities described in the 19th and early 20th century. The same applies with regard to the stone-built architecture present across many of these landscapes: such features were hardly described in ethnographies of the Bedouin, and new explanations are required about why such features were created in the past and what their significance was to ancient nomadic communities.

It is important in this respect, firstly, to better understand some of the practical purposes these features were intended to fulfil. Archaeological research in the Black Desert has attempted to do so to some degree, but many issues remain unresolved. One relevant example pertains to the function of cairns, for which, as shown above, there is no typo-chronology or clear insight about their function. This is largely due to the extreme paucity of excavations targeted at these features. Recent excavations in the Jebel Qurma region (e.g. Akkermans and Brüning 2017), but also in other desert regions of the Near East (e.g. Abu-Azizeh *et al.* 2014; Crassard *et al.* 2010; McCorriston *et al.* 2011), have provided new insights into the diversity of cairns in terms of their function, morphology, and date of construction, use, and reuse. A similar example comes from the thousands of stone-built enclosures documented in the Black Desert (Meister *et al.* 2019). A variety of interpretations have been proposed for these features, including their use as animal pens (e.g. Rollefson *et al.* 2014) or, alternatively, that they had a residential or even a cultic function (Kennedy 2011: 3189; Kennedy 2012b): these interpretations remain assumed rather than substantiated. Again, excavations are required to establish the ways in which these features were used in the past. If, for example, these features were primarily used to confine animals one would expect limited artefactual remains and, instead, the presence of animal remains, such as in the form of macro- or microscopic dung remains (e.g. Rosen *et al.* 2005; Shahack-Gross and Finkelstein 2008; Shahack-Gross *et al.* 2014). If, on the other hand, they were used for residential purposes one may expect to find artefacts that were used in such contexts, like fire places, or perhaps the footings of tents or huts (Cribb 1991; Rosen 2003; Simms 1988).

In addition to establishing the way in which permanent architectural features may have been practically used, understanding the purpose of these features in nomadic landscapes also entails studying

them within their broader geographic context. Given the inherently mobile character of nomadic communities, the features they leave behind in the landscape cannot be adequately evaluated when studied in isolation. Instead, the structure of the landscape within which these features are present needs to be investigated. Nomadic landscapes consist of a variety of man-made features, artefacts, and natural elements that reflect the patterned engagement of nomadic communities with these landscapes (Frachetti 2008; Hammer 2012). This patterning may be identified by investigating relationships between various elements of the landscape, both natural and man-made. It is important, in this respect, to take into account various temporal and spatial scales on which these features may have functioned (cf. Cribb 1991: 19; Frachetti 2008; Honeychurch and Makarewicz 2016).

Temporality is of direct relevance, as stone-built features may have been used long after their initial construction. Moreover, this may be one of the very reasons why such architecture was created. There is a wide range of ethnographic examples in which nomads structure the landscape in ways that are related to anticipated future engagement with that landscape. Butler, who travelled through Northern Arabia in 1908, describes how piles of stone are used as territorial markers. His travelogue reports: '*A noticeable thing about all the country between Kabweisa and the hollow of Al Jauf is the presence of many "riġms," or piles of stones, which mark the boundaries of the authority of various Beduin sheikhs.*' (Butler 1909: 520). These features were thus purposefully created to communicate territorial claims, also when those who laid claim were not physically present themselves. In a recent study by Hammer (2012, 2014), many more examples are presented for the construction of permanent features in the landscape. She interprets these features as a kind of "landscape capital" in which investment in stone-built architecture served to facilitate certain social and economic strategies in the long term. Examples are features that improved the quality of pasture such as cairn fields and check dams, as well as stone-built enclosures used to provide shelter in winter long after their initial construction (Hammer 2012, 2014). To investigate these possibilities through archaeological remains, it is important to regard to what degree features may have been reused and modified over time. This entails establishing detailed chronological reconstructions of particular use phases of features through excavations and relative or absolute dating methods.

Equally relevant is the spatial scale on which a stone-built feature, or a collection thereof, may have functioned. Nomads typically operate over large geographic areas, and their migrations may extend over areas of dozens or even hundreds of kilometres. Even so, their daily activity radius may be confined to a much smaller geographic area (Hammer 2012). Similarly, the features that are created in the landscape may be related to the variety of geographic scales in which nomads operate. The spatial distribution of desert kites may serve as an example here. It has often been noted how the local topography of the landscape is employed in the functioning of these features. For the purpose of hunting wild animals, the traps of these features were purposefully created behind ridges, obscuring their presence from view of approaching game (Abu-Azizeh and Tarawneh 2015). In this sense, the functioning of a kite is understood through analysing its local landscape context. But desert kites were structured on a much larger scale as well, as they form strings of similar features extending for many dozens of kilometres across the *harra* landscapes (Betts and Burke 2015). The construction of these series of kites did not only require a large amount of time and energy, but possibly also considerable planning and cooperation between many people (Crassard *et al.* 2015: 1096). These multi-scalar analyses (cf. Frachetti 2008) thus provide complementary information on the function of desert kites. Understanding the construction and use of other types of permanent architectural features may benefit from similar multi-scalar analyses.

In summary, in order to better understand why stone-built architecture was created in the landscapes of the Black Desert by nomads, the following aspects should be investigated. Firstly, a better understanding of the function of various types of stone-built features should be obtained. How were features such as enclosures and cairns practically used? Secondly, it should be investigated whether these features were created to function over the long term, or for ephemeral use only. Were these features used on multiple

occasions and, if so, in what fashion? Thirdly, it should be explored how these features functioned in a wider landscape context. To what degree were specific areas in the landscape favoured over others for the creation of certain features, and what do these patterns tell about the function of such features?

1.5.3 Investigating nomadic landscapes of the Jebel Qurma region

The foregoing paragraphs explored how nomadic landscapes may be revealed through archaeological methods, and how the construction of permanent features in the landscape may be understood. Based on this, the methods and analyses that were employed in this research are outlined in this paragraph.

The first step in this research was to compile an inventory of the archaeological remains in the Jebel Qurma region, based on fieldwork carried out there by the *Jebel Qurma Archaeological Landscape Project* between 2012 and 2016. This research included a remote sensing study, in which an initial inventory of archaeological remains was compiled through the study of aerial photographs and satellite imagery. As discussed above, remote sensing in the Black Desert is an effective method of obtaining a broad overview of the types of archaeological features present in the *harra* landscapes of the Black Desert. At the same time, however, more detailed information on the nature and chronology of the archaeological remains can only be acquired through direct field work. Data from pedestrian surveys and excavations were therefore also employed in this research. Pedestrian surveys in the Jebel Qurma region were carried out using a highly intensive survey method, as discussed above, which is ideally used to obtain a more targeted overview of the diversity of ancient remains within the nomadic landscape. Various kinds of remains that could not be studied through remote sensing were documented through this intensive survey, including small stone-built features as well as rock art, inscriptions, and artefacts present on the surface. Even more detailed information on the nature and chronology of individual features was acquired through excavations at a number of sites.

These datasets were then used to reconstruct a broad chronology of inhabitation of the Jebel Qurma region in the Classical and Late Antique periods. Essential in this respect were different kinds of remains that could be dated with relative or absolute dating methods. Many ceramics were collected that could be relatively dated on typological grounds; absolute dating methods included radiocarbon dating of charred plant material and skeletal remains, as well as OSL dating of soil sediments. These absolute dating methods were specifically used to determine the construction date of several types of stone-built features.

In order to better understand why certain features were constructed in the landscapes of the Jebel Qurma region, the results of the pedestrian surveys and excavations were analysed together. The excavation results were used to qualify how individual features were used in the past, while the results from pedestrian surveys identified how these features may have functioned on various geographic scales. Other elements of the landscape, both natural and anthropogenic, also were taken into account for this purpose. The natural elements of the landscapes of the study area were reconstructed on the basis of various datasets, including cartographic information, satellite imagery, but also environmental proxies such as botanical remains.

1.6 Brief structure of this book

In the subsequent chapter, this book continues with a study of the natural elements of the landscapes of the Jebel Qurma region. This provides the wider context of the archaeological remains discussed in the remainder of this book. Chapter 3 presents an overview of the archaeological remains that were documented in the Jebel Qurma region through pedestrian and remote sensing surveys. It also includes a first chronological overview of the history of inhabitation in the Jebel Qurma region, based on the analyses of datable remains collected on the surface, including pottery sherds. It further provides an

initial assessment of the types of stone-built features that were potentially used during the period under investigation. Chapters 4 and 5 present the results of excavations carried out at a number of stone-built features to offer a more detailed view of these features. The spatial distribution of these features is analysed across the landscapes of the study area. A discussion of the results of the surveys, excavations, and analyses is presented in Chapter 6, which already aims to provide answers to some of the questions posed in this introductory chapter. Finally, an answer to the main research question of this study is formulated in Chapter 7, which also includes an evaluation of the methods employed in this study, as well as suggestions for future research.