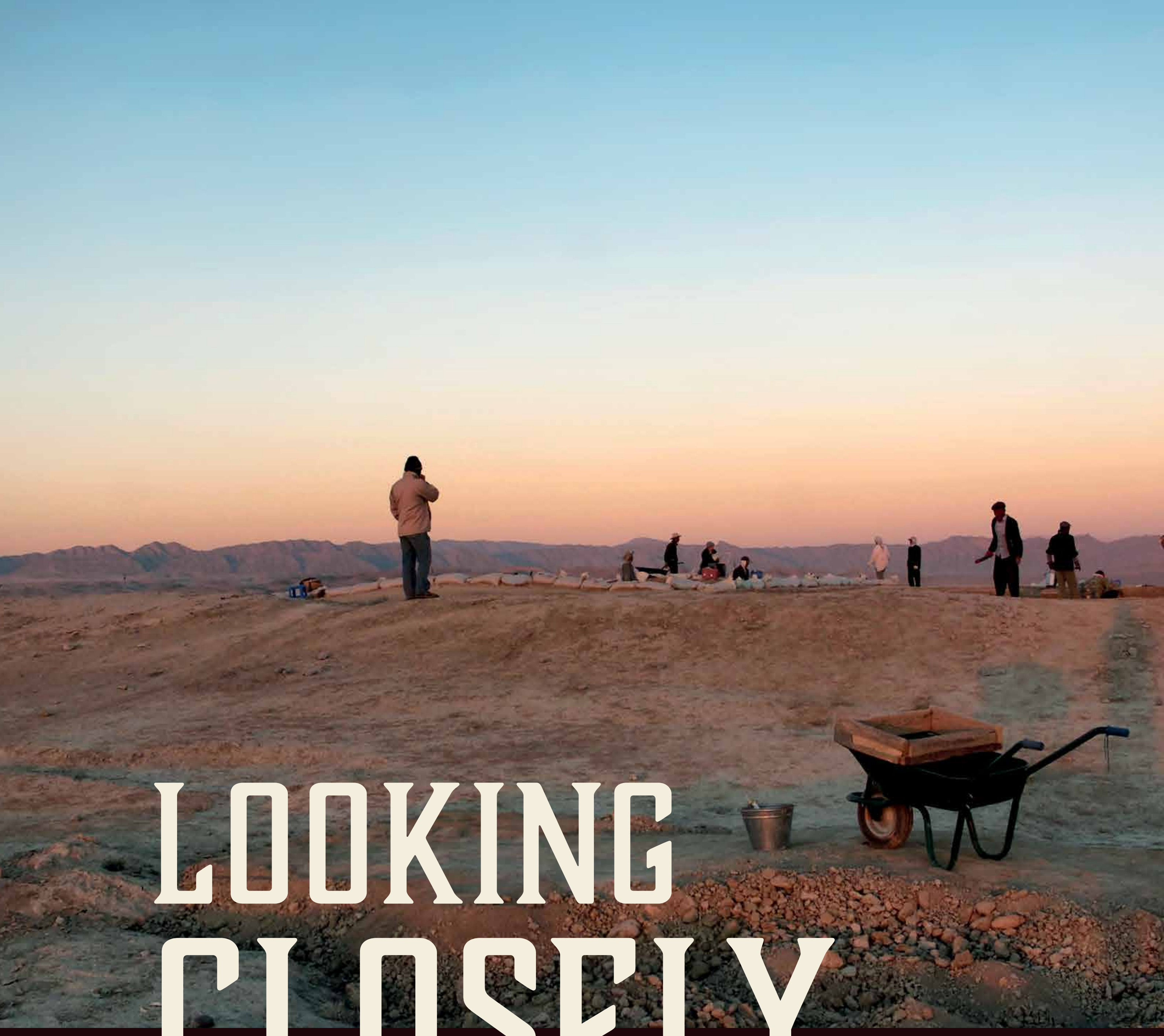

LOOKING CLOSELY

Excavations at Monjukli Depe, Turkmenistan, 2010 – 2014, Volume 1

Susan Pollock
Reinhard Bernbeck
Birgül Öğüt (eds)

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Sidestone Press

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Preface

Susan Pollock and Reinhard Bernbeck

The project at Monjukli Depe that forms the subject of this volume came about, as is the case for many research projects, through a series of coincidences as well as deliberate planning. For us as project directors, the work in southern Turkmenistan represents an extension of our long-standing interests in the later Neolithic and Chalcolithic/Aeneolithic in the region stretching from the Euphrates Valley in southeastern Turkey to the Zagros mountains of Iran. As archaeological research has repeatedly shown, an understanding of the dynamics of early village societies – their adoption, adaption, or even rejection of farming and animal husbandry, their degrees of mobility, and the socioeconomic interactions among them – can benefit from a comparative perspective as well as from detailed investigations at a small scale. In that respect our work at Monjukli Depe is set in the context of our previous projects at a variety of early village sites, including Fıstıklı Höyük and Kazane Höyük in southeastern Turkey, Tol-e Bashi and Rahmatabad in central Fars in southern Iran (Bernbeck et al. 1999; Bernbeck et al. 2003; Bernbeck et al. 2005; Pollock et al. 2010).

Our initial foray into archaeology in Middle/Central Asia was also linked to our move from Binghamton University in upstate New York to the Freie Universität Berlin in 2009. For a variety of reasons, our prior work in Iran was on hold and the fieldwork portion of our research in Turkey had ended. When Svend Hansen, director of the Eurasian section of the Deutsches Archäologisches Institut (DAI), suggested to us that we might consider Turkmenistan – after all, just over the northeastern Iranian border on the other side of the Kopet Dag – we were intrigued. Thanks to the advice and connections of Svend Hansen's then doctoral student, Aydogdy Kurbanov, we were able to participate in the conference "Ancient Jeitun – the centre of early agriculture" in Ashgabat in September 2010. In that context we met with a number of officials connected to archaeology and the antiquities service of Turkmenistan to discuss the possibilities of beginning a project.

On the basis of these initial contacts, we decided to try to pursue fieldwork in Turkmenistan that would address some of our existing research interests in late Neolithic and early Chalcolithic communities: examinations of small-scale, intrasite interactions and processes of community, household, and subject formation as counterpoints to standard larger-scale narratives of neolithization and the development of hierarchical societies. The first hurdle we faced was in deciding on which region to focus. We knew from the existing archaeological literature that most Neolithic and early Chalcolithic sites that had so far been identified were within the northern piedmont zone of the Kopet Dag. But which portion of this region would be most suitable and at which site we would begin our work were open questions. We applied for visas for ourselves and Svend Hansen to visit sites in the foothill zone in order to make an informed choice.

Unfortunately, these visas did not materialize within the foreseen timeframe. In the meantime, we had applied for and received financial support from the Excellence Cluster Topoi to undertake a preliminary season of work. Academic scheduling meant that this fieldwork needed to take place sometime between early August and mid-October 2010. As the time drew closer, we were forced to find a different solution. Luckily, Nikolaus Boroffka (also from the DAI, Eurasian section) had been in Turkmenistan shortly before and had kindly taken it upon himself to visit Monjukli Depe on our behalf. The site had already come up in our conversations regarding a suitable place to work; according to the literature, it was perhaps the only known site that was potentially settled continuously from Neolithic to early Chalcolithic times, making it eminently suitable for a detailed examination of changes and continuities through these periods. Nick Boroffka told us how and where the site could be found and that a substantial village, Meana, was nearby that could provide a place for a group of archaeologists to stay while working at the site. Furthermore, Monjukli Depe was not the only known Neolithic or Chalcolithic site in the area. In the Meana-Chaacha region (see Fig. 1.4), there were several other potential candidates that might also be suitable for our research goals.

With this preliminary decision reached, another matter had also to be arranged: a permit to work in the region. This was kindly made possible by Natalia Solovyova of the St. Petersburg Institute of Material Culture of the Russian Academy of Sciences, who allowed us to work under her license, issued by the Office for the Protection, Preservation and Research of Historical Monuments of Turkmenistan. We thank the director, Mukhammed Mamedov, for his assistance throughout the project.

We set out in mid-August for a first field season. Given the remaining uncertainty about whether we would excavate at Monjukli Depe or at another site in the Meana-Chaacha area as well as our complete lack of experience in the region, we decided to travel a few days earlier than the remainder of our team in order to settle some of the most basic issues. There we encountered for the first time the conditions of life in an area of the country remote from any major city, in which the one road from outside already seemed in 2010 to consist primarily of potholes that only multiplied from one year to the next. Acquiring food and water locally that did not upset the stomachs of those used to European diets and hygiene proved to be an ongoing challenge that absorbed considerable amounts of our time and energy.

Throughout our initial work as well as in four subsequent field seasons (2010-2014), we were fortunate to have the support and logistical help of numerous people and institutions without whom we would not have been able to conduct this research. In Meana we lived at the home of Bayram Yagshymyradov, his wife Gözel, and their children. The family helped us in numerous ways especially during our initial stay to adjust to life in the village. Bayram also served as our driver, as did Durdymyrat and in later years Annaguly and Mohammed. In the field we enjoyed the good humor and incredibly hard work of our workmen from the village of Meana. Without them the excavations would never have happened.[1] Yagshi Halmyradova and Annasoltan Hudayberenova cooked for us for several excavation seasons and were instrumental in keeping the team healthy and happy.

Ahmet Khalmyradov, Director of the State Historical and Cultural Park "Abiverd," supported us in numerous ways, not least with transportation and personnel, including Durdyrmyrat Atayev, Azdar Agadurdyev, and Nury Atayev. We benefited on multiple occasions from the expert conservation help of Mekan Annanurov. Aydogdy Kurbanov shared his knowledge of the archaeology and culture of the region, helping us to navigate the sometimes rocky waters of life in an out-of-the way corner of the country. He met with us both in Ashgabat and Berlin on numerous occasions to discuss the progress of our work. We also thank colleagues from the Institute of Archaeology and Ethnography of the Academy of Sciences of Turkmenistan. The German embassy in Ashgabat supported us logistically in various ways, and several members of the embassy staff visited us in the field over the years. In particular, Wolfgang Eminger made the long trip to Meana on numerous occasions, bringing wine, news, and a lively interest in our work.

The members of our team from outside Turkmenistan were equally instrumental in the success of the work. Many of them are authors in this volume. The full list of participants is as follows:

2010: Reinhard Bernbeck, Susan Pollock, Gabriela Castro Gessner, Jana Eger, Arnica Keßeler, Peter Sturm

2011: Reinhard Bernbeck, Susan Pollock, Jonas Berking, Jana Eger, Tobias Etessami, Arnica Keßeler, Jana Rogasch, Julia Schönicke, Peter Sturm, Kilian Teuwsen

1 It is unfortunate that under current conditions it is inadvisable to list them by name.

2012: Reinhard Bernbeck, Susan Pollock, Jan Ahlrichs, Brian Beckers, Jonas Berking, Gabriela Castro Gessner, Julia Daitche, Jana Eger, Lujain Hatahet, Arnica Keßeler, Birgül Ögüt, Fahd Sbahi, Julia Schönicke, Dawnie Steadman, Peter Sturm
2013: Reinhard Bernbeck, Susan Pollock, Jan Ahlrichs, Julia Daitche, Vera Egbers, Jana Eger, Hana Kubelková, Birgül Ögüt, Nolwen Rol, Julia Schönicke, Peter Sturm
2014: Reinhard Bernbeck, Susan Pollock, Julia Daitche, Vera Egbers, Jana Eger, Dominik Jentzsch, Hana Kubelková, Birgül Ögüt, Nolwen Rol, Julia Schönicke, Peter Sturm

Outside of the field context, we wish to reiterate our thanks to Svend Hansen, who from the very beginning offered us his full backing. Not only did he encourage us to begin this project, he also provided us with much-needed logistical support throughout the years of fieldwork and a substantial set of field and office supplies in our first season. Nikolaus Boroffka was always available to share his experience and advice, which helped us to negotiate the (for us) unfamiliar officialdom in a post-Soviet state.

Our project was funded in its initial phase by the Excellence Cluster Topoi and the National Geographic Society. Topoi's help continued in subsequent years, with the financing of radiocarbon dates run at the laboratory in Poznań (see Chap. 3) as well as the provision of short-term fellowships or lecture invitations to Gabriela Castro Gessner, Naomi Miller, Anahita Mittertrainer, Arlene Rosen, and Wendy Matthews, each of whom supported the project with their expertise. The bulk of our work was financed by the Deutsche Forschungsgemeinschaft. To all of these institutions we wish to express our thanks for their support.

The production of this volume involved many steps and the help of numerous people, from the original fieldwork to the many hours spent in a basement workroom in Berlin. Ezel Güneş was a student assistant in the project during much of the time this book was in production, and her editing support was instrumental in seeing the manuscript to completion. Michael Rummel joined the project in an advanced stage, helping in the final rounds of manuscript editing.

We thank the Open Access Fund of the Freie Universität for their financial contribution to the publication of this book. It is a particular pleasure to acknowledge the staff of Sidestone Press whose friendly and professional support made the work of turning a lengthy manuscript into a published book as easy and painless as possible.

In the field, excavation photographs were taken by Susan Pollock (2010), Kilian Teuwsen (2011), Jan Ahlrichs (2012-13), and Peter Sturm (2013). Artifact photographs are primarily the work of Peter Sturm, whose patience and attention to detail produced fine pictures under difficult circumstances. Artifacts were drawn in the field by Reinhard Bernbeck, Jana Eger, Arnica Keßeler, Nolwen Rol, Julia Schönicke, and Nury Atayev. Turning them from pencil drawings into publishable imagery was done by Nolwen Rol, Jana Eger, Konrad von Fournier, Hans Riediger, and Franziska Schmidt. The plans in Chapter 2 are the work of Nolwen Rol, based on earlier versions produced by Arnica Keßeler; Nolwen Rol also designed the catalogs in Chapters 8, 10, 12, and 13. The texts of chapters originally written in German (Chaps. 3-4, 6-7, 10-11, and 13) were translated by Susan Pollock.

Team 2010

Team 2012

Team 2013

Team 2014

Chapter 1

Introduction to the Project

Susan Pollock and Reinhard Bernbeck

Keywords: *Kopet Dag; Neolithic; Aeneolithic; Jeitun; Anau IA; cultural technique; political ecology*

This volume presents results of the archaeological research conducted at the small Late Neolithic to early Aeneolithic[2] site of Monjukli Depe in southern Turkmenistan from 2010-2014 (Figs. 1.1 and 1.2). Monjukli Depe is located on an alluvial plain in the piedmont zone of the eastern Etek region of southeastern Turkmenistan at 36.8484° N and 60.4180° E. The piedmont plain is a relatively narrow strip between the Kopet Dag range

Fig. 1.1. Monjukli Depe seen from the north.

2 In the (mostly Soviet) archaeological tradition in the region, Aeneolithic is used instead of Chalcolithic. We follow this usage in our work.

Fig. 1.2. The location of Monjukli Depe in Turkmenistan.

to the south that today marks the border with Iran and the Kara Kum desert to the north that covers much of central Turkmenistan (Fig. 1.3).

Monjukli Depe is situated approximately three km from the modern village of Meana and a stream of the same name (Fig. 1.4). The Meana as well as the Chaacha, some 10 km southeast of Monjukli Depe, are two of the numerous streams that derive their waters from the Kopet Dag and flow out into the piedmont plain, producing gravel fans that end in the desert. Today both streams carry water only seasonally, although in the past they may have been perennial (Berking et al. 2017; Berking and Beckers 2018).

The site of Monjukli Depe already figured in archaeological literature on the early prehistory of the region prior to the start of our project (e.g., Berdiev 1972; 1974; Kohl 1984, 65-71; Hiebert 2002). On the basis of earlier work at the site, its occupation was dated to the late Neolithic, or Middle to Late Jeitun period, and the early Aeneolithic, or Anau IA period (Kohl 1984, 52, 70-71). Importantly, it was considered to be one of the only known sites in the Kopet Dag piedmont region with stratigraphic continuity from the Jeitun to the Anau IA occupations (Berdiev 1972, 32; Kohl 1984, 52).

Background to the present project

As already indicated, the project at Monjukli Depe represents an extension of the authors' long-standing interests in the later Neolithic and Chalcolithic/Aeneolithic in Western Asia. Although we came to Monjukli Depe without prior experience in the Kopet Dag region, our work there did not take place in a local vacuum. Archaeological investigations in the piedmont zone north of the Kopet Dag, in what is today southern Turkmenistan, began in the 1880s, following the Russian conquest of the region (for overviews, see Müller-Karpe 1982; Kohl 1984, 17-23; Coolidge 2005, 7-22; Harris with Coolidge 2010, 44-46). The first excavations with an explicit focus on the early village societies of the region were those carried out by Raphael Pumpelly and Hubert Schmidt in 1904 at Anau (Pumpelly 1908). They observed a very early level that they called Anau IA. As part of their work, the Pumpelly expedition collected animal bones and plant impressions in pottery and mud bricks, at a time when virtually no other archaeological excavations paid attention to such remains. Together with his observations from other trips around Central Asia, the material from Anau led Pumpelly to propose that agriculture began as a result of

Fig. 1.3. A view of the Kopet Dag from Monjukli Depe. In the foreground is the piedmont plain.

increasing aridity, a postulate that was later reformulated by V. Gordon Childe into his well-known “oasis theory” of agricultural origins (Childe 1936).

Beginning in the 1930s, the Soviet archaeologist Aleksandr A. Marushchenko identified a number of early village sites in the Kopet Dag foothill zone and excavated soundings in many of them. Unfortunately, he published little of this work, and knowledge of his results comes primarily from mentions in later publications by other archaeologists. A substantial emphasis on the archaeology of early village societies emerged after World War II, with the formation of the Southern Turkmenistan Archaeological Complex Expedition (YuTAKE), set up to focus in grand style on particular periods and sites. In 1952, Boris A. Kuftin excavated soundings at Namazga Depe from which he developed the six-phase occupational sequence, extending from the Aeneolithic through the Bronze Age, that remains widely used up to today for regional comparative purposes.

The late 1950s to the early 1970s represented a florescence in research on the Late Neolithic and early Aeneolithic in the region. From 1958 to 1963, Vadim M. Masson excavated at the eponymous Neolithic site of Jeitun, where he exposed substantial portions of one occupation layer of the settlement. In 1959 Marushchenko began work at Monjukli Depe where he excavated a sounding in the middle of the mound down to sterile soil. His unpublished notes were later summarized by his Turkmen colleague Ovlyakuli K. Berdiev, who, under Marushchenko’s direction, undertook a large-scale exposure of the uppermost architectural level at the site in 1960. During the 1960s, Berdiev participated in and then directed excavations at many of the other known Neolithic and early Aeneolithic sites in the piedmont zone, including Chagylly and Chakmakly Depe in the Meana-Chaacha region but also at Bami, Togolok, and Pessejik Depe in the west. According to the prevailing Marxist focus of this work, special attention was given to production, ranging from food to tools and craft products. This emphasis resulted, in turn, in the use of innovative methods of research that were attentive to the possibilities of studying organic remains, use traces, and so forth. Due to Berdiev’s unfortunate early death, no comprehensive reports on his work were published. The one article he wrote specifically on his excavations at Monjukli Depe includes a plan of the architecture exposed as well as summaries of the buildings and the artifacts recovered (Berdiev 1972).

After the early 1970s, interests shifted, and from then until the end of the Soviet Union, relatively little new fieldwork was conducted on these early periods, although excavations at the large Aeneolithic site of

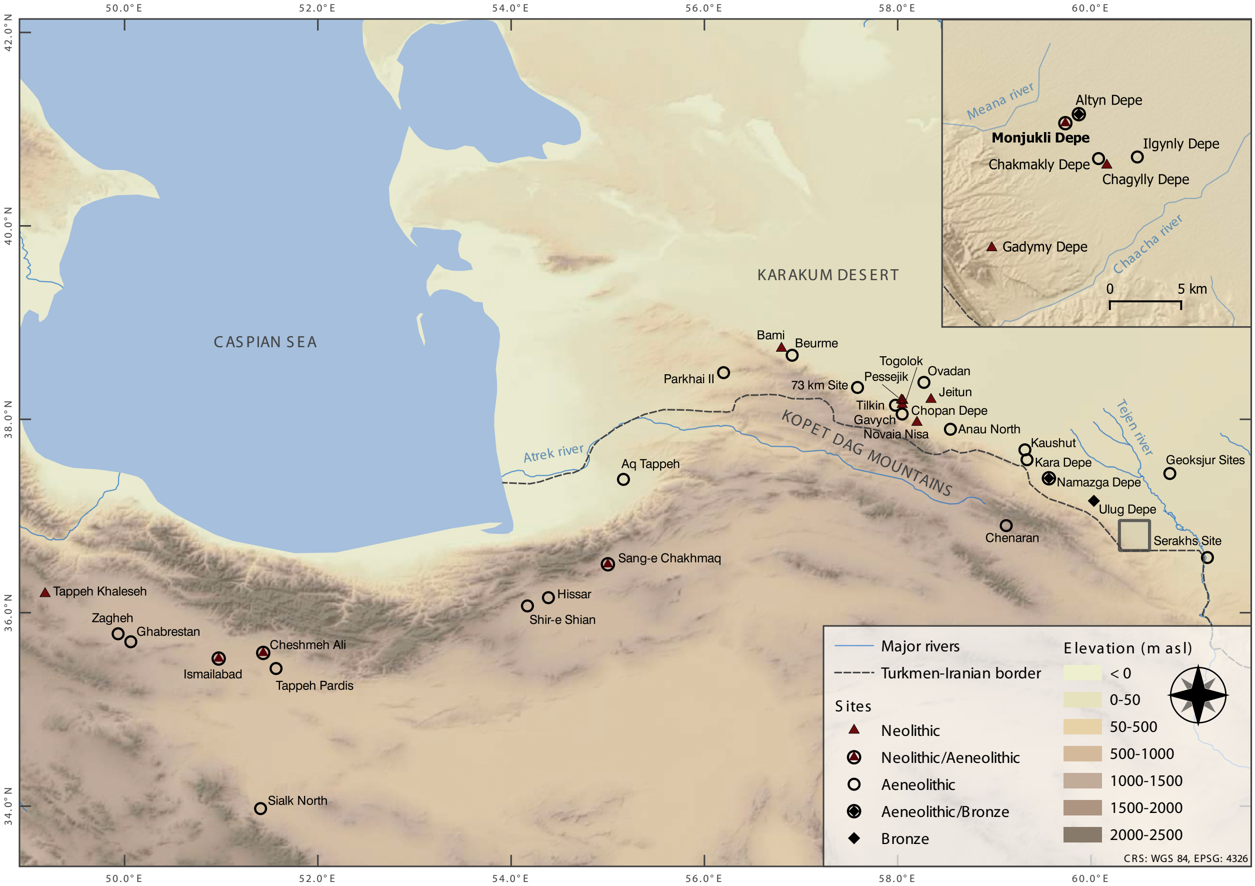

Fig. 1.4. Neolithic, Aeneolithic, and Bronze Age sites mentioned in the text and located in the piedmont plain of the Kopet Dag, Turkmenistan and in north-central Iran. The inset shows the location of the main Neolithic and Aeneolithic sites in the Meana-Chaacha region as well as the Bronze Age site of Altyn Depe. Data sources: Topography: Global Multi-resolution Terrain Elevation Data (GMTED2010) (large map) and Shuttle Radar Topography Mission Digital Elevation Model (SRTMGL1) (Meana-Chaacha inset); Boundaries: "www.naturalearthdata.com"; Hydrography: Digital Chart of the World (DCW) 1992.

Ilgynly Depe were renewed in 1985. Starting in 1989 and continuing until 1994, a new project featuring a British-Russian-Turkmen team led by David R. Harris in collaboration with V. M. Masson and Kakamurad K. Kurbansakhatov resumed fieldwork at the site of Jeitun (Harris and Gosden 1996; Harris 2010). The goals of this project were to obtain data on the economy of this Early Jeitun village, investigate the paleoenvironment, and establish a solid radiocarbon-based chronology. The work focused purposely on the small scale as a complement to the extensive excavations undertaken in the 1950s and 1960s by Masson (1971).

In 1997 Fredrik Hiebert undertook renewed excavations at Anau North. The overarching goals of the project were to place the period of early village life in Anau North into a larger regional and interregional framework and to obtain sufficient material in good stratigraphic context so as to be able to integrate previously excavated materials from the site (Hiebert with Kurbansakhatov 2003, xvii, 1-2). Working at the edge of the trench excavated in 1977-1982 by Kurbansakhatov, Hiebert and team reached Anau IA levels in a small area. Several radiocarbon samples were dated, providing some of the first secure chronological assignments for this heretofore earliest Aeneolithic occupation in the Kopet Dag piedmont zone (Hiebert 2002; Hiebert with Kurbansakhatov 2003, 55-56).

On the basis of these prior field projects, a general set of understandings of the Jeitun and Anau IA periods was available to us when we started our work at Monjukli Depe. The *Jeitun period* is characterized by small, predominantly sedentary villages that lack for the most part obvious signs of internal hierarchy, although a large building with a wall painting at Pessejik has been interpreted as either a cultic or an assembly building. Three subphases – Early, Middle, and Late Jeitun – were initially distinguished on the basis of changes in pottery forms and decoration as well as the composition of the lithic industry (Korobkova 1996, 51), but also in terms of building materials and settlement layouts.

Characteristic Jeitun pottery is chaff-tempered and thick-walled with occasional painted designs. Houses consist of single, nearly square rooms of relatively similar sizes, often with a fire installation located against one wall. At the Early Jeitun settlements of Jeitun and Pessejik, houses were freestanding and distributed within the settlement in a way that appears unplanned; in Middle-Late Jeitun Chopan and Chagylly Depe, buildings were constructed abutting one another. While people in the earlier Jeitun settlements used hand-made bricks, rectangular bricks of standard sizes make an appearance in Late Jeitun. Villagers practiced cereal agriculture, growing emmer and einkorn wheat as well as barley, and they raised sheep, goat, and dogs. The locations of many Jeitun sites at the terminal gravel fans of the Kopet Dag streams suggest that they were placed so that their inhabitants could practice agriculture without the use of irrigation.[3] Although most Jeitun-period sites appear to have been occupied more or less permanently, there is evidence at Jeitun itself for short-term abandonments, the lengths of which are unclear (Masson and Sarianidi 1972, 33-46; Müller-Karpe 1982; Kohl 1984, 45-55; Harris and Gosden 1996; Hiebert 2002; Harris 2010).

A suite of radiocarbon samples from the renewed work undertaken in the late 1980s and 1990s at Jeitun date the occupation of the site to ca. 6200-5500 cal BCE (Harris et al. 2010; see Chap. 3, this volume). In his review of the early village periods in southern Turkmenistan, Hiebert (2002) attributed the remaining Middle and Late Jeitun phases – for which only one old date from Chagylly Depe with a very large error margin was available – to the approximately one thousand-year gap between the (Early) Jeitun dates and the radiocarbon-dated beginning of Anau IA. As a result, the Jeitun period as a whole was stretched over a span of more than one-and-a-half millennia, from ca. 6200 to 4500 BCE.

Most researchers considered the "Jeitun culture," with its developed agricultural and pastoral subsistence economy and village life, to have been introduced – apparently fully formed – from elsewhere. Regions to the south and west, today parts of Iran, but also occasionally Turkmen sites of the so-called Caspian Mesolithic or Kelteminar (now mostly discredited), have been named as likely places of origin of this way of life and of the people assumed to have migrated to the Kopet Dag region with their plants, animals, and technical know-how. The absence of documented early Neolithic predecessors in the Kopet Dag foothill zone and the fact that the wild progenitors of domesticated sheep, emmer, and einkorn are not found in the region have been cited to bolster arguments for the introduction of a "Neolithic package" rather than a local development of agriculture, animal husbandry, and village life (Harris and Gosden 1996; Harris 2010; for problems with the notion of such a "package," see Dittrich 2017).

The succeeding *Anau IA period*, named for the lowest occupation reached in Pumpelly's excavations at Anau North, represents what was thought to be the earliest phase of the Aeneolithic in the region. Remains attributed to this period have been recognized at a handful of sites but substantial exposures are limited to only a few, including Monjukli Depe and Chakmakly Depe as well as Kaushut (Masson and Sarianidi 1972, 47-52; Kohl 1984, 65-71). Based on a series of radiocarbon dates from Anau North, Hiebert assigned the Anau IA period to ca. 4500-4000 BCE (Hiebert 2002). Masson and Sarianidi (1972, 50-52) tried to subdivide the period into an earlier and a later aspect on relative chronological grounds using painted pottery. In their scheme, Anau North is supposed to represent the later, Monjukli and Chakmakly Depe the earlier ("Pre-Anau") subphase. As discussed in this volume, our work has led us to distinguish an earlier Aeneolithic phase at Monjukli Depe, the Meana Horizon.

In many respects, characteristic Anau IA features suggest significant changes in comparison to the Jeitun period. Anau IA pottery is mineral-tempered, thin-walled, and well fired. Small copper tools occur regularly, albeit in limited numbers, and spindle whorls are present in large quantities. The use of materials such as lapis lazuli, alabaster, and shell point to long-distance connections, and a stone hoe at Chakmakly Depe has been taken to suggest parallels to Tappeh Sialk (Berdiev 1968; Kohl 1984, 69). Settlements shifted to more upstream locations, and this, together with the occurrence of bread wheat, may indicate the beginnings of small-scale irrigation. Anau IA communities appear to have been planned, with more structured arrangements of buildings and internal divisions by streets as well as the appearance of multi-room compounds.

The apparent technological changes between the Jeitun and Anau IA periods have led some researchers to postulate another migration of people coming from outside the Kopet Dag region (e.g., Masson and Sarianidi 1972, 51-52). Taking a somewhat different approach, Berdiev argued for a combination of immigration from Iran and mixture with coexistent local, Late Jeitun populations (Berdiev 1974; Kohl 1984, 67). Kohl and Hiebert go a step further, postulating continuities between Jeitun and Anau IA by pointing to similarities in ceramic motifs, the continued importance of chipped stone blades, sporadic use of copper in Jeitun times, and architectural continuities, especially of storage structures (Kohl 1984, 71; Hiebert 2002, 37).

3 Substantial aggradation in the region has resulted in the deposition of at least four meters of sediment, undoubtedly obscuring shorter-lived occupations (Hiebert 2002, 37; Berking and Beckers 2018; Castro Gessner 2018). As a result, settlement patterns for early periods are highly incomplete.

As should be clear from this overview, archaeological interpretations of the early Kopet Dag settlement are based on a "macro-perspective" that tends to lump rather than differentiate. Regional and local differences may be mentioned but play a limited role, if any, in interpretations, with change over time supposed to have happened everywhere more or less simultaneously. The sweep of major migrations is assumed to have been what drove historical change, both for the advent of the Jeitun culture as well as for the change from the Jeitun period to Anau IA.

Project goals

When we began our project in 2010, we initially proposed to investigate the transition from the late Neolithic Jeitun period to the early Aeneolithic Anau IA period at Monjukli Depe. We aimed to focus on when and how innovations – including such frequently cited characteristics of early Aeneolithic communities as high-fired ceramics, metallurgy, and textile production – were introduced, adopted, adapted, or in some cases perhaps rejected. We reasoned that to adequately address such questions, one should not assume the advent of a whole "technological package." Instead, we aimed to examine the specifics of individual households and the technological practices in which they engaged, paying particular attention to variations in those practices and small-scale shifts over time. We chose Monjukli Depe as it was one of the very few sites in the region where an Anau IA occupation was known to be directly superimposed over Jeitun/Neolithic layers. We anticipated being able to explore directly the connections between these two periods.

Already in the first excavation season it became apparent that there was a substantial hiatus in settlement, or at least a significant spatial shift, between the Neolithic and Aeneolithic occupations. In one excavation unit there were aeolian deposits separating the Neolithic from the Aeneolithic levels, pointing to a break between the two major occupational periods (Pollock, Bernbeck and Schönicke 2013, 55-56, Fig. 4). The first suite of radiocarbon dates, although beset by problems, nonetheless suggested a hiatus of almost one thousand years between the two settlement periods (Pollock et al. 2011, 183-184). Under these circumstances, our objectives required rethinking.

At the same time, our interest in examining the small-scale practices of daily life as a first and crucial research step toward larger syntheses led us to rethink the relevance of innovations as a useful analytical category. Although not limited to technologies (Burmeister and Bernbeck 2017), the concept as well as the investigation of innovations often remain at the level of entities rather than practices, thereby glossing over the daily and the small scale. For these reasons, we replaced the focus on innovations with one that examines microhistories of cultural techniques (*Kulturtechniken*) and technological changes. Following the work of scholars such as Timothy Ingold (1987) and Marcia-Anne Dobres (2000), we understand technologies as "the ways in which knowledge, both discursive/explicit and embodied/practical, is brought to bear through practices and gestures ("Kulturtechniken") on materials and objects" (Pollock et al. 2011, 172). In distinction to technologies, cultural techniques – everyday, routinized practices in which people interact with the material world – are constituted by practical dispositions and preferences, but also reproduce those dispositions. These can include practices involved in the acquisition of materials, the working of them into objects or food, and their use or consumption. We formulated six realms of cultural techniques that we proposed to examine:

1. Pyrotechnologies, involving the use of fire for cooking, heating, and light but also for the transformation of materials into other states – fired clay becomes ceramic, metal ores can be melted and formed into objects;
2. Subtractive technologies, in which the working of materials proceeds in an irreversible fashion by removing portions of them. At Monjukli Depe these technologies are best represented by stone working, whether chipped stone or ground/used stone,[4] but also by bone tools;
3. Subsistence technologies: procuring or raising animals and plants for food as well as the use of techniques such as irrigation;
4. Fiber working, involving spinning of fibers into thread or yarn as well as weaving or felting to produce textiles;
5. Food preparation, most commonly thought of in terms of cooking, roasting, grilling, or baking but also potentially involving a range of techniques that do not require heat, such as fermenting, sprouting, or salting; and
6. Ideological cultural techniques, including practices such as disposal of the dead by means of burial.

Many of these cultural techniques are addressed in the contributions to this volume, including the production

4 The stone assemblage at Monjukli Depe consists of a continuum of pieces that range from formal tools to those that were used without any alteration of their natural shape. There is no adequate English term that covers this range, but we have adopted the term "used stone" as a shorthand (Öğüt in preparation).

of contained fire (Chap. 6), making and use of ceramics (Chap. 10), animals as food sources for feasting (Chap. 7), spindle whorls for fiber production (Chap. 11), and burial practices (Chaps. 8 and 9). Additionally, building practices and the abandonment of structures came to play a major role in our work, thanks to the excellently preserved Aeneolithic architecture (Chaps. 2, 4, and 5). We also extended our efforts to address ideological cultural techniques to include human-animal relations (Chaps. 4, 7, and 12) as well as fields of representation that raise questions about categorization and degrees of ambiguity in representations (Chaps. 12 and 13).

Additional inspirations and questions arose in the course of the project as well as in the context of related research endeavors. As part of a group in the Excellence Cluster Topoi (www.topoi.org) that examines the political ecology of non-sedentary societies, we began to pay greater attention to questions of how the Monjukli Depe villagers perceived, conceptualized, exploited, and interacted with their environs. Our approach to political ecology draws on three intertwined notions of *Umwelt, Umgebung*, and especially *Mitwelt* (Bernbeck et al. 2016). *Umgebung* refers to that which is in a society's surroundings, regardless of whether humans were interested in or influenced it. *Umwelt* concerns that part of the total environment that is changed and manipulated by human practices, whereas the *Mitwelt* is the part that is *perceived* as having an agency that impinges on people's lives.[5] In Monjukli Depe, we have begun to explore the particular roles of specific animals in the inhabitants' *Mitwelt*.

Other issues that emerged during considerations of the results of our work are discussed in the concluding chapter. These include in particular regimes of visibility, questions of work and value of material things.

This volume

The current volume aims to accomplish several goals. First, we present basic data from the 2010-2014 seasons at Monjukli Depe, including stratigraphy, architecture, radiocarbon dates, pottery, spindle whorls, clay tokens, figurines, animal bones, human burials, and fire installations. As this list makes clear, the volume does not constitute a complete publication of the excavations. Other categories of objects, such as used stones, macrobotanical remains, and the results of our program of microdebris recovery and analysis are subjects of doctoral dissertations in progress and will be published in due course. Other material categories, including but not limited to chipped stone, beads, bone tools, and metal objects, have not yet been analyzed in depth. Nonetheless, this book offers a first in-depth insight into our work at Monjukli Depe and makes primary data available in a timely fashion. In addition to presentation of basic data, the chapters in this volume offer interpretations of the materials they analyze with reference to the overarching project goals.

Alongside our work at Monjukli Depe itself, two closely related projects have researched the region in the immediate vicinity of the site. Investigations were conducted by Jonas Berking and Brian Beckers to examine landscape changes in the Meana-Chaacha region since the time of Monjukli Depe's occupation, with special emphasis on the availability of water (Berking et al. 2017; Berking and Beckers 2018). A regional survey carried out in 2012 in the Meana-Chaacha region by Gabriela Castro Gessner offers a long-term perspective on settlement in the region (see Castro Gessner 2018; Castro Gessner and Mittertrainer in preparation).

Previous publications

Several papers on our work at Monjukli Depe have already been published or submitted for publication. These include three fieldwork reports in *Archäologische Mitteilungen aus Iran und Turan* (Pollock et al. 2011; Pollock et al. 2013; Pollock et al. 2018) and one in *Neo-Lithics* (Bernbeck et al. 2012). Several articles have examined specific conceptual elements, including the notion of affordance (Keßeler 2016), *Eigensinn* (Sturm 2015), issues of scalar differences, both temporal and spatial (Bernbeck and Pollock 2016), a preliminary study of grinding stone use through the lens of phytolith analysis (Öğüt 2016), and the first results of isotopic analyses of faunal remains (Eger et al. in press).

As often happens, these publications have not always been consistent in the use of terminology. Moreover, as excavation and analysis continued, some decisions – for example, how to make stratigraphic divisions – of necessity had to be revisited and modified. Among the most important are the designations for stratigraphic units; here we follow our original usage of *stratum* as the basic division of architecture, features, and deposits into site-wide stratigraphic levels. In all cases in which there are discrepancies between the usage in this volume and earlier publications, the designations and usages here are the preferred ones.

5 For example, if we give a hurricane the name "Katrina," we personalize weather patterns, treating them as if they are clearly bounded entities with their own agency and intentions. We do so in order to control them by defining their spatiotemporal beginnings and ends, but also to be able to blame "someone" instead of an extremely complex set of factors (ourselves included!) for destruction and mayhem. We do not treat thunder in the same way, even though it may be regarded in a similar fashion in other cultures.

Chapter 2

Stratigraphy and Settlement Layout

Susan Pollock and Reinhard Bernbeck

Keywords: *stratigraphy; architecture; corner deposit; street; Meana Horizon; Neolithic*

Introduction

We began fieldwork at Monjukli Depe in 2010. Four seasons of excavation (2010-2013) were followed by a study season in 2014 in which our aim was to complete the recording of previously excavated materials. In addition, one trench was excavated in 2014 for purposes of geomorphological study, and a substantial portion of the surface of the mound was investigated using the technique of surface scraping (see below).

A total of 10 excavation units were opened over the course of these seasons, labeled with letters from A to M (Table 2.1, Figs. 2.1 and 2.2).[6] The locations and sizes of excavation units were chosen to fulfill general project goals as well as to address specific questions that arose during the course of the fieldwork. The largest trenches were 10 x 10 m (B, D, E, F), opened in order to obtain a broad exposure of the latest phase of the Aeneolithic settlement at Monjukli Depe. They were placed so as to investigate different parts of the site, including both sides of the street that, according to Berdiev, divided

Unit	Size (m)	Seasons excavated
B	10 x 10	2010, 2011
C	5 x 5	2010, 2011
D (A)	10 x 10	2010, 2011, 2012, 2013
E	10 x 10	2011, 2012
F	10 x 10	2012
G	5 x 3	2012
H	3 x 1.5	2012, 2013
I	2 x 1.5	2013
K	2 x 1.5	2013
L	2 x 1.5	2013

Table 2.1. Excavation units at Monjukli Depe.

6 Unit A was subsumed into Unit D after the 2010 season. We did not assign a Unit “J”, due to the potential for confusion with “I”. Unit M designates a geomorphological trench excavated in 2014; it will not be discussed further here.

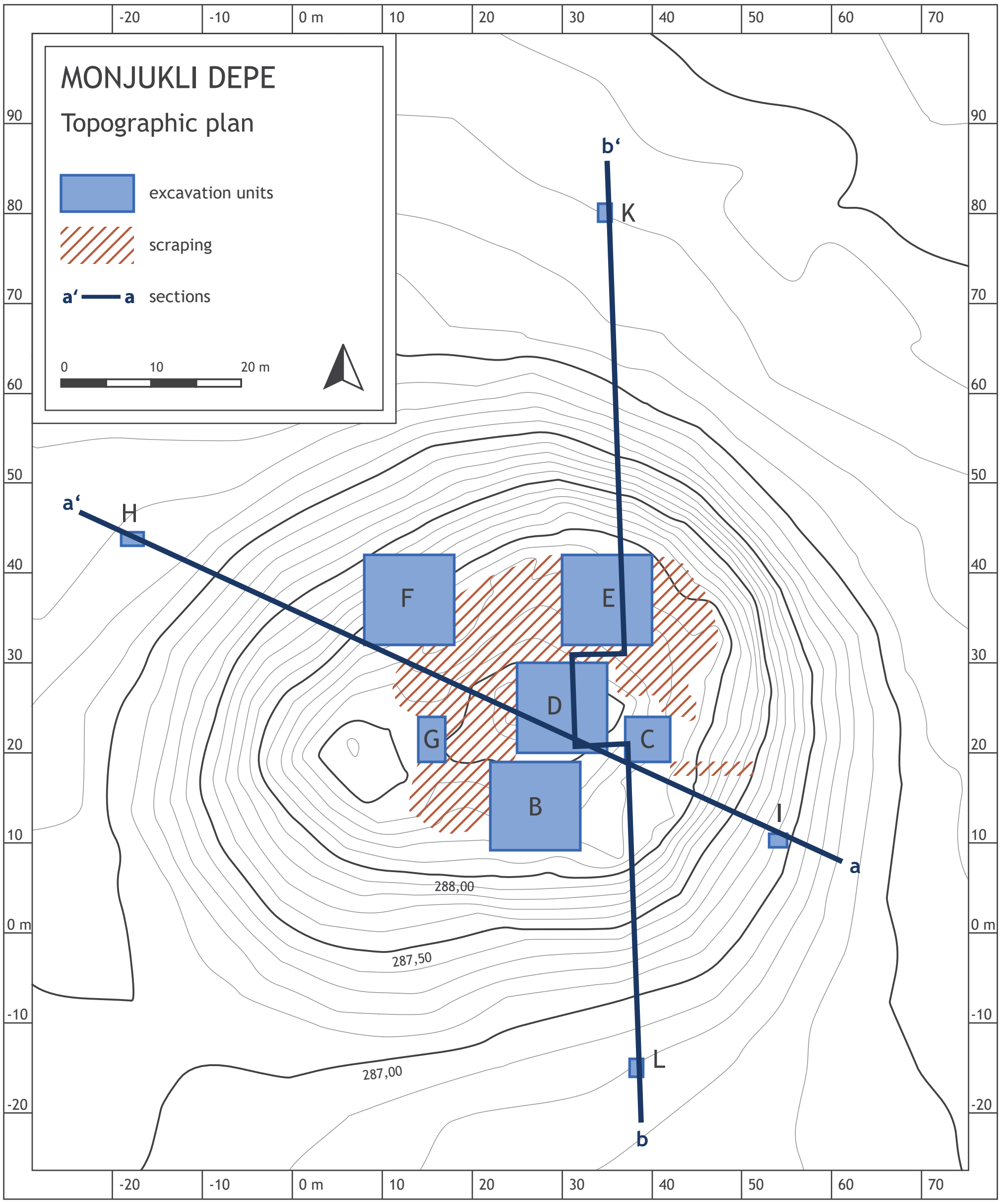

Fig. 2.1. Topographic plan of Monjukli Depe with the locations of the excavation units. For the schematic profiles a´- a and b´- b, see Fig. 2.10. We thank Jegor Blochin and members of the 2011 Ilgynly Depe excavation team for the preparation of the topographic plan.

the settlement in two as well as to trace the street to the northwest (Fig. 2.3). Units C and G were smaller soundings, the goals of which were to expose earlier portions of the Aeneolithic settlement as well as the Neolithic occupation.

In 2012 in the course of work in Unit F, it became clear that the Aeneolithic occupation extended well past the edge of Berdiev's 1972 plan. We decided to open a small sounding, Unit H, beyond the edge of the topographically visible mound to the west. Underneath heavily weathered upper deposits, nearly 5.5 m of cultural layers dating to the Aeneolithic and Neolithic periods were exposed below the present-day surface of the plain. With this lesson in mind, we excavated three further soundings, Units I, K, and L, to the east, north, and south of the mound, respectively (Fig. 2.1). In each case we encountered substantial cultural deposits that left no doubt that major portions of the settlement are today buried below deep accumulations of alluvial and aeolian sediments (Berking and Beckers 2018).

Toward the end of the field season in 2012, our work was halted for a day by a rainstorm. When we returned to the site, we were astonished by the ease with which we could recognize the outlines of unexcavated walls

Fig. 2.2. Overview of the excavation at the end of the 2011 season, view toward the northwest.

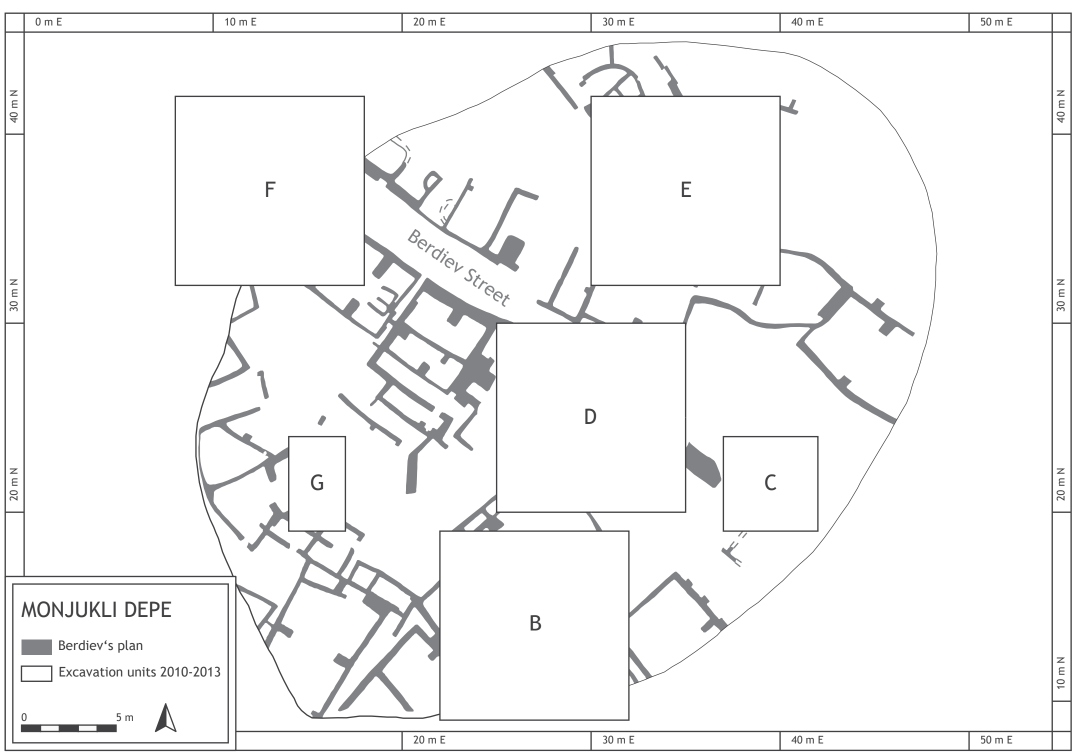

Fig. 2.3. Berdiev's plan of Monjukli Depe with the main 2010-13 excavation units superimposed over it (after Berdiev 1972, Fig. 1).

Fig. 2.4. Surface scraping at Monjukli Depe.

immediately beneath the surface. This was the impetus to try out the technique of surface scraping, which was used to good effect on sites in Iraq to identify and map large areas of architecture directly below the mound surface (Postgate 1983; Matthews 1990; Pollock et al. 1996). We conducted the scraping in 2014 with the aim of addressing specific questions about settlement layout and extending the plan of the last well-preserved level of occupation at the site (Figs. 2.1 and 2.4).

Excavation methods and documentation

The basic unit of excavation and recording that we used at Monjukli Depe was the locus. Loci were assigned to all excavated deposits, whether or not they corresponded to meaningful stratigraphic contexts or features. As a result, every artifact and every sample can be attributed to a locus, which can be located within the Harris matrix of all excavated deposits in a unit. Locus numbers consist of the letter of the excavation unit plus a number, beginning with 1 for the first excavated deposit (0 was assigned for surface collections). Any visible feature or deposit differentiable in terms of sediment color and/or texture, including walls, was given its own locus number(s).

Within each locus, registration numbers (RN) were allocated for every artifact collection, or occasionally for a single object, as well as for each sample that was taken. The RN is a unique number that occurs only once in the excavation. It thereby allows a group of lithics, for example, to be attributable to the locus from which it came. RNs were not reused from one day to the next, so it is not uncommon for there to be multiple RNs for one type of artifact from the same locus. When artifacts from a locus were processed, single pieces from collections, for example, sherds or tokens, were distinguished by the

Fig. 2.5. Screening at the excavation. Volumes of screened deposit were measured using buckets of known size.

addition of a number after the RN. In the case of an RN for chipped stone with the number 6473, single chipped stone artifacts could thus be assigned RN 6473.1, RN 6473.2, and so forth.

The large majority of excavated deposits were dry screened using sieves of 5 mm mesh (Fig. 2.5). The only exceptions were clearly identifiable tertiary contexts, such as wall fall, walls,[7] and disturbed or undifferentiable

7 Walls are themselves primary contexts, but – with rare exceptions – artifacts within them are in tertiary context.

Fig. 2.6. Checkerboard sampling of a surface. Every second square was sampled for flotation, and a film container of sediment was taken for subsequent analyses (e.g., for phytoliths).

deposits directly under the surface of the mound, which were not screened. When the status of a deposit was unclear, it was generally screened as a precautionary measure. The volumes of all screened deposits were measured in liters using buckets of known size. This in turn allowed the calculation of densities of materials and thus meaningful comparisons across loci, excavation units, and context types (Wright et al. 1980; Pollock 1999).

In addition to a standard procedure of dry screening and measurement of excavated volumes, we also sampled deposits for flotation and wet screening. This was done on a judgmental basis, based on several criteria. First, ashy and burnt contexts were sampled in order to recover botanical remains. Second, samples were taken from floors in houses as well as exterior surfaces so as to recover microdebris, which can be used to assess the spatial distribution of activities (Sturm in preparation). Starting in the 2011 season, surfaces and floors were sampled in a checkerboard pattern in order to achieve broad and systematic coverage (Fig. 2.6). Each surface was covered by a grid of 50 x 50 cm squares, unless the exposed or preserved area was small, in which case 25 x 25 cm (or, rarely, 30 x 30 cm) squares were used. Every second square was sampled in a staggered fashion. In addition, deposits immediately above surfaces, fire installations, pits, and other features were sampled for flotation in order to recover both light (botanical) and heavy (microdebris) fractions. Sample sizes rarely exceeded six liters and were often smaller, due to the size of the deposit. This was in part a function of our fieldwork strategy, which put a preference on smaller but more widely dispersed samples. Flotation samples were "whole earth," meaning that we did not remove any artifacts from them prior to the flotation/wet screening process.[8]

Flotation was done in a bucket and the light fraction scooped out with a fine-mesh (0.5 mm) sieve (Fig. 2.7). The decision to use the bucket method was a pragmatic one, as water was a scarce resource in the village where we lived and worked. The heavy fraction was recovered in a screen of 1 mm mesh and later sorted by size categories (2-5 mm; > 5 mm) (Sturm 2011; in preparation). The samples of deposit to be floated were measured with a greater degree of accuracy – to 0.1 liter – than those (dry) screened on the excavation.

Other kinds of samples were also collected on a regular basis. These included charcoal samples from well stratified contexts for radiocarbon dating and sediment samples for phytolith (Ryan 2011; Öğüt 2016), phosphate, or sedimentological analyses. Pieces of ocher, plasters, bricks, and floors were collected for compositional analysis, and targeted micromorphological samples were taken. Many of these still remain to be analyzed.

At the end of each field season we backfilled all of our excavation units. In those cases where we planned further excavation the following year, we covered the walls and installations with plastic. Where no further work was anticipated, we coated the walls with mud plaster or with geotextile (Fig. 2.8).

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8 The only exceptions were fragile, unbaked clay objects such as tokens that might have been damaged by prolonged contact with water.

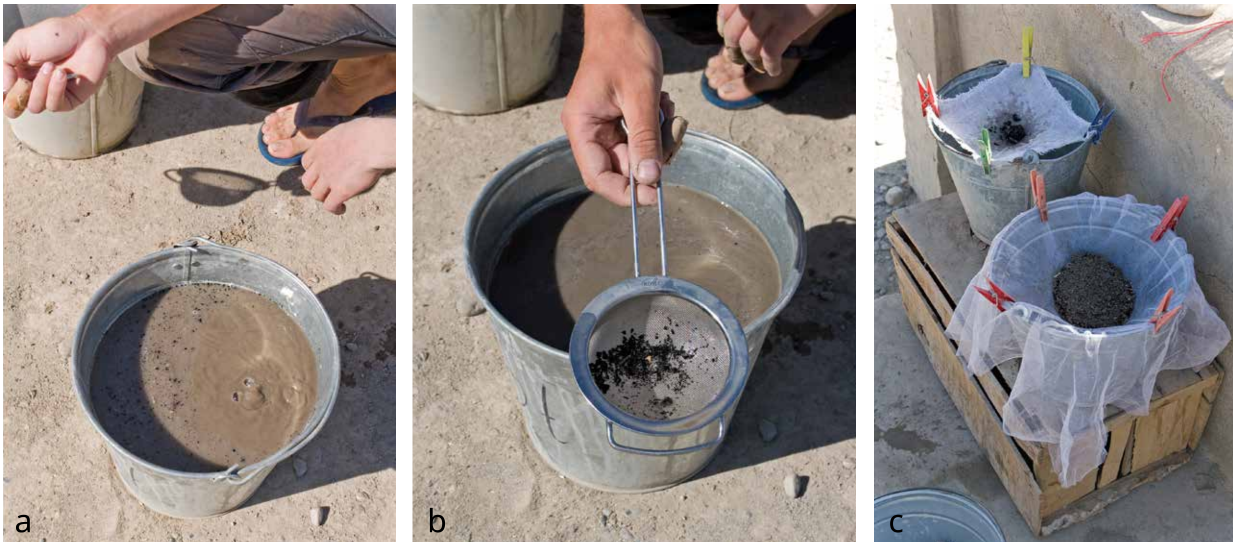

Fig. 2.7. Flotation: a) preparing to collect the light fraction, b) the light fraction in a fine-mesh sieve, c) light and heavy fractions drying in the shade.

Fig. 2.8. Wall covered with mud plaster prior to backfilling.

Creating a site-wide stratigraphy

Immediately after the close of excavations but while still in the field, a written summary of the work conducted in each unit was prepared. This included the division of the excavated areas into stratigraphic levels and sub-levels, a narrative description of those levels and the features and architecture found in them, and a Harris matrix displaying the stratigraphic relationships among all excavated loci. Levels were distinguished primarily on the basis of architectural changes, that is, as building levels, with sub-levels corresponding to internal modifications in the use of buildings. Where architectural structures were absent, levels correspond to major changes in use or deposition, for example, a shift from an abandoned building to an outdoor midden.

To create a site-wide stratigraphy, we began by correlating units and their levels in immediately adjacent excavation units, in particular from Units B, C, D, and E (Fig. 2.1). Other units were then added, based on common features such as the street that runs through Units D and F, and, where necessary, on the coarser and less trustworthy basis of elevations. A further means to correlate excavation units, the analysis of chronologically diagnostic artifacts, was of limited use at Monjukli Depe due to the small quantities of such artifacts present: to our initial surprise, pottery was too scarce, especially in the Aeneolithic levels, to be of much use as a basis for chronological divisions or correlations (see Chap. 10). Once a preliminary comparative stratigraphy was completed, it was compared to the results of the ^{14}C dating (Chap. 3). Where necessary, specific stratigraphic connections were then reconsidered in light of the ^{14}C results.

Within excavation units we refer to stratigraphic divisions as "unit levels," for example, Unit level D4. These were, in turn, divided into sublevels where deemed appropriate, for example, Unit level D4a and D4b. Their correlation in a site-wide stratigraphy yields strata: (building) levels that group together architecture, features, and other remains that can be – in ideal cases – directly connected stratigraphically or inferred to be more or less contemporary. It should be emphasized that designations of strata or building levels are always simplifications: it is only rarely the case that all structures in a settlement are destroyed, abandoned, or (re)built simultaneously. For analytical purposes, however, it can be useful to group those buildings and occupational deposits that can be considered to be approximately contemporary. Not all

<table>
<tr><th></th><th>Iran</th><th colspan="6">Turkmenistan</th></tr>
<tr><th>Dates BCE</th><th>Tehran Plain</th><th>Kopet Dag region</th><th>Anau North</th><th>Monjukli Depe</th><th>Chagylly Depe</th><th>Chakmakly Depe</th></tr>
<tr><td>4350 - 3900</td><td>Early Chalcolithic</td><td rowspan="2">Early Aeneolithic</td><td>Anau IA</td><td></td><td rowspan="5">1
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3
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12</td><td>I
II
III
IV</td></tr>
<tr><td>4800 - 4350</td><td rowspan="2">Transitional Chalcolithic</td><td rowspan="5"></td><td>Meana Horizon I
II
III
IV</td><td rowspan="4">Hiatus ?</td></tr>
<tr><td rowspan="2">5600 - 4800</td><td rowspan="2">???</td><td rowspan="2">Hiatus</td></tr>
<tr><td rowspan="2">Late Neolithic</td></tr>
<tr><td>6200 - 5600</td><td>Late Neolithic (Jeitun)</td><td>V
VI
VII
VIII
IX
X</td></tr>
<tr><td>??</td><td></td><td>aceramic Neolithic?</td><td></td><td></td><td>(V ?)</td></tr>
</table>

Table 2.2. Comparative chronology of Monjukli Depe and other key sites in the Kopet Dag piedmont zone of southern Turkmenistan. Chronological divisions used in the Tehran Plain are included for comparison. Stratum 0 could not be assigned to a general period.

differentiations are equally clear, however. For instance, the distinctions we have made between Strata IV and III, as well as between III and later strata, are relatively straightforward, whereas the differentiation of Strata II and I is less clear.

We designate strata by roman numerals,[9] with Stratum I referring to the latest well-preserved[10] building level and Stratum X the earliest occupation level (Table 2.2). In this way, we distinguish our designations from those of Berdiev, who used arabic numerals.

In the course of our first season of work at Monjukli Depe, we inadvertently encountered in our excavation Unit D the outline of the sounding excavated by Marushchenko in 1959. We decided to empty it in order to use the profiles to document the stratigraphic sequence in the central portion of the mound and to take samples from them. The original sounding was oriented southwest – northeast and was reported to be 5 x 3 m; at its base an area of only ca. 1 x 2 m remained. It was filled with backdirt, presumably from the sounding itself and/or from the subsequent excavations at Monjukli Depe that were conducted one year later (Fig. 2.9) (Berdiev 1972, note 2).

Descriptions of the strata

In this section the strata are described from oldest to youngest. Due to the limited exposure of Neolithic levels, the Neolithic strata are presented here as a group, with internal divisions mentioned where relevant. For the much more fully documented Aeneolithic-period occupation, each stratum is discussed individually.

9 This use of roman numerals for strata was, unfortunately, reversed in one publication (Bernbeck and Pollock 2016).

10 Traces of a later building level are present in the northeastern corner of Unit D. These scant remains were designated Stratum 0.

Fig. 2.9. View of the mound from the south at the start of work in 2010. The high point in the middle is backdirt from the 1959-60 excavations.

Strata	Unit levels	Height (approx.) in m asl	Characterization	Phase
II	D2	288.55 – 288.10	ashy working surfaces belonging to a major architectural level	**Aeneolithic**
III	D3	288.10 – 287.45	two walls limiting a set of loose ashy fill layers and wall fall	
IV	D4a	287.45 – 286.50	architectural layer, with much ash in the spaces between walls that are only visible outside the drawn profile	
	D 4b, c, d	286.50 – 285.85	architectural level, lots of wall fall	
V	D5	285.85 – 285.50	architectural level with a few charcoal-speckled layers	**Neolithic**
VI	D6	285.50 – 285.08	directly below D5; D5 and D6 might even be sublevels of one major level; at the base a set of dense ashy layers with indications of a working space and a hard floor	
VII	D7	285.08 – 284.50	hard bricky material, with a stone-hard, white plaster surface at the bottom	
VIII	D8	284.50 – 283.13	thick sequence of aeolian deposits; very few recognizable surfaces	
IX	D9	283.13 – 282.45	more ephemeral surfaces and aeolian deposits; the lowest surface is marked by white plaster	
X	D10	282.45 – 281.65	architectural level, some bricks recognizable; lots of finds, several floors/surfaces associated with the architecture	
-	D11	281.65 and below	sandy, empty layer	**Sterile**

Table 2.3. Stratigraphy of the Marushchenko sounding.

The Neolithic strata

We have divided the Neolithic occupation into six strata from X to V. Neolithic levels were reached in Units C, D, H, I, and K (Figs. 2.1 and 2.10). On the basis of our current knowledge, the sequence in Unit D, where Marushchenko excavated his sounding in 1959, spans nearly the full sequence of Neolithic occupation at the site. It is therefore used as the main point of reference. After cleaning and drawing the southeastern profile of the Marushchenko sounding in 2010 (Fig. 2.11), the deposits were grouped into levels according to visible architectural elements or surfaces that seemed to mark transitions (Table 2.3).

Neolithic strata in Unit D

The Neolithic strata as visible in Marushchenko's sounding comprise a substantial depth – approximately 4.2 m – below which there were sandy deposits that appear to represent sterile soil. The lowest cultural material reached in Stratum X at 281.68 m asl contained building remains in the form of large lumps of straw-tempered clay. The two strata IX and VIII immediately above consist of occasional

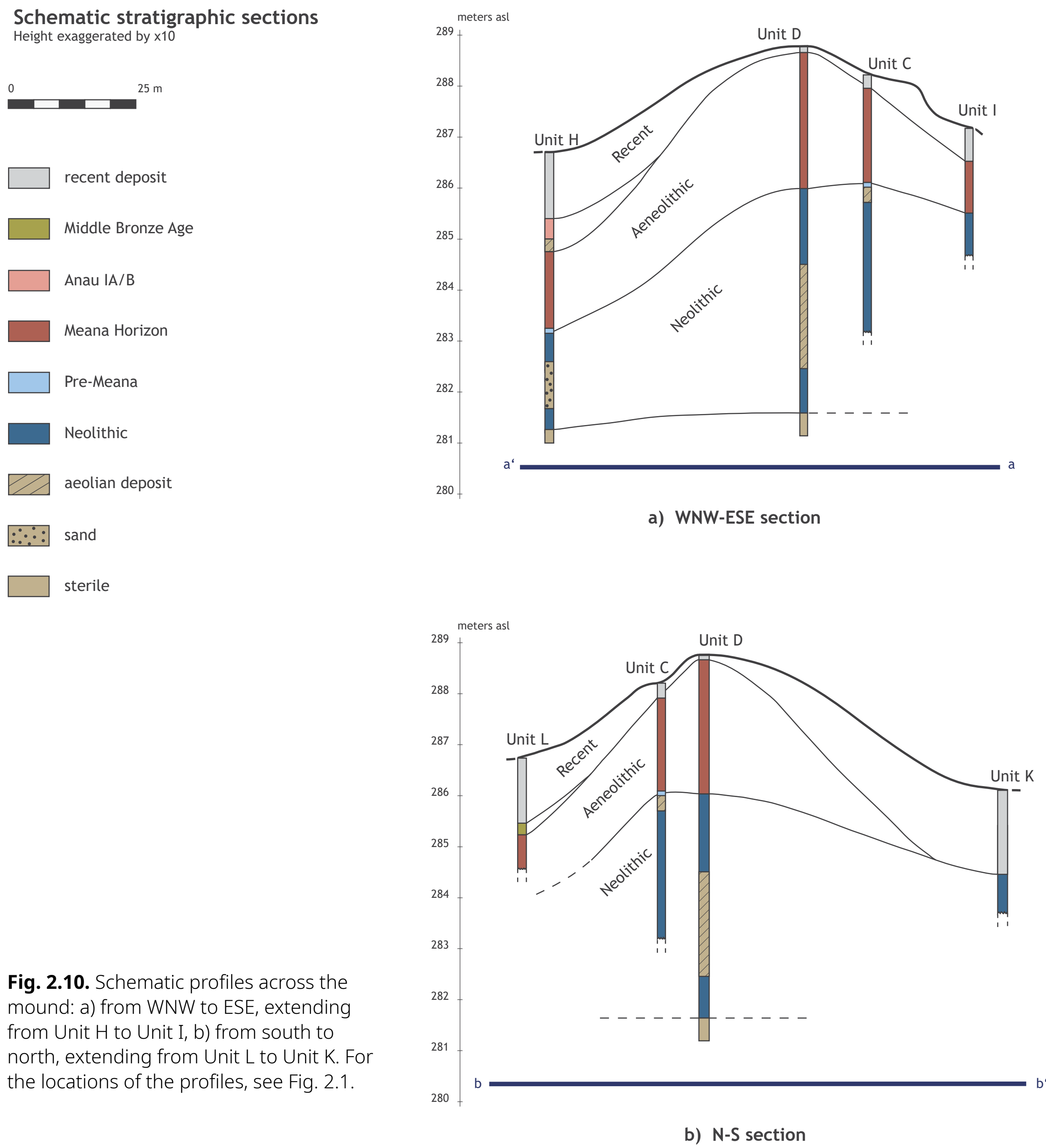


Fig. 2.10. Schematic profiles across the mound: a) from WNW to ESE, extending from Unit H to Unit I, b) from south to north, extending from Unit L to Unit K. For the locations of the profiles, see Fig. 2.1.

ephemeral surfaces with flecks of charcoal and some sherds, separated by thick accumulations of virtually sterile aeolian or water-laid deposits. These layers seem to represent temporary abandonment(s) of the settlement – or at least this part of it – interspersed with short-term, ephemeral uses.

The succeeding Stratum VII is comprised of a thick layer of bricky material or adobe wall fall, ending in a hard, grayish-white, well-prepared plaster floor. The bricky material appears to derive from a wall (D800) that may have been more than 1 m wide. The subsequent Stratum VI contains layers of ash that run up to this wall. The uppermost layers contain bricky debris that also are associated with a wall further south, as do the deposits of the last Neolithic level, Stratum V. These latter layers lie above wall D800 of Strata VII-VI. The uppermost elevation of Stratum V, corresponding to the end of the Neolithic deposits in the sounding, is at 285.92 m asl.

An attempt at correlating the stratigraphy derived from our excavations with the profile of Marushchenko's

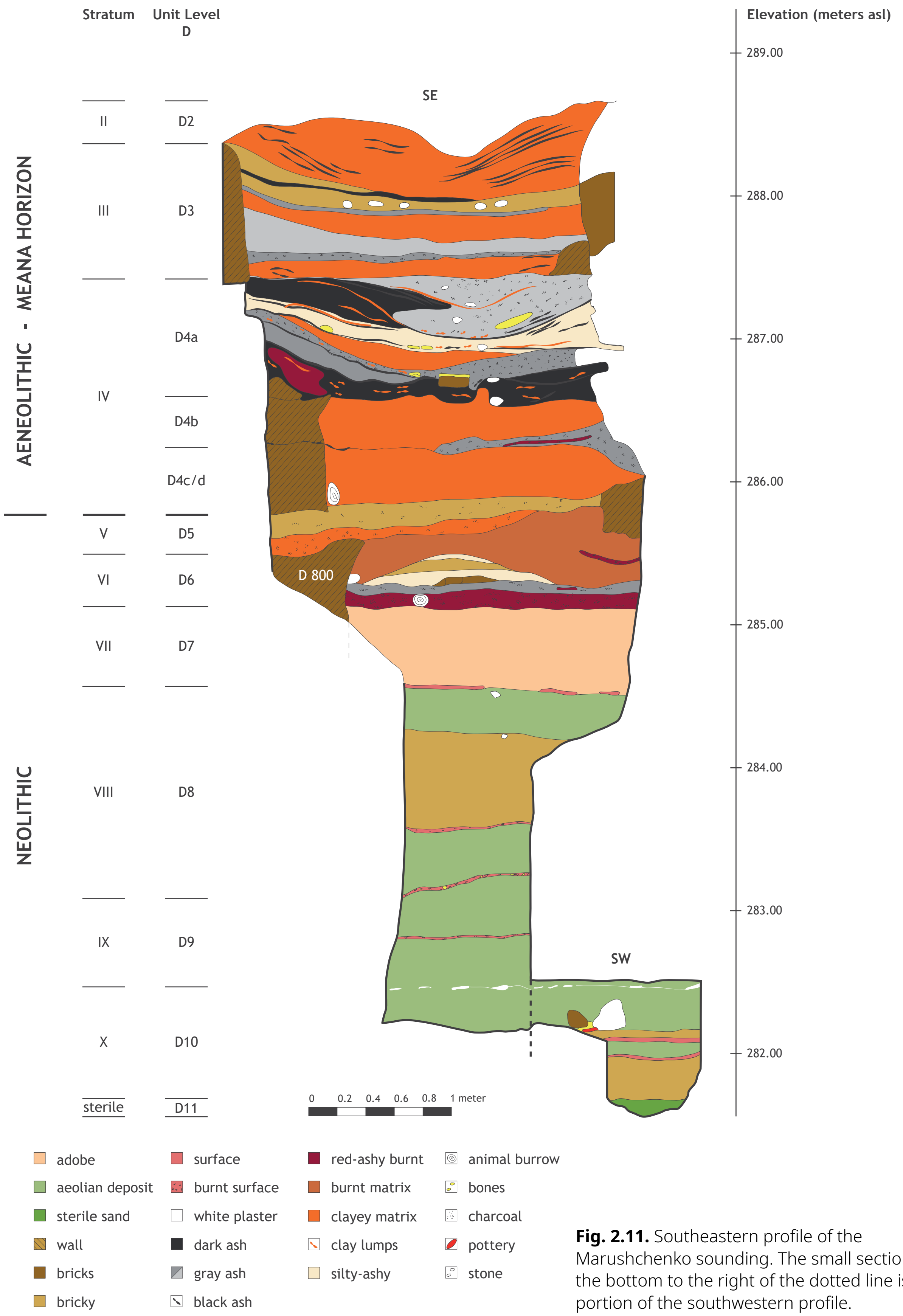


Fig. 2.11. Southeastern profile of the Marushchenko sounding. The small section at the bottom to the right of the dotted line is a portion of the southwestern profile.

sounding on the one hand and Berdiev's description of these strata on the other needs to take into account that Berdiev based his stratigraphic divisions on architectural levels alone. The two levels we designate Strata IX and VIII, which are largely devoid of cultural material, were therefore probably not taken into consideration by Berdiev. As a result, our Stratum VII would correspond to Berdiev's third building level; his levels 4 and 5 might then correspond to our Strata VI and perhaps V.

Neolithic strata in Unit C

Unit C is located approximately 6 m from the Marushchenko sounding, and as a result the stratigraphy in Unit C cannot be directly correlated to it. Based on the character of the deposits and features excavated in Unit C, it is likely that this was an open area in Neolithic times. The Neolithic layers C3b-e do not contain any architecture but rather consist of ephemeral, flat surfaces strewn with ash, bone, and pottery as well as some informal fireplaces (Fig. 2.12). The full sequence of Neolithic deposits in Unit C was 2.5 m deep, but sterile soil was not reached. Above the uppermost Neolithic level, at an elevation of ca. 285.65 m, there was a substantial deposit of aeolian and alluvial materials (C3a), seemingly representing a hiatus of occupation. Above these deposits were the earliest Aeneolithic levels. This represents a contrast to Unit D where, in the Marushchenko sounding profile, the lowest Aeneolithic layer lies immediately above the final Neolithic occupation, despite a chronological break of approximately 800 years. In the lowest Aeneolithic levels of Unit C as well as just below them, a few sherds of a painted Black on Red Neolithic-type ware (see Chap. 10) were recovered. Their size and worn condition indicates that they were found outside their original context.

Neolithic strata in Unit I

The stratigraphic sequence of Unit I, located on the lower southeastern slope of the mound, corresponds in some respects to that of the nearby Unit C, although the upper Aeneolithic levels gave way abruptly to Neolithic ones below. Neither abandonment layers in the form of aeolian or alluvial deposits nor any of the late Neolithic Black on Red pottery was encountered. Excavation reached a depth of 283.75 m asl without any indications of an end to the cultural sequence. Unlike in Unit C, traces of architecture were identified in Unit I, but the sounding was too small to be able to distinguish more than their presence.

Neolithic strata in Unit H

Unit H was situated well beyond the current topographic limits of the mound. Below the Aeneolithic occupation was a shallow layer with a mix of Aeneolithic wares and Neolithic Black on Red pottery. The uppermost Neolithic deposit was located at 283.13 m asl, distinctly below that of Units C, D, I, and K (Fig. 2.13). The Neolithic levels in Unit H consisted of surfaces as well as aeolian sediments similar to those exposed in Unit C. They contained exclusively coarser, unpainted Neolithic pottery. The appearance of light-colored silt suggested that sterile soil might have been reached at 281.24 m asl or 5.4 m below the modern surface and 0.4 m lower than the base of Marushchenko's sounding, although the presence of some charcoal flecks in the deposit makes this attribution uncertain. Should this be sterile soil, it would mean that the total depth of Neolithic deposits in Unit H is less than in the soundings to the east of the mound. This observation suggests that the Neolithic mound was located to the south and east of the one visible today, at the periphery and against the slope of which Unit H would have been located.

Neolithic strata in Unit K

Finally, Neolithic architecture was encountered in Unit K, below a dense, ca. 1.60 m-deep layer of sterile loam. The thickness of the walls is similar to the later Aeneolithic architecture at Monjukli Depe, but the building material – whether bricks or pisé was unclear – was of a much sandier texture than that used in Aeneolithic contexts (Fig. 2.14). The walls were preserved to a height of only ca. 0.30 m. Against one wall, a surface with a stone packing was found (Fig. 6.1). Work in this sounding had to be ended before reaching sterile soil. A single radiocarbon determination from the Neolithic deposits in Unit K yielded a 2σ-calibrated date of 5730-5640 cal BCE, thus falling immediately after nearly all of the other dated Neolithic contexts at Monjukli Depe (Chap. 3). It points to some shifting of the settlement over the course of the Neolithic occupation, which fits well with other indications of short-term, local abandonments and resettlement.

Hiatus

Approximately 70-75 cm (286.40 – 285.65 m asl) of virtually sterile,[11] aeolian or alluvial deposits separating the Neolithic and Aeneolithic occupations in Unit C suggest temporary periods of abandonment (C3a, Fig. 2.12; Chap. 3). The last attested Neolithic levels in Units C, D, H, and I were all followed by Aeneolithic occupations that date approximately 800-900 years later (Chap. 3, Fig. 3.15). Whereas in Unit C this hiatus is marked by the aforementioned layer of aeolian/alluvial deposits, in all other excavation units with the possible exception of Unit H, the Aeneolithic occupation sits directly atop the latest Neolithic layer. This would appear to suggest denudation by wind following the abandonment of the

11 The aeolian/alluvial deposits included flecks of charcoal and very occasionally small sherds or pieces of bone. This is not necessarily surprising, since at least some of the sediments may derive from the mound itself.

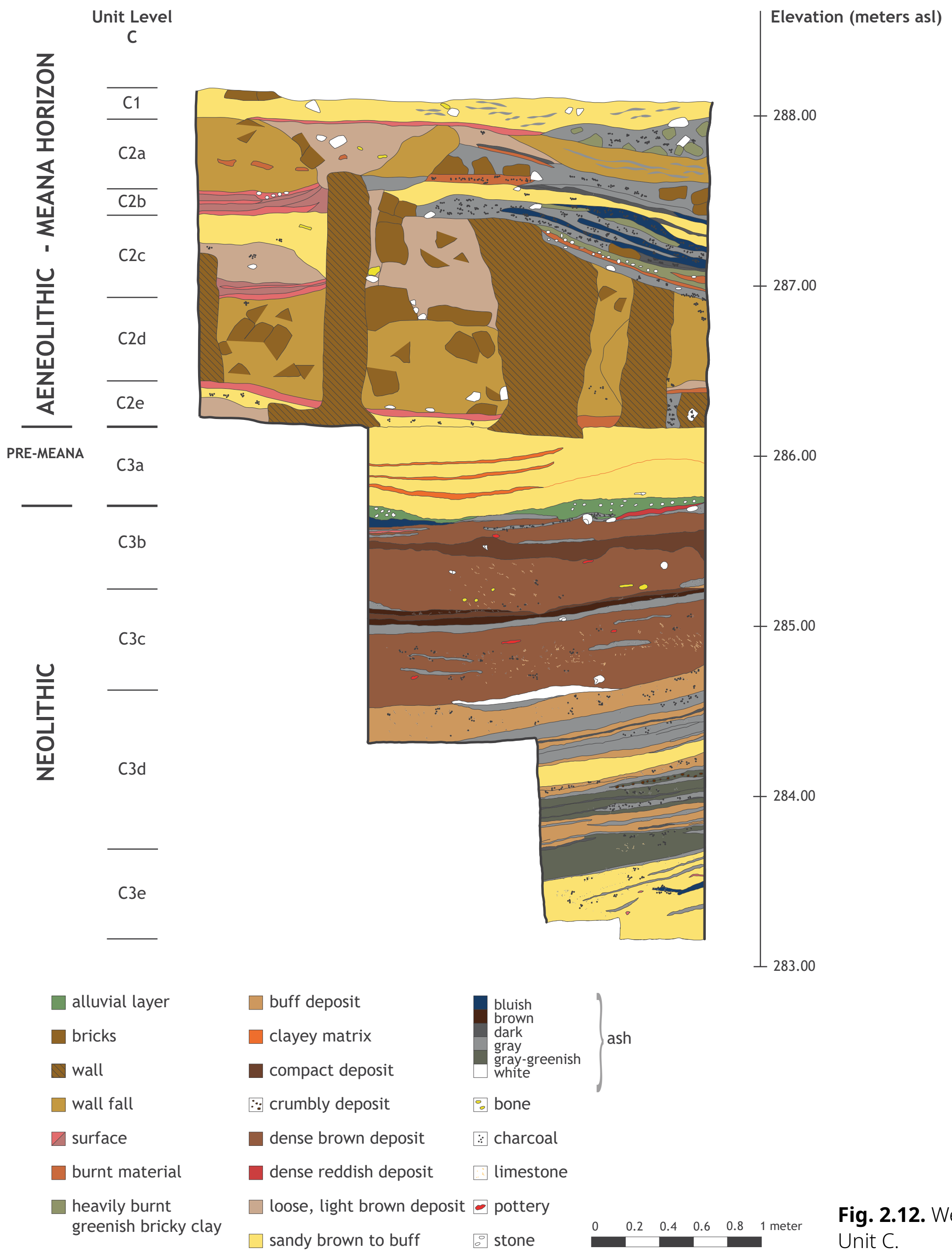


Fig. 2.12. Western profile of Unit C.

Neolithic village and/or terracing activities by the earliest Aeneolithic settlers. This is further supported by the observation that the uppermost Neolithic deposits in Unit C are approximately 0.25 m lower than those in Unit D.

The Aeneolithic (Meana Horizon) strata

As will be discussed in more detail in Chapters 3 and 10, the Aeneolithic occupation of Monjukli Depe predates by several centuries Anau IA, previously thought to be the earliest phase of the Aeneolithic in the Kopet Dag piedmont zone. Although the pottery from Monjukli Depe is technologically similar to Anau IA – high-fired, thin-walled, and

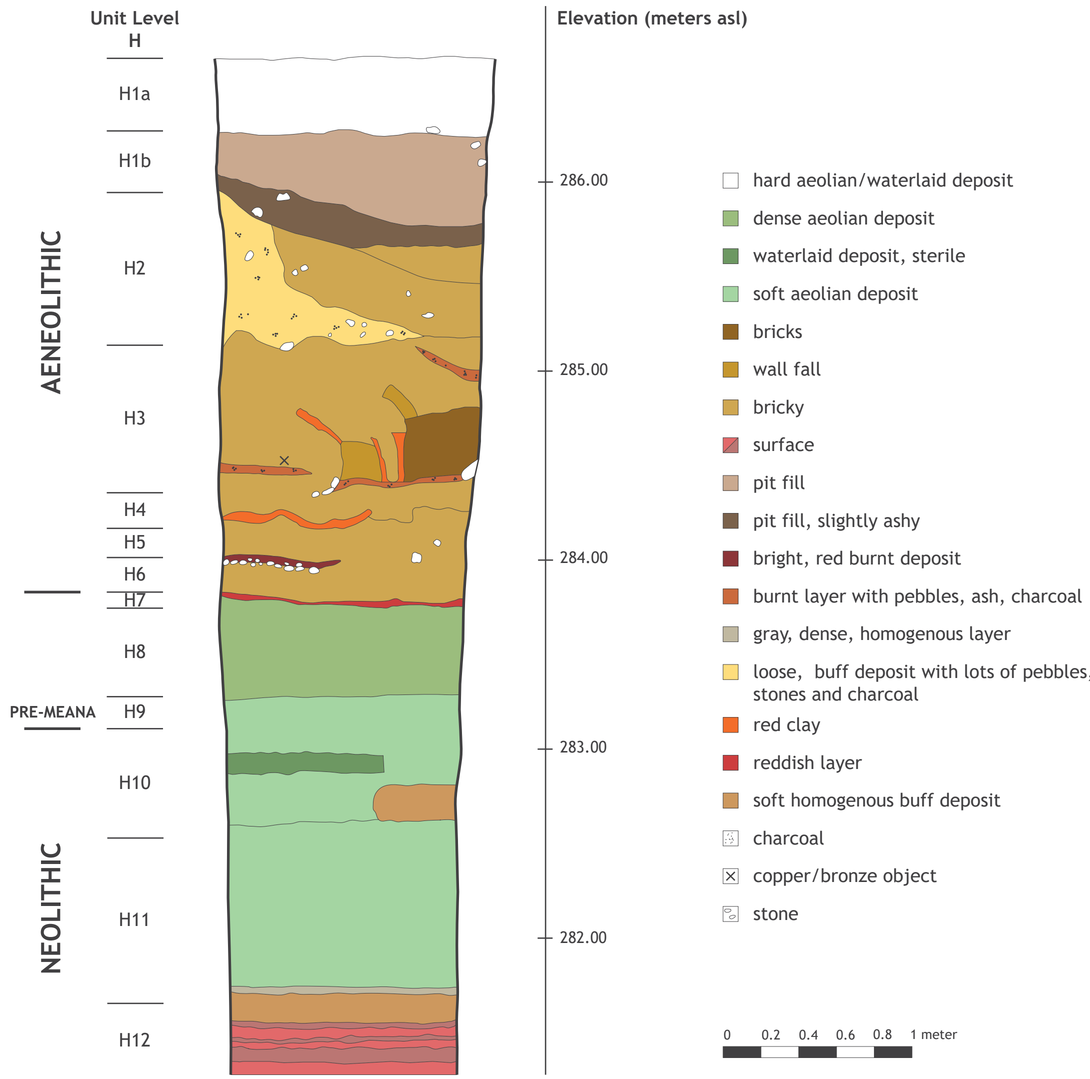


Fig. 2.13. Western profile of Unit H.

with little or no visible temper – the painted designs are distinct. We suspect that there are not only temporal, but also spatial differentiations in the early prehistoric traditions of the Kopet Dag foothills that have so far remained unrecognized. For these reasons, we use the term "Meana Horizon" to designate the Aeneolithic occupation at Monjukli Depe.

In contrast to the Neolithic contexts that we have exposed up to now, the Aeneolithic strata of the Meana Horizon are marked by densely spaced, well preserved architecture. All of the excavated buildings contained the kinds of installations and debris that we expect to be associated with domestic structures. For this reason, the authors refer to them throughout this volume as either houses or buildings, with no distinction intended.

A variety of characteristics of this architecture persist throughout the four Aeneolithic strata and are briefly summarized here; more exemplary detail is available in Chapters 4 and 5. (1) Adjacent structures do not share walls; instead, buildings were usually constructed immediately next to neighboring ones but with separate walls. (2) Walls were made out of mud bricks laid as headers. They were invariably a single brick wide (Fig. 2.15); only for internal buttresses were different brick-laying patterns used. Walls were rarely bonded. (3) Both walls and floors were plastered, usually multiple times and often thickly, but not frequently enough to suggest yearly replasterings. The plaster of the

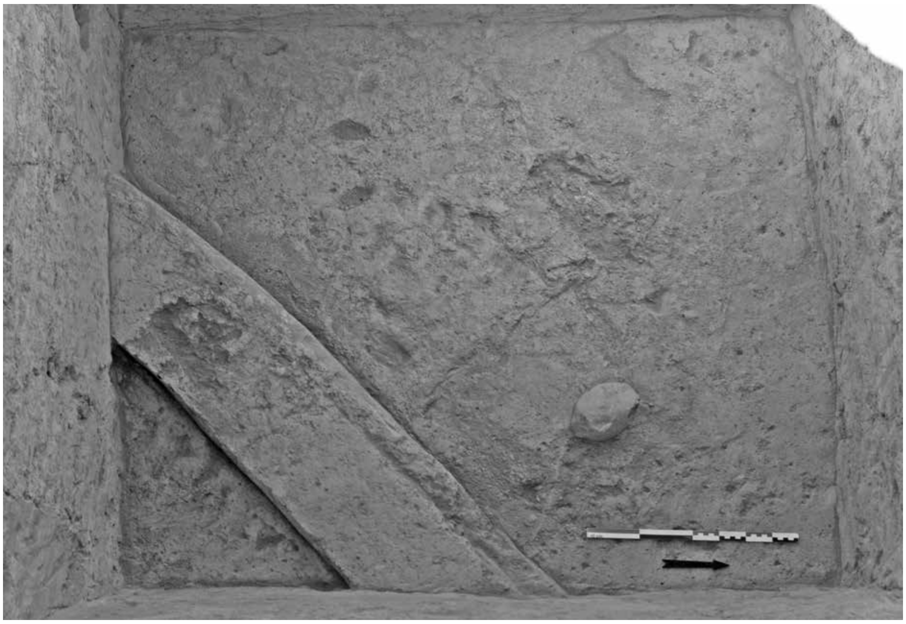


Fig. 2.14. A Neolithic wall in the sounding Unit K.

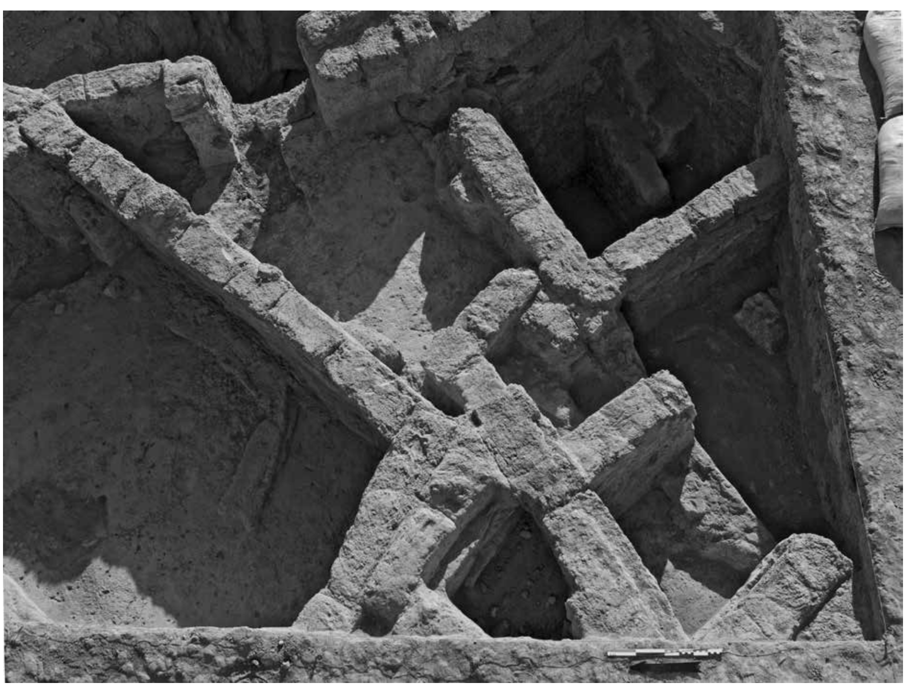


Fig. 2.15. Mudbricks visible in walls in Unit D.

floors and walls was often colored red, probably using ocher (Fig. 2.16).[12] In some cases, a white plaster was used instead, and in House 1, for example, there was a sequence of white, red, and white plasters on a block placed in front of one of the buttresses (Fig. 2.41). (4) The basic form of most buildings was a single room divided into two slightly unequal parts by opposing buttresses. This division was often marked by a low step that divided the lower, front part from the higher, back portion of the house. (5) Buttresses, either T-shaped or rectangular, were a feature of every building. (6) Doorways, where present,

12 No chemical or other analyses have been carried out on the plasters. However, numerous pieces of ocher were found during excavation, making the identification of the pigment as ocher nearly certain.

Fig. 2.16. Red floor plaster in House 4 room 4a (in background).

were narrow passageways. Only one, at most, is attested per house.

Stratum IV

The earliest Aeneolithic occupation at the site was reached in Units B, C, and D (Fig. 2.17). Whether the earliest Aeneolithic levels from Unit H should be attributed to this stratum is uncertain, but the radiocarbon dates point in that direction (see Chap. 3).

The settlement plan for Stratum IV shows a series of closely spaced buildings in NE-SW and NW-SE arrangements. Parts of eight different structures were excavated. In most cases, houses were built directly up against each other or were separated only by centimeters.

Houses 3, 14, and 20 conform to the standard single-room type mentioned above. Houses 4 and 7 both have an additional room or annex, labeled in the former case room 4b, in House 7 a parallel space to the northeast of the main room.

Three of the buildings – 3, 14, and 17 – have T-shaped buttresses, whereas three others – 4, 7, and 20 – have rectangular ones (see Chap. 14, Table 14.1). In two cases, Houses 3 and 14, passageways into the houses could be discerned. Both had been blocked at some point. In general, the very small size of the openings and their presence in only two of the four houses excavated to a substantial extent suggest that there were likely other access ways into the house, perhaps through the roof (see Chap. 5).

House 14 is discussed in detail in Chapter 5, and the description here is therefore confined to some general remarks. The northwestern portion of the house was removed by Marushchenko's sounding, but apart from that and a small area in the southwestern corner that lies in the baulk between Units B and D, the house was completely excavated down to its uppermost floor (Figs. 2.18 and 2.19). The profile visible in the Marushchenko sounding reveals that there were five previous floors. The building consists of a slightly smaller and lower front portion and a raised back area. Some sort of access to the building was possible through the northeastern wall in which there was a small, triangular passageway only about 0.55 m high and maximally 0.45 m wide; it was blocked at some point. This opening was so small that it would have been barely usable, except perhaps for a child. Once House 17 was built, this opening would have served no purpose, as it gave out directly onto the southwestern wall of the neighboring house.

Located between the two buttresses in the front area of the house was a large, irregularly shaped fire installation (FI 46). Also in the front portion of the house were two bins, a deep one along the southeastern wall and a shallow, semi-circular one extending from the northeastern wall of the house. In the back of the house,

Fig. 2.17. Plan of the earliest Aeneolithic level, Stratum IV.

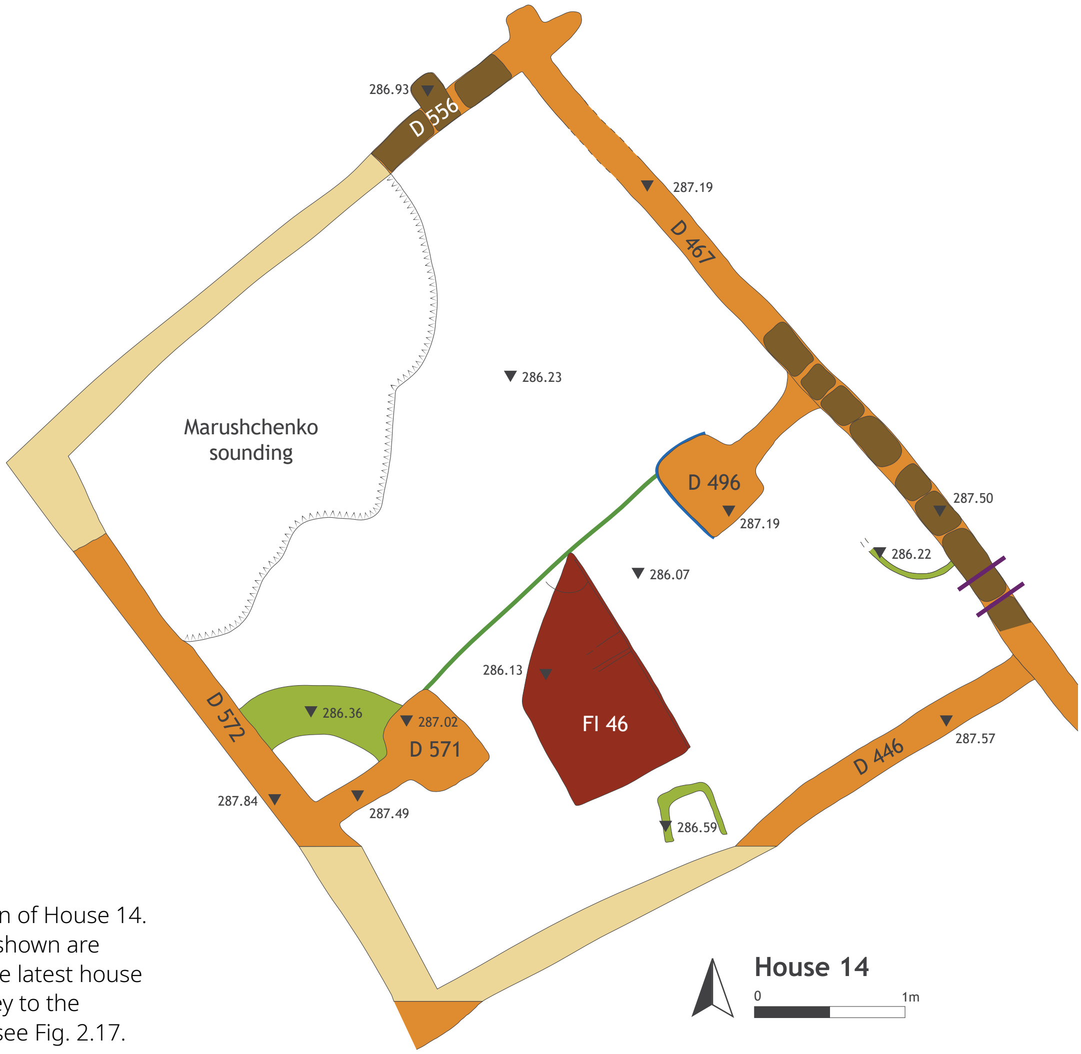


Fig. 2.18. Plan of House 14. Installations shown are located on the latest house floor. For a key to the colors used, see Fig. 2.17.

another bin was constructed as a quarter circle that enclosed the backside of the western T-shaped buttress, a feature that is repeated in House 3. The last, completely exposed floor was heavily strewn with stones, especially in the back portion of the house. This practice was noted in House 10 (Stratum III) and House 11 (Stratum I) as well and appears to be part of an abandonment ritual (see Chaps. 4 and 5 for further discussion).

House 14 differs from other buildings in two notable respects: two sides of the eastern buttress D496 were painted, one with geometric and stylized plant designs and the other with anthropomorphic figures (Figs. 2.20 and 5.4), and the house was destroyed by fire, filling it with large quantities of ash, burnt clay, and burnt and unburnt brick (Fig. 2.21; for a detailed discussion of the conflagration, see Chap. 5). The fill, especially the ashier portions, contained large quantities of unbaked clay objects, including tokens, figurines, and clay rings as well as other artifacts (see Chaps. 11-13). Whether because of the fire or for some other reason, the space occupied by House 14 was never built upon again during the remainder of the village's occupation.[13] However, two deceased individuals, MDB11 and MDB12, were interred in the fill, one directly atop the western, T-shaped buttress (Chaps. 8 and 9).

In contrast to House 14, which seems to have been in use for a relatively brief period of time, **Houses 3** and **4** to the southwest of it had long histories that extended from Stratum IV until the final occupation of the village in Stratum I.

House 3 is situated immediately to the southwest of House 14, and the adjacent walls of the two houses were built directly against one other (see Fig. 2.17). In its earliest phase in Stratum IV, House 3 exhibited a number of similarities to House 14, with two opposing T-shaped buttresses and a storage bin, B212/222, constructed behind the western one (Fig. 2.22). This bin, the walls of which reached up to 0.60 m in height, contained a series of

13 Other than a partial overlap of the southwestern wall of House 10 (Stratum III) over the northeastern wall of House 14.

Fig. 2.19. Overview of House 14. Note the stones strewn on the floor in the background.

artifacts, at least some of which may have been connected with stone-working: a grinding stone, a hammerstone, three stone balls, a perforated stone, a burnt stone, two other used stones, the horn of a sheep, and the jaw of a sheep or goat (Fig. 2.23).

An entryway into House 3 was located in the southeastern wall B93 (Figs. 2.22 and 2.24). It measured at least 0.8 m high and 0.5 m wide. It was blocked at some point in the house's history, presumably no later than the point at which the house was restructured internally (see Stratum III). Immediately to the right of the doorway when one entered the building was a more or less rectangular platform, 0.8 x 0.9 m and approximately 0.5 m high, with traces of burning on its upper surface. The floor of the house was reached only in a few small areas, and it is therefore unclear whether there was a step between the front and back of the house, similar to House 14. There was a sequence of at least five floors, each of which was plastered red. Substantial quantities of ground, chipped, and burnt stone were found on and immediately above the floors of this building.

In addition to the two opposing T-shaped buttresses, of which just a corner of the eastern one was visible extending out of the baulk, a small rectangular buttress or reinforcement was constructed in the southwestern corner of the building. An oval buttress was situated approximately at the midpoint of wall B93; unlike most other constructions at Monjukli Depe, this buttress was bonded with the wall.

Above the floors of this earliest phase of House 3 a thick layer of debris accumulated. The debris varied from decayed brick and silty deposits with some brick fragments to brick fall with recognizable pieces of brick. A couple pieces of thick plaster with parallel impressions of a thick-stemmed plant (approximately 1 cm in diameter), probably portions of roofing material, were recovered in this debris (Fig. 2.25). The deposit varied in thickness from 0.25 to 0.75 m, increasing in depth from the northwest toward the southeast. This material represents an abandonment, however brief, of the house, including or followed by reconstruction and thereby a razing of the upper portions of the walls. Overall, the walls and plasters were in good shape, with the plasters covering the walls in their entirety, which speaks against a lengthy period of non-occupation. During this brief "abandonment phase," a fire installation was constructed within the standing walls of the house. FI 17, a chimney, was built directly above the large bin B212/222 and up against T-buttress B92 (Fig. 6.3). It consisted of a rounded “snout” created out of thick plaster that was smeared up against the stem of the buttress and reached a height of approximately 1 m. Near the top an oval opening, approximately 15 x 20 cm, was present, and two small holes were located at the base. The fill within the chimney consisted of ash, but there were no other signs of burning in or around any of the holes.

House 4, like House 7, appears to have consisted of two rooms, 4a and 4b (Figs. 2.26 and 2.27). The main room, 4a, was divided by means of a step that ran along a line between the two rectangular buttresses. In the earliest phase of the house, the poorly preserved wall B80 further partitioned the back portion of the house into two irregularly shaped parts. No surface associated with wall B80 or with this early phase of the house was reached in 4a. A small, semi-oval buttress was located along wall B30, approximately midway between the back wall of the house (B29) and the eastern of the two rectangular buttresses.

To the east of the main room of House 4 was an additional space, 4b, that probably also belonged to this structure. It was built directly up against House 3, resulting in a double or even triple wall, B35 and B66. B66 appears to have been an earlier wall that may have fallen out of use relatively early in the history of this house. This could not be determined with certainty due to the disturbances caused by Marushchenko’s and Berdiev’s excavations in this area. Wall B66 had a small rectangular buttress; another semi-oval buttress was located on the eastern side of wall B30 directly opposite the one on the western side of that wall. The use of space 4b is unclear, but it seems rather large to have been a storage room; moreover, its latest floor was well plastered and colored red.

Both rooms of House 4 were filled with substantial quantities of bricky collapse (Fig. 2.28), reaching up to one meter in depth in room 4b. As was the case for House 3, this debris may have accumulated during a (brief?) abandonment of the house or during a planned refurbishment. The burial of a child, MDB4, was found approximately 15 cm above the last floor in room 4b, within the bricky collapse (Chaps. 8 and 9).

To the east of House 14, only the northwestern corner of **House 17** was excavated. Little can be said about it, other than that it had T-shaped buttress(es). It was separated from House 14 by a narrow space (Fig. 2.17).

Further to the east and built at a different orientation to the four buildings just discussed were **Houses** 7 and **8** (Fig. 2.29). They were constructed adjacent to one another with a narrow gap between the southeastern wall, C24, of House 7 and the northwestern wall, C9, of House 8 (Pollock et al. 2011, Figs. 9-11). No traces of buttresses were identified in House 8, probably due to the small portion excavated. Four small, bell-shaped pits, possibly for storage, were associated with the earliest floor of the house. In one of them a bone of a marsh sandpiper was recovered. A small fire installation was located on a later floor of the structure.

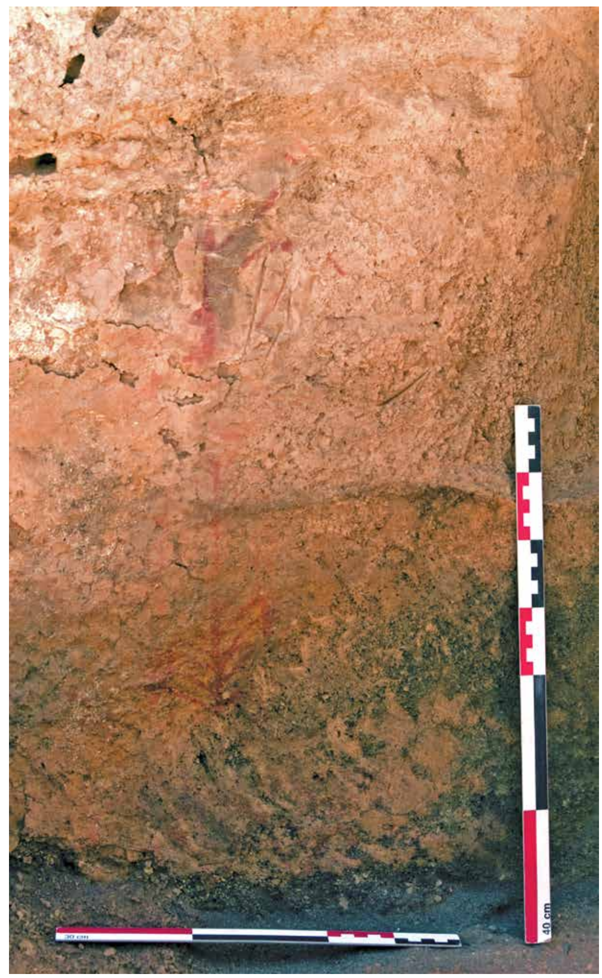


Fig. 2.20. The wall painting on two faces of buttress D496 in House 14. The upper image shows one of the anthropomorphic figures on the NW face. The lower image depicts a plant-like motif on the SW face.

Fig. 2.21. Section through burnt deposits in House 14. The ashy layers at the top left are part of the (later) Eastern Midden.

House 7, like House 4, consisted of a main room plus an annex to the northeast that was added somewhat later. This long narrow space apparently served for storage of cereal products, potentially wheat, straw, or threshing remains, as indicated by both macro- and microbotanical samples (Miller 2011, 219; Ryan 2011, 225-226; Miller and Ryan 2011, 227), providing an important hint about the potential function of similar annexes to other houses. The main room of the house contained one small rectangular buttress that may have been part of a partition wall (C28) that extended in the direction of another, unexcavated buttress.

To the northwest of and built up against House 14 was "**House 19**". Much of this structure must have been destroyed by Marushchenko's sounding. If it ran up to House 20 it would have been an unusual shape and extremely narrow. Alternatively, the northeastern wall of House 19 may originally have been part of House 20, as its orientation is the same as the latter's northeastern wall. A final possibility is that House 19 was an annex similar

Fig. 2.22. Plan of House 3, first phase. For a key to the colors used, see Fig. 2.17.

Fig. 2.23. Bin B212/222 in House 3. Note the objects on the floor of the bin.

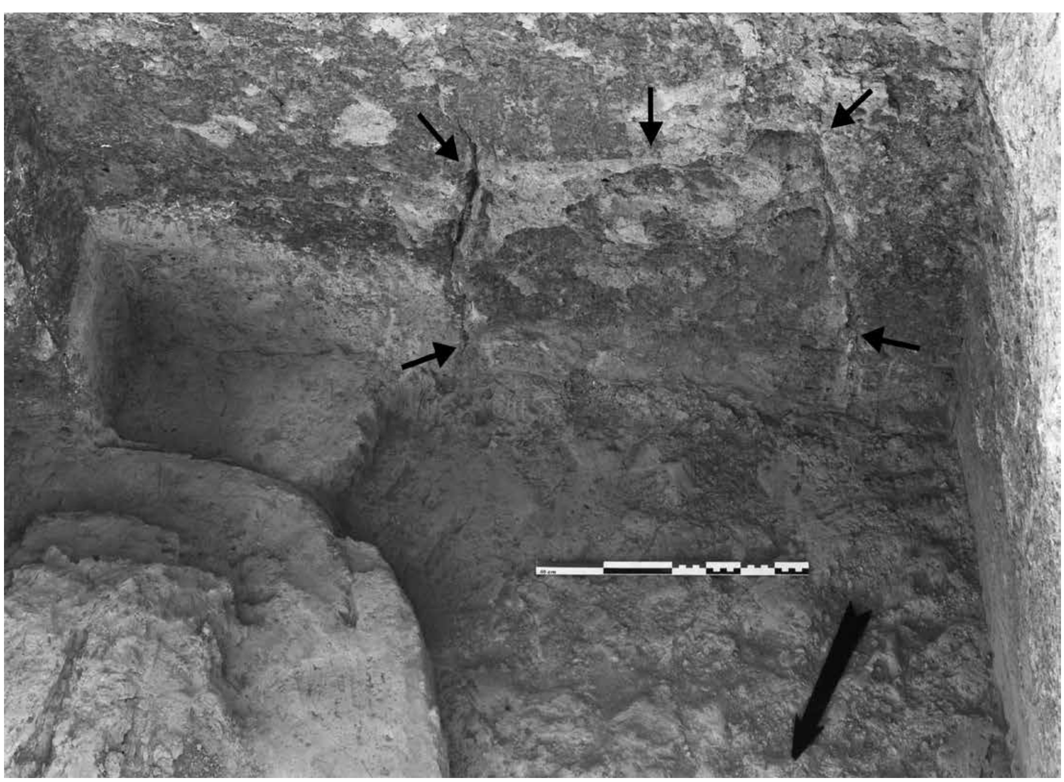


Fig. 2.24. Blocked entrance into House 3.

Fig. 2.25. A piece of plaster from House 3 with impressions of thick plant stems. The impressions of plant stems are approximately 1 cm in diameter.

to those identified for Houses 4 and 7. Three floors were recognized, the oldest of which contained a door socket associated with a doorway near the northeastern corner of the structure. Stones were strewn on this floor.

Immediately to the northwest of House 19 is **House 20**. It consisted of a single room divided into two sections by opposing rectangular buttresses. No floor was reached, and hence little can be said about installations in this building.

In only one area, located between Houses 17 and 19, was an outdoor space excavated. It consisted of numerous ashy layers that sloped from the south towards the north. A few ephemeral fire installations containing small pebbles or even fist-sized stones were present as well. Relatively few artifacts were found in these ashy deposits, distinguishing them from the ashy accumulations in House 14 and in the later Central and Eastern Middens.

Stratum III

Stratum III was reached in Units B, C, D, E, and G (Fig. 2.30). In several cases, buildings that had been constructed in the previous stratum continued to be occupied (Houses 3, 4, 7, and 8) or a successor structure was built on the same spot as an earlier one in a very similar orientation and form (House 9 above House 20). Elsewhere there were notable changes. The space where House 14 had stood was replaced by an open area. To the north, in what had been an ashy outdoor area in Stratum IV, House 10 was built and to the north of it, House 12. To the west of this heavily built-up area, Unit G contained outdoor surfaces and fire installations, but little architecture.

Above a thick layer of bricky debris and wall fall, **House 4** continued to be occupied. The overall structure of the house remained similar, but the partition wall, B80, in the back of the main room fell out of use as did the northeastern wall, B66, of room 4b (Fig. 2.26). The walls and floors in the back portion of room 4a were repeatedly plastered. Most of the plasters were colored red, in one case so dark as to be nearly black. A series of at least six floors belonged to this phase of the house (Fig. 2.31).

The southern portion of the main room, presumably the lower, front portion of the house, was not investigated in its entirety, and it is therefore unclear whether the apparent

Fig. 2.26. Plan of House 4. For a key to the colors used, see Fig. 2.17. The blue walls represent an early phase of construction.

gap in the southwestern corner was an entrance or not. The walls were less frequently plastered than those in the northern portion of the room. A small bin was constructed up against the eastern buttress, B39. A square block of clay placed in an analogous position next to the other buttress was probably a reinforcement. Built into wall B29 in the back of the house were two small, shallow fire installations, FI 12 and 13 (Chap. 6). In room 4b, the wall plaster was generally thinner and usually white, in contrast to the red plaster that covered the walls of room 4a.

Two "corner deposits" (see below and Table 2.4) were placed in corners of the house in room 4a. One consisted of a collection of ground stone, burnt stone, and some pieces of broken, unburnt stone, all wedged into the corner and into the plaster of the walls. The second deposit, located between the wall and a buttress contained stones as well as animal bones.

An enigmatic installation was situated between the southwest wall of House 4 and the northeast wall of the unexcavated House 23 (Fig. 2.46). It was closed by a thick cross-wall, B9, that created a small, elongated space partially filled with closely packed stones (Fig. 2.32).

House 3 underwent substantial changes in Stratum III. Atop the fill of bricky debris that points to the partial demolition of the earlier walls, a series of cross walls were constructed (Fig. 2.33). One, constructed in segments, divided the structure longitudinally (B97/109/D76), two others (B100/175) connected the two buttresses, and

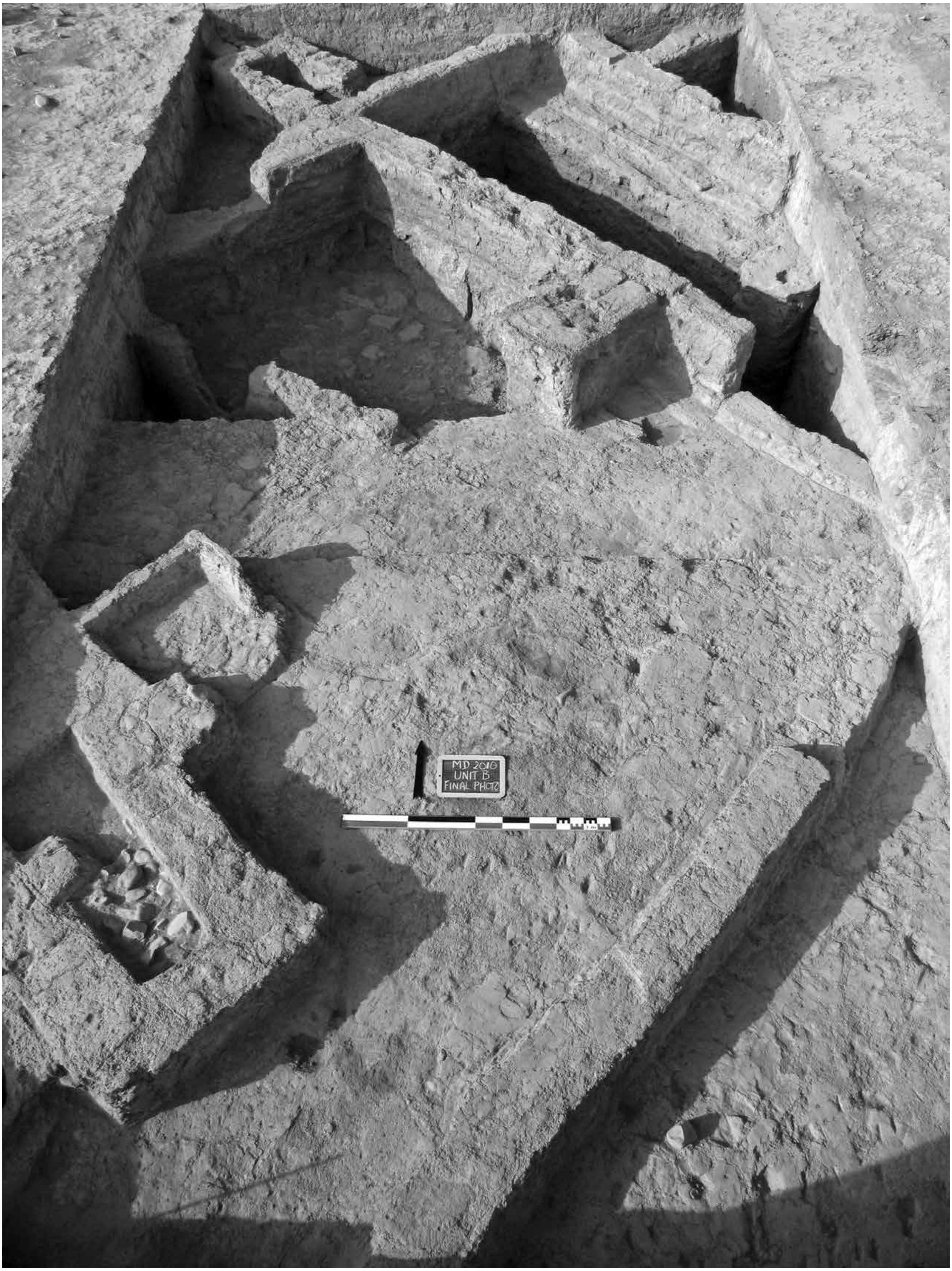


Fig. 2.27. House 4 at the end of excavation.

Fig. 2.28. Wall fall in room 4a of House 4.

Fig. 2.29. Houses 7 (to the west) and 8 (note that the house number designations on the photo board are incorrect). A portion of the large outdoor fire installation, FI 5, is visible in the background.

Fig. 2.30. Plan of Aeneolithic Stratum III.

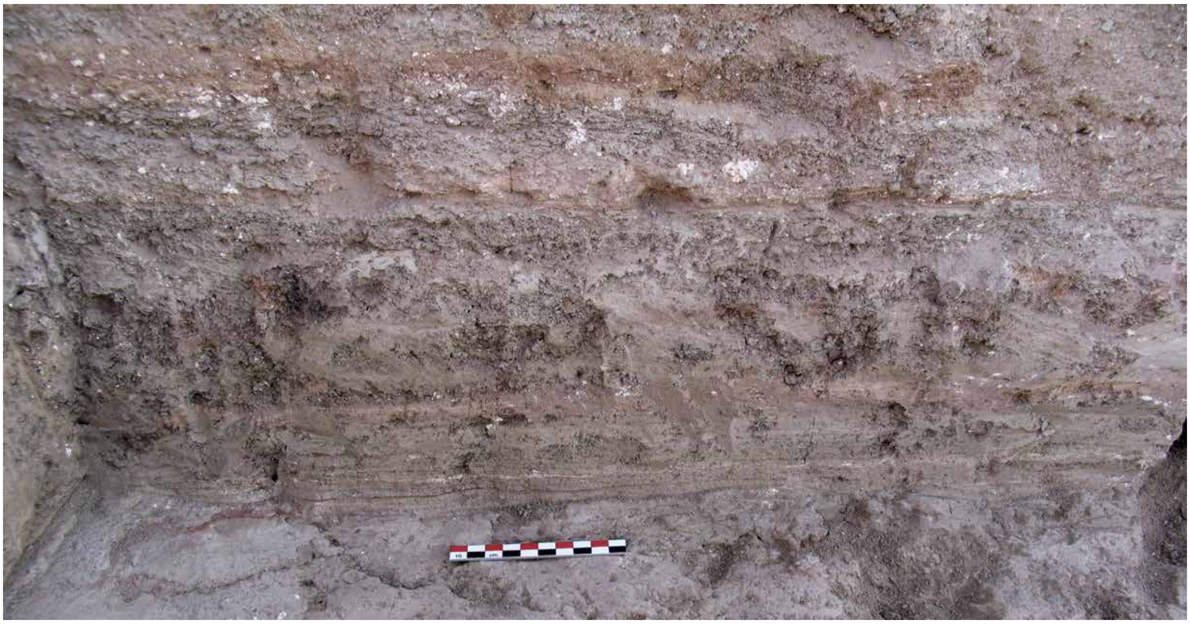


Fig. 2.31. A profile in House 4 showing a sequence of floors, many of them red plastered.

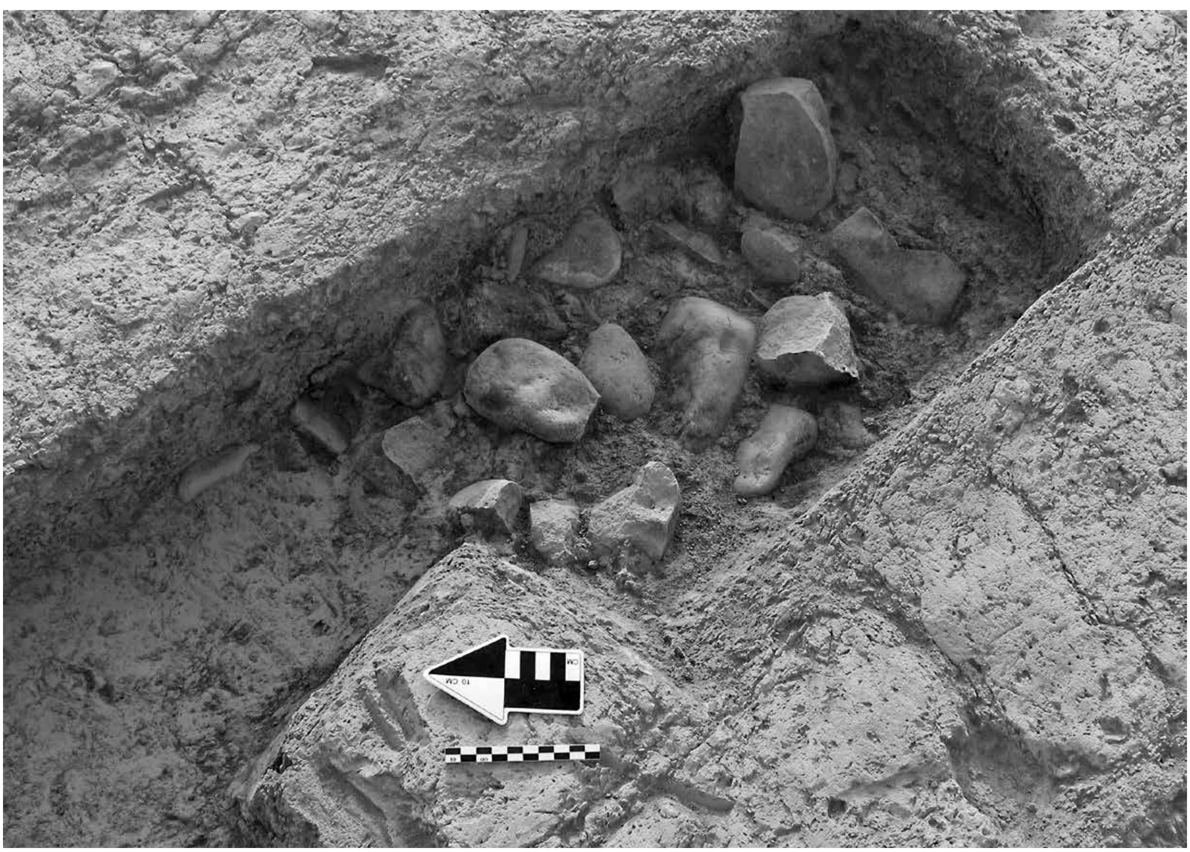


Fig. 2.32. Stone-filled space at the southwestern edge of House 4.

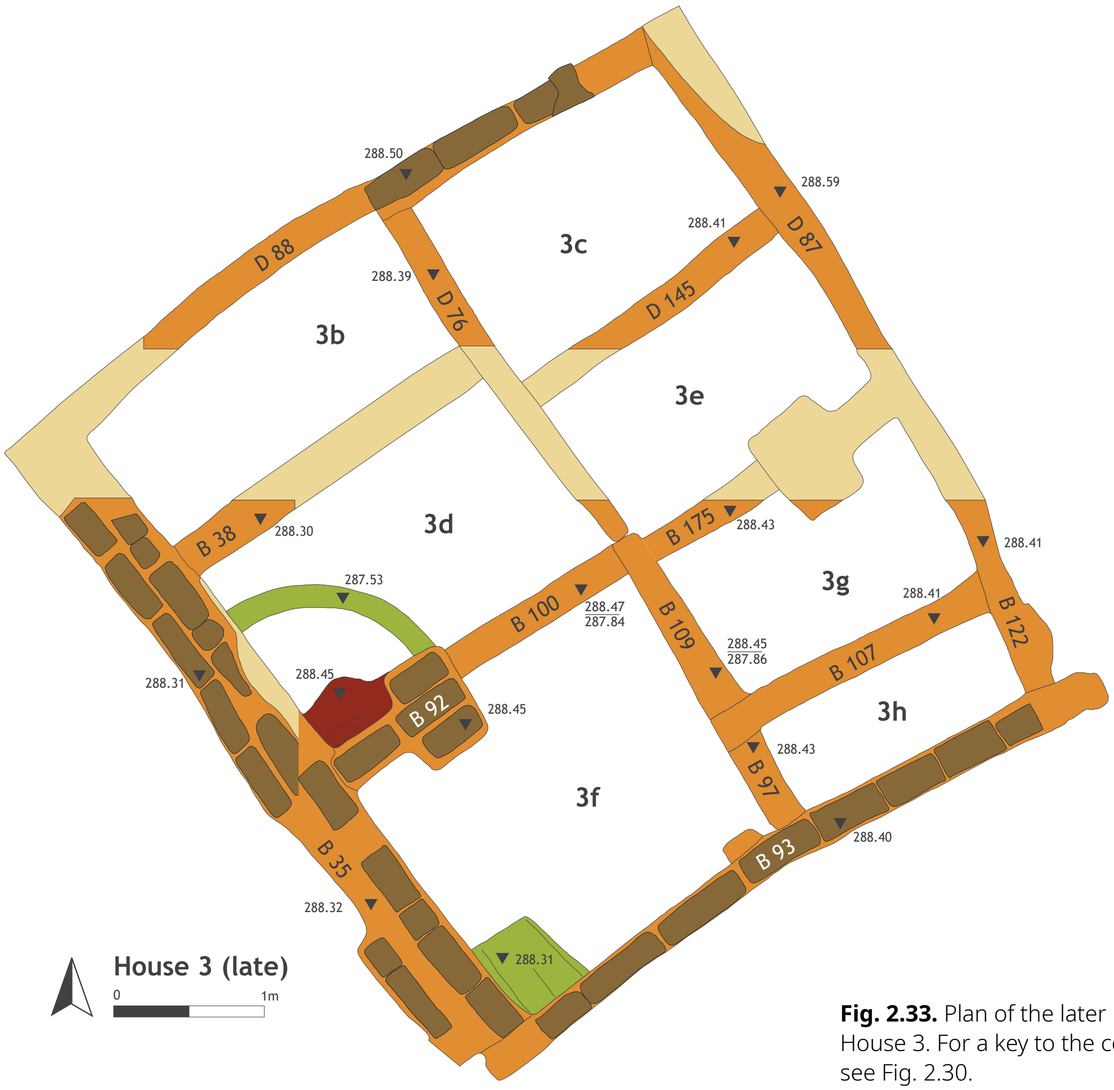


Fig. 2.33. Plan of the later phase of House 3. For a key to the colors used, see Fig. 2.30.

three additional short walls (B38, B107, D145) were added parallel to B100/175. The result was a subdivision of the previously one-room building into seven unequal spaces. Unlike almost all other walls excavated at the site, these cross walls remained unplastered. In none of the cubicles were any floors found, nor were any passageways among the spaces identified. Perhaps the subdivided space was used for storage or as a basement space, for which it was judged unnecessary to plaster the walls, although the presence of FI 17 speaks against this interpretation.

In **House** 7 the storage annex fell out of use. Instead a large, circular hearth with a dense pebble floor layer, FI 5, was constructed in an outdoor space just to the north of Houses 7 and 8 (Figs. 2.29 and 6.6). Special corner deposits were present in the northeastern and northwestern corners of the main room as well as against the buttress/partition wall C28. They included animal bones, in one case also an animal horn and stones, and in another three vertebrae of a human infant (Table 2.4).

House 9 was built on top of House 20 (Figs. 2.34 and 2.35). Below the lowest floor a layer of ash extended throughout the room, separating House 20 and House 9. Nonetheless, some features belonging to the earlier building were reused in the first phase of House 9: the southwestern buttress was turned into a threshold, while the northeastern one was modified to make a bin. Two walls of the earlier structure, D520 and D529, were reused as benches in House 9. These observations might be indications that House 9 was a later phase of House 20 rather than an entirely new building, similar to Houses 3 and 4.

The two opposing T-shaped buttresses of House 9 differ from those in other buildings in that they both sloped markedly inwards from bottom to top (Fig. 2.36). A low step running between them separates the lower, southeastern portion of the building from the higher back part to the northwest. A doorway approximately 50 cm wide was located in the southwestern wall, D299/300.

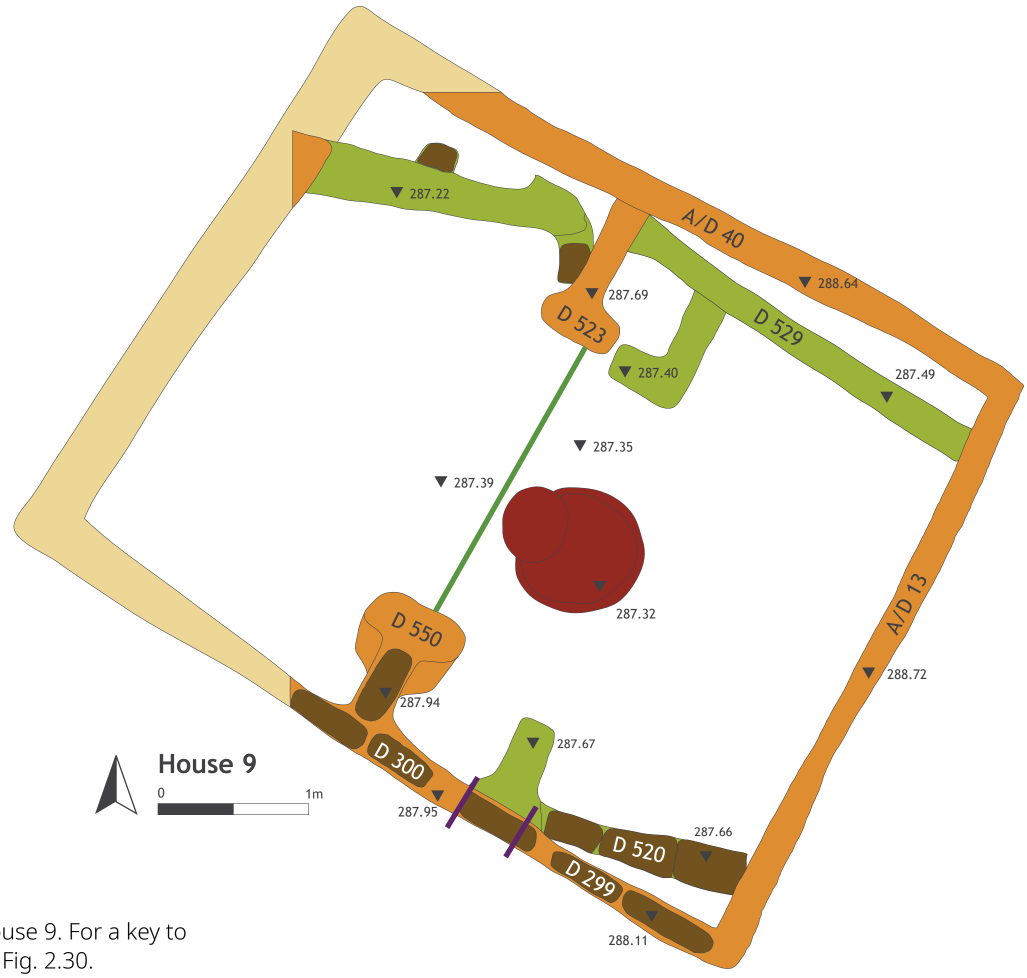


Fig. 2.34. Plan of House 9. For a key to the colors used, see Fig. 2.30.

At least five and maybe as many as eight red plastered floors were recognized in House 9. The impression of a reed mat was visible in one area of one of the floors. Two round to oval fire installations were located on consecutive floors midway between the buttresses in the lower, front part of the house, indicating a continuity in use of this area. The location is similar to the one in which a large rectangular fire installation was constructed in House 14.

In a corner created by wall D300 and buttress D550, a feature (D537) was present consisting of many small, smooth, grayish-blue pebbles pressed into the floor and wall plaster, on top of which were two larger stones, perhaps a corner deposit (Table 2.4).

In a subsequent phase of House 9, a small room was constructed outside and against the southwestern wall of the house (Figs. 2.30 and 2.35). It was probably around this time that the entrance, which could no longer have been used, was blocked with bricks and plaster. This separate room also had multiple floors that were plastered red or white. After House 9 fell out of use, food preparation activities were conducted in the room/annex, as indicated by several fire installations, two bins, burnt surfaces, charred grain, and possible storage pits.

House 10 is presented in detail in Chapter 4 and will therefore be mentioned only briefly here (Figs. 2.37 and 4.5). The house was constructed above a sequence of ash layers, fire installations, and a part of the earlier Building 17.

As is the case in many other buildings, a low step separated the front from the back portion of the house. Floors in House 10 were renewed multiple times; most were red plastered. Strewn across the last house floor was a large number of stones, mostly burnt, probably part of a closing or abandonment ritual (Fig. 4.18). The footprints of a child and pawprints of two dogs were left in the wet floor plaster of one of the floors in the back portion of the house (Fig. 4.17). In addition to bin D552 that was constructed against buttress D466 and wall D469 (Fig. 4.8), the front portion of the house contained a very well preserved, double-chambered oven, FI 44, located immediately to the right of the entrance

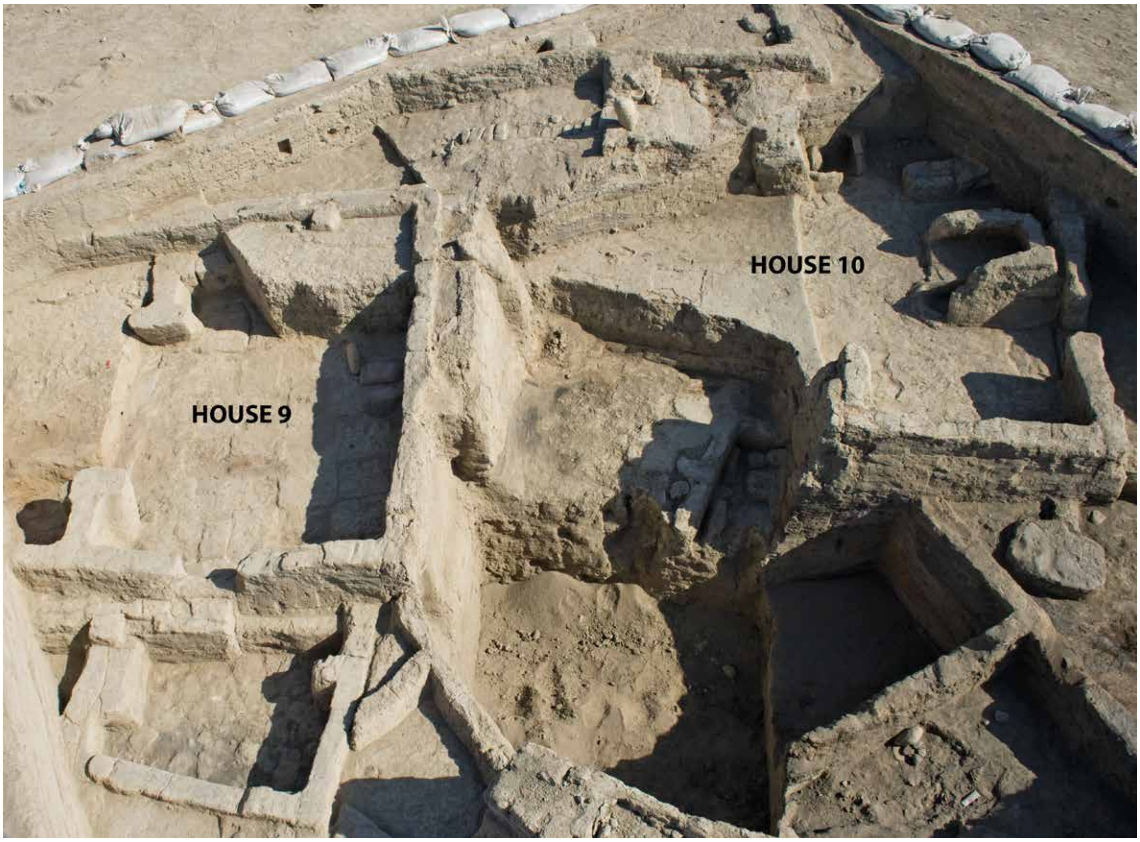


Fig. 2.35. View of House 9, with the annex visible in the lower left. In the upper right is House 10.

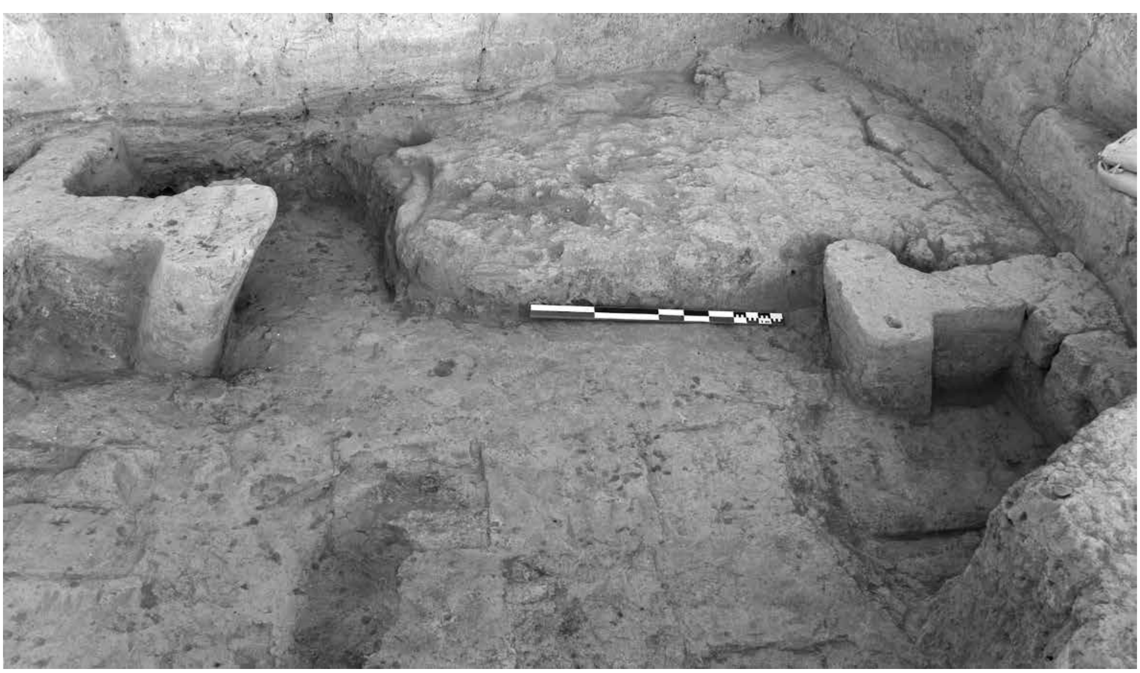


Fig. 2.36. Inward-sloping buttresses in House 9.

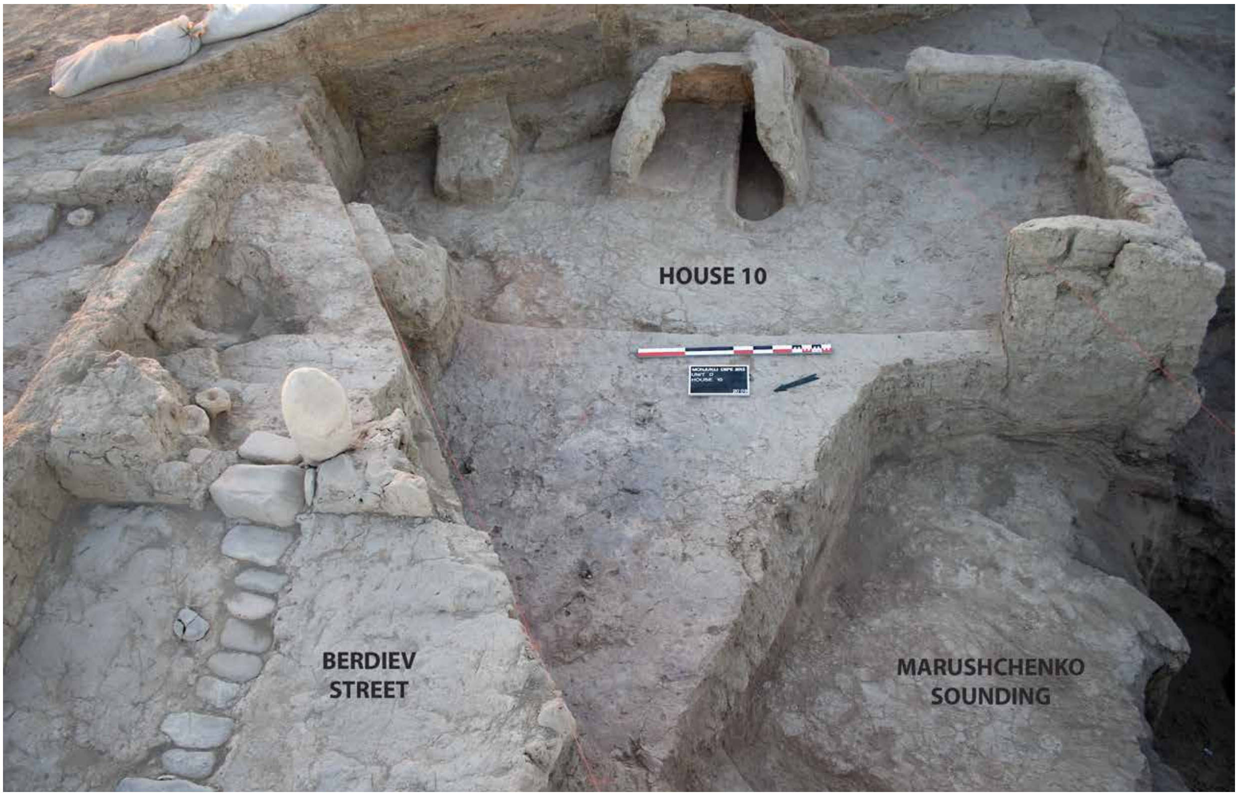


Fig. 2.37. House 10, looking from the back of the house toward the front. To the left is the later Berdiev Street and Gate 1.

(Figs. 4.15 and 6.7). This fire installation may be an early version of the “raised-box” type hearth found across wide areas of southern Turkmenistan and Iran (cf. Meier 2017, 160-161). Along the southwestern side of the front section of the house was a narrow bench, D606 (Fig. 4.12). Several corner deposits were associated with the house (Table 2.4).

Outside House 10 and separating it from House 3 was a sequence of well-prepared outdoor use surfaces. On one of these (D441) were substantial quantities of microdebris from the working of stone.

Only a portion of **House 12** consisting of two rooms was excavated (Fig. 2.30). It appears to have been a predecessor of House 2, which reused some of the earlier walls.

In **Unit G**, little coherent architecture was encountered. The earliest level reached was an outdoor surface covered with gray ash and two small fire installations. Above it were two more outdoor surfaces that ran up to walls enclosing a roughly rectangular space. These were, in turn, succeeded by lenses of aeolian deposits, suggesting that the area lay open and little used for some time. This was, in turn, capped by a destruction layer consisting of fist-sized burnt stones, brick lumps, and burnt bone. At least some of these deposits may be attributable to the Central Midden, which was defined in the course of the scraping season 2014 (see below).

Stratum II

Architecture, features, and deposits attributable to Stratum II were reached in Units B, C, D, E, and G (Fig. 2.38). Unlike the other three Aeneolithic strata, Stratum II is not particularly well defined, and in a number of cases a specific attribution of a use phase to Stratum II or Stratum I is uncertain. However, Stratum II is the earliest one that allows us to distinguish the basic plan of the village. The most characteristic features are the Eastern Midden, Central Midden, and the streets.

Houses 3 and **4** continued to be occupied. Their configurations remain the same as in Stratum III.

To the southeast of House 3 and directly abutting it is **House 5**; immediately to the southeast thereof is **House 6**. Their precise stratigraphic attributions are unclear; they may belong to Stratum II, I, or both.

Little can be said about House 6 of which only the northwestern corner was excavated, apart from the fact that a series of red floors was present not far below the mound’s surface.

House 5 was constructed more or less directly up against House 3, thereby rendering useless its earlier entryway. House 5 consists of two rooms with no apparent passageway between them. However, since they share a wall, B99, and have some other similar attributes, it seems reasonable to consider them part of a single building. In the earliest phase reached, two parallel walls were identified below the floors of the western room. Together with the southwestern wall of the house, they created two or three long, narrow spaces, maximally 70 cm wide. Apart from a potential storage function, it is unclear what other use such spaces might have had.

Fig. 2.38. Plan of Stratum II.

After the two earlier walls fell out of use, the space was transformed into a room of approximately 1.9 x 2.0 m. Its floors exhibited substantial undulations due to the underlying walls which were not leveled prior to the laying of the later surfaces. A brick bench was present along a portion of the northeastern wall of the room, and a small fire installation was located on the latest surface.

The eastern room of the building contained a sloping surface. A single buttress projects into the room from its southwestern wall.

House 1 is situated to the north of House 3 and atop House 9 (Figs. 2.39 and 2.40). The northern wall of the house, A/D40, forms the southern edge of Berdiev Street (see below). The house consists of a typical, squarish, one-room building with opposing T-shaped buttresses.

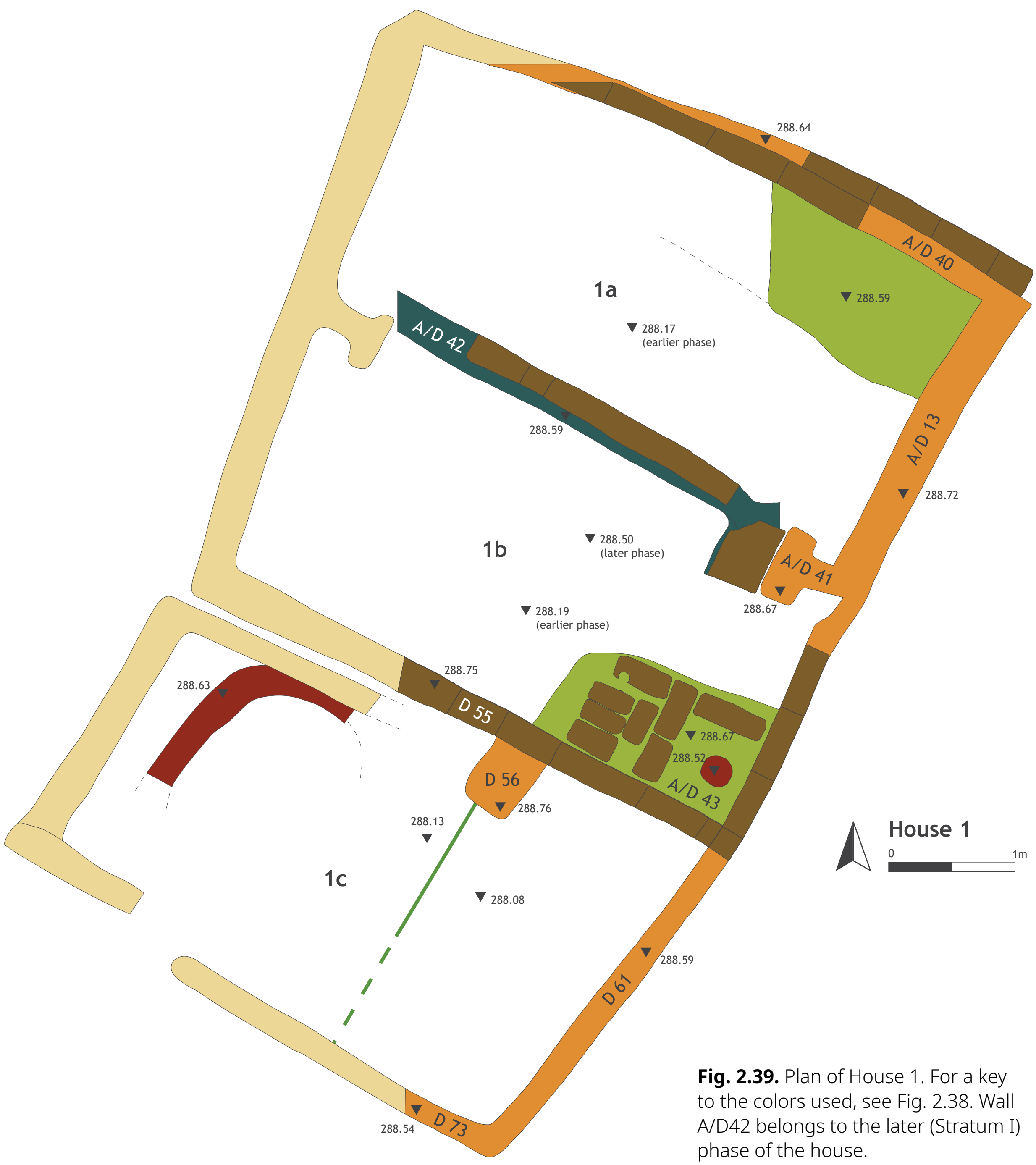


Fig. 2.39. Plan of House 1. For a key to the colors used, see Fig. 2.38. Wall A/D42 belongs to the later (Stratum I) phase of the house.

Fig. 2.40. View of House 1 from the north.

An annex to its south may be a part of this structure as it shares a wall, although otherwise it shows signs of being an independent building. Further to the south, House 1 is separated from House 3 by a gate (see below).

The annex/southern room shows a sequence of well prepared, in part red-colored floors. In the earlier use phase, there was a hole in the southeastern wall, D61, that seems to have drained into South Street. A rectangular buttress, D56, extends from the northeastern wall, most probably once matched by one on the opposing wall but outside of the excavation area. Extending from the preserved buttress was the typical low step separating the front and back portions of the room. A fireplace was located in the back portion, as recognized from the scraping.

Two use phases were distinguished in the main portion of House 1. The earlier one included an infant burial, MDB 6, just north of wall D55 and underneath a podium, A/D43, in the southeastern corner of the house. It is likely that the burial was interred at the same time as the construction of the podium. The latter contained a brick framing for a small fire installation, perhaps a container for holding glowing coals, set on a red floor that runs underneath the framing bricks and the podium to the northwest. In front of this installation was a square block of clay covered by successive plaster layers. The first two plaster layers were white, followed by a red one, with the latest one again a white plaster. The T-shaped buttress, A/D41, next to which this block was set had a set of similar plasters that were all white. The fact

Fig. 2.41. White-plastered block next to the buttress A/D41 in House 1.

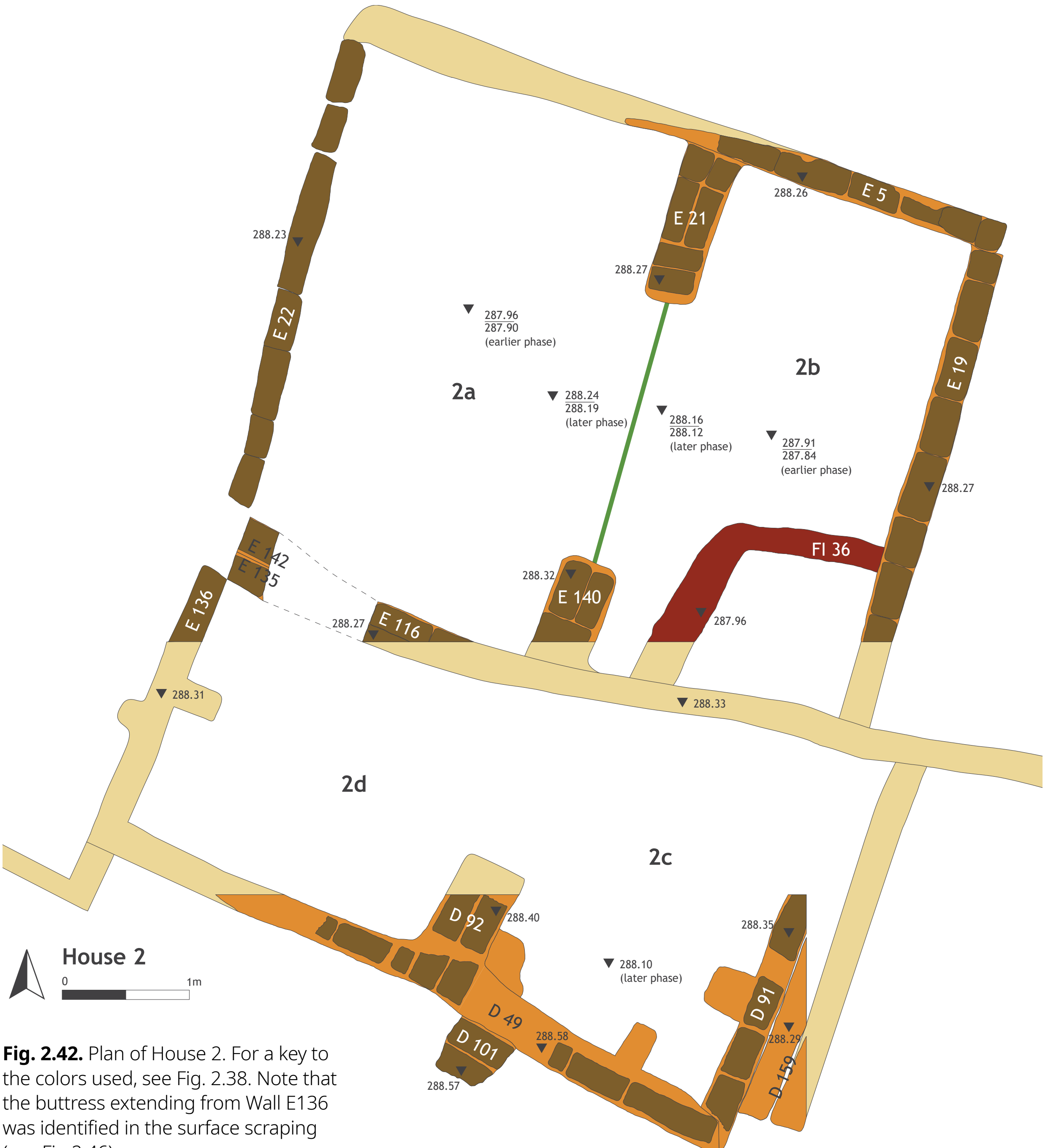


Fig. 2.42. Plan of House 2. For a key to the colors used, see Fig. 2.38. Note that the buttress extending from Wall E136 was identified in the surface scraping (see Fig.2.46).

that there is a sequence of floor, block, and buttress plasters colored white or red suggests that there was an intended play of colors, as there must have been one phase with a red block and a white buttress plus (likely) a red floor (Fig. 2.41).

In the northeastern end of the house a bench or platform, over one meter wide and at least two meters long, was constructed against wall A/D40.

House 2 was situated just to the north of Berdiev Street (Figs. 2.42, 2.46). It consists of four spaces. The two northern ones, 2a and 2b, correspond to the usual division of the house by two opposing buttresses. Spaces 2c and 2d to the south appear to be connected to the rest of the structure by an entryway. This additional space is similar in a number of respects to the one attached to House 1, sharing a wall with the main part of the house and including internal buttresses. Whether such annexes are typical for the later phases of the Aeneolithic settlement remains unclear.

The main part of House 2 consists of a squarish room divided by two opposing rectangular buttresses and a low step that runs between them. The floors were

Fig. 2.43. Berdiev Street: a) paved section leading up to Gate 1, b) northwestern section near the edge of the mound, Houses 11 and 15 in the background.

reddish brown and separated by very thin ashy layers. A corner deposit was set into the southeastern corner of space 2a (Table 2.4). A burial of a perinatal infant, MDB 8, was located in the northwestern corner of space 2b. The burial was placed at the same level as the bottom of the walls, so that it may have been a founding deposit for the house (see Chap. 8). In the southeastern corner of 2b, a large rectangular hearth (FI 36) was located.

The additional portion of the structure to the south consists of two rooms. Only a corner of the western one, 2d, was excavated, and hence little can be said about it. The other part, 2c, contained substantial quantities of burned fill. One of the fill deposits above a white floor consisted of a highly structured arrangement of materials, including bone, burnt clay, and stones. These may have been kept on a roof that collapsed, or they may have been remains of installations in the room. A door socket was located on the white floor below just to the west of wall D91, together with bricks framing a small, box-like space. A possible corner deposit was located in the southwestern corner of 2c, between walls D49 and D92, containing bones and a horn core of a goat (Table 2.4).

Two sets of non-architectural outdoor features played a significant part in structuring the Stratum II village. The streets that we have dubbed Berdiev and South Streets meet at a more or less perpendicular angle near the center of the village (Fig. 2.38). In the southeastern portion of the settlement, the extensive Eastern Midden was formed in an area that had been previously occupied by houses; to the west was the Central Midden.

Berdiev Street runs WNW-ESE and is joined by the much less well preserved, NNE-SSW running **South Street**, which was heavily damaged by Marushchenko's sounding.[14] Berdiev Street consisted of a long sequence of surfaces. The earliest investigated use phase included a central stone paving set into the street surface, forming a stair-like construction that led up to Gate 1, at which the street ended (Fig. 2.43a). The northern door jamb of Gate 1 consisted of a mud brick buttress, D101; the opposite door jamb was a large, upright-standing, ellipsoidal limestone with a slight notch on the side of the gate's opening. This

14 We did not reach Stratum II levels in Unit F and hence cannot ascertain whether Berdiev Street reached this far to the west in earlier times as it did in Stratum I.

Fig. 2.44. Gate area from the southeast, with door sockets, grinding stone, and the large standing stone that formed the southern door jamb.

door jamb was set against the immediately adjacent wall D162, which separated a small alley running towards the southwest – South Street – from the Eastern Midden. Much of wall D162 was destroyed by Marushchenko's sounding.

In its earliest phase, the gate was marked by a grinding stone at the threshold. Later, a smaller, almost unused handstone was set on top of it, followed by mortar or brick remains. Numerous door sockets and grinding stones were present around the gate on both the western, streetside and on the eastern, courtyard side/open area (Fig. 2.44). The use of grinding stones as part of the gate construction may have contributed to marking it as a liminal space in the village, where an open area (to the east) could be closed off from a main thoroughfare.

In the succeeding use phase, only a few stones were present around the gate, including a door socket on the outer, eastern side, next to buttress D101 that extended from the southern wall of House 2 (Fig. 2.42). In this phase, the gate had two door sockets, one on each side, suggesting that at least one was placed there more for symbolic than functional reasons. To the east of the gate, the courtyard contained a number of small postholes in a row, as if to support an awning. Finally, the latest attested use phase of Berdiev Street in Stratum II consisted of a well trampled, compact surface. The door socket on the western side of the gate was still present.

South Street was only attested in small areas on the northwestern side of Marushchenko's sounding. It, too, is marked by a narrowing of the street by means of a brick feature added to the two bounding walls near its southwestern end.

The area to the east and south of Gate 1 in which Houses 7, 8, 10, and 14 had stood in earlier times was covered in Strata II and I by the **Eastern Midden** (see Chap. 7). The midden consists of a complexly stratified set of ashy layers interspersed with compact, bricky ones and contained large quantities of animal bones, stones, and unbaked clay objects such as tokens (Fig. 2.45, 7.1, and 7.2). The most extensive distributions of animal bones, including some still in articulation, were part of a level that derived from the slaughtering of large animals and a destruction that left numerous stones covering an uneven surface. This slaughtering event occurred after the destruction of House 10 but not immediately thereafter, since it was located some 20 cm above the upper level of one of the House 10 walls.

The outdoor space excavated in **Unit G** was characterized by a series of fragmentary walls and surfaces, including one with a thick layer of brick fall, and thick layers of differently colored ash containing a fetus (MDB 15; see Chaps. 8 and 9) and numerous shaped clay objects, including tokens (Chap. 13). These ash- and refuse-filled layers are part of the Central Midden, which bears at least some resemblance to the Eastern Midden. A substantial oven, FI 39, was built directly atop this ash; above it, another oven, FI 38, of similar shape and size was constructed directly on the walls of the earlier one (Figs. 6.10 and 6.11). The older of the two ovens seems to have been used more intensely or was exposed to higher temperatures, based on the greenish color of its walls. Associated with the earlier oven were a series of fragmentary walls and a pit surrounded by bricks.

Stratum I

Stratum I was excavated in all of the units on the mound. In addition to the excavated remains of this level, the scraping undertaken in 2014 revealed further elements of this settlement phase (Fig. 2.46). Overall, the resulting plan fits well with the one published by Berdiev in 1972 (Fig. 2.3). Our work has allowed us to extend Berdiev's plan, to differentiate outdoor spaces and their features, and to make important temporal differentiations.

The basic outlines of Stratum I are similar to the preceding Stratum II. The settlement was structured to a significant extent by Berdiev Street, which at this time extended from the central part of the mound (Unit D) to the northwestern part and beyond (Unit F) (Fig. 2.43b). Where the street began (or ended) to the northwest is unclear; further work planned in this area for 2015

Fig. 2.45. Profile of the Eastern Midden showing the ashy and bricky layers.

Fig. 2.46. Plan of Stratum I.

Fig. 2.47. Large stone that probably once stood alongside Berdiev Street, lying on top of wall F28.

and 2016 to try to trace the street to its end could not be carried out due to the postponement of those field seasons. Over its currently documented 25 m length, the street narrowed in some places and widened in others, ranging from a minimum of 1.0 m to a maximum of 1.8 m wide. It was lined on the south side by houses that were built one next to the other along it; the situation on the north side is less clear but was similar for at least a short stretch. The street consisted of several mud plaster and silty surfaces. It sloped upward by 0.4-0.5 m toward the center of the settlement in the direction of Gate 1. A large stone, similar to the one that marked the southern side of Gate 1, was found just next to the street in Unit F but was no longer in situ (Fig. 2.47).

Beyond Berdiev Street to the southeast, the Eastern Midden remained in use. The lowest layer was directly above the sloping surface that existed in this area in Stratum II. Numerous stones, ranging from fist-sized to larger examples, were strewn throughout the midden area. They were followed by a thick, dark black ash layer containing many shaped clay objects, including tokens, spindle whorls, figurines, and pieces of unfired clay vessels. In addition, several cattle and sheep/goat skulls along with articulated vertebrae were encountered in a lighter-colored ash layer. In addition, horns of sheep/goat, cattle, and gazelle were recovered. It is impossible to assign these accumulations of bone and horns unequivocally to either Stratum II or to I. Above them was another ashy layer into which small pits had been dug.

On the basis of the scraping conducted in the area between Units D and B to the east and Units F and G to the west, another area with dense, ashy layers that appears to be a similar kind of midden was identified. We refer to it as the Central Midden. How far it extends to the west is unclear, although Berdiev's plan of the uppermost level showing an absence of architecture in this area gives some hints. The dense ash accumulations excavated in Unit G belong to this midden.

Both the Eastern and Central Middens appear to have been bounded on at least three sides by houses (Figs. 2.46 and 2.48). This arrangement might imply that the village was divided into neighborhoods that each shared a midden/feasting area (see Chap. 7). Whether a similar arrangement was present to the north of Berdiev Street cannot be ascertained due to the limited work conducted in that area. In any event, there seem to have been two structuring principles underlying the layout of this phase of the village:[15] 1) Houses were clustered around major middens/open spaces, and 2) houses were arrayed along a long, straight street that ran through a portion of the village, ending abruptly at a gate. Middens seem to have been conceived as public spaces that were to be kept separate from thoroughfares in the village, as suggested by Gate 1 and the efforts at rendering it closeable.

Houses 3, 4, 5, and **6** all continued to be occupied in Stratum I.

House 1 underwent some modifications. In the main room, parallel to walls A/D40 and D55, wall A/D42 was constructed between the two buttresses, dividing the room in two (Fig. 2.39). The portion of the room north of wall A/D42, 1a, contained a platform or bench that occupied much of the space in front of the northern wall and a fire installation, FI 19, lined with pebbles. The floor was resurfaced multiple times, and under one of these surfaces a child was buried (MDB1; see Chaps. 8 and 9).

The space south of wall A/D42, 1b, was also frequently resurfaced. Four elongated rectangular bins with hard, burnt surfaces and ranging in width from 0.3-0.6 m and in length from 0.8-1.1 m were constructed in this southern portion of the main room. They seem to have been made and used sequentially (Fig. 2.49).

The various floors of room 1c cannot be assigned clearly to either Stratum II or I.

House 2 remained similar in configuration to its previous arrangement apart from the fact that the large

15 It is quite possible that a similar situation prevailed in Stratum II, but this cannot be determined at the present stage of research.

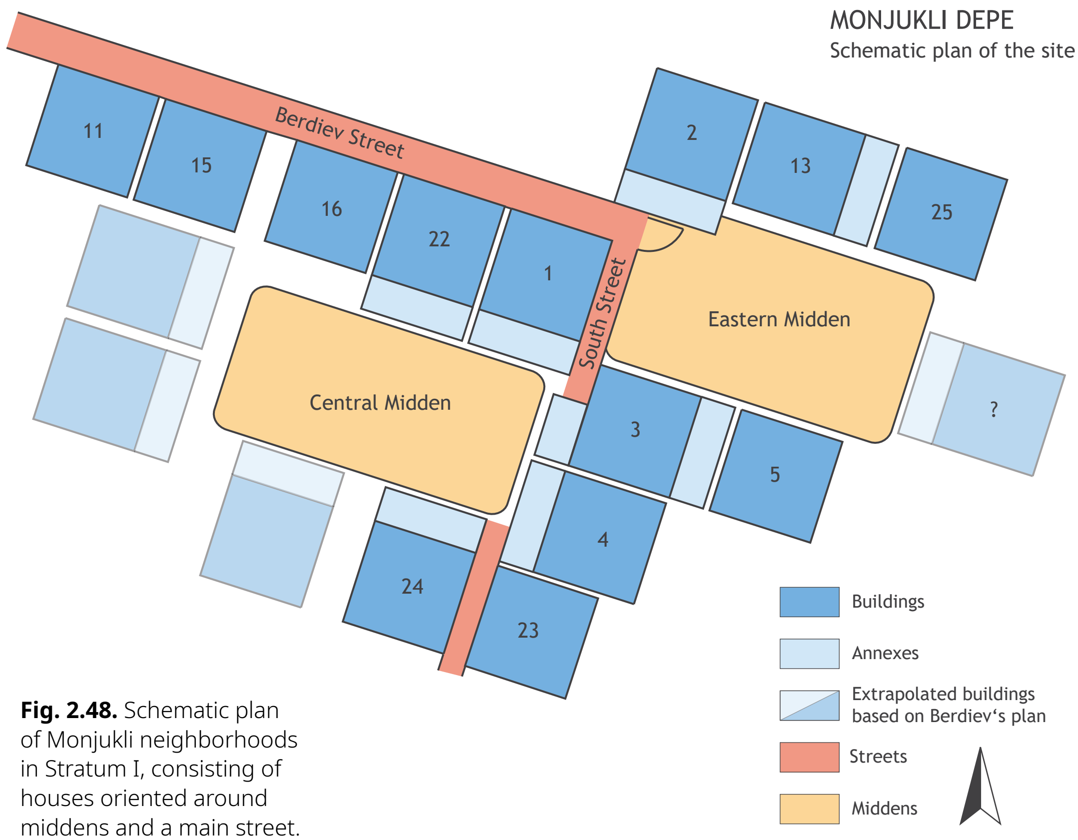


Fig. 2.48. Schematic plan of Monjukli neighborhoods in Stratum I, consisting of houses oriented around middens and a main street.

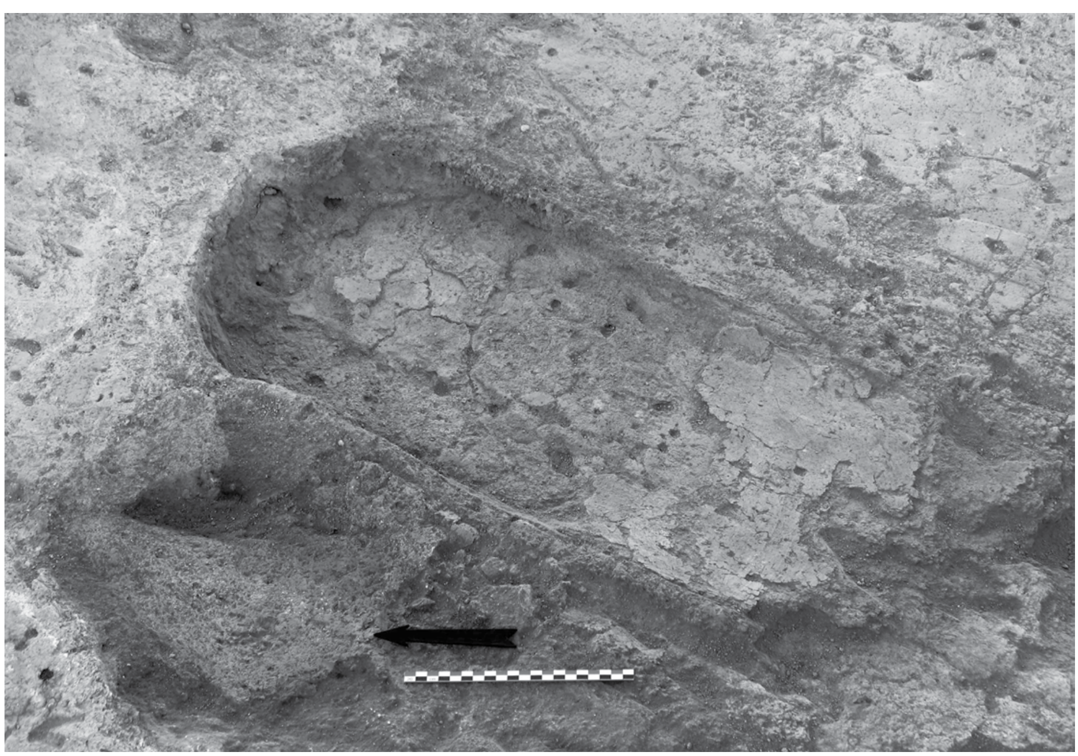


Fig. 2.49. Bin A36 in House 1.

Fig. 2.50. Impressions of reed matting on a floor of House 2.

fire installation in room 2b fell out of use (Fig. 2.42). Several well-prepared floors as well as walls and buttresses were covered in red plaster. On one floor impressions from reed matting were visible (Fig. 2.50). Immediately to the east of House 2 is **House 13**, only a relatively small portion of which has been excavated. To the north of Houses 2 and 13 was an outdoor area in which a sequence of three large fire installations was constructed (FI 1, 2, and 34), including one with two chambers (see Chap. 6). The successive construction of ovens on more or less the same spot points to a continuity in use of this area for fire-related activities, presumably involving but not necessarily limited to food preparation.

In the northwestern part of the mound, portions of three structures were excavated in Unit F. **House 11** had T-shaped buttresses and a low step running between them, whereas **House 15** had rectangular buttresses and no sign of a step.[16] Only a corner of **House 16** fell within the excavation unit; the remainder of its plan was identified in the course of scraping (Fig. 2.46). Between Houses 15 and 16 was a space that was for at least some time used as an outdoor area. All of the structures border Berdiev Street.

House 11 was built directly up against House 15 (Fig. 2.51). It consists of a single room with two distinct use phases. The excavated area includes primarily the higher portion of the house, although a small area to the northwest of the T-buttress belongs to the lower part of the structure. Based on parallels with other buildings, it is therefore likely that an entrance to the building was in the northwestern part of the structure. To the southeast of the buttress, a greenish gray floor was reached. It was clean apart from a complete horn of a wild sheep that lay in the southern corner.

The subsequent use phase of House 11 consisted of a destruction or abandonment level. The room was filled with a combination of ash and silty deposits containing lumps of mudbrick and numerous stones (Fig. 2.52). The large quantities of ash as well as some burnt clay suggest either in situ burning or the deposition of burnt material in the room in conjunction with its abandonment. There are no traces of fire on any of the walls, suggesting that if the burning occurred in situ it was not a very intense fire.

House 15 also consists of one room, with the remains of a single, rectangular buttress that was detached from the wall (Figs. 2.51 and 2.53). Several phases of use could be distinguished. In the earliest one reached, the structure was somewhat smaller than in the later phase. Wall F90, to which buttress F53 was attached, formed the northeastern edge of the house. This wall was badly damaged by fire, as evident from the burnt clay and ash found among the bricks. The fire led to a marked slumping of part of wall F90 toward the southwest and to the detachment of the buttress from the rest of the wall. The buttress was plastered white, but traces of an earlier red plaster were also visible. At least three successive mud-plaster floors were associated with this use phase of the house. Above the latest floor, the building was filled with quantities of ash that contained numerous animal bones and artifacts including clay tokens and clay horns.

Subsequent to this apparently irreparable damage to wall F90, a new one, F83, was constructed a little more than

16 Only one buttress was attested within the excavated area in each of these houses, but there is every reason to expect the opposing ones to have been present.

Fig. 2.51. House 11 to the west (foreground) and House 15 to the east, both bordering Berdiev Street (to the left). The detached buttress in House 15 is visible in the background.

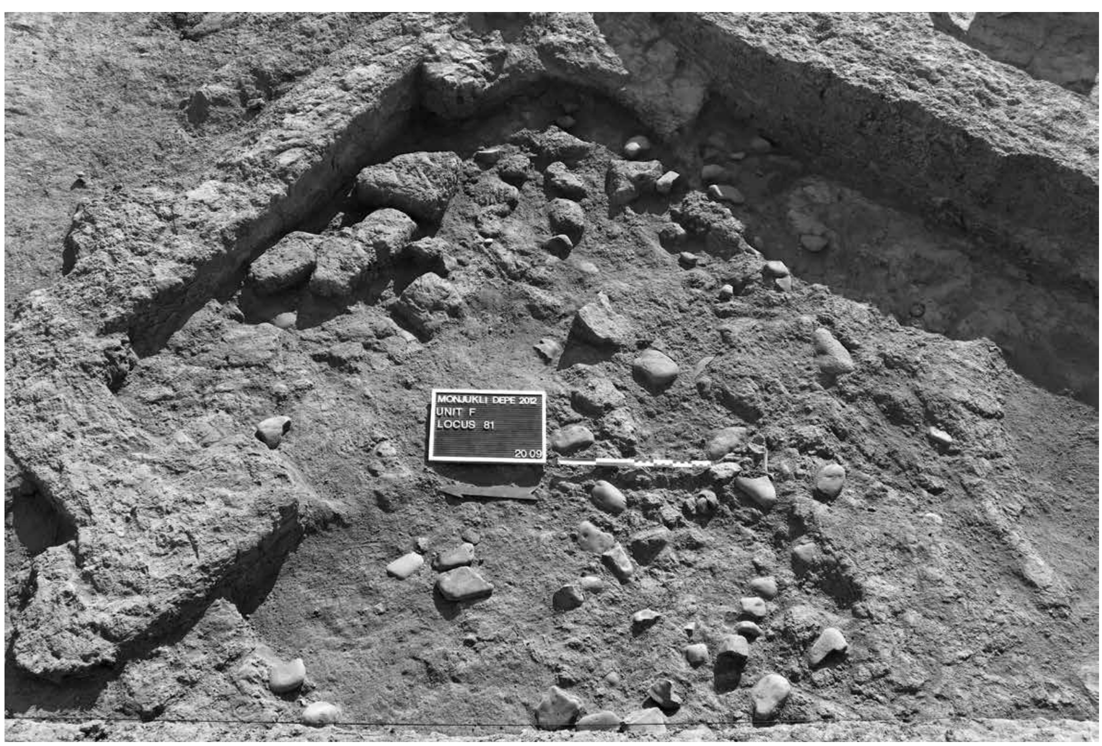


Fig. 2.52. Destruction/abandonment level in House 11.

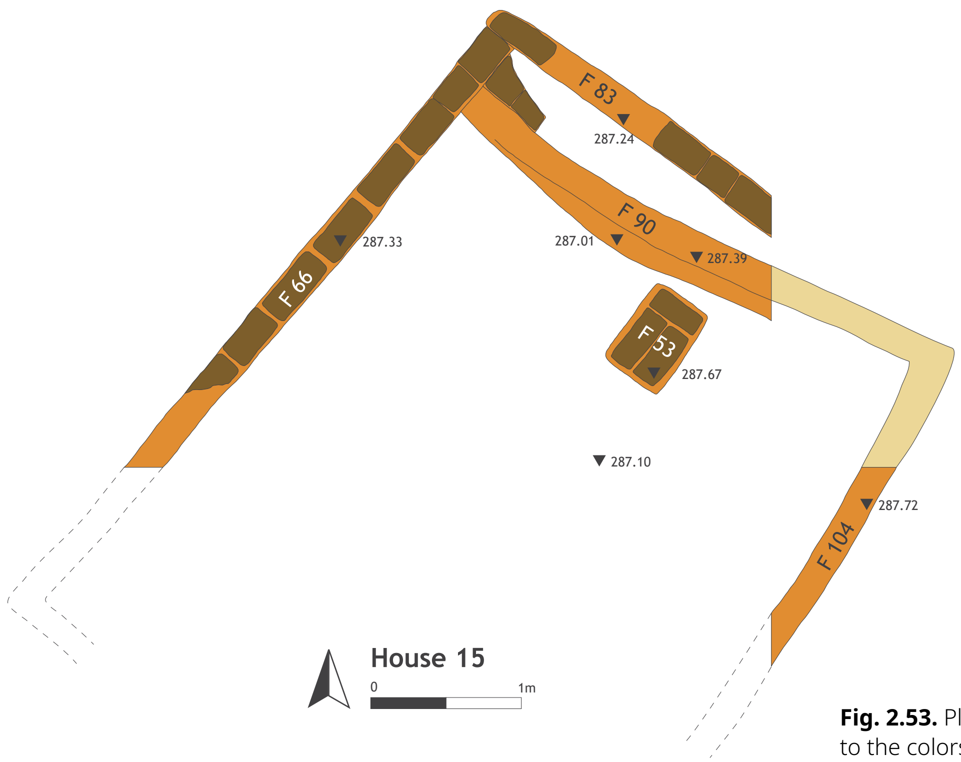


Fig. 2.53. Plan of House 15. For a key to the colors used, see Fig. 2.46.

half a meter to the northeast. No floors associated with this later phase of the building were identified, suggesting that they existed at a higher level and fell victim to erosion. Yet another ash level postdated the use of House 15.

Several reddish mud-plaster floors were encountered in the small area of **House 16** excavated. A door socket was embedded in one of the earlier ones; it does not seem to have been in situ, but it might nonetheless be an indication that there was an important entryway in the vicinity. Surface scraping revealed that the remainder of the house plan consists of the usual one room with two opposing rectangular buttresses. In the southeastern part of the house was a double-chambered oven (see Sarianidi 1963, Fig. 3(2)).

Between Houses 15 and 16 is an area approximately four meters wide. In the earliest phase of use reached, we encountered fragmentary walls. Subsequently, this area became an open space used for activities involving fire, as is evident from the substantial quantities of ash as well as the traces of burning on the thick plaster that covered the face of the bordering wall to the north. In its earliest use as an open area, there was a feature consisting of a nearly 3 m-long line of partially burnt brick and patches of burnt clay floor. Due to time constraints, it had to be left unexcavated, and it was unclear if it was part of a collapsed wall or of an installation, and if so, of what kind.

A number of general observations can be made on the architecture of Stratum I on the basis of the plans derived from scraping (Fig. 2.46). Whereas most structures consist of the usual single, squarish room divided by opposing buttresses and a low step, a number of buildings appear to have had an annex. This sometimes took the form of one or two substantial rooms, as is the case for House 1 room 1c, House 2 rooms 2c and 2d, House 4 room 4b, or the unexcavated House 22. In other cases, the annex was composed of a row of cubicles, as seen to the northwest of Houses 3 and 4 or to the northeast of the unexcavated House 24. The range of sizes of the components of these two types of annexes may be an indication that they were used differently. The cubicles most likely served storage purposes, whereas House 1 room 1c contained a fire installation. A storage purpose for the larger annexes cannot be excluded, as the annex of House 7 (Stratum IV) suggests. An intriguing question is why only some houses had these annexes. They appear to increase in frequency over time, although this may be due in part to the larger scale at which we were able to document the later occupation levels.

Stratum 0

In a small area in the northeastern quadrant of Unit D, the fragmentary and mostly poorly preserved remains of walls of a later occupation level were encountered. They were erected over a surface of Berdiev Street, at a time when Gate 1 was no longer in use (Fig. 2.54). At this time, the street ended approximately 1 m further to the west of its previous end at Gate 1, and it was narrowed by the addition of a wall parallel to and south of the southwestern wall of House 2. At

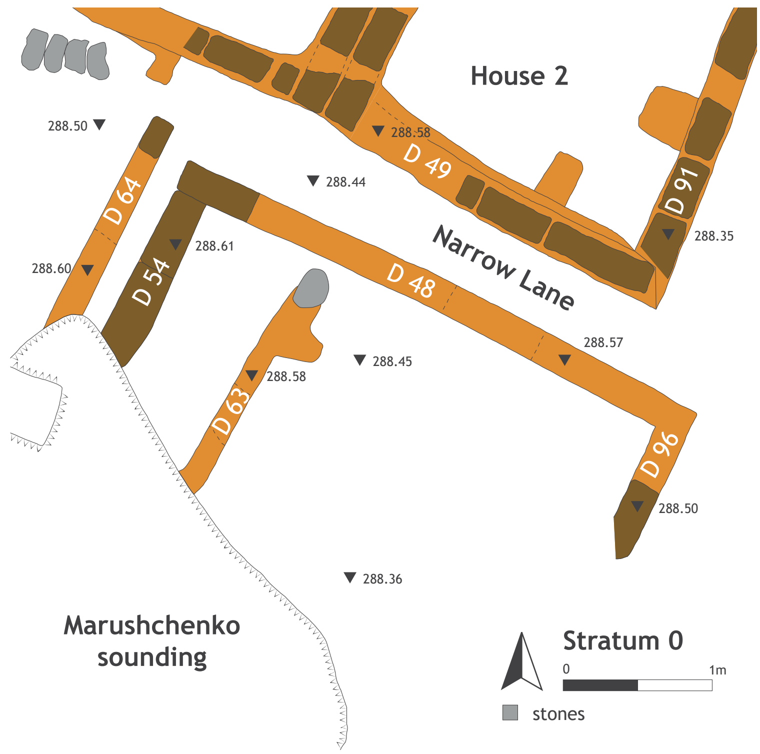


Fig. 2.54. Plan of fragmentary building, House 18, attributed to Stratum 0. It lay partially over Berdiev Street.

that spot, there is an indication of a narrow gate in the form of a brick protruding from House 2 into the street. A portion of a building, House 18, could be traced.

Post-Meana Horizon occupation

Some 0.5 m under the modern surface in Unit H, a large pit was encountered in the level designated H1b (Figs. 2.1, 2.13). Its fill varied from dense and clayey to loose and ashy with numerous charcoal inclusions and large numbers of fist-sized stones. The pottery from the pit included both Neolithic and Aeneolithic sherds. Among the other objects recovered were several stylized anthropomorphic figurines reminiscent of those found at Ilgynly Depe (Solovyova 2005; Chap. 12), pointing to a post-Meana Horizon date for the deposition of the contents of the pit.

Some 60 meters beyond the northwest edge of the mound, a long trench, Unit M, was excavated by a bulldozer in 2014 for purposes of geomorphological investigations. Near the base, at a depth of approximately 283.75-283.90 m asl, cultural material was encountered. This took the form of fireplaces with pebble floors, ash, and charcoal, along with small fragments of bone and a few lithics. Ceramics from the backdirt – presumably from the same occupational level, as no other remains were visible in the profiles – seem to belong to a "Chakmakly Horizon" (Chap. 10) that dates to Anau IA or to Namazga I/Anau IB. This is based on the similarities in painting on two fine-ware sherds to that known from Anau IA and the presence of very coarse sherds with heavy vegetal tempering. In the absence of further study of this material, the dating must remain provisional, but it nonetheless offers invaluable evidence of a buried occupation in the vicinity of Monjukli Depe that in this case probably more or less immediately postdates the main Meana Horizon settlement at Monjukli.

Three of the burials excavated – MDB 5, 7, and 13 – may also post-date the Meana Horizon (Chap. 8). A Middle Bronze Age burial (MDB 14) encountered in Unit L is clearly much later and may be a relic of the time when Altyn Depe was a major urban center in the vicinity (Masson 1988).

Corner deposits

As the name suggests, corner deposits are placements of materials in corners, generally of rooms but also between walls and buttresses and occasionally in other contexts, and partially or completely covered with clay or a stone. The list of corner deposits in Table 2.4 is likely incomplete as we may not have recognized all of them, especially in the early stages of excavation.

Corner deposits were found in 11 houses. The buildings lacking them were invariably those of which only a relatively small portion was excavated. These deposits may therefore have been a standard part of houses in the village. Corner deposits are found in houses belonging to all strata, although it must be cautioned that it is often unclear when exactly in the life of a house such a deposit was added. Houses contained different numbers of corner

Fig. 2.55. Corner deposits: a) in House 1 (D147), b) in House 2 (D139), c) between Houses 2 and 13 (E301).

Location	Locus	Corner	Contents
House 1	D147	east of wall A/D40, near former wall D64	stones and a horn of a male goat embedded in hard matrix
House 2	D139	SW corner of room 2c, corner of walls D49 and D92	one large long bone, one small (possibly bird) bone, and a horn of a male goat in hard matrix
House 2	E115	SE corner of room 2a, corner of wall E116 and buttress E140	one roundish, flat worked stone, one unworked stone with celt-like shape
House 3	B136 (part)	SE corner of room 3h, corner of walls B122 and B93	lump of brick, a sheep/goat mandible, and other bone; another animal mandible lower down (removed with B144)
House 4	B225	SE corner of room 4a, corner of walls B18 and B26/30	pile of 15 stones, many burnt and several used stones, some pushed into the wall plaster
House 4		corner of wall B30 and northern side of buttress B39	stones and bones from animal foot
House 5	B145 (part)	NE corner of room, corner of walls B99 and B115	several fist-size stones and a spindle whorl
House 7	C52	NW corner of room 7a	some bones of sheep/goat under a large stone, small pieces of burnt stone
House 7	C53	SW corner of room 7a, wall C28 at edge of doorway	mandible of an onager
House 7	C55	SE corner of room 7a	a large animal horn under two stones, three vertebrae from a human neonate
House 9	D537	western corner of buttress D300 into baulk	two fist-size stones on top of a thick layer of hundreds of pebbles
House 10	D618	between wall D290 and oven D611	three stones, one potsherd, shaped clay, and three animal bones
House 10	D334	between wall D290 and oven wall D346	bones of sheep/goat
House 10	D436	SW corner of front area between wall D289 and buttress D426	a horn of a male sheep
House 10	D492	between wall D290 and D493, outside and just north of entry to House 10	bones
House 10	D632	buttress D466	animal horn, cattle-size
House 11	F69 (part)	wall F65	female cattle horn and a spindle whorl pressed up against wall
House 14	D582	next to buttress D496 and wall D467	two horns from female goats (possibly the same animal)
Berdiev Street	D187	corner of South and Berdiev Streets	left and right mandible of an adult sheep/goat, horn of a female goat, and a grinding stone
outside House 18	D72	between south side of wall D49 and north end of wall D64, at gap between them	gap filled with a stone and a bone of a sheep-size animal
between Houses 2 and 13	E301	fill between walls E12 and E19	a pottery sherd and many used and worked stones
unnumbered building	G56	adjacent to wall G29	two tokens and an animal horn in one spot along wall

Table 2.4. Corner deposits.

deposits: often there were just one or two, but House 7 had three and House 10 five.

The most common materials found in corner deposits are stone, present in more than half (n=12 out of 22), followed by animal bones (n=10) and animal horns (n=9; see Fig. 2.55). Not all of the animal bones have been identified,[17] but where they have been, they include sheep/goat but also onager, a relatively rarely occurring taxon at Monjukli Depe (Chap. 7). The horns – also not all identified to taxon – include five goats (two in one deposit that may be from one animal), one sheep, and one cattle horn. Three horns are from male animals (two goat, one sheep) and four female (three goat and one cow). Apparently, the sex of the animal did not matter for this purpose but rather the presence of a horn. In one case, vertebrae of a human neonate were included in a corner deposit (C55, see Table 2.4). Two corner deposits contained spindle whorls, two have potsherds, and one each shaped clay, a token, and a piece of brick. Every corner deposit included stones and/or an animal part; all else seems to have been optional. That the corner deposits bore a symbolic meaning derived from their contents, placement, and (partially) hidden character seems clear (Chap. 14). However, they should not be interpreted as "foundation deposits" since they were not necessarily deposited at the time of building a house. They may have been put in place during the laying of a new plaster floor or when an installation was added, such as oven FI 44 in House 10.

17 Not all bones could be exported, and time in the field was not sufficient to examine all faunal remains.

Settlement at Monjukli Depe: changes over time

The full analysis of the stratigraphy and of the buildings and outdoor features is still underway. Here, the aim has been to offer an overview of the settlement history of Monjukli Depe as well as to briefly describe the various buildings, outdoor spaces, and their main features. In conclusion, we briefly summarize some of the main characteristics of the village at Monjukli Depe and changes over time.

The Neolithic settlement remains poorly known, as we have only been able to access it in small areas scattered around the settlement. It seems to have been as large or quite possibly larger than the Aeneolithic one. There are indications of substantial architecture, but at present we can say little more than that buildings existed. The presence of outdoor surfaces and fire installations seemingly unconnected to buildings – although the small size of the exposures may in some cases be misleading in this regard – points to substantial open, unbuilt space within the Neolithic village. Aeolian layers interspersed among occupational levels suggest that there were temporary abandonments, the lengths and frequencies of which cannot at present be specified.

With the beginning of the Aeneolithic occupation, some 800 years later, the village was densely settled, with houses constructed immediately adjacent to one another but with separate walls. A building plan consisting of a single, squarish room with opposing buttresses and a low step between front and back is attested throughout the Meana Horizon occupation. Where identified, entrances are in the lower part of the house. Fire installations were located both inside buildings and in outside spaces. Bins inside houses often have curved walls, although they are sometimes rectangular, and they were frequently constructed up against buttresses or walls.

It is first in Stratum II that there is evidence of streets in the village along which houses are constructed and of large middens. The limited areas excavated in the earlier strata preclude any definitive statements about whether these features were present – or in the case of the Central Midden, their extent – in the earlier levels. The observations that streets do not seem to contain substantial quantities of macro-refuse and that their surfaces were at least semi-prepared may point to a particular importance of the street in the life of the village.

A variety of ritualized practices can be recognized in the Meana Horizon village. They include the occasional burial of an infant as a "foundation deposit," the use of corner deposits in many houses, closing rituals that mark the end of the use of a house (or one phase of use) by strewing stones on the floor, and the marking of gates with special stones.

There is a substantial degree of continuity in the layout of the village during the Meana Horizon. In several houses there are phases of partial destruction, indicated by wall fall and thick deposits of bricky debris, followed by a reoccupation along nearly if not exactly the same house plan. In other cases, specific places in the settlement underwent significant changes, with buildings falling out of use and being replaced by open areas or the reverse. Striking throughout are the large quantities of ash found in many contexts in the Aeneolithic village, both indoors and outdoors. Although Houses 14 and 15 exhibit substantial damage due to fire, most others do not, pointing to good control of fire and mastery of pyrotechnology.

Why the settlement in Monjukli Depe came to an end remains uncertain. The latest traces of occupation have likely been obscured if not erased by the erosive forces of wind. On the mound itself, there is little indication of a post-Meana Horizon occupation. Nonetheless, only some 60 m to the northwest in Unit M, a completely buried Anau IA or IB occupation is attested. Whether it is directly connected to the former occupants of Monjukli Depe is a question awaiting future study.

Chapter 3

Chronological Modeling for Monjukli Depe and the Kopet Dag Region

Ilia Heit

Keywords: *radiocarbon dating; Bayesian modeling; chronology; Kopet Dag region; settlement history; Jeitun; Anau IA*

Introduction

The use of Bayesian statistics for the analysis of radiocarbon determinations has become common in the course of the past decade, as reflected in the number of published works in which the method is used (Bayliss 2015, 677-680, Fig. 2). In a Bayesian analysis archaeological information is included in the statistical analysis as *prior* information by means of which the probability distribution of ^{14}C measurements is approached in order to calculate a *posterior* probability for the dated events (Bronk Ramsey 2009a, 338). The aim is to make radiometric dating more precise by shortening the probability intervals of dated events, but at the same time the risk of error may also increase. The intent is not only to develop a finer chronology of past time slices; a Bayesian analysis may give archaeologists a hint of the duration of specific events and processes, offering an approximation of time as experienced by people in the past. It may also draw on archaeological evidence as the basis for a concrete story that might have been experienced by a person who once lived at a site (Bayliss et al. 2007; Whittle et al. 2011).

In the years 2010-2014, a large series of ^{14}C samples were collected at Monjukli Depe that provide an excellent basis for the application of Bayesian analysis. At the same time, they call into question elements of the existing chronology of early village societies in the Kopet Dag region. This paper aims to refine the chronology of Monjukli Depe and uses it to propose statements about the duration of specific structures or estimations of intervals between settlement phases. Starting from the modeled data, a renewed chronology for the Neolithic and early Aeneolithic periods in southern Turkmenistan is proposed.

Stratigraphy of Monjukli Depe

The stratigraphy of Monjukli Depe is based principally on the levels of Units D, C, and B in the central part of the settlement. They can be integrated into ten chronostratigraphic macro-units, or strata. The sequences of levels from the other units were integrated into this framework, insofar as the existing stratigraphic information allowed (Chap. 2).

Strata I-IV belong to the Aeneolithic period and include architecture in the form of mudbrick buildings. The boundaries dividing the Aeneolithic strata are formed by the building foundations and other notable stratigraphic changes in Unit D. The elevations of the upper and lower limits of Aeneolithic contexts from the soundings on the edge of the site suggest that the topography of the mound at the time of the Aeneolithic settlement was steeper than at present. This makes a correlation with contexts from the central part of the site difficult, although elevations can serve as a rough guide for connecting the broader exposures in the central part of the site with each other (see Fig. 2.10).

In comparison to the upper strata, the Neolithic Strata V-X offer a markedly different picture. They consist of a mixture of deposits with variable artifact densities and only few recognizable architectural structures, although some surfaces could be identified. This earlier settlement period has so far been explored only in a small area in Units C and D in the central part of the settlement as well as in the soundings H, I, and K at the edge of the site (Chap. 2).

In addition, there are occasional features that point to reuse of the site after the main settlement period. A pit in Unit H on the edge of the site revealed Aeneolithic materials of a more recent date than elsewhere on the mound. A ^{14}C sample from the pit yielded a correspondingly late date of 4317-4045 cal BCE. A burial in Unit L can be attributed to the late Middle Bronze Age.

Overview of the ^{14}C dates

As part of the excavation praxis at Monjukli Depe, an intensive sampling of materials was undertaken for various analytical purposes including radiocarbon dating (Chap. 2). A preselection was carried out in the course of the excavation: larger charcoal fragments were chosen and wrapped in aluminum foil, avoiding direct bodily contact. Before their export to Germany, a further preselection took place, with samples from less well stratified or multiply sampled contexts removed from the set for export. Prior to submission to a laboratory, the samples were identified and examined in terms of their suitability for ^{14}C dating by Dr. Reinder Neef (DAI).[18] The final selection rested on the appropriateness of the samples to address the overall objectives of the project.

In the years 2011-2017, 87 dates were obtained in different laboratories using accelerator mass spectrometry technology (Table 3.1). 23 dates of these (published in Pollock et al. 2011, 183-184) proved to be invalid. These are measurements from the Leibniz Laboratory in Kiel that were conducted in the problematic period 2010-2011. Reports emerged regarding the invalidity of dating performed by the lab during that period, which was probably due to problems in the preparation and combustion of the samples (Lull et al. 2015; Meadows et al. 2015). Almost all of the ^{14}C dates run during that period yielded results that were older than expected, with no discernible pattern in their deviations from expected values; therefore, measurement error cannot be calculated (Lull et al. 2015, 1039). The dates from Monjukli Depe that were run by the Leibniz Laboratory during this period also tend to be older in comparison to reference measurements from other laboratories and those run in Kiel from 2014 onward.

Redating of 10 samples by the laboratory in 2013, when, according to John Meadows et al. (2015, 1046), the Kiel dates should have once again been reliable, still seemed to be problematic (Fig. 3.1). Out of the age determinations of six Aeneolithic samples from the second round, four are younger than those from the first round and two are older. Four of these six age determinations are effectively in agreement with dates from other laboratories, but one (**KIA-43796**) stands out as too old.[19] Additionally, the ages of two determinations from the same sample (**KIA-43800**) clearly diverge.[20] The Neolithic contexts that were dated in the second round all yielded younger dates than in the first round. Nevertheless, three of the four ^{14}C dates are not consistent with those from other laboratories, still falling on average 100-150 years older than the comparison datings. In 2017 eight of these samples were measured once again and received new Kiel laboratory codes.[21] All of these determinations yielded results that are markedly younger in comparison to the first two dating rounds and correspond well to those from other laboratories. For this reason, the dates run by the laboratory in 2011 as well as the repeat determinations performed by the Leibniz laboratory in 2013 are judged as invalid and are excluded from the present analysis.

The remaining age determinations, a majority of them analyzed by other labs in the period 2014-2016, are distributed irregularly through the stratigraphic sequence (Table 3.2). Twelve come from Neolithic contexts. Two-thirds of those are from Units C and D and can be connected to the

18 The project members would like to express their thanks to Dr. Neef for his willingness to undertake this work, often at a moment's notice.

19 In a lab report from 2013, Meadows mentions that sample **KIA-43796** contained too little carbon, thereby probably making the dating invalid.

20 For four samples from Aeneolithic and Neolithic contexts, **KIA-43790**, **KIA-43801**, **KIA-43804**, and **KIA-43800**, enough alkali residue could be obtained for two dates each. The dates of the first three samples are statistically consistent, so that their mean values could be computed in order to make the results more precise. The dates of **KIA-43800 (**5880 ± 35 BP and 5770 ± 30 BP), however, show no statistical correlation with one another (John Meadows, 2013, pers. comm.).

21 We would like to thank John Meadows for his efforts in seeing the dating program at Kiel through to a successful end.

Laboratory	2011	2012	2013	2014	2015	2016	2017
Kiel	23		10 reruns		7		10 (8 reruns)
Poznań			10	5	5	10	
Athens, GA		6					
Miami, FL				1			

Table 3.1. The number of dated samples by laboratory and year of submission. The measurements were conducted in the Leibniz Laboratory for Radiometric Dating and Stable Isotope Research (Kiel); Poznań Radiocarbon Laboratory (Poznań); Center for Applied Isotope Studies at the University of Georgia (Athens, GA); Beta Analytic (Miami, FL).

site-wide stratigraphic sequence, whereas the remaining dated Neolithic contexts derive from the soundings H, I, and K on the edge of the settlement and cannot be directly connected stratigraphically to contexts in the central part. 41 dates come from the Aeneolithic Strata I-IV, with the majority from the earliest Aeneolithic Stratum IV. Three determinations from the Aeneolithic Meana Horizon come from the sounding Unit H at the settlement edge, the layers of which can only be partially correlated with contexts from the central part of the settlement. These dates will be discussed in more detail below. The date of the aforementioned more recent Aeneolithic contexts in the upper deposits of sounding H (**Poz-67232**) was not included in the modeling discussed below.

Data modeling and the OxCal program

The statistical data modeling was performed with the program OxCal 4.3 (Bronk Ramsey 1995; 2009a) and the calibration of the conventional ^{14}C dates with the calibration curve IntCal 13 (Reimer et al. 2013).

A fundamental basis of the statistical data modeling is that a chronology is broken down into individual events representing points on a progressive timescale (Bronk Ramsey 2009a, 338). The temporal processes can be modeled only when they have first been described in terms of a sequence of events. With *phase* and *sequence*, the program has two key tools for creating data models. For a *phase* two hypothetical *boundary events* are defined within which the dated events are supposed to have taken place (Bronk Ramsey 2009a, 343-345). If no information on the distribution of events within a phase is available (*uniform phase*), simple phase boundaries are used (*boundaries*) (Bronk Ramsey 2009a, 346). With the *sequence* command, the chronological sequence of dated events and phases can be included in the *prior* model. In the following modeling, the two tools just described are used in combination.

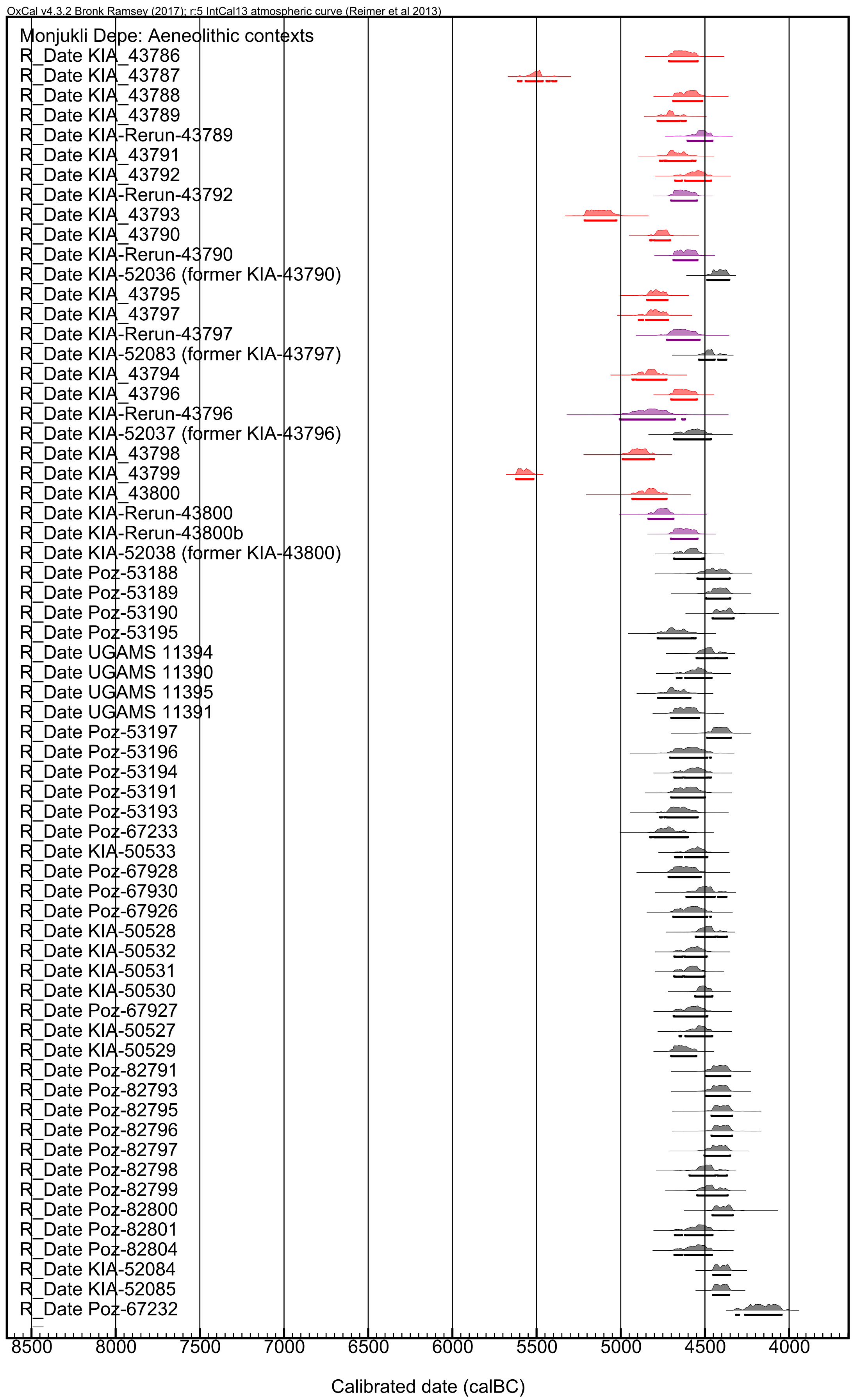
Furthermore, the command *span* in the OxCal program is a tool with which the duration of individual phases and sequences can be estimated. With the command *interval* it is also possible to determine a duration between two boundary events in a sequence. These estimates are probability-based, hence they can at least provide information on the minimum and maximum duration of events and processes.

A diagnostic tool to test the consistency of the model with the dating evidence is the *agreement index* (A). It permits statements to be made as to whether the entire model is reliable and how well individual determinations fit into it (Bronk Ramsey 2009a, 354-357). The agreement index should generally be above 60% for the model to be considered acceptable.[22]

It should be kept in mind that the classification of several events into one phase for which a temporal proximity is presumed is an interpretive operation, which at least in the case of Monjukli Depe can be carried out in various ways. First, the interpretative scope is limited by the fact that a stratigraphy can provide information about a sequence of events. However, the length of time between the events can at best be estimated. Second, there is only a small selection of dated events available from the history of any site. This limited prior information significantly influences a chronological model. The separation of these time slices from a continuum – the settlement phases which are taken over as *phases* in the data modeling – is essentially an arbitrary decision that the researcher reaches based on archaeological evidence as a materialization of time, in which prominent features of the stratigraphic record are used as phase boundaries. The ^{14}C-dated contexts often do not stem from these boundary features but from contexts that lie somewhere in between, and they are distributed very unevenly throughout the individual settlement phases.

The modeling process involves a series of choices which an investigator makes in order to create an interpretative construction in which prior information and radiocarbon data achieve the best possible consistency. To make this process more transparent, I present the single steps of the modeling process that were necessary to incorporate the prior information and make judgments regarding outliers.

22 This value corresponds to a confidence level of 5% in a χ^2 test (Bronk Ramsey 1995, 429).


OxCal v4.3.2 Bronk Ramsey (2017); r:5 IntCal13 atmospheric curve (Reimer et al 2013)
Monjukli Depe: Aeneolithic contexts
R_Date KIA_43786
R_Date KIA_43787
R_Date KIA_43788
R_Date KIA_43789
R_Date KIA-Rerun-43789
R_Date KIA_43791
R_Date KIA_43792
R_Date KIA-Rerun-43792
R_Date KIA_43793
R_Date KIA_43790
R_Date KIA-Rerun-43790
R_Date KIA-52036 (former KIA-43790)
R_Date KIA_43795
R_Date KIA_43797
R_Date KIA-Rerun-43797
R_Date KIA-52083 (former KIA-43797)
R_Date KIA_43794
R_Date KIA_43796
R_Date KIA-Rerun-43796
R_Date KIA-52037 (former KIA-43796)
R_Date KIA_43798
R_Date KIA_43799
R_Date KIA_43800
R_Date KIA-Rerun-43800
R_Date KIA-Rerun-43800b
R_Date KIA-52038 (former KIA-43800)
R_Date Poz-53188
R_Date Poz-53189
R_Date Poz-53190
R_Date Poz-53195
R_Date UGAMS 11394
R_Date UGAMS 11390
R_Date UGAMS 11395
R_Date UGAMS 11391
R_Date Poz-53197
R_Date Poz-53196
R_Date Poz-53194
R_Date Poz-53191
R_Date Poz-53193
R_Date Poz-67233
R_Date KIA-50533
R_Date Poz-67928
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R_Date Poz-82801
R_Date Poz-82804
R_Date KIA-52084
R_Date KIA-52085
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4500
4000
Calibrated date (calBC)

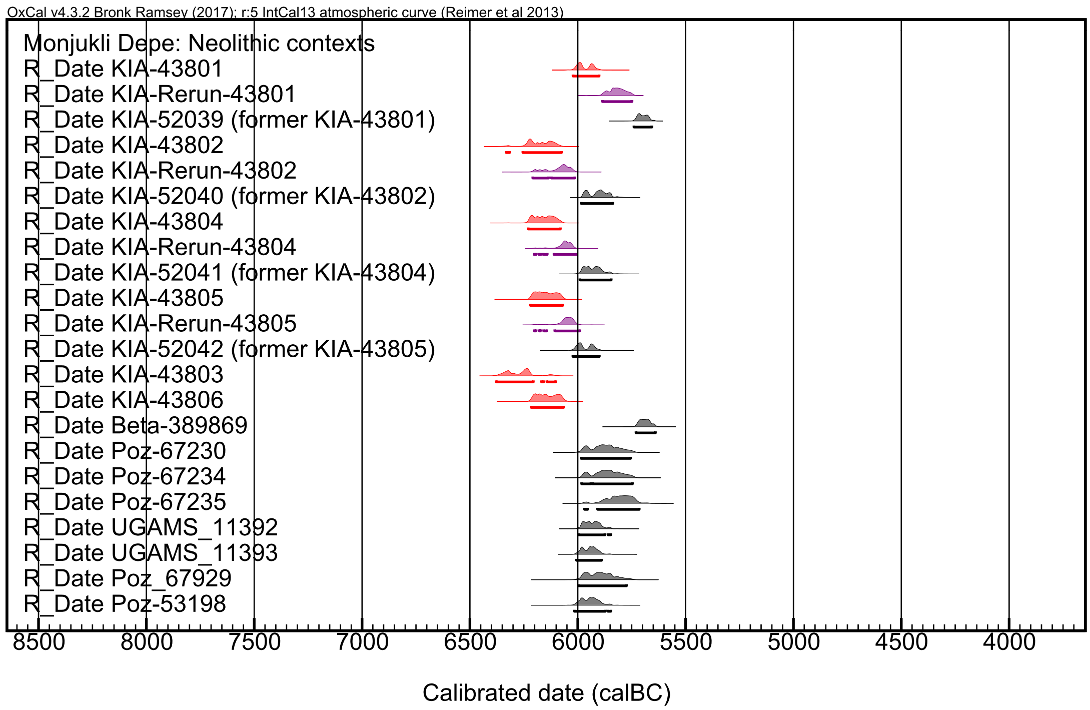

Fig. 3.1. (continued from opposite page) Overview of all radiocarbon dates from Monjukli Depe. Measurements made by the Leibniz laboratory (Kiel) in 2011 are marked in red. Re-runs made by the Leibniz laboratory in 2013 are marked in purple. The re-runs from 2017 are in gray.

Because there is a hiatus of at least 800 years between the Neolithic and Aeneolithic periods at Monjukli Depe, data modeling was performed for each one separately.

Aeneolithic model

The first step in the data modeling for the Aeneolithic settlement phase was to review the coherence of the age determinations with the stratigraphic macro-units. For this purpose, only dates from contexts from the centrally located Unit D were initially selected, since its levels form the basis of the site stratigraphy. These dates were then divided into contiguous phases. The resulting very low overall agreement index of 3% might give the impression that the model is incorrect and/or that there are outliers among the dates (Fig. 3.2).

Two dates deviate significantly from the other determinations in the corresponding phases: the probability distribution of **UGAMS-11395** (locus D236) is much older than the *posterior density estimates* calculated for the phase Stratum II, that from **Poz-53196** (locus D439) is older than probability distributions of five other determinations in the phase Stratum III. It seems likely that these two determinations are outliers. Both cases are samples from secondary contexts: **Poz-53196** is a sample from the outdoor space between Houses 3 and 10 where destruction material and ashy layers were deposited at the very end of Stratum III. **UGAMS-11395** stems from the large rubbish heap, the Eastern Midden from Strata II-I, that covered the area of House 10 and the open space between Houses 3 and 10 in Stratum III. It is quite possible that material from earlier contexts were redeposited in these garbage layers, so that taphonomic processes may underlie this outlier (*T-type outlier*, following Bronk Ramsey 2009b).

Both of these determinations were marked as outliers and removed from the model.[23] This led to a marked improvement of the agreement index (A_{model} = 36%), but it still remained below the minimum acceptable value.

In the second run, the phase model was refined by incorporating further stratigraphic connections between dated contexts. These include the addition of data from Unit C – a Stratum IV context – as well as from Stratum I contexts from Units E and F (Fig. 3.3). Except for **Poz-53195** (profile Unit F), which is probably a case of old wood[24] and was therefore marked as an outlier, the dates from the other units fit well into the scheme.

The oldest phase of the sequence, Stratum IV, contains the largest number of dated contexts (Fig. 3.4). Although there are no determinations that would mark the beginning of the

23 For the strategy of manually sorting out outliers, see Bronk Ramsey 2009b, 1024-1025.

24 This sample was already noted as possibly dating too old at the time it was selected.

Laboratory code	Locus	Stratum	Context	Sample type	Radiocarbon age (BP)	Calibrated date (95% confidence)
Poz-67232	H56	post I	large pit containing post-Meana Horizon finds in the upper layers of Unit H at the NW edge of the settlement	charcoal, branch fragment (*Tamarix*)	**5330±40**	***4317-4045***
Poz-53191	H22	I-IV	bricky deposits containing Meana Horizon pottery and a large copper blade	charcoal (*Populus/Salix*)	**5750±40**	***4703-4500***
Poz-53193	H43	I-IV	loose deposit with only occasional finds, lower Aeneolithic layers in Unit H	charcoal (indeterminate)	**5800±40**	***4768-4544***
Poz-67233	H54	I-IV (*pre IV*)*	loose deposit with only occasional finds and some Neolithic pottery under the Aeneolithic layers in Unit H	charcoal, branch fragment (*Tamarix*)	**5850±40**	***4826-4602***
Poz-53190	F64	I	ashy layers in House 15	charcoal, branch fragment (*Tamarix*)	**5530±40**	***4456-4330***
Poz-53195	F-Q3	I	deposit in House 15	charcoal, stem fragment (*Juniperus*)	**5820±40**	***4782-4555***
Poz-53189	F4	I	deposit under the NW walls of House 16	charcoal (indeterminate)	**5590±40**	***4495-4349***
Poz-53188	E253	I	floor layer in early building phase of House 2	charcoal (*Tamarix*)	**5620±50**	***4545-4352***
Poz-82800	E272	I	deposit above surface in early use phase of House 2	charcoal, branch fragment (*Tamarix*)	**5540±40**	***4456-4335***
KIA-52036	B20	I	uppermost surface series in House 4, room 4a	charcoal, stem fragment (*Tamarix*)	**5593±27**	***4490-4350***
Poz-82804	B251	I	deposit above surface in area immediately outside House 3	charcoal, branch fragment (*Tamarix*)	**5710±40**	***4682-4459***
KIA-52085	D287	II	founding layer of House 1	charcoal, branch fragment (*Tamarix*)	**5571±23**	***4460-4350***
KIA-52084	D234	II	installation in the southern corner of House 1	charcoal, branch fragment (*Tamarix*)	**5560±24**	***4460-4350***
Poz-82801	D105	II	deposit above surface in House 1, room 1c	charcoal, branch fragment (*Tamarix*)	**5700±40**	***4679-4456***
UGAMS-11394	D192	II	upper floor sequence in House 1, room 1c	charcoal, branch fragment (*Tamarix*)	**5650±35**	***4550-4368***
UGAMS-11395	D236	II	clayey deposit in the Eastern Midden	charcoal, branch fragment (*Tamarix*)	**5820±30**	***4781-4585***
Poz-82796	D408	II	ashy deposit in the Eastern Midden	charcoal, branch fragment (*Tamarix*)	**5560±40**	***4462-4338***
Poz-82797	D413	II	ashy deposit in the Eastern Midden	charcoal, branch fragment (*Tamarix*)	**5600±40**	***4504-4351***
Poz-82798	D416	II	probable earliest deposit in the Eastern Midden	charcoal, branch fragment (*Tamarix*)	**5660±40**	***4592-4370***
UGAMS-11390	B173	I-II (*III-IV*)*	ashy layers from a chimney in the destruction phase between early and late use phase of House 3	charcoal, branch fragment (*Tamarix*)	**5710±30**	***4668-4460***
KIA-52083	B74	II-IV (*III-IV*)*	surface in the later building phase of House 4, room 4b	charcoal, stem fragment (*Tamarix*)	**5638±24**	***4540-4370***
KIA-52037	B88	II-IV *(IV)**	deposit above surface in early building phase of House 4, room 4b	charcoal, branch fragment (*Tamarix*)	**5721±39**	***4690-4460***
Poz-53197	D526	III	ashy layer, destruction phase in House 9	charcoal, branch fragment (*Tamarix*)	**5580±40**	***4490-4346***
Poz-82793	D374	III	fire installation in later use phase of House 9	charcoal, branch fragment (*Tamarix*)	**5590±40**	***4494-4350***
Poz-82795	D393	III	fill between large groundstones on surface in House 9	charcoal, branch fragment (Chenopodiaceae)	**5560±40**	***4462-4338***
Poz-82791	D343	III	last floor in House 10, southern area	charcoal, branch fragment (*Tamarix*)	**5590±40**	***4494-4350***
Poz-53196	D439	III	garbage deposits on upper outer surface SW of House 10	charcoal (indeterminate)	**5740±50**	***4708-4464***

Table 3.2. (continued on opposite page) Monjukli Depe. Overview of the radiocarbon determinations, excluding those from the Leibniz laboratory (Kiel) run in 2011-2013. The attributions to strata indicated in parentheses with an asterisk indicate new or more precise assignments based on the modeling.

Laboratory code	Locus	Stratum	Context	Sample type	Radiocarbon age (BP)	Calibrated date (95% confidence)
Poz-82799	D448	III	pit dug from outer surface SW of House 10	charcoal, branch fragment (*Tamarix*)	**5640±40**	***4462-4338***
UGAMS-11391	B235	III-IV (*IV*)*	deposit on the latest floor in early building phase of House 3	charcoal, branch fragment (*Tamarix*)	**5760±30**	***4702-4536***
Poz-67928	D554	IV	ashy deposit over ruins of House 17, beneath outer surface SE of House 10	indeterminate	**5770±40**	***4717-4526***
Poz-67930	D563	IV	mixed deposits over ruins of House 14	indeterminate	**5670±40**	***4611-4443***
Poz-53194	D576	IV	ashy layer, destruction phase in House 14	charcoal (*Tamarix*)	**5720±35**	***4684-4464***
KIA-50532	D703	IV	burnt deposit, destruction phase in House 14	charcoal, branch fragment (*Populus/Salix*)	**5723±29**	***4690-4490***
KIA-50531	D709	IV	bricky collapse, destruction phase in House 14	charcoal (*Tamarix*)	**5736±26**	***4690-4500***
KIA-50530	D717	IV	ashy layer, destruction phase in House 14	charcoal, branch fragment (*Tamarix*)	**5682±24**	***4560-4450***
Poz-67927	D719	IV	ashy layer, destruction phase in House 14	charcoal (indeterminate)	**5725±35**	***4686-4486***
KIA-50529	D726	IV	deposit on floor in House 14	charcoal, branch fragment (*Tamarix*)	**5780±23**	***4710-4550***
KIA-50527	D728	IV	deposit on floor in House 14	charcoal, branch fragment (*Tamarix*)	**5701±31**	***4660-4450***
Poz-67926	D671	IV	burnt deposit in the outer area NW of House 19	indeterminate	**5730±40**	***4689-4486***
KIA-50528	D673	IV	ashy fill between two surfaces, over ruins of House 17	charcoal, branch fragment (*Populus/Salix*)	**5655±35**	***4560-4370***
KIA-50533	D570	IV	ashy layer beneath series of outer surfaces and above ruins of House 19	charcoal, branch fragment (*Tamarix*)	**5717±25**	***4680-4480***
KIA-52038	C64	IV	uppermost floor layer in House 7	charcoal (*Tamarix*)	**5738±25**	***4690-4500***
KIA-52039	C74	post V	surface scatter in layers between the main Neolithic and Aeneolithic occupation in Unit C, level C3a	charcoal, branch fragment (*Tamarix*)	**6818±25**	***5740-5650***
Beta-389869	K18	V-X (*post V*)*	wall fall associated with Neolithic architecture in Unit K, level K4	charcoal, branch fragment (indeterminate)	**6800±30**	***5730-5640***
Poz-67230	I23	V	ashy layer between two levels with architectural remains in Unit I, level I4b	charcoal (*Tamarix*)	**6990±50**	***5985-5756***
Poz-67234	H91/94	V-X (*post V*)*	trampled surface at base of Unit H, level H12	charcoal (*Tamarix*)	**6980±50**	***5983-5747***
Poz-67235	H99	V-X *(post V)**	trampled surface at base of Unit H, level H12	charcoal (*Tamarix*)	**6920±50**	***5969-5716***
Poz-53198	D598	V	mixed deposits in upper Neolithic layers, level D5	charcoal, branch fragment (Chenopodiaceae)	**7060±40**	***6016-5846***
KIA-52042	C79	V	mixed deposits in upper Neolithic layers, level C3b	charcoal, branch fragment (*Tamarix*)	**7090±32**	***6030-5900***
KIA-52040	C80	V	possible outer surface in upper Neolithic layers, level C3b	charcoal, branch fragment (*Tamarix*)	**7007±26**	***5990-5830***
KIA-52041	C89	VI	loose grayish-buff deposits, lower layer C3b	charcoal, branch fragment (*Tamarix*)	**7034±31**	***6000-5840***
Poz-67929	D800	VII	Neolithic platform, level D7	charcoal (*Tamarix*)	**7010±50**	***5998-5775***
UGAMS-11392	C324	VIII	Neolithic fireplace in Unit C, level C3d	charcoal, branch fragment (*Tamarix*)	**7040±30**	***5997-5847***
UGAMS-11393	C331	VIII	ashy and aeolian deposits in Unit C, level C3e	charcoal, branch fragment (*Tamarix*)	**7060±30**	***6008-5889***

Table 3.2. (continued).

settlement when the first houses were built, there are several dated contexts that represent their final use and especially destruction as well as some from the reuse of the ruins.

Eight dates come from contexts in House 14, which is the most comprehensively excavated structure in the stratum. The relatively high numbers of dated contexts and their clear division into use phase, destruction, and after-use allowed me to replace the single phase "Stratum IV" with three contiguous subphases marking the early settlement period in Monjukli Depe.

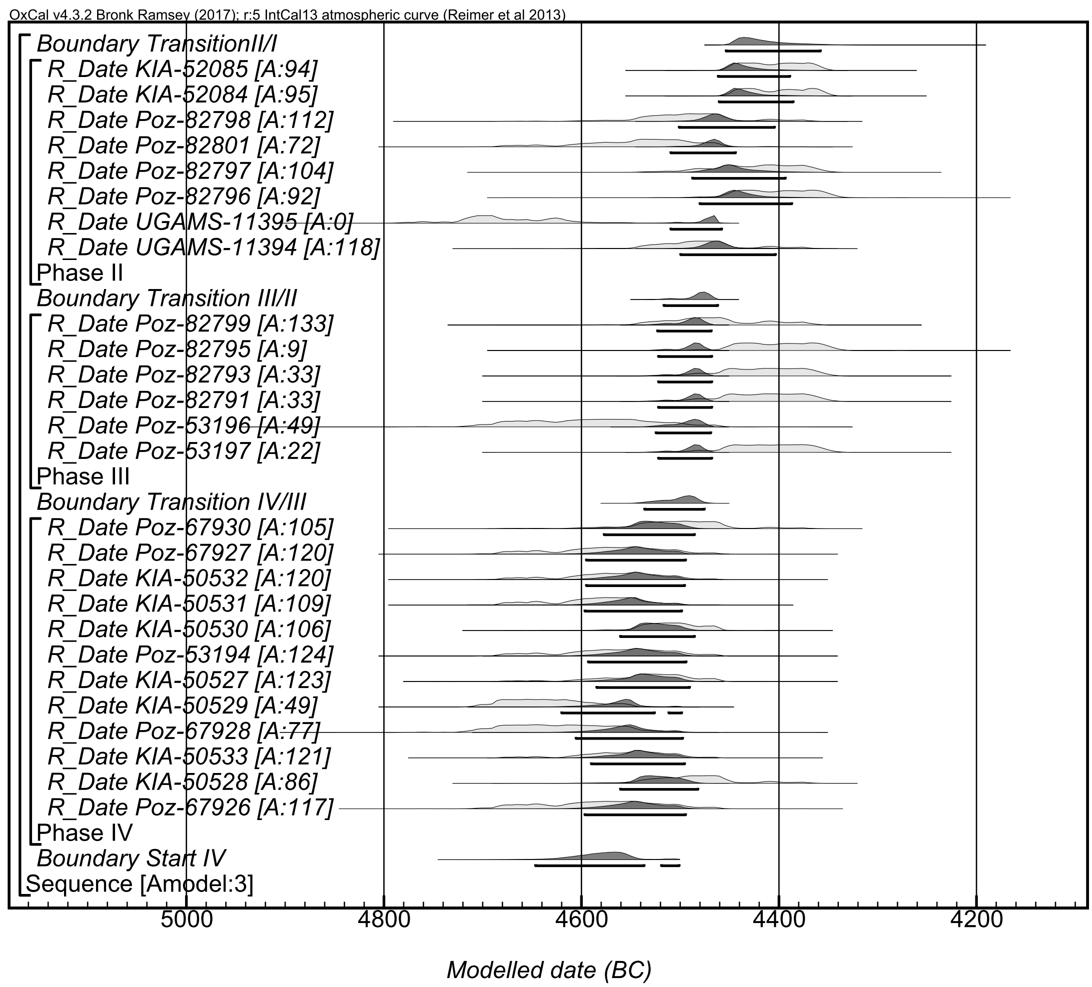

Fig. 3.2. Posterior density estimates of run 1 of the Aeneolithic model.

To the beginning of this sequence belong two dates from samples located directly on the floor in House 14. The third date comes from a sample from a floor layer in House 7, Unit C. The next phase in the sequence includes dates from the burnt layers of House 14, representing a relatively short, and with five radiocarbon determinations extremely well dated, event of house destruction.[25] The final stage represents contexts of reuse over the ruins of the first houses. One date comes from the deposits that accumulated on the ruins of House 14. Two determinations come from contexts in the ruins of House 17, which has not been excavated down to a floor. One of the samples comes from the lower, the other from the upper part of the fill. The latter, **Poz-67928** (locus D554), seems to be an outlier: it dates too old and may come from redeposited material or may be an old wood sample, as it unfortunately lacks a botanical identification. An additional determination stems from the ruined House 19, from deposits on an outer surface northeast of the building that probably accumulated after its destruction.

The next phase, Stratum III, marks the time period in which new buildings – Houses 9 and 10 – were constructed in the central part of the Monjukli settlement, covering areas of former Houses 14, 17, 19, and 20 (see Fig. 2.30). As in Stratum IV, the dated evidence does not encompass the time of construction or early use of the new houses but rather their late use phases and post-destruction. Three dates are available from contexts in House 9. Two of them belong to the late phase of the building, which is marked by ashy deposits and several small fire places inside the house walls, from a time when the structure was probably no longer used as a dwelling. The third date comes from ashy deposits covering large, ocher-covered stones placed on the uppermost floor of the building. The deposit could have accumulated either at the very end of the early use phase or, like the other dated contexts, in the subsequent late phase of House 9. The contemporaneous House 10 yields one dated context from the uppermost floor, D343,

25 For a detailed study of the destruction of House 14, see Chap. 5.

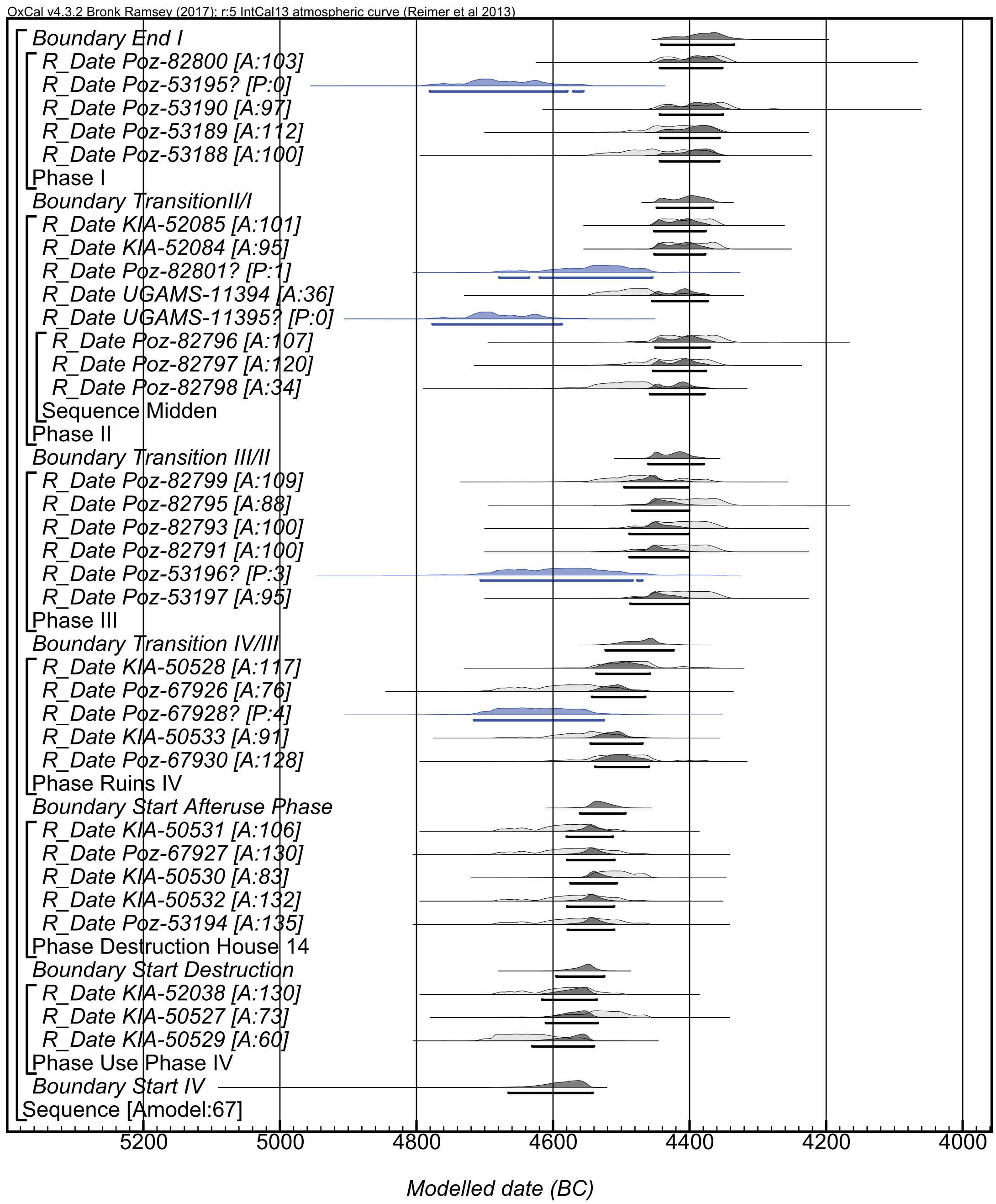

Fig. 3.3. Posterior density estimates of run 2 of the Aeneolithic model. Probable outliers are marked in blue.

of the late use phase of the building.[26] The last date comes from a pit dug in an outdoor surface southwest of House 10 at the time when this building was already destroyed. Except for the aforementioned possible outlier, **Poz-53196**, these five dates show a good internal correspondence.

The subsequent Stratum II is a problematic one, as it contains several determinations that fall below the agreement index. This phase encompasses the settlement period when the huge trash dump, the Eastern Midden, stretched over the central and eastern area of the settlement, covering the former House 10. Northwest of it a new building, House 1, was constructed on the ruins of House 9. In addition to the aforementioned outlier, **UGAMS-11395**, three dates come from the lower portions of the midden deposits that were carefully sampled while removing a baulk that had been left between the Marushchenko sounding and the area of Unit D to

26 For a detailed study of the biography of House 10, see Chap. 4.

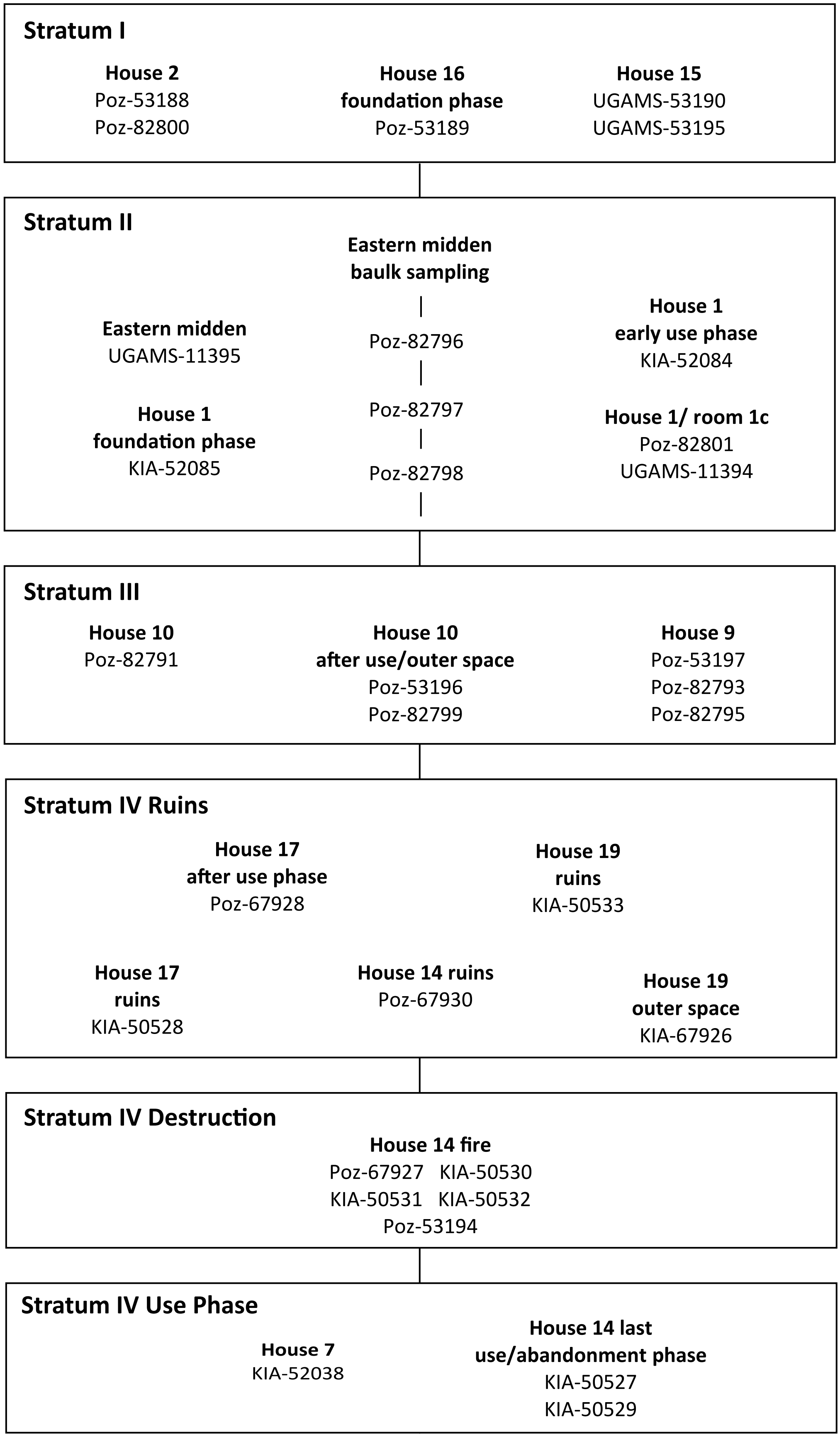

Fig. 3.4. Summary of prior information incorporated in run 2 of the Aeneolithic model. Single phases are enclosed in rectangles. Sequences of phases and dated events (with the oldest below) are indicated by vertical lines.

the southeast of it. These dates have been ordered in a *sequence*, beginning with **Poz-82798** (locus D416), which marks the earliest midden deposits. It was followed by two subsequent depositional events, **Poz-82797** (locus D413) and **Poz-82796** (locus D408). The first date, **Poz-82798**, tends to be considerably older than the other two determinations, and its individual agreement index (A_i=34%) lies below the acceptable value.

The remaining four dates derive from the earlier building phase in House 1. **KIA-52805** (locus D287) comes from a foundation layer of House 1 on which the southern wall (locus D55) and a buttress in room 1c (locus D56) were erected. **KIA-52084** (locus D234) is a sample from a surface of the installation in the southern corner of the building. Two dates, **Poz-82801** (locus D105) and **UGAMS-11394** (locus D192), are in conflict with the model and the archaeological evidence as well. These samples are both from room 1c, a small structure adjacent to the southwestern wall of House 1 that was built after the destruction of House 9 (Fig. 2.39). The dates from room 1c seem, however, to be older than the determinations from the preceding House 9 as well as those from the contemporaneous main room in House 1. **Poz-82801** comes from a fill in room 1c that could potentially have contained deposits from elsewhere, whereas **UGAMS-11394** derives from secure contexts in the form of an upper series of multiple floor layers inside this structure.

The last phase, Stratum I, marks the latest recovered Aeneolithic settlement period at Monjukli and includes six dates, none of them from Unit D. One is the aforementioned probable old wood sample from the fill of House 15 (**Poz-53195**). Another one is a sample from House 3, discussed below. Of the other four, two are attributed to the early use phase of House 2, which is located to the north of the Eastern Midden in Unit E (see Figs. 2.42 and 2.46). Two samples from Houses 15 and 16, respectively, are located some distance from the center of the settlement. The dates from these buildings confirm their attribution to the late settlement phase.

With an agreement index A_{model} of 67%, this model lies above the threshold value. The individual agreement indices of two determinations from Stratum II, **Poz-82798** (A_i=34%) and **UGAMS-11394** (A_i=36%) fall, however, clearly below the 60% value. Additionally, the model contains five outliers (15.6% of the determinations used in the model). These may come from redeposited materials or, at least in one case, from old wood. This model was used for the third run that aims to integrate six dates from Unit B. These were previously connected only loosely to the main stratigraphic sequence.

Three dates from Unit B come from contexts in House 3 and its surroundings. This building with well-preserved walls reaching up to ca. 1.7 m in height seems to have had an exceptional longevity, making it difficult to correlate sequences of interior contexts from House 3 with the rest of the site stratigraphy. Two main use phases can be distinguished within this structure (Pollock, Bernbeck, and Schönicke 2013, 57-58, 63; Chap. 2). Another three dates derive from contexts in the adjacent House 4, which consists of two rooms. The northeastern one, room 4b, shares a wall (locus B35) with House 3. The biography of this room seems to have a strong connection with the neighboring dwelling (see Figs. 2.26-2.28).

In the early phase, originally correlated with Strata III and IV, House 3 consisted of one squarish room with two opposing T-shaped buttresses, typical for the dwelling architecture at Monjukli Depe (Fig. 2.22). One date, **UGAMS-11391** (locus B235), comes from the lowermost floor of this early phase reached in the excavation. On nearly the same elevation is the lowermost floor reached in House 4, which can be attributed to the earlier use phase of that building. **KIA-52037** (locus B88) comes from deposits directly above this surface. The floors of the early phase in both Houses 3 and 4 were located approximately 0.60 m below the foundations of House 10 (Stratum III), but also ca. 0.65 m above the last floor in House 14, perhaps indicating the use of terracing in the beginning phase of the Aeneolithic settlement. At the end of this phase, House 3 apparently fell temporarily out of use and was exposed to the elements. At this time, a chimney (Fig. 6.3) was constructed inside the building's ruins. One sample, **UGAMS-11390** (locus B173), comes from the ashy layers associated with the use of this installation.

In its later phase House 3 underwent substantial reconstruction. The room was (probably intentionally) covered with dense bricky material, up to 0.75 m thick, upon which cross walls were built, dividing the original single room into seven small cubicles (Fig. 2.33). A similar situation can be found in room 4b of House 4 which was filled with dense wall fall up to a height of ca. 0.7 m. On top of this fill is a dated floor layer (**KIA-52083**, locus B74) which marks a later use phase of the building apparently coinciding with the "cubicle phase" of House 3. It is unclear when the reconstruction in both buildings took place and how fast the deposits inside accumulated. This could have occurred at the time when House 10 was built or sometime before. At that point the area of former House 14 was an open space, as indicated by surfaces D470 and D472. The eastern wall of House 3 (locus D87) was reinforced by a supporting wall (locus D458) apparently erected directly atop the adjacent western wall of House 14. The space containing the ruins of House 14 was levelled.

The last two dates from Unit B can be attributed to Stratum I, due to their position just below the mound surface. One sample, **Poz-82804** (locus B254), derives from deposits in the outdoor area that run steeply up to the eastern wall of House 3. The dating seems, however,

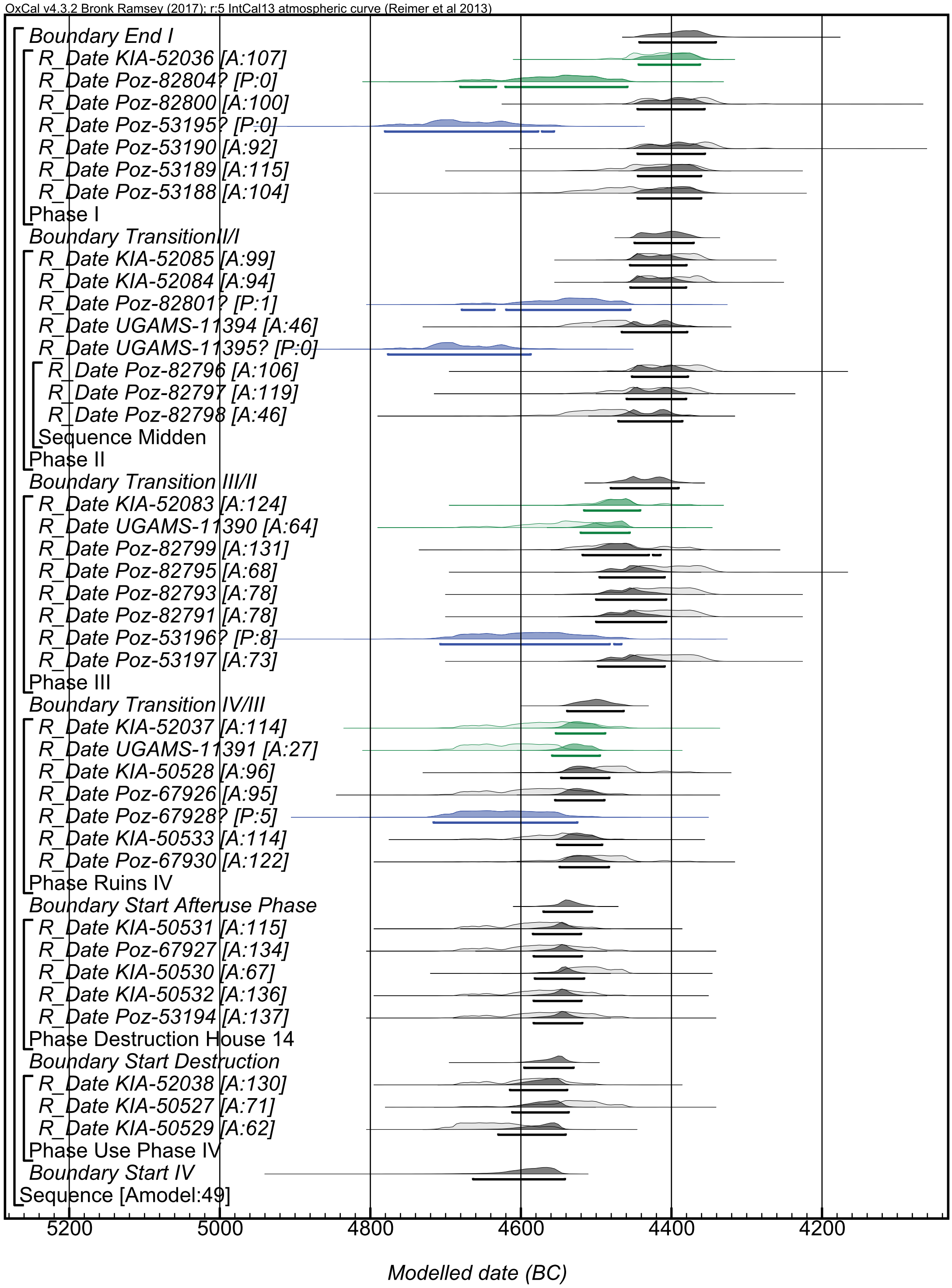

Fig. 3.5. Posterior density estimates of run 3a of the Aeneolithic model. Probable outliers are marked in blue. Dates from Unit B are marked in green.

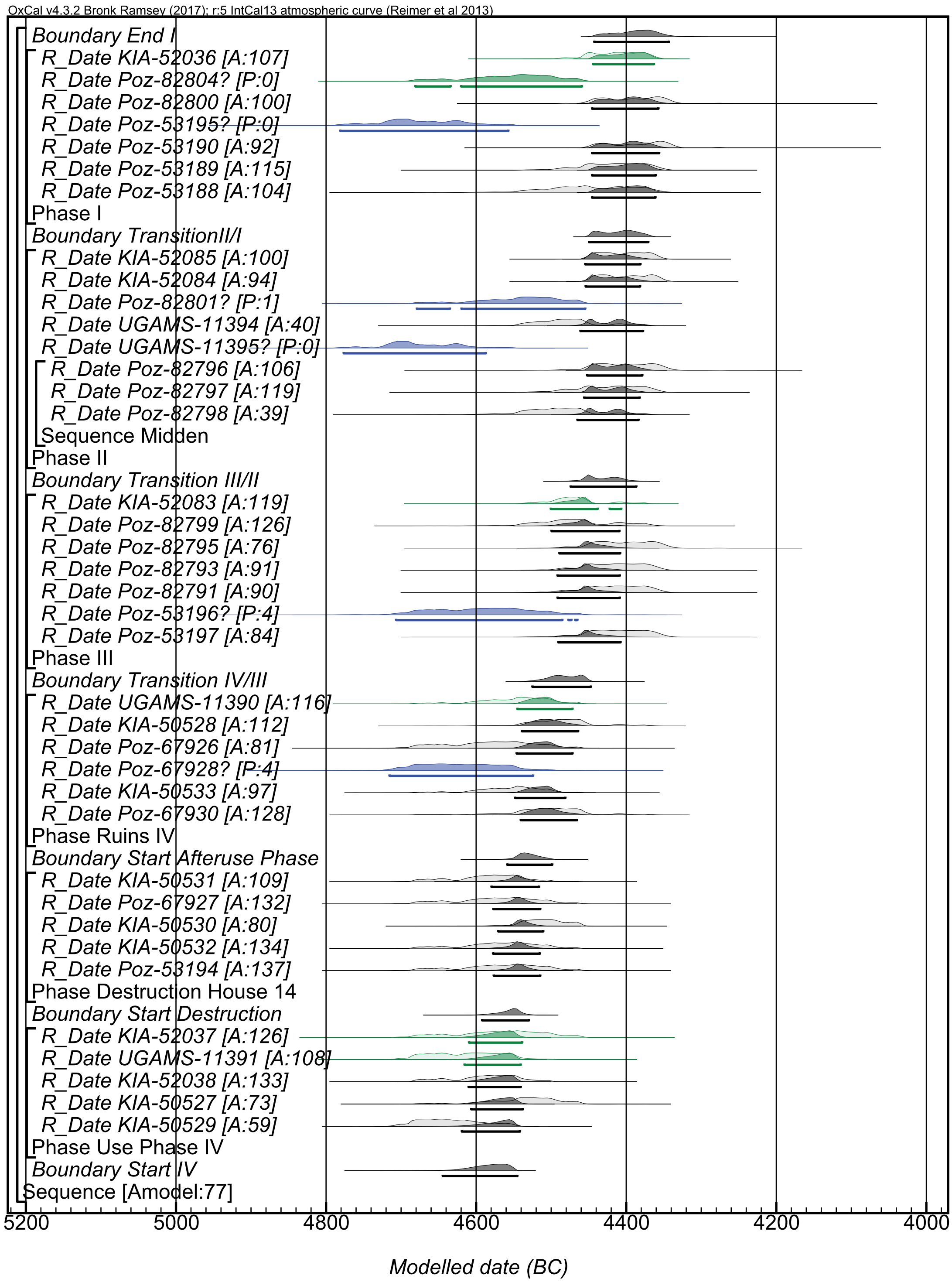

Fig. 3.6. Posterior density estimates of run 3b of the Aeneolithic model. Probable outliers are marked in blue. Dates from Unit B are marked in green.

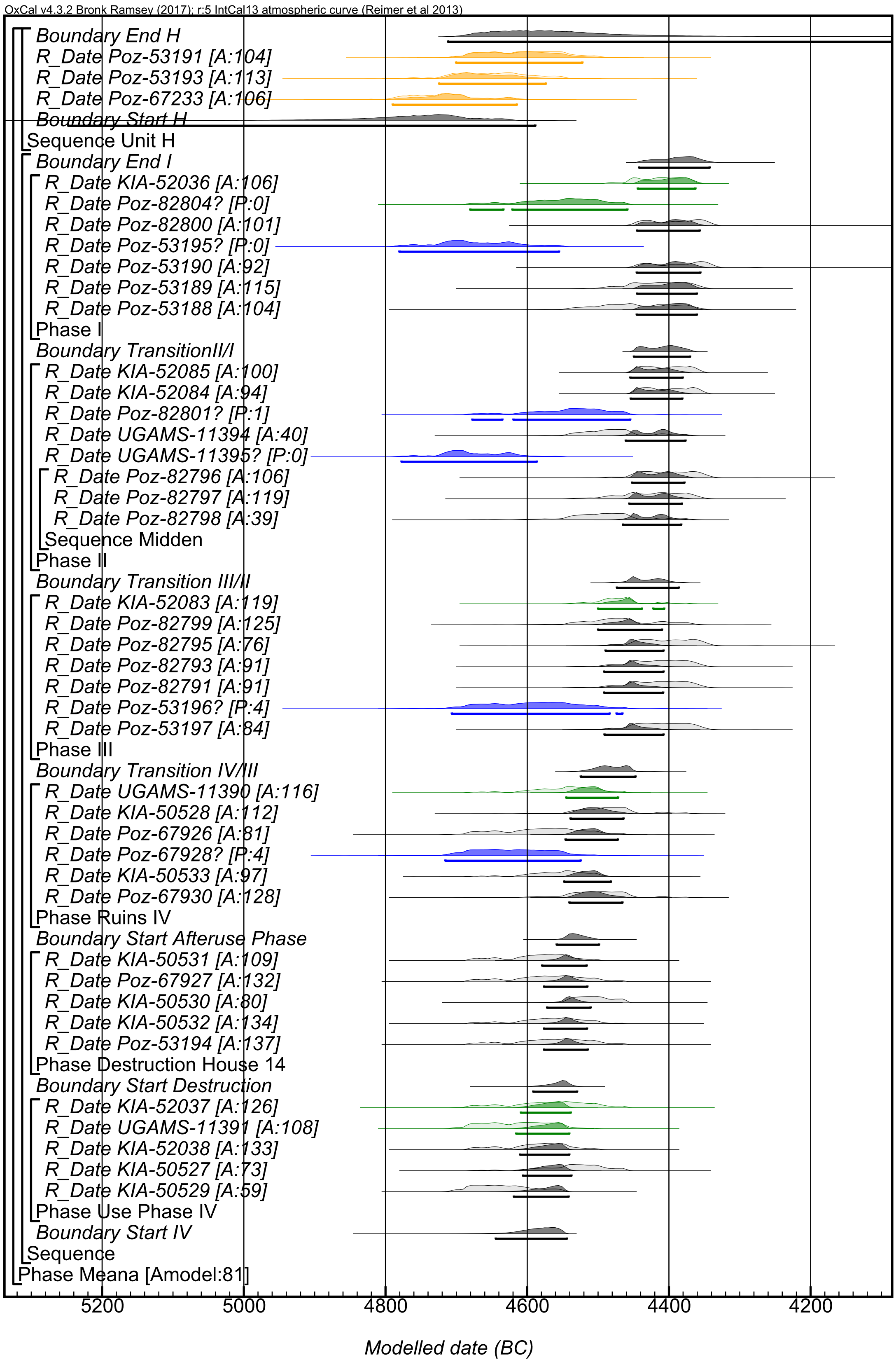

Fig. 3.7. Posterior density estimates of run 4 of the Aeneolithic model with dates from Unit H (marked in orange). Probable outliers are marked in blue, dates from Unit B in green.

to be significantly older. As the stratigraphic attribution of the dated contexts is not secure, the date was marked as an outlier. Another sample, **KIA-52036** (locus B20), comes from the uppermost floor layers of room 4a in House 4 and marks the latest use phase of this building.

In sum, the dated evidence from Unit B encompasses six determinations from Houses 3 and 4 belonging to four chronological phases. A first attempt to integrate these dates into the sequence of the Aeneolithic model was conducted by a simple correlation of elevations with the adjacent Unit D. According to this model, the dates for the earlier use phase of Houses 3 and 4 would fall within level D4a and be attributed to the "ruins phase" of Stratum IV in the model. The elevations of contexts from the intermediate abandonment phase of House 3 and later building phase of House 4 correspond to those of Stratum III. The latest contexts not far below the mound surface can be attributed to Stratum I. The elevation-based integration (run 3a) conflicts with the previous model leading to an unacceptable agreement index A_{model}=49% (Fig. 3.5). Whereas the individual agreement indices of three determinations lie above the threshold value, one date, **UGAMS-11391** (A_i=27), does not fit into the model.

In the next run (3b) a solution was sought that would integrate the Unit B dates as best as possible into the model, while nonetheless remaining within the framework of what the stratigraphic evidence suggested to be possible. The best solution proved to be one that arranged the dates of the early use phase of Houses 3 and 4 into the "use phase of Stratum IV," the date from the temporary use of the ruins of House 3 into the "ruins phase of Stratum IV", the date from the subsequent late building phase in House 4 into Stratum III and the latest contexts into Stratum I (Fig. 3.6). In this case, not only the model agreement index, A_{model}=77%, but also all individual agreement indices of the dates from Unit B lie well above the threshold value, with the exception of the one obvious outlier, **Poz-82804**.

The integration of the dated contexts from Unit B into the main settlement stratigraphy by Bayesian modeling offers new insights into the biography of the settlement. Houses 3 and 4 were apparently erected and used contemporaneously with at least two other structures, Houses 7 and 14. House 3 was partially and the neighboring House 14 completely destroyed, and they stood simultaneously in ruins at the end of Stratum IV. In the subsequent period both Houses 3 and 4 underwent substantial reconstruction, which took place before Houses 9 and 10 (Stratum III) were in use. At least House 4 seems to have been continuously used until the last phase Stratum I.

The last two runs aimed at integration of dates from Unit H at the edge of the settlement.

Three ^{14}C dates come from the Unit H sounding and can be placed in a chronological order relative to one another. The uppermost one, **Poz-53191** (locus H22), derives from a context that contained, alongside the usual Meana pottery, a dagger-like object, the largest copper artifact yet found at Monjukli Depe (Fig. 3.16). The second dated context, **Poz-53193** (locus H43), was located about 0.60 m deeper and consisted of aeolian deposits with scattered Aeneolithic sherds. The third date, **Poz-67233** (locus H54), derives from a layer 0.20 m deeper, with aeolian deposits but no Meana ceramics and instead a sherd of a chaff-tempered Black on Red ware that occurs in very small amounts and is only found in highly fragmented pieces at Monjukli Depe (Pollock et al. 2011, 185-186). It may be a witness of a sporadic human presence in Monjukli Depe in the period between the Neolithic and Aeneolithic occupation phases. Since the sequence in Unit H cannot be correlated stratigraphically with the central settlement area, a model with two overlapping phases was used as a solution to allow data from the settlement edge to be included in the Aeneolithic model (Bronk Ramsey 2009a, 349). The result shows that the dates from Unit H tend to be relatively old in comparison to others from the Meana horizon (Fig. 3.7). The contexts in Unit H date to 4791-4522 cal BCE.

Especially the lowest context in the sequence, **Poz-67233,** appears to be older than the main Aeneolithic occupation at Monjukli Depe. The last step (run 5) was to test whether this scenario was in agreement with the previous model. For this, a process referred to as *cross-referencing* was applied (Bronk Ramsey 2009a, 351-352), which allows several parallel dating sequences to be merged by means of single, synchronous boundary events. The goal was to test whether the model is still coherent if the boundary event "beginning Stratum IV" is placed between the two earlier dated events in Unit H.

The result of the *cross-referencing* with the sequences of Model 1 and Unit H yields an overall agreement index of 74% and for the individual determination **Poz-67233** 80% (Fig. 3.8). This means that a chronological model makes sense in which the layers with "Neolithic Black on Red" sherds were deposited prior to the Aeneolithic settlement during an as yet undefined "pre-Meana" phase. For comparison a model was tested in which the lowest post-Neolithic strata in Unit H were assigned to a time after the establishment of the Aeneolithic settlement. Here, the individual agreement index for **Poz-67233** was, with 38%, clearly below the acceptable value, while the other two contexts from Unit H showed a good agreement with the model. This observation suggests that the lowest post-Neolithic contexts at the edge of the site could precede the main Aeneolithic settlement of Monjukli Depe. In any case, all deposits in Unit H seem to belong to the early phase of the Aeneolithic settlement at Monjukli Depe, as their determinations are older than the calculated estimations for Strata II and I.

The final model yields the following estimates for the major events in the Aeneolithic settlement at Monjukli Depe. Its beginning falls in the period *4689-4555*

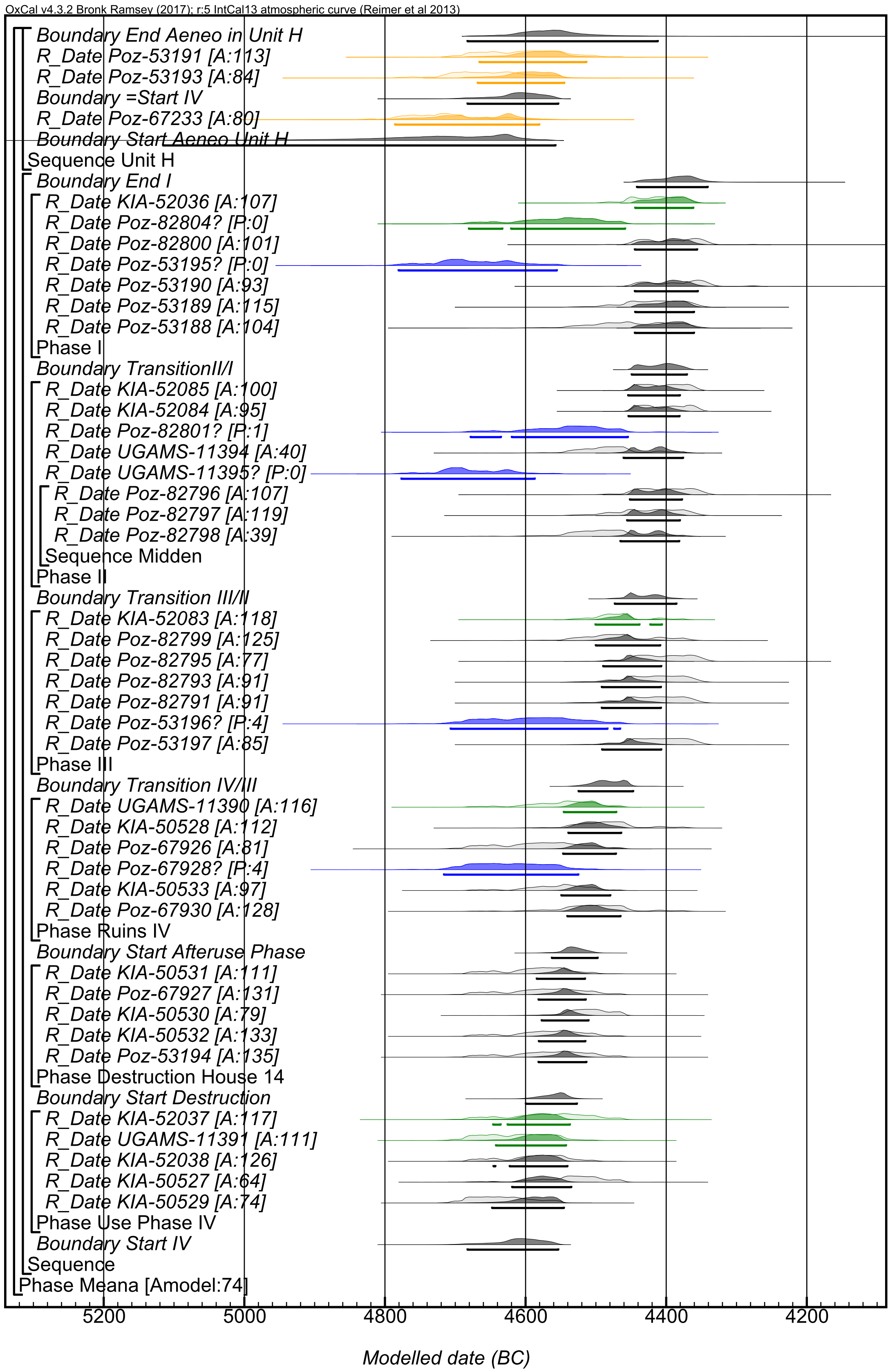

Fig. 3.8. Posterior density estimates of run 5 of the Aeneolithic model with dates from Unit H (marked in orange). Probable outliers are marked in blue, dates from Unit B in green.

cal BCE (95% probability; Start IV). The destruction of House 14 began *4601-4526 cal BCE (95% probability; Start destruction)*. The first afteruse of its ruins in Stratum IV happened *4561-4496 cal BCE (95% probability; Start afteruse phase)*. The accumulation of deposits in Stratum III began *4517-4431 cal BCE (95% probability; Transition IV/III)*. The first trash deposition in the Eastern Midden occurred *4462-4382 cal BCE (95% probability; Transition III/II)*. Stratum I began *4448-4371 cal BCE (95% probability; Transition II/I)*. In the period *4441-4338 cal BCE (95 % probability; End I)* the Aeneolithic settlement at Monjukli Depe came to an end.

Neolithic model

A similar procedure was followed for the Neolithic dates. To begin, only the determinations from the centrally located Units C and D were included in the modeling. The levels of these units can be roughly correlated according to their elevations. The stratigraphic evidence and the distribution of dated contexts allowed the creation of a model with three *contiguous phases* of the main Neolithic settlement and one *sequential* phase marking a later presence at the site after an interruption (Fig. 3.9).

The earliest dated sample, **UGAMS-11393** (locus C331), comes from the lowermost layer of Unit C. Approximately 0.8 m above it and separated by a deposit of aeolian and ashy material is an ash accumulation with a ^{14}C date (**UGAMS-11392**, locus C324). From their elevations both contexts would correspond to Unit D Stratum VIII. To the next phase encompassing Strata VI and VII belongs a platform-like construction dated by the sample **Poz-67929** (locus D800) in Unit D Stratum VII. Another date, **KIA-52041** (locus C89), comes from the bottom of layer C3b in Unit C which can be correlated with lower Stratum VI in Unit D.

The following phase, Stratum V, contains three dates. **Poz-53198** (locus D598) comes from the uppermost Neolithic contexts in Unit D. Two other samples, **KIA-52042** (locus C79) and **KIA-52040** (locus C80), were taken from the upper layers of level C3b and correspond to the latest Neolithic phase in Unit D.

At least a sporadic human presence at the site after the end of Stratum V is attested by aeolian and water-laid deposits of approximately 0.70-0.75 m thickness in Unit C (C3a), which separate the Neolithic from the Aeneolithic levels (Fig. 2.12; Pollock et al. 2011, 180-181). Within these sterile deposits were occasional surface scatters containing a few pieces of bone, Neolithic pottery, and charcoal, which provided the date **KIA-52039** (locus C74). This determination is considerably younger than the Neolithic dates from the preceding phases and confirms the presumption of a later Neolithic phase of human presence on site after abandonment of the main settlement in Stratum V.

In the next step the other four determinations from the soundings H, I, and K at the edges of the site were integrated into the model. The stratigraphic sequence of Unit I at the southeastern edge of the settlement can be correlated with that of the nearby Unit C. At approximately the same depth as in Unit C, Unit I contains compact silt deposits that mark a post-Stratum V phase. Approximately 0.9 m below these deposits is a series of ashy layers that correspond in their composition to layer C3c in Unit C. Between the silty and

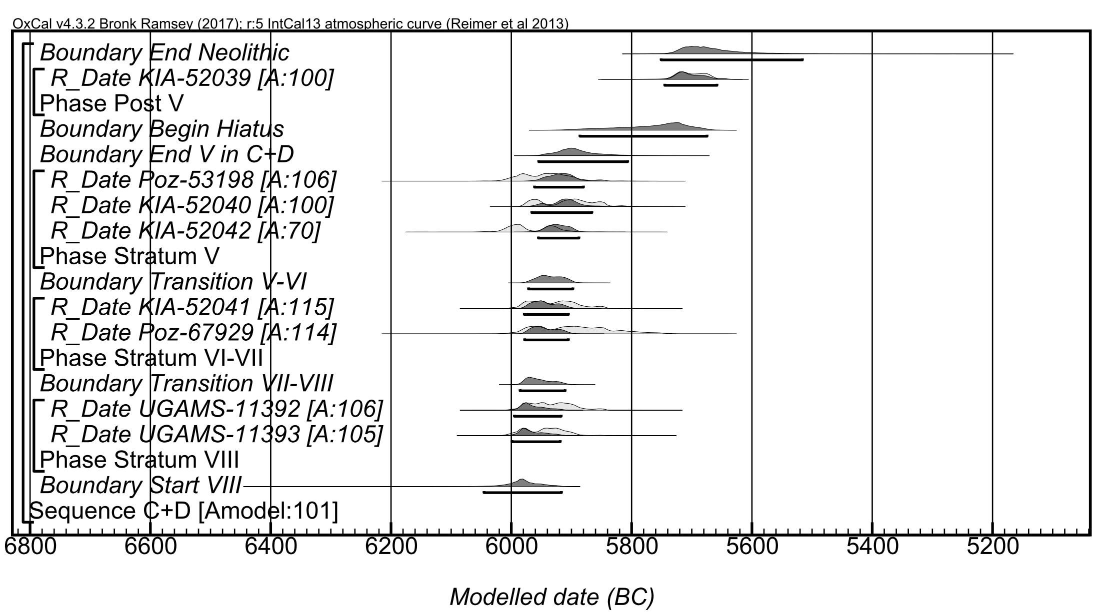

Fig. 3.9. Posterior density estimates of run 1 of the Neolithic model.

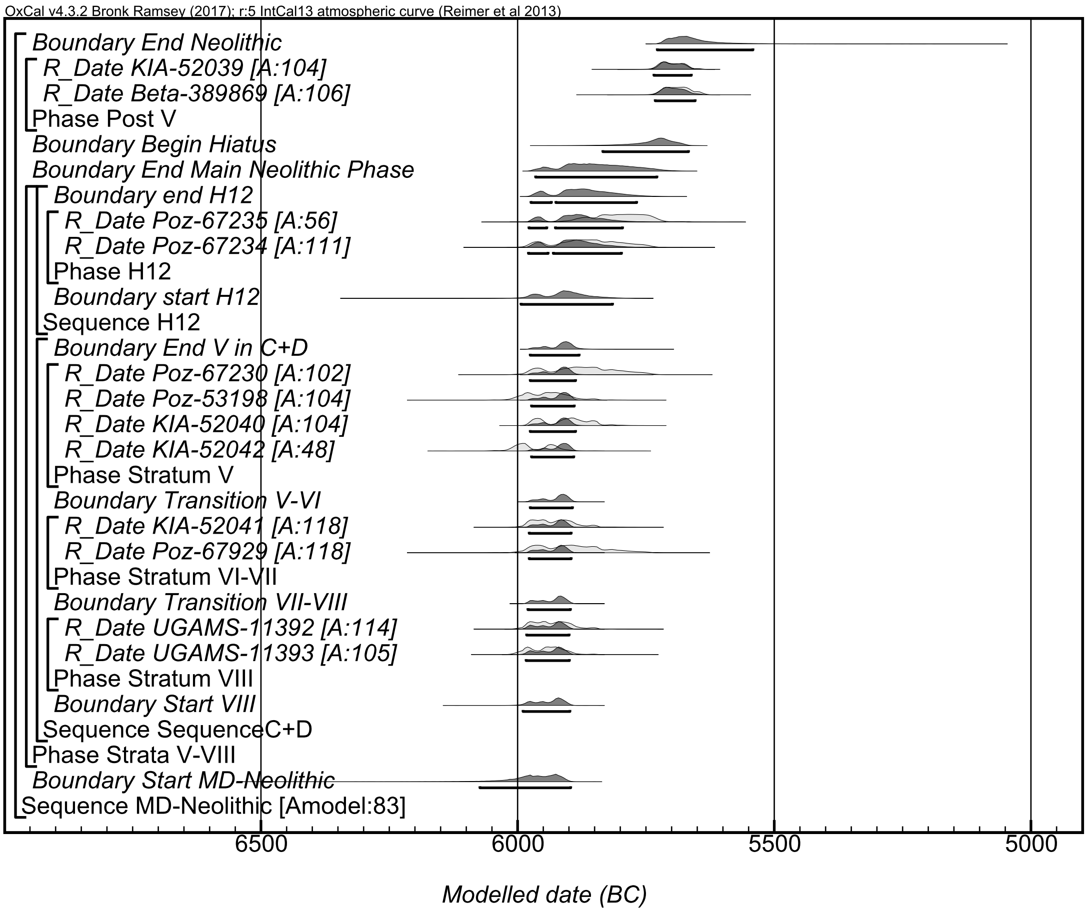

Fig. 3.10. Posterior density estimates of run 2a of the Neolithic model.

ashy deposits, two levels of architectural remains were exposed that yielded a sample, **Poz-67230** (locus I23), attributable to Stratum V. The contexts from Units K and H at the northern and northwestern edges of the settlement, respectively, cannot be connected stratigraphically to the main Neolithic sequence. A date from Unit K, **Beta-389869** (locus K18), derives from contexts associated with architectural remains and has almost identical probability distributions to the determination **KIA-52039** from a later Neolithic surface scatter in Unit C. It is conceivable that this later Neolithic settlement at Monjukli Depe was a relocation to the north, so that the area of Units C and D was a periphery.

The dates from Unit H, **Poz-67234** (locus H91/94) and **Poz-67235** (locus H99), are from its lowermost level reached, H12. Although H12 lies at a considerable depth (281.26-281.67 m), the dates are slightly younger than those from the main Neolithic settlement phase. To further examine the implications of this observation, in a first attempt (run 2a) a model was constructed in which level H12 would fall into the time frame of the main settlement in Units C and D. The dates from Unit H were combined into a main Neolithic settlement phase with the determinations from Strata VIII-V. This model has an acceptable agreement index (A_{model}) of 83%, but the individual agreements of two determinations, **KIA-52042** and **Poz-67235**, fall under 60% (Fig. 3.10).

In an alternative model (run 2b), it was proposed that the Neolithic material from Unit H ("Stratum V_H") might date to a period after the main settlement ("Stratum V_M"), marking an early phase of resettlement activities, whereas the architectural remains from Unit K and the surface scatters in the upper Neolithic layers in Unit C represent the last Neolithic resettlement ("Stratum V_K"). The model from Neolithic run 1 was extended with an additional *sequential* phase placed after the end of Stratum V and before the occupation phase in Units K and C (Fig 3.11). This scenario yielded an agreement index (A_{model}) of 104% and acceptable individual agreement indices for all determinations (Fig. 3.12). There is no direct stratigraphic evidence confirming that the bottom layers of Unit H belong to an occupational phase after Stratum V, and both scenarios are plausible, as the depositional processes in the northwestern part of the settlement are markedly different in terms of their sedimentation rate than in the central part. From a modeling point of view, I prefer the

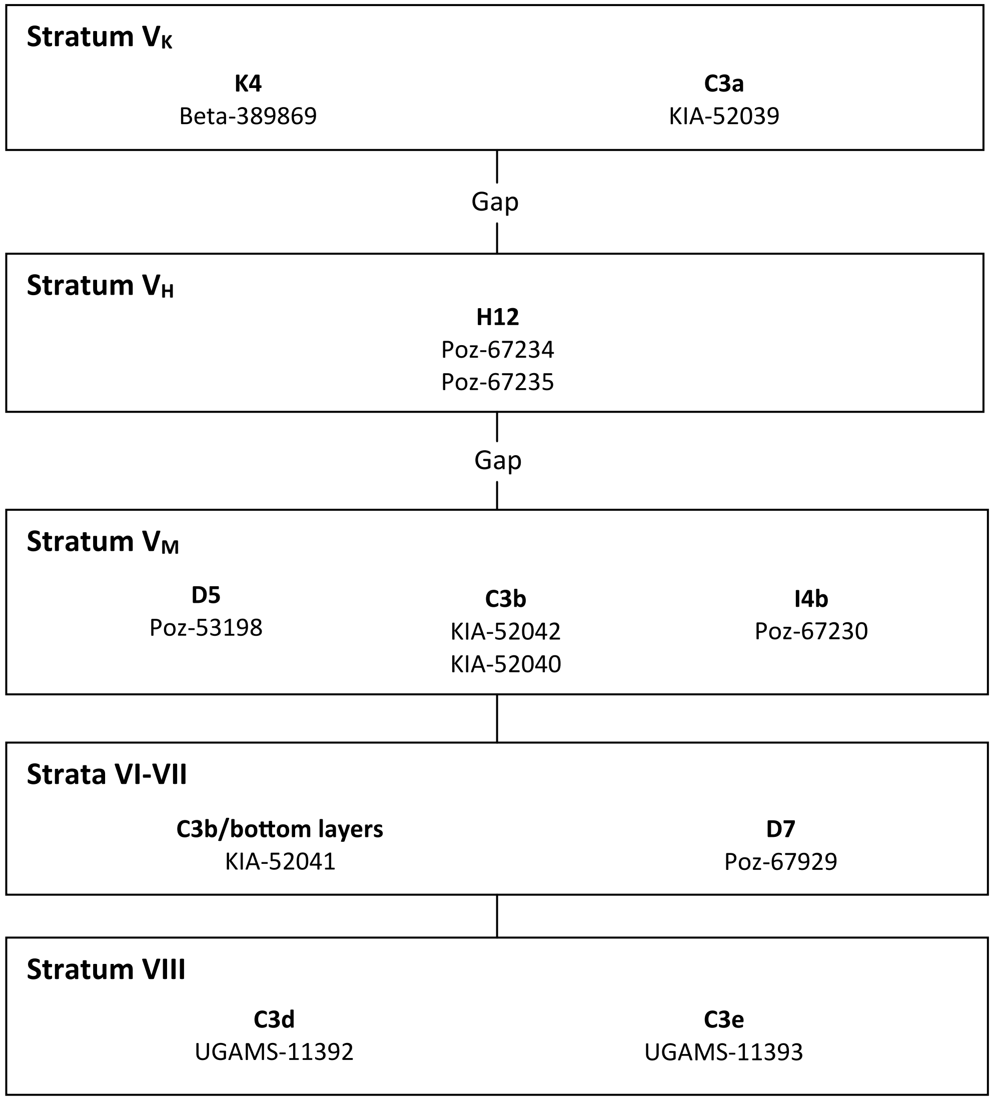

Fig. 3.11. Summary of prior information incorporated in run 2b of the Neolithic model. Single phases are marked with rectangles. Sequences of dated events (with the oldest below) are indicated by vertical lines.

second run since it yields a greater consistency with the dated evidence.

According to this model, the earliest dated occupation at Monjukli Depe, Stratum VIII, began *5028-5913 cal BCE (95% probability; Start VIII)*. The deposition of contexts in Stratum VII began *5986-5906 cal BCE (95% probability; Transition VIII-VII)*. Stratum V_M started in *5971-5896 cal BCE (95% probability; Transition VI-V)* and ended *5954-5843 cal BCE (95% probability; End* V_M*)*. The first reoccupation phase traced in Unit H began 5916-5766 cal BCE (*95% probability; Start* V_H) and ended 5870-5714 cal BCE (*95% probability; End* V_H). The last traced occupation at the northern settlement edge began 5784-5670 cal BCE (*95% probability; Start* V_K). The Neolithic settlement was finally left unoccupied for a longer time in *5731-5616 cal BCE (95% probability; End MD-Neolithic).*

Lengths of phases

In addition to achieving a more precise chronology of individual phases, the modeling was used to produce estimates of the duration of settlement stages. To do this, the spans of all events in single phases were sampled using the *span* command. The occupational gaps in the Neolithic period were estimated with the *interval* command used for determination of time intervals between boundary events marking repeated abandonments (*End* V_M*; End* V_H) and resettlements of the site (*Start* V_H*; Start* V_K), respectively.

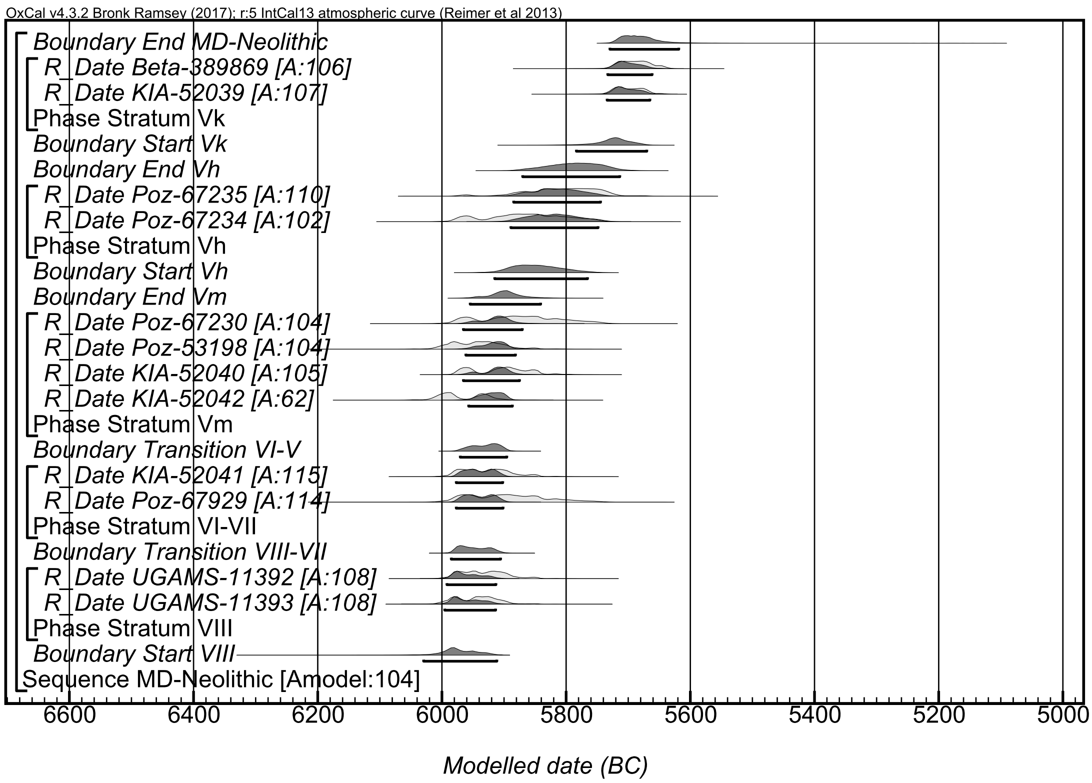

Fig. 3.12. Posterior density estimates of run 2b of the Neolithic model.

Phase according to model	Duration (*years*)
Aeneolithic settlement	*118-288*
Stratum I	*0-44*
Stratum II	*0-42*
Stratum III	*0-69*
Stratum IV, ruins	*0-78*
Stratum IV, conflagration Hs. 14	*0-50*
Stratum IV, use phase	*0-66*
Neolithic settlement	*205-379*
Stratum V_K	*0-40*
Occupational gap between Strata V_H and V_K	*0-142*
Stratum V_H	*0-71*
Occupational gap between Strata V_M and V_H	*0-125*
Stratum V_M	*0-61*
Strata VI-VII	*0-25*
Stratum VIII	*0-30*

Table 3.3. Estimates for durations of single settlement phases at Monjukli Depe.

The estimates for the total duration of the Neolithic and Aeneolithic settlement are relatively coarse (Table 3.3).

The Neolithic period as a whole would have lasted *205-379 years*, with a *probability of 95%*. The estimated duration of the Aeneolithic settlement is *118-288 years*, with a *probability of 95%.* For each of the individual time slices of the Neolithic and Aeneolithic occupation, only estimates of the maximum duration can be made, since the lower limit of the probability intervals is zero. The duration of phases can be estimated as follows. The Neolithic phase Stratum VIII lasted no more than *30 years*, with a *probability of 95%*, Strata VII and VI together maximally *25 years*. A short duration in both of these cases is remarkable given the considerable thickness of accumulated deposits in these strata. Stratum V_M lasted maximally *61 years*. The gap between the occupation in Stratum V_M and reoccupation (V_H) traced in Unit H is estimated as *0-125 years*. The duration of Stratum V_H is estimated as *0-71 years*. A second occupational gap followed it, lasting between *0-142 years*. The last reoccupation traced in Unit K, Stratum V_K, lasted maximally *40 years*.

For the Aeneolithic period the use phase of the houses of Stratum IV is estimated as no more than *66 years*, with a *probability of 95%*. Interestingly, the duration of the conflagration that destroyed House 14, which on the basis of archaeological evidence is considered a one-time, short-term event (Chap. 5) is estimated as *0-50 years*. Although an exact synchronicity of abandonment of Houses 14, 17, and 19 cannot be assumed, the period after their destruction is estimated to have lasted maximally *78 years*, suggesting that the ruins of these houses may have stood open for quite some time. The duration of the subsequent Stratum III was at most *69 years*. The last two segments of the Aeneolithic settlement, Stratum II (*max. 42 years*) and Stratum I (*max. 44 years*), yield shorter estimates.

Absolute chronology of the prehistoric Kopet Dag

The previous chronology of early village societies in the Kopet Dag region envisioned a protracted Neolithic period, the Jeitun culture. Immediately following late Jeitun came the Anau Ia phase, which was supposed to mark the beginning of the Aeneolithic period. This chronological outline was based on stratigraphic sequences from various Neolithic sites in the region,[27] with the strata of individual settlements correlated primarily by comparison of painted pottery motifs. Classification into the Anau Ia phase was made on the basis of the presence of a fine painted pottery without organic inclusions that was regarded as typical of this period.

The initial attempt at periodization of Jeitun times goes back to Masson (1960a), who used ceramic motifs from the first excavated Jeitun-period sites, Jeitun itself and Chopan Depe in the central Kopet Dag piedmont region, to distinguish an early and a late Neolithic phase. With the increase in numbers of sites excavated in the western and southeastern portions of the region, Berdiev (1969) extended the relative chronological model to include a third phase, and with the first ^{14}C dates (Dolukhanov and Timofeev 1972, Tab. 3), the Jeitun period could be assigned roughly to the late 7th to early 6th millennium BCE. According to this scenario, sites of the early Jeitun phase should be found only in the central Kopet Dag piedmont region. In the middle and late phases, settlement was thought to extend to include the western and eastern foothills. In this way the differences in material culture of Jeitun sites were declared to be primarily chronological, although Berdiev left open the possibility of local variations and pointed to peculiarities in the material culture of each region. These included, for example, the low incidence of painted ceramics in the Meana-Chaacha region in comparison to sites elsewhere (Berdiev 1969, 56-60).

The stratigraphy of Monjukli Depe, up to now the only published site containing excavated occupational sequences of both Jeitun and the earliest Aeneolithic periods, was in Berdiev's model an important bridge between the two. The Neolithic layers of Monjukli Depe were placed by Berdiev in the middle and late Jeitun phases and the Aeneolithic occupation in late Anau Ia. He assigned Strata II-IV of nearby Chakmakly Depe to the early Anau Ia phase and thereby considered it to be approximately contemporary with the earliest occupation at Anau North (Berdiev 1976, 47-48). Masson and Sarianidi's view that a "pre-Anau" phase existed prior to the Anau Ia period, to which they assigned the Aeneolithic sites Chakmakly Depe and Monjukli Depe (Masson and Sarianidi 1972, 50), received no further consideration.

Berdiev's chronological scheme was largely adopted in the excavations at Jeitun and Anau North that resumed in the late 1980s and early 1990s (Hiebert 2002; Harris 2010). They yielded for the first time larger series of AMS dates with which the early phase of the Jeitun period as well as portions of the subsequent Aeneolithic period could be dated calendrically. The determinations from Jeitun dated the early phase of Jeitun to ca. 6400-5700 cal BCE (Harris et al. 2010, 119-123, Tab. 9.1), while for the early Aeneolithic Anau Ia, age determinations fell between 4500 and 3800 cal BCE (Hiebert with Kurbansakhatov 2003, 55-56, Tab. 5.1). Between these periods was a yawning gap of at least 1200 years. It was provisionally filled by the two hitherto undated phases of middle and late Jeitun (Hiebert 2002, 32, Fig. 3).

The ^{14}C dates from Monjukli Depe raise serious doubts about this existing chronology of the early village societies in the Kopet Dag region. First of all, the Aeneolithic settlement of Monjukli Depe appears substantially earlier than the first settlement phase, Ia, at Anau North, which has hitherto been regarded as the earliest Aeneolithic in the region. This has led us to define an independent phase before Anau Ia, for which we use the term "Meana Horizon" (Pollock et al. 2011, 183-184; Bernbeck and Pollock 2016). We do not use the term "phase" in order to avoid the insinuation that this early Aeneolithic cultural tradition at Monjukli Depe existed across the entire Kopet Dag piedmont zone.

Secondly, the ^{14}C dates indicate a hiatus of about 800 years between the Neolithic and Aeneolithic settlement at Monjukli Depe. The middle and upper Neolithic layers at Monjukli Depe[28] fall into the time frame of the site of Jeitun. This would mean that the Neolithic period at Monjukli Depe is, contrary to previous assumptions, neither late Jeitun nor was it followed immediately by Anau Ia levels. In view of the new dating, one of two conclusions can be drawn:

- The chronological position of Neolithic Monjukli Depe in middle to late Jeitun was mistaken. It belongs instead to the early phase of the Jeitun tradition.
- The Jeitun period was considerably shorter than previously thought and does not extend beyond the first half of the 6th millennium BCE. There is an occupational gap in the region that can only be filled through identification of new sites or renewed work at others such as Chagylly Depe.

27 An overview in English of Neolithic settlements in the Kopet Dag piedmont zone and their pottery is available in Coolidge 2005.

28 The lowermost levels, Strata X and IX, have not been dated.

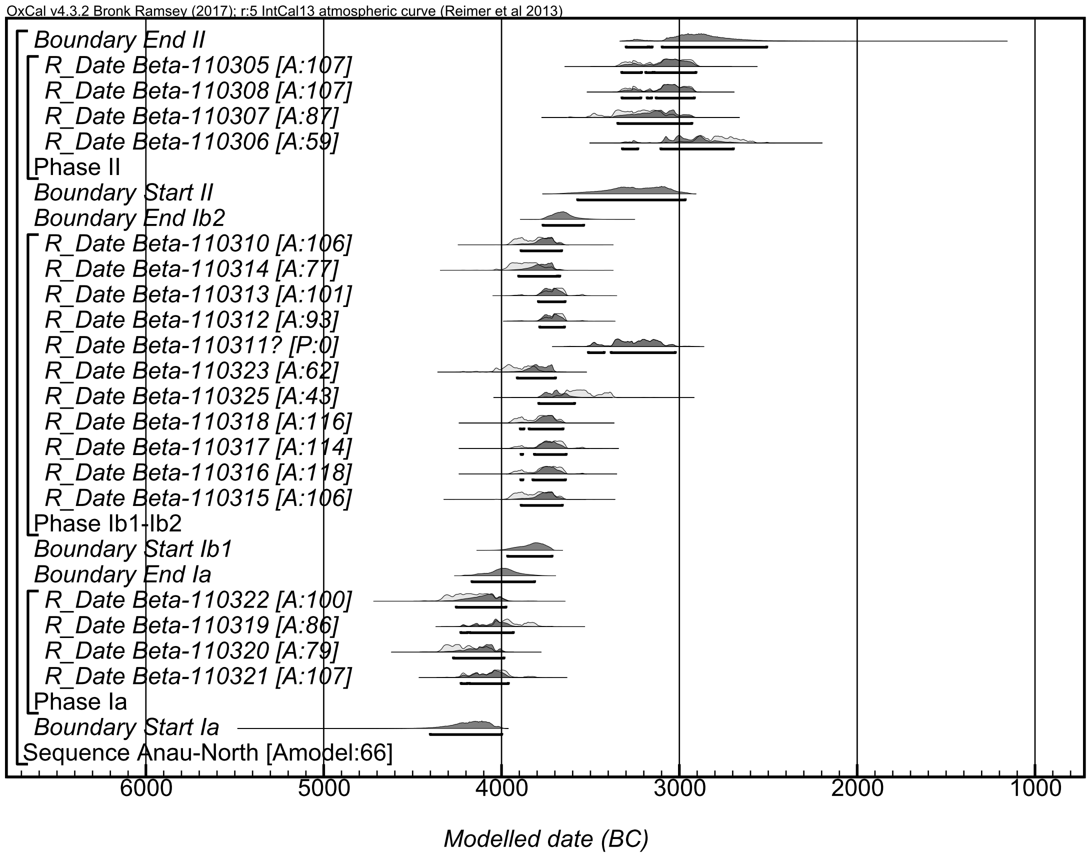

Fig. 3.13. Anau North. Posterior density estimates of the three-phase model.

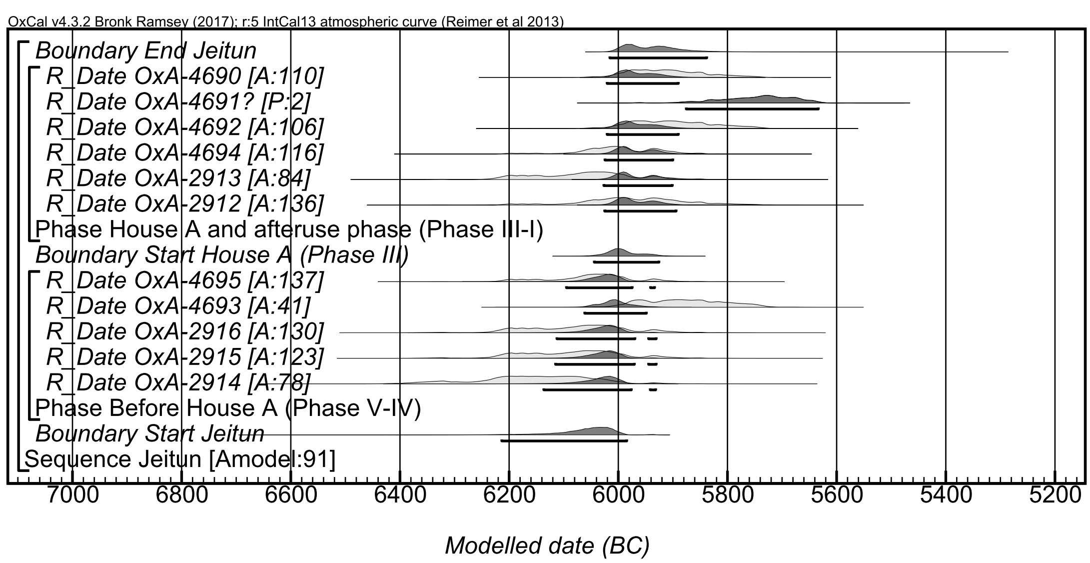

Fig. 3.14. Jeitun. Posterior density estimates of the two-phase model.

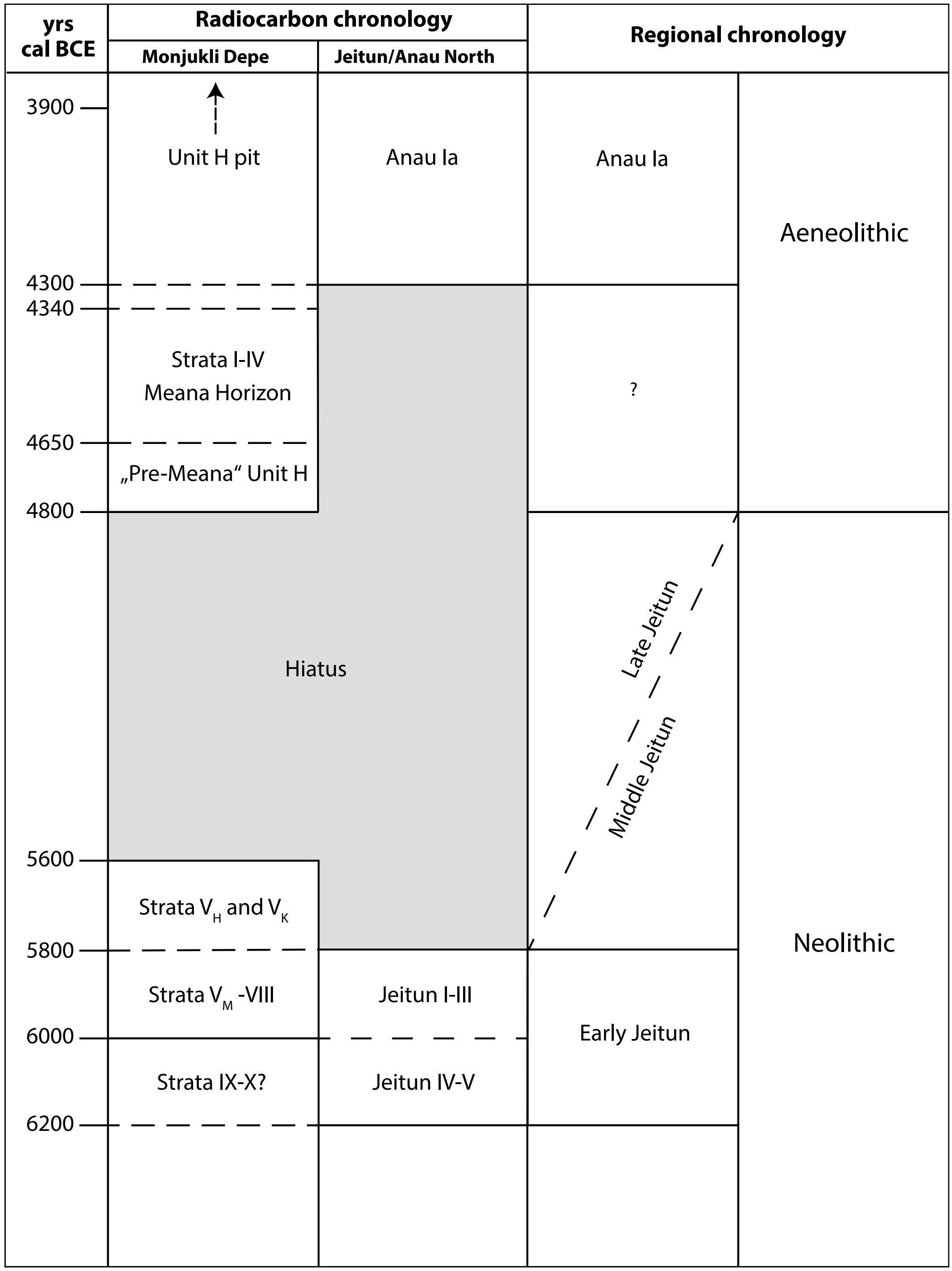

Fig. 3.15. Proposed chronology for the Neolithic and Aeneolithic periods in the Kopet Dag region.

To better address these issues, a closer look at the ^{14}C dates from Anau North and Jeitun is necessary. Simple models were created for a statistical analysis of both series of dates.

From Anau North 19 ^{14}C determinations are available (Hiebert with Kurbansakhatov 2003, Tab. 5.1), distributed relatively homogeneously over the occupation periods. A simple model with three *sequential phases* was created in OxCal (Fig. 3.13). This phase model was preferred over one with *contiguous phases*, as two stratigraphic hiatuses – between Phases Ia and Ib1 and between Ib2 and II – point to interruptions in settlement. The subdivision of Phase Ib into two subphases, Ib1 and Ib2, was tested in the first run but was in apparent conflict with the existing ^{14}C dates, which point to more or less the same period. As a result, the subdivision of Anau Ib was omitted in the second round. With the exception of **Beta-110311**, which is probably an outlier, the data fit well in this model (A_{model} = 66%). The timing of Anau Ia is of particular interest. The beginning of the Anau Ia settlement is suggested to date *4403-3998 cal BCE (95% probability; Start Ia*), that is nearly at the end of Stratum I at Monjukli Depe, and possibly after its abandonment. Its end is estimated at *4167-3814 cal BCE (95% probability; End Ia)*. This would mean that the Meana Horizon marks a chronological period that begins and ends before Anau Ia.

Eleven ^{14}C dates from Jeitun (Harris et al. 2010, Tab. 9.1) were also statistically evaluated in a simple model (Fig. 3.14). House A from the trench excavated in 1993 by Harris and team (Harris with Gosden 2010a, 102-103) was selected as an anchor point for the phasing due to its well-stratified contexts. House A is part of Stratum III of Masson's stratigraphy (Harris with Gosden 2010a, 102). The dated contexts were divided into two *contiguous phases*; the first marked the phase prior to House A (Masson's Strata V-IV), the second the period after its establishment (Strata III-I). In this model there is a separation between an early and late phase of settlement, with an arbitrary boundary between them set by the construction of House A.

Except for one clear outlier, **OxA-4691,** and one determination, **OxA-4693**, that falls somewhat younger, these dates are consistent with the schematic model (A_{model} = 91%). The following estimates can be drawn from this model. The settlement in Jeitun would begin *6214-5985 cal BCE (95% probability; Start Jeitun)*. The building of House A, marking the later phase, into which the main part of the excavated and published material falls, occurred *6045-5926 cal BCE (95% probability; Start House A)*. The settlement ended *6016-5839 cal BCE (95% probability; End Jeitun)*. Thus, the late settlement period in Jeitun seems to be approximately contemporary with the dated contexts from Strata VIII-V from the main Neolithic settlement phase in Monjukli Depe.

The comparison of ^{14}C dates from Monjukli Depe and Jeitun contradicts the conventional chronological attribution of the upper layers of Neolithic Monjukli Depe to late Jeitun. In my view, one of the possible causes for this discrepancy lies in Berdiev's questionable integration of the Monjukli Depe Neolithic sequence into his chronological model. As noted above, the Jeitun chronology is based primarily on a comparison of painted pottery motifs. Painted Neolithic ceramics make up a very small proportion of the pottery recovered in the recent Monjukli Depe excavations (Chap. 10). In the material analyzed by Berdiev from Marushchenko's deep sounding, there are only two highly fragmented painted sherds in the lowest layers, one with a line motif and the other with a triangle (Berdiev 1972, 16, Fig. 2: 9, 15), which he attributed to middle Jeitun. In the upper Neolithic layers in the sounding that he assigned to late Jeitun, no painted pottery was found (Berdiev 1972, 16-18). Berdiev himself did not explicitly mention which diagnostic features he used for the relative chronological assignment of Monjukli Depe.[29] My guess is that this assignment resulted from stratigraphic observations. Unlike in other areas of the site such as Unit C, in which sterile deposits indicate a hiatus between the two major occupational periods, in the area of Marushchenko's old sounding the deposits of the Aeneolithic period lie directly above Neolithic layers. For this reason, Berdiev may not have recognized the interruption in settlement, and the fact that Monjukli Depe was the only site with a direct succession of Jeitun and Anau Ia occupations was probably the cause of the mistaken relative chronological attribution.

Given the new information from Monjukli Depe, a revised chronological scheme for the Neolithic and early Aeneolithic is appropriate (Fig. 3.15). The early Jeitun period has been securely dated by ^{14}C determinations from Jeitun and Monjukli Depe Strata VIII-V to 6200-5800 cal BCE. There is also evidence of repeated resettlement in Monjukli Depe extending to 5600 cal BCE. After this there follows a stretch of at least 800 years without any evidence of occupation. It is possible that Pessejik Depe, Bami, or even Chagylly Depe, which have been assigned on the basis of cultural comparisons to middle or late Jeitun, may fall in this period of time.

29 The presence of tree motifs in the painted pottery of both upper Neolithic and Aeneolithic layers at Monjukli Depe was reported (incorrectly) in the publication on the relative chronology of the region (Berdiev 1969, 47), while, according to a later article, this motif is only to be found among the Aeneolithic ceramics at Monjukli (Berdiev 1972, 19; Fig. 3, 35).

The ceramic inventory of Chagylly Depe displays some differences to Monjukli Depe that might potentially be explained chronologically. In Chagylly Depe there are more painted motifs and a carinated vessel form that is nearly unknown at Neolithic Monjukli Depe (for details, see Chap. 10). One ^{14}C date from an upper layer of Chagylly Depe points to an occupation in the first half of the 6th millennium BCE, but its validity can be questioned on the grounds that it was obtained during an earlier stage of development of the radiocarbon dating method and in the Leningrad laboratory where several imprecise and conflicting determinations are attested. There need to be new ^{14}C dates from Chagylly Depe and other middle and late Jeitun sites in order to determine whether this gap in the dated sequence can be closed or whether the attribution to middle or late Jeitun is itself problematic.

The Meana Horizon, the first early Aeneolithic phase that is represented by four strata at Monjukli Depe, falls into the period 4650-4340 cal BCE. However, there are indications from layers at the settlement edge of temporary uses of the site prior to full-scale settlement. These might be associated with the occurrence of the organic-tempered Black on Red ware. A date from these contexts, **Poz-67233**, falls into the timespan 4826-4602 cal BCE, hence much closer in time to the Aeneolithic settlement than to the preceding Neolithic occupation.

The Anau Ia period follows the Meana Horizon, possibly with a temporal gap. Anau Ia is dated 4300-3820 cal BCE, as represented by the lowermost layers at Anau North. Strata II-IV from Chakmakly Depe definitely belong to the early Aeneolithic, but it is unclear whether they are contemporary to Monjukli Depe or date to the somewhat later Anau Ia period. This is a question that could be resolved in the future with ^{14}C dates from Chakmakly Depe (see also Chap. 10).

Conclusion

The Bayesian modeling of the dates from Monjukli Depe allows us to pinpoint major events in the settlement history such as the beginning and end of the Neolithic and Aeneolithic settlement and shifts between Aeneolithic phases. Furthermore, the estimates of durations offer insights into maximum lengths of the lifecycles of buildings included in particular Aeneolithic phases. The modelling also makes it possible to integrate into the established site stratigraphy some loosely connected contexts and structures such as the phases of House 3 or deposits in Unit H at the edge of the settlement, including the previously mentioned find of a large copper object (Fig. 3.16).

New insights were also obtained for the regional chronology based on the modeling. The middle and upper layers of the Neolithic occupation in the central part of Monjukli Depe are synchronous with upper building horizons from Jeitun and can be attributed to the early Jeitun period. Shortly after the main Neolithic settlement, the site appears to have been repeatedly

Fig. 3.16. Large copper knife-like object recovered from the sounding in Unit H. Note that the object has not been restored. Length: 19.3 cm.

resettled for some time before it was abandoned for at least 800 years. The new center of the (re)settlement may have been to the north of the original one. In order to examine this possibility further, substantial exposures of Neolithic occupation contexts would be necessary. The Aeneolithic settlement of Monjukli Depe is clearly attributable to a time prior to the Anau Ia period. Whether there are contexts that date to shortly before this main settlement period in Aeneolithic Monjukli Depe is open to discussion. A related question surrounds the temporal placement of the Black on Red ware, which could potentially be testimony to a sporadic human presence at the site at a time of only ephemeral occupation at best.

Chapter 4

The House as Process

A Biography of Building 10 in Monjukli Depe

Vera Egbers

Keywords: *narrative in archaeology; house biography; architecture; built environment*

Introduction

In this chapter I examine the life cycle of House 10 as a case study in the use lives of houses at Monjukli Depe. In doing so, I have two goals. First, a use-life approach allows me to analyze the processual elements of a building, rather than presenting a static image of the architecture of an entire level. It also permits me to make visible past actions that took place in and through a building. Second, I follow this analysis with an attempt to give this particular house a face by using the results of my analysis to imagine small-scale events from the perspective of one of the residents. The approach offers an example that can be applied to other buildings in Monjukli Depe as well as elsewhere.

After some introductory remarks on the Neolithic and Aeneolithic architecture in what is today southern Turkmenistan, I outline my methodology based on the object biographical approaches of Arjun Appadurai (1986a) and Igor Kopytoff (1986). I then turn to a detailed analysis of House 10 as process, examining the phases of its existence from its construction up to the present. This is followed by an interpretation of my findings that moves past the material itself and takes the form of two fictional scenarios revolving around a specific event in the life of House 10. These scenarios are an attempt to go beyond "typical" archaeological work on architecture and to look at prehistory as populated by people. In this regard, I borrow ideas from feminist archaeology, specifically from the work of Ruth Tringham (1991) and Janet Spector (1993).

Neolithic and Aeneolithic architecture in southern Turkmenistan

Neolithic (Jeitun period)

In his summary of the Jeitun period, Hermann Müller-Karpe presents an overview of the architecture of Neolithic localities in southern Turkmenistan (Fig. 4.1). He notes that buildings from this time were more or less square, single-room structures. They averaged 20-30 m² in size, with the exception of one house in Pessejik that was 64 m² (Masson and Sarianidi 1972, 37; Müller-Karpe 1982, 16). Doorway forms were variable, some consisting of thresholds constructed of mud, others without, and others lacking

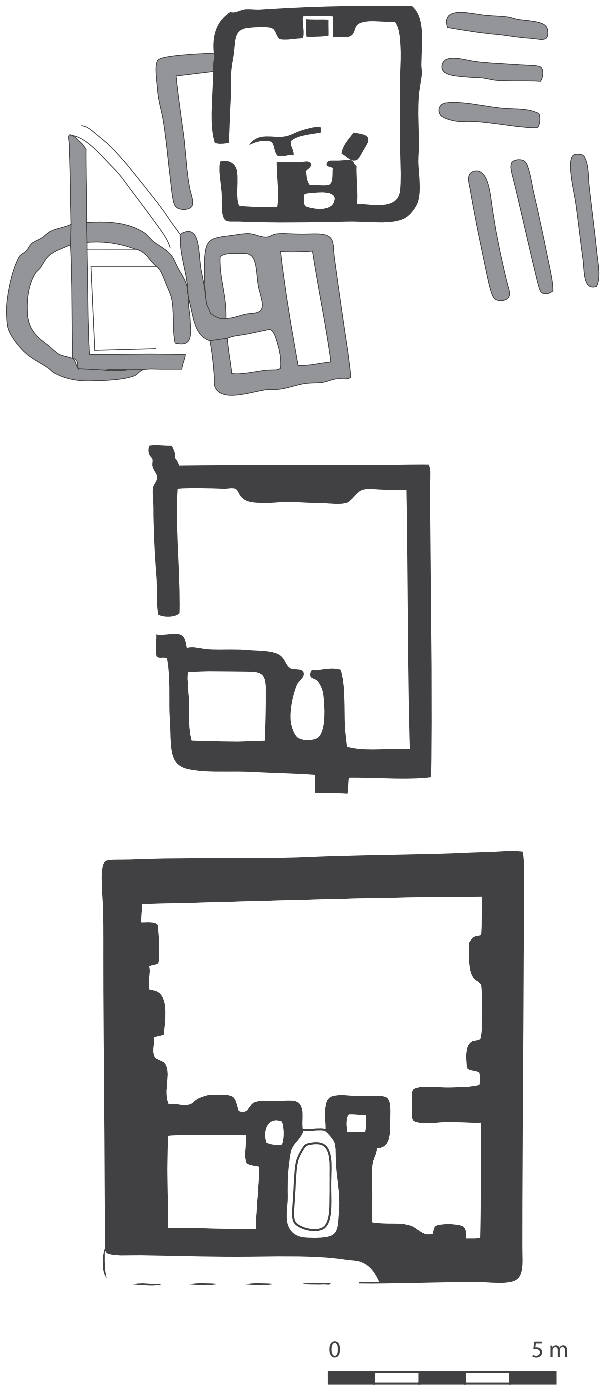

Fig. 4.1. Three examples of Neolithic house plans from Turkmenistan; upper and middle from Jeitun, lower from Pessejik (after Müller-Karpe 1982, Fig. 14).

any ground-level entrances. Often, however, the entry was in the wall to the left of an oven. The 25 cm-thick walls were constructed of clay lumps, oval in cross-section (approximately 60-70 x 20-25 x 10-12 cm) and tempered with coarsely chopped straw (Müller-Karpe 1982, 16). The walls stood directly on the surface without any foundations. Floors and walls were usually covered with several superimposed layers of plaster, indicating maintenance practices. In many cases, remains of red (ocher) or black (soot) color could be observed on the walls and floors. In Pessejik a figurative wall painting was discovered on which anthropomorphic and zoomorphic figures can be recognized. At Togolok, Chopan, Pessejik, and Chagylly Depe, reed mat impressions were observed in the clay surfaces (Müller-Karpe 1982, 18-19).

At the site of Jeitun, approximately 28 houses were exposed in the second building phase.[30] They stood in a loose, irregular arrangement, connected by open areas. In the open spaces there were structures composed of parallel walls as well as circular adobe constructions. These were interpreted as storage areas or as equipment for drying foods (light gray structures in Fig. 4.1; Hiebert 2002, 30). Almost every house had an oven built against the northern or eastern wall, usually situated next to a 60-70 cm-high platform that was interpreted by the excavators as a place to sleep (Harris et al. 1996, 426).[31] In one of the houses (House A), a small, ca. 40 cm-high window was discovered in the wall next to one of these platforms (see the cross-section of the southeastern wall in Harris et al. 1996, 431, Fig. 3). Floors and walls were plastered with lime, and in several floors depressions were found in which storage jars may have stood (Hiebert 2002, 30). From the building forms and arrangements, no settlement-internal hierarchy can be ascertained, unlike in Pessejik with its one large building, on the walls of which was the aforementioned wall painting.

Aeneolithic (Meana Horizon and Anau IA)

As an example of early Aeneolithic architecture, I briefly discuss the settlements of Anau North and Chakmakly Depe.

The excavated architectural remains from Anau North were limited because of the small size of the excavated area. Only two layers of Anau IA architecture, levels 20 and 19, were excavated in Kurbansakhatov's 3 x 2 m-deep sounding. The oldest structures were located in Layer 20 and appear to have been built on a hard, undulating surface containing ceramic and brick fragments (Hiebert with Kurbansakhatov 2003, 98, Fig. 8.2). As was the case in the Jeitun period, floors consisted of successive layers of lime plaster. Fire was apparently made directly on the two later floors, as attested by patches of charcoal and burnt earth. From the pieces of brick that had accumulated in the fill of the room, mud-brick sizes could be reconstructed

30 Recent work requires a partial revision of Masson's original phase division (Harris et. al. 1996, 428; Harris with Gosden 2010a, 100).

31 Harris suggests that these platforms were primarily but not exclusively used for sleeping. However, he does not pursue this element of life in Jeitun any further.

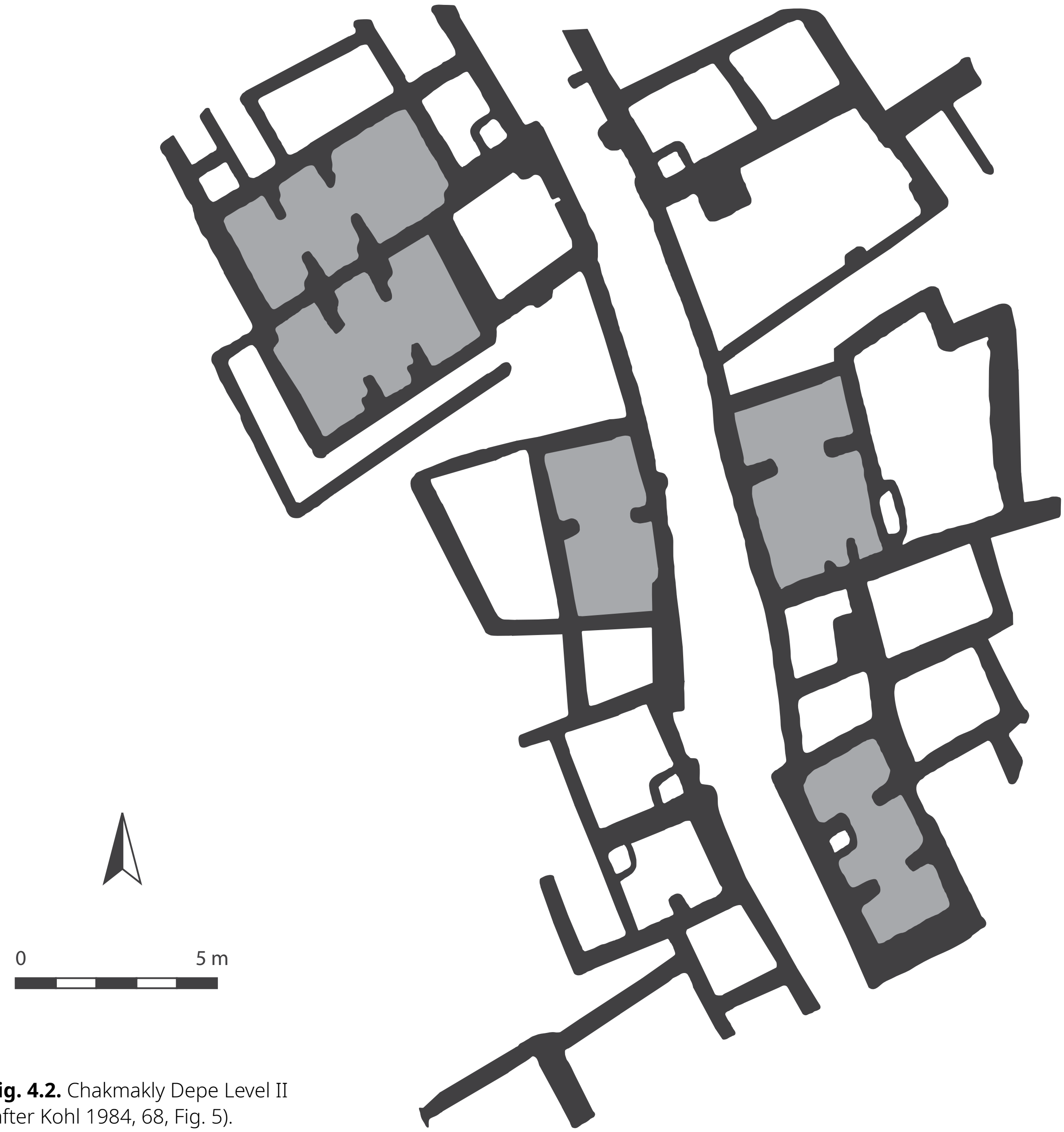

Fig. 4.2. Chakmakly Depe Level II (after Kohl 1984, 68, Fig. 5).

as 40-50 x 20 x 8-10 cm. In the later Level 19, the mud-brick walls were preserved up to a height of 1.25 m and had been erected on piles of mud brick (see the brief description in Hiebert with Kurbansakhatov 2003, 98-99). From the two Aeneolithic layers came spindle whorls, flint blades, stone beads, sling balls, and fragments of copper (Hiebert et al. 2003a, 82).

Mud bricks were also used for building at Aeneolithic Chakmakly Depe and were generally of a size of 40 x 20 x 10 cm (Berdiev 1968; Kohl 1984, 68). The walls in Level II were preserved up to 50 cm in height, and both red and black pigments were observed on them. As at Monjukli Depe, Chakmakly's settlement layout was marked by a long street that divided the settlement in two as well as by two smaller paths. Unlike the loose arrangement in Jeitun, the houses were built close to one another along the street. The more than 30 rooms of Level II were divided by Berdiev into four complexes (Kohl 1984, 68). An oven and a courtyard were part of each of these complexes. In one case, an installation composed of multiple small, parallel walls was discovered that – as in Jeitun – was thought to be used for drying food. Berdiev identified two different types of rooms: a) a small square type (around 4.5-10 m^2) with an oven, and b) larger rectangular rooms that were further divided by buttresses (marked in gray in Fig. 4.2; Kohl 1984, 69).

Monjukli Depe

The Aeneolithic architecture at Monjukli Depe is characterized by an extremely good state of preservation. The walls have survived in part to 1.5 m or higher, perhaps thanks to the so-called "wind of 100 days," which brings with it large amounts of sand and dust that cover and thereby preserve the architectural remains. So far, portions of 20 Aeneolithic houses have been exposed (Figs. 2.17, 2.30, 2.38, and 2.46), most of which consist of a single, more or less square room, measuring 4-5 m on a side. Berdiev classified the 40 rooms he exposed into a "multi-room" main type with three subcategories: a) those with buttresses, b) those with installations (benches, ovens, etc.), and c) those with a long, narrow shape (Berdiev 1972, 15).

The orientation of the buttresses is either southwest-northeast or offset from this by 90°. They are, when viewed in plan, either T-shaped or rectangular and made of mud brick. The division of the room occasioned by the buttresses was in several cases emphasized by a low step that ran between them.

Unlike the walls that lack any foundation trenches, some buttresses have a shallow foundation, and they tend to have a thicker plaster than the walls. The position and construction methods suggest that the buttresses supported roof beams.

Due to the step between the buttresses, the front part of the house where the door is located is often somewhat lower than the back and includes the majority of the fixed installations, such as ovens or fireplaces, benches, or bins of mud and brick fragments built into corners. The entrance in House 14 was less than 0.6 m high, so that one would have had to crawl through it. Many entrances were later blocked with bricks (including in House 10). The higher, rear portion of houses typically had fewer installations. However, the finds, such as spindle whorls, grinding stones with ocher, and other tools, show that various activities were also carried out in this part of the houses.

Life history of a building

To approach the analysis of a prehistoric house by way of its "biography" brings with it several advantages. It is an alternative to a macro-sociological level of observation that tends to draw a static image of prehistoric architecture and, by that, of society (Gerritsen 1999, 81; Trebsche 2010, 156). Material culture in general, and architecture in particular, is not only a functional tool. It is more than a passive reflection of human action (Tringham 1991, 98). A theoretical basis for a biographical approach as well as associated analytical methods have been offered by Arjun Appadurai and Igor Kopytoff in two seminal articles in *The Social Life of Things* (Appadurai 1986b). In his extensive introduction, Appadurai makes the argument that many different meanings are attributed to things according to particular situations in their "social life" (Appadurai 1986a, 13). The idea is that things have the potential to interact with the social life of people by animating people to act, think, etc. and thus influence them in their being. People and things are responsible for their mutual creation and "behavior," through which a dialectical relationship is established and maintained. This also applies to the built environment. There is a reflexive relationship between the built environment and people, in which people – sociocultural beings – are co-responsible for the creation of the architecture, and the architecture in turn is responsible for the peculiarities and particularities of human society.[32] That is, its form affects the conduct of its users; a change of function can therefore lead to a change in its form (see, in this regard, Altman 1975; Rapoport 1976; Sanders 1993, 44).

Although things affect people, they have, according to Appadurai, no inherent meaning: it is only through people that they acquire significance (Appadurai 1986a, 3, who refers to the social philosopher Georg Simmel). For this reason, their meaning varies both cross-culturally as well as during their social "life story." Appadurai argues on that basis for a "methodological fetishism" (Appadurai 1986a, 5) that states that the history of objects should be pursued in order to find out how their meaning changes in the process of interaction with people. The focus should be on the thing, its pathway, and encounters with people. One thereby learns the different social meanings that are attributed to a thing in diverse contexts of human social relations. There is a special role for identifying the varying values that things hold for people (or that have been attached to them) as well as for determining the circumstances in which they received a specific value or meaning. The changing status of having or acquiring values is part of the human sociocultural world.

However, one must distinguish between two notably different levels: on the one hand, long-term dynamics on a large scale that form the history of objects and, on the other hand, individual, specific lifeways (Appadurai 1986a, 34). The difference between them arises from different temporal and sociocultural scales. While an individual object accumulates a specific biography in the course of its life (Kopytoff 1986), the type of object to which it belongs as well as the whole object class can exhibit significant, lasting shifts in meaning and value (Appadurai 1986a).

The concept of the object biography has been expanded by Fokke Gerritsen, among others, to apply to houses, using the example of prehistoric farms in the Netherlands (Gerritsen 1999). He begins by demonstrating that houses in premodern societies are much more than physical structures to protect against

32 A separate sociological subdiscipline, architectural sociology, has been founded to explore the specific relationship "built space – person" (see, for example, Delitz 2010; for archaeology, Trebsche et al. 2010, 9, 13-16).

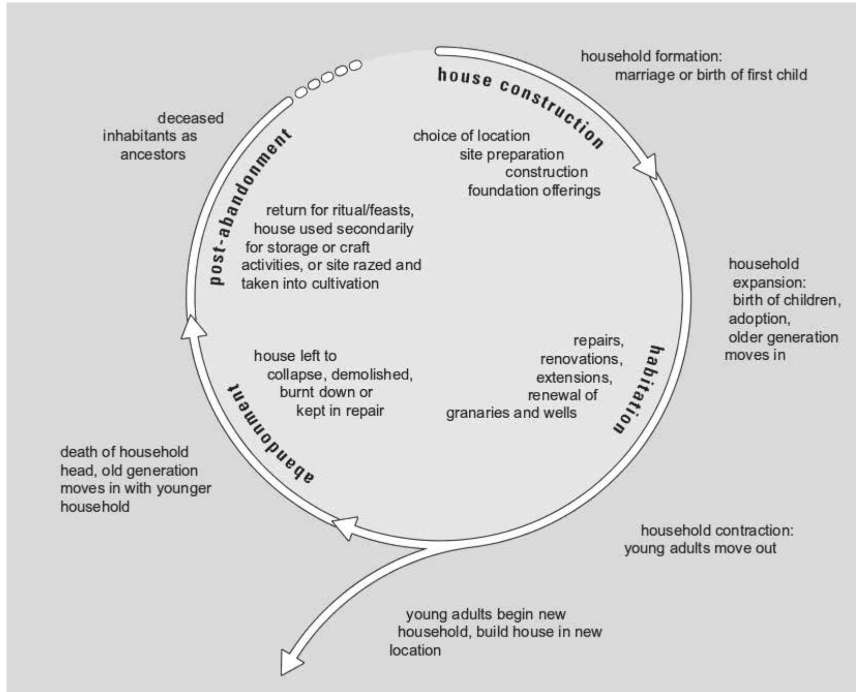

Fig. 4.3. The potential cultural biography of a farm in the prehistoric Netherlands, starting from the assumption that the lifespan of a house corresponds to one residential generation (from Gerritsen 2003, Fig. 3.1, used by permission).

the elements (Gerritsen 1999, 80-81). He refers to two ethnographic studies that examine the significance of houses in a Zafimaniry society in Madagascar (Bloch 1995) and among people in New Ireland, Papua New Guinea (Küchler 1993). Maurice Bloch demonstrated that for the Zafimaniry, homes are closely linked to people's own life cycles. The construction of a house is connected with the marriage of a couple and is altered or embellished in the course of the marriage, for example, upon the birth of a child, becoming over time a highly symbolic place that also can serve as a memorial to the couple after their death or to the ancestors (Bloch 1995; Gerritsen 1999, 80-81). In contrast, Susanne Küchler observed in New Ireland that houses of dead people are completely eliminated in the course of a few years. This includes eating the last harvests from the garden, burning down the house, cutting down trees on the plot of land, etc. (Küchler 1993, 97-100). In both case studies houses play an active role in the constitution of (parts of) the social identity of their inhabitants.[33] To the extent to which the residents change, so, too, is the social and symbolic meaning of a house altered and the perception of it by the community (Carsten and Hugh-Jones 1995, 36-42). Major events in the "life" of houses, such as construction and destruction, are associated with social and cultural events (Gerritsen 1999, 81).[34] Gerritsen argues for a dynamic perspective that focuses on spatial and temporal changes in the cycle of a house. As a critique, he notes that in many archaeological investigations the symbolic structuring and social conception of houses are investigated, but the temporal dimension is often ignored. This prompted him to apply the concept of cultural biography to houses (Fig. 4.3). For him it represents an appropriate way to connect an anthropological notion of dynamic buildings that exert a socializing function with archaeologically recoverable house remains (Gerritsen 1999, 82).

With regard to the social relations in a settlement such as Monjukli Depe, I consider it useful to analyze architecture on three levels, of which the investigation presented here is the first:

- individual house biography
- comparison or juxtaposition of several house biographies from one settlement
- internal spatial arrangement of a settlement and its development over time.

Only when one has conducted at least two of these investigative stages is it possible to draw conclusions about the social constitution of a settlement.

33 Claude Lévi-Strauss originally proposed the concept of house societies (*société à maison*) for those where the social organization is tightly linked to the house (referred to as a "moral person") and less to kinship (cf. Carsten and Hugh-Jones 1995, 6; Joyce and Gillespie 2000).

34 One might think of festivities during the construction of a house, where up to today the completion of structural work is celebrated, and traditionally a blessing was asked for the new house.

The use of terms such as "house" or "room" can be problematic. They are ethnocentric, referring to a modern western concept of housing and at the same time imply specific meanings such as "house → family." For this reason they must be used with caution (see, for example, Spector 1991). Nevertheless, I will not address this terminological problem further, since it is not the focus of my analysis. By using a variable terminology for the spatial unit 10 presented here – building, house, room – I wish to indicate that I neither intend to offer a precise definition and thus an attribution of meaning, nor do I necessarily see any benefit for my research question in doing so.

In summary, by means of a house biography the human social system as well as ideas about how people interact with houses come fleetingly to light. Nevertheless, I agree with Matthias Jung's critique that in talking about "object biographies" we run the risk of forgetting that the term is ultimately no more than a metaphor (Jung 2012, 376). Objects and houses have, literally speaking, neither life nor intentions. Although they affect people's actions, they do not have the potential to engage in independent action, at least as traditionally understood. It is useful in this regard to consider the ideas of the anthropologist Alfred Gell concerning the relationship between humans and objects. In his posthumously published book, *Art and Agency: An Anthropological Theory*, Gell advocates a division into so-called primary and secondary agents (Gell 1998). He thereby tries to avoid the problem of equating – or making symmetrical – people and objects by postulating that, "Art objects are not 'self-sufficient' agents, but only 'secondary' agents in conjunction with certain specific (human) associates" (Gell 1998, 17). The difference between primary and secondary agents lies in the moral responsibility for their respective actions. Secondary agents are therefore objects that exercise their power to act (agency) through primary agents (Gell 1998, 20). Secondary agents are not responsible for the effect of their "agency," ergo are not in the last instance to be equated with people or their biographies.

In the next section I describe in detail the life story of House 10 in Monjukli Depe, its construction, modification, and destruction.[35] In so doing, I will analyze and interpret its changing states. In the biographical peculiarities of the house, cultural and/or social decisions of the former residents can be recognized indirectly as well as directly. I will not explicitly address the influence of the house on the actions of people in it (for example, circulation possibilities, phenomenological approaches based on the human senses, etc.). Through the information gained about the building sequence and formation processes (cf. Trebsche 2010, 146), I will then engage with an event in the life of the house and its inhabitants from two perspectives.

Biography of House 10

The building we refer to as House 10 is located in Unit D. Its uppermost and therefore final layers were reached at the end of the 2011 excavation season (levels D2, D3a1, D3a2). In the 2012 season the majority of the main use-phases of the house were excavated (levels D3b1, D3b2), so that in the summer of 2013 the earliest stages of the building and its construction (level D3c) could be investigated. In this way, by the end of the 2013 season, almost the entirety of House 10 had been excavated with the exception of the areas in the baulk, those removed by Marushchenko's sounding, or under Berdiev Street.

In the following section, I begin with a brief description of the excavation methods and phasing, after which I turn to a detailed report on the excavation of House 10. I will follow the house as a process, moving from the earlier to the later stages.

Location and plan

Unit D is located in the center of the mound with Marushchenko's deep sounding in its middle (Fig. 4.4). House 10 was located in the northeastern part of Unit D and was cut on its southwestern corner by the Marushchenko sounding. Layer D3 includes the entirety of the house's existence, from initial construction until its complete disappearance in ruins. In four other units, structures that belonged to the same stratum as House 10 were excavated (Fig. 2.30). House 9 lay directly to the west of House 10. Between Houses 3 and 10 was an open area with a surface that was in part carefully prepared (see description of level D3b2). While the stratigraphic connection between Units D and B can be reconstructed, an assessment of the relationship between Units D and E in Stratum III is more difficult, especially because Berdiev Street was not excavated down to this level. In the preceding Stratum IV, Building 19 was located on the spot that later became the western, rear area of House 10. In Stratum II, a large open space covered the site of the former House 10. This Eastern Midden was probably used for feasting or the deposition of refuse from such activities (Chap. 7).

Phasing and spatial divisions

The period during which House 10 existed was divided into sublevels based on the levels of Unit D and corresponding to the site-wide strata (Tables 2.2 and 4.1). The division of the sublevels is based on sequences of surfaces and architecture that indicate changes in use.

35 As a comparison, see the comprehensive "Last House on the Hill" project of Ruth Tringham and Mirjana Stevanović. Over several years they studied the life history of a Neolithic house from Çatalhöyük and presented their results not only in book form, but also as a website in which alternative forms of representation have found a place (http://lasthouseonthehill.org/, Tringham and Stevanović 2012).

Fig. 4.4. Unit D from the northeast in 2012. On the left the oven, FI 44, in House 10 can be seen. In the middle is the Marushchenko sounding, which cuts into the house.

Unit Level	Sublevel	Use
D2	D2	ash or waste dump ("reuse")
D3	D3a1	ash or waste dump ("reuse")
	D3a2	abandonment
	D3b1	main and late use
	D3b2	earliest use
	D3c	founding phase

Table 4.1. Levels of House 10.

House 10 can be loosely conceptualized as being composed of three areas: the rear of the house ("main area"), the front part ("vestibule"), and the exterior (south and especially east, directly in front of the door to the house and framed by wall 493; Fig. 4.5). These zones differ in terms of their installations and other contexts. The floor of the rear part of House 10 stood somewhat higher than the front and was clearly separated from it by a threshold that ran between the two buttresses. All of the identifiable fixed installations were found in the vestibule. The axis that ran between the oven D475/611 (FI 44) in the front of the house and the buttress-like projection D465 on the back wall, D210, could be interpreted as an element that formed additional subzones within the house. It should be emphasized that these areas have been conceived as such by the excavators and do not necessarily correspond to the perceptions of the house residents.

Construction phase (D3c)

House 10 was oriented along the older wall A/D13 of a neighboring building, as is evident from the alignment of its northwestern wall D210 (Fig. 4.5). A/D13 was originally the southeastern wall of Building 20 (Stratum IV), over which House 9 was later built (Stratum III). This neighbor of House 10 consisted to a large extent of reused architectural elements of the previous Building 20, including wall A/D13 (Fig. 2.34). The transition from House 20 to House 9 involved a temporary disuse, indicated by ash and rubble layers.

The southern portion of House 10 was superimposed over Stratum IV Houses 14, 17, and 19 in Unit D. Before the construction of House 10, the abandoned houses had apparently been used as dumps for ash and waste. The remainder of a wall of House 14 was cut down to prepare the building area for House 10. Unlike House 9, House 10 was not a direct successor of any older

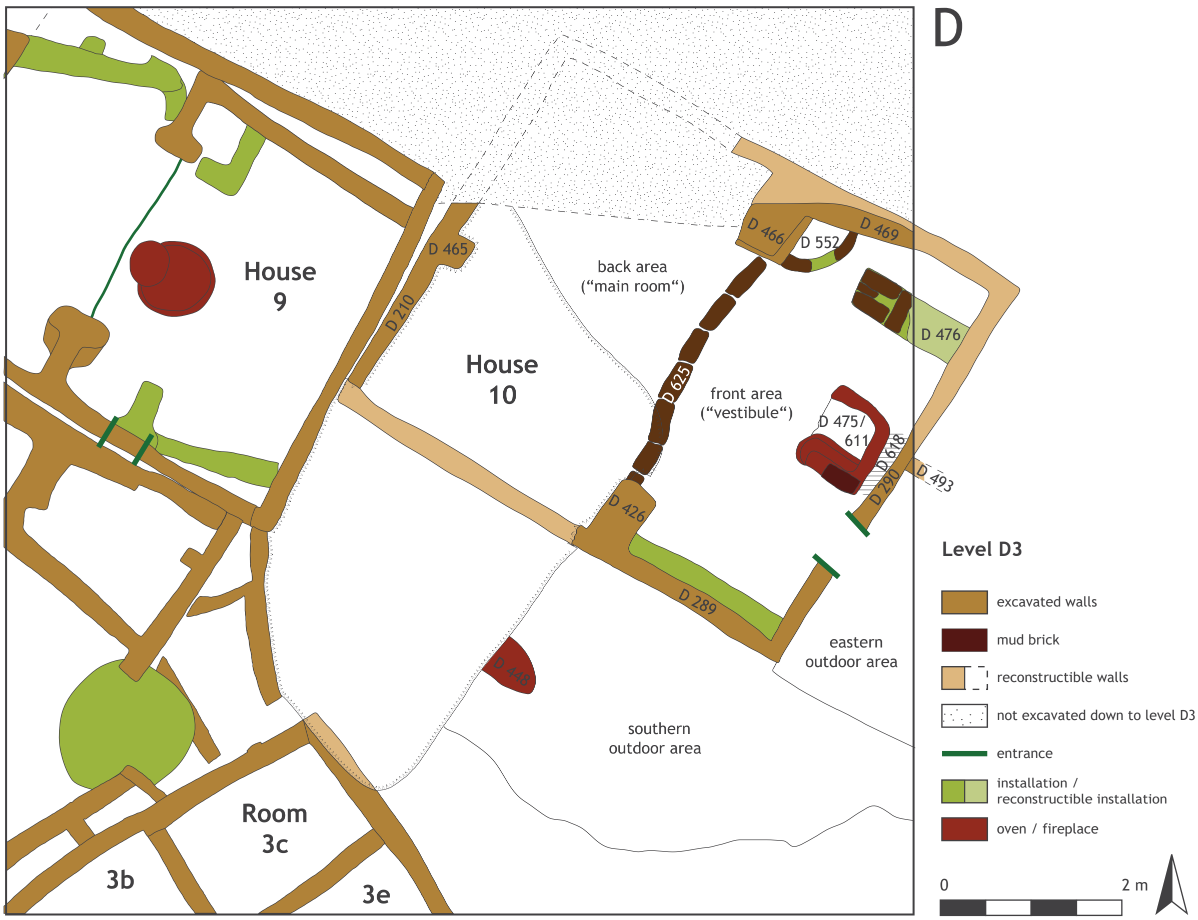

Fig. 4.5. Unit D Stratum III level D3 with Houses 3, 9, and 10.

building. A sequence of at least 11 layers of ash and burnt material (loci D643, 645, 650, 660, 664-5, 669, 671, 675-6, 680, 682, 685) accumulated to the north and east of House 19, approximately at the position of the later buttress D426 of House 10, and to the west of House 17. These deposits point to the existence of an open area with various ephemeral fire installations in use prior to the construction of House 10 (see Chap. 2, 63). Whether this was a predecessor of the Eastern Midden, a feasting/rubbish disposal space in the center of the settlement that followed Stratum III/House 10, cannot be answered due to the small size of the exposed area in Stratum IV. However, the substantial distance between Houses 10 and 3 makes clear that such spaces were part of the village structure in Stratum III as well.

The ground on which House 10 was built consisted mainly of uneven ashy layers. The foundation level itself was a reddish, 2-4-cm-thick surface (loci D627, D638, and D696). The thin, ashy layers (loci D634 and D636) on top of the reddish surface formed the basis of the walls and buttresses of the house. It is especially noteworthy that these were not carefully prepared surfaces. Locus D636 was a white to dark gray ashy surface with almost no finds. On top of it was a sandy, reddish-beige fill (loc. D634), with some charcoal flecks, bone, and used stone fragments; a human tooth and a broken spindle whorl were also present. Walls D289, D290, D469, and buttresses D426 and D466 as well as wall D493 were all constructed on top of these ashy surfaces. Only in a few places were the walls deeper than the surface of loc. D634: the two buttresses, the place where wall D289 and buttress D426 met, and the northern part of wall D290 seemed to have had some kind of foundation or were at least set slightly lower on loc. D636. Since we did not disassemble wall D210 and the small buttress D465 due to their proximity to the Marushchenko sounding, observations could only be made from the profile, which suggest that neither of them was lower than loc. D634. It is unclear whether this means that the walls were built first and then the buttresses were set into the house and that they had to be placed deeper because of their massiveness. As the point where buttress D426 and wall D289 met was deeper, this hypothesis seems quite plausible. However, it is also possible that the area sunk slightly over time due to the weight of the buttresses

Fig. 4.6. Detail of the eastern profile of wall 290, with the thin white coating of the bricks and the reddish mortar visible.

and their presumed roof support function. Damage to the walls from such a subsidence was not, however, observed.

The southeastern wall of the house (D290) in which the entrance was located consisted of mud bricks covered with a thin, at the time probably liquid, limey solution. The bricks were set as stretchers in a strongly binding, red mortar. This resulted in an alternating pattern of white-beige brick and red mortar (Fig. 4.6), which was characteristic of all walls in House 10.

Both on the inside walls as well as outside at the corner of walls D289 and D290, mud plaster covered the mud bricks. This means that the red and white color of the bricks and mortar was not visible, but that does not imply that the coloring was unintentional or unknown to the residents. Under certain circumstances, the concealment of a color pattern could have a specific meaning, as Serena Love recently suggested for Neolithic Çatalhöyük (Turkey). She examined Neolithic mud bricks from neighboring houses in Çatalhöyük and demonstrated differences among the mortar and the color of the bricks used. She interpreted her observations to mean that social identity could be given expression not only during the production of bricks and houses, but that this knowledge of each house's "autonomy" worked later as well, when the differences in material and color were no longer visible because the walls had been plastered (Love 2013). The same can be imagined for Monjukli Depe. This would imply, however, that all practices were carried out intentionally, an assumption that is open to question.

From wall fall that accumulated during the subsequent decay of the house, it became clear that the bricks of the upper parts of the walls must also have been coated white (see description level D3a2/1). The same can be said of the buttresses: the more northerly of the two (D466), next to which the corner installation D552 was later set (see below), consisted of bricks that also had a very thin white coating. The entire buttress had multilayered white plaster over a layer of mud. On the west side a large cattle horn (loc. D632) was attached to the buttress.[36] It was discovered in the profile during excavation in 2013. A brick slightly west of it could have been part of an installation to which the horn belonged. Due to the absence of information on its exact position, the importance and precise time at which the horn was attached remain uncertain.

After constructing the walls and buttresses, a 6½-brick-long threshold, D625, was laid on top of an ashy-bricky fill layer (loc. D631). It ran in a slight arc between buttresses D426 and D466 (Fig. 4.7) and must have been laid without the aid of a string. All bricks were white on their outer surfaces and had the typical dimensions of 42 x 20 x 8-9 cm. They were exactly the same size as those exposed in Anau North; in this respect we can speak of a kind of standardization at a regional level. Through differentially thick layers of plaster (loc. D610), the irregularly arching outline of the threshold was partially offset. The result of this construction was the step from the "vestibule" to the "main room." The step was lower to the sides of the buttresses than in the middle. Through another series of ash and clayey fill layers (loc. D626, D619, D617) west of the threshold, a raised "platform" was created for the first surface (loc. D616, level D3b2) in the rear ("main room") of the house.

Also east of the brick threshold in the vestibule, the lowest floor, locus D621 (level D3b2), was set on a fill layer (D631). The newly built house had the following internal dimensions: vestibule: 2.00 x 4.10 m; rear area: 2.90 x 4.40 m.

The events of this initial establishment phase can be summarized as follows: first, people decided to construct a new building in an open area in which previously fires had occasionally been made and which lay next to ruined houses. The construction and the distribution of work were organized. While the building area was prepared by (intentionally?) strewing ash (the mud layers

36 Cattle were symbolically important at Monjukli Depe, as demonstrated in detail in Chap. 7.

Fig. 4.7. House 10 after erection of the walls and brick threshold, end level D3c.

below showed no marks of burning), parts of the still visible walls of House 14 were cut down. Considerable amounts of water had to be brought for making mud bricks, probably from the wadi at some distance away. In addition, the moulds for the mud bricks had to be prepared. The bricks were made and then dried in the sun.[37] Then the mortar had to be mixed. The walls were built, the places for the buttresses deepened slightly. After this first architectural skeleton was standing and had dried, the roof was probably laid on the walls – it remains unclear whether it was flat or pitched – and the plastering of walls both inside and out with a white lime coating was begun. Thereafter, the construction focused on the interior. The brick threshold was laid "free hand," and all kinds of soil, debris, and ash were brought in to prepare for the construction of the floors. With that, the newly erected building moved into its next phase: the earliest residential use.

37 Perhaps the lime or salt content led to the white coating of the dried bricks.

Earliest use (D3b2)

The earliest use phase of the house is defined by the first floors, D621 (east) and D616 (west) (Fig. 4.8). The well-preserved white floor D621 was not present in the south toward wall D289, probably due to the bench D606 (see below) that was later located there. One of the first "events" related to floor D621 must have been the impressing of three human fingers into the wet clay. The impressions (loc. D623, Fig. 4.9) were located in the northern part of the vestibule, near the place where the oven later stood. To floor D621 belonged a 20 x 20 cm pit, loc. D622, located right next to the threshold. The pit was encircled by stones. At its eastern edge lay half of an oval grinding stone with a flat working surface that faced the center of the pit. The construction of this pit makes an interpretation as a posthole very probable (for the location of the level D3b2 installations in the house, see Fig. 4.8). This might mean that already early on the roof needed support, unlike in most other houses (except House 3) where no such posthole was found. Since it disappears in later levels, it may mean that a rather poorly constructed roof was replaced with a higher quality one.

Fig. 4.8. House 10, beginning of level D3b2.

In the southern part of the vestibule, there were two smaller depressions with a diameter of 6-7 cm and a similar depth (D629, D630). They were near the southern buttress D426 and could also have served to support some construction. In the northern part of the vestibule, two installations, also associated with surface D621, were built and continued to be used in the subsequent phases of the house: Loc. D476 (Fig. 4.10) and D552. D476 was a mud-brick construction similar in form to the buttresses of the building, although the connection to wall D290 lay outside the excavation unit. It might instead have been a grinding installation, at which one knelt and in the center of which the ground material was collected (for example, by leather draped in the free space).[38] During the excavation a greenish-colored deposit was found on this installation. A sample taken revealed a double layering of brick as well as a thin plaster. The core of the brick was crumbly, light gray, and tempered with fine chaff, a little straw, and occasional charcoal inclusions. Over it was a relatively thin coating, also of friable mud, which was tempered with fine sand and silt and contained small charcoal flecks. Over this outer layer was a reddish coating made from ocher.

The other installation (loc. D552) was a quarter-circle mud-brick arrangement of 2.5 bricks in length (1.1 m long, 45 cm wide, 33 cm high), framed by the inside corner between buttress D466 and wall D469 (a similar installation, D720, was found in House 14 [Chap. 5] and in House 3 [Chap. 2]). The bricks were thickly plastered with mud, on which there was in turn a thin layer of lime. The interior of the installation consisted of particularly fine sediment. The various layers of ocher-red and yellowish

38 Compare the grinding installations out of mud described by C.B. Coockson, which are in some respects reminiscent of installation D476 in House 10 (Coockson 2009, 130).

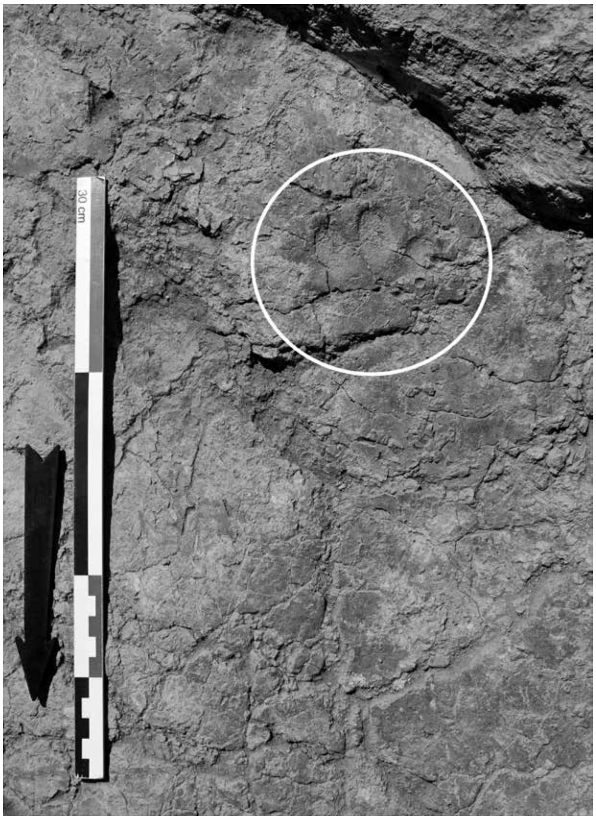

Fig. 4.9. Finger impressions (loc. D623, marked in white) in floor D621.

Fig. 4.10. Mud-brick construction D476 in the northern part of the vestibule.

silty clay were relatively thick. Within the installation under an ocher-red surface was a group of four white, unmodified pebbles and one dark gray siltstone used for smoothing. A large animal scapula found its way into this container at a later time.

At the end of its use, floor D621 was damaged by two small holes, D629 and D630, as well as by a small, shallow depression (loc. D628, ca. 42 x 31 cm), close to the threshold between buttress D426 and pit/posthole D622 (Fig. 4.11). The depression, D628, may have been a fireplace, since at that time the large oven D475 did not yet exist.

The depression was filled with broken brick and over it another ocher-colored floor had been laid (loc. D613). This maximally 4-cm-thick surface was the base of a sequence consisting of floor (D613) → fill (D615) → floor (D614) → fill (D612). The two floors were irregularly ocher-colored, which is most likely due to the higher traffic especially near the door, as the red floor in the back of the house, for example, had a thicker ocher coating. This pattern can also be observed in House 14 (Chap. 5). The deposits on the floors (D615, D612) consisted of loose, crumbly material without significant finds. A bench-like construction (D606) of unknown height was located in the southernmost part of the vestibule, directly at and parallel to wall D289 (Fig. 4.12). It was one brick wide (ca. 26 cm), 1.78 m long, and seems to have been built on floor D613. The bench had a slightly reddish color. Floor layers appeared to run up to and over it.

Over the threshold D625 in the middle of the house ran a sequence of 12 individual floor layers, which were grouped during excavation into one locus, D610 (Fig. 4.13). Together, the layers were 15.2 cm thick. The first five averaged 2.1 cm thick, while the later seven were on average only 0.6 cm. The thicker, earlier layers were regular mud plasters without pigment, whereas the following layers were much finer plasters with a thin color coating. At least three of the thinner layers were ocher colored.

In the western back part of the house, Locus D616 was the first surface laid down after setting the threshold. This beige floor was very uneven and not particularly carefully laid despite its smooth surface. Toward the northern buttress D466, the floor was noticeably lower than elsewhere. Very few artifacts were present on this surface. It appears as if there had then been a dense package of three or four surface layers, presumably only thin color coatings, but this was difficult to ascertain. The deposit above was a fill layer of charcoal, limestone, and mud-brick remains (loc. D608), which in some places exhibited a greenish tinge. Above this fill was the main floor, locus D445, of the main use phase D3b1.

In the outside area to the east of House 10 and directly in front of walls D290 and D493, a sequence of surfaces could also be traced. They had been created with care, as if they were the floors of a house. The existence of the thin wall D493, which ran in a southeasterly direction from the outside of wall D290 to the edge of the trench (and for this reason could not be further investigated), supports the

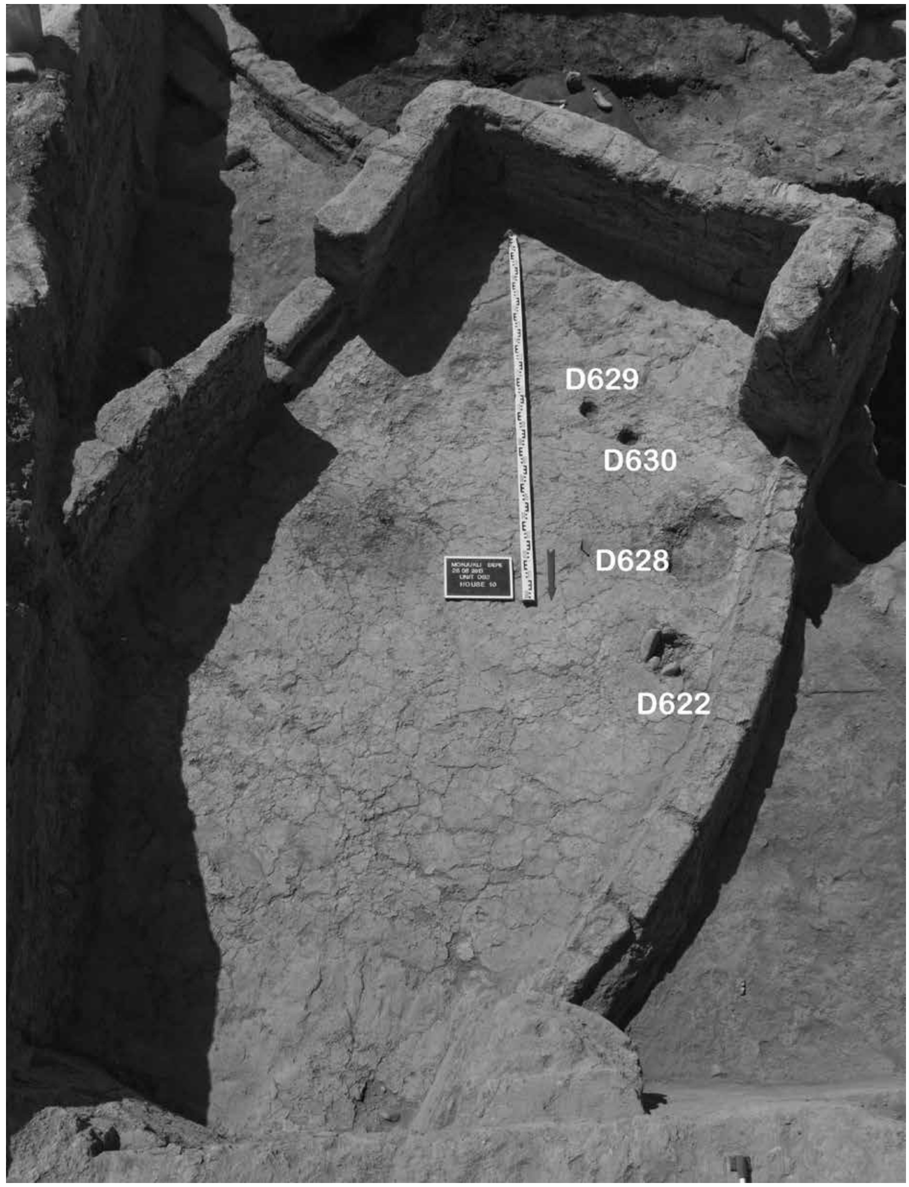

Fig. 4.11. View of the vestibule from the north, with Loci D622, D628-D630.

assumption that these external surfaces should be seen as part of the house(hold). The surfaces could not be stratigraphically connected to the interior floors, but nonetheless elevations, appearance, and the way they were made allow an attribution. The lowest of the outdoor surfaces (D460), just like the first floor in the vestibule (D621), was white and even. It was set on a layer of ash and mud-brick fragments that covered the remains of House 14 (loc. D554). Above surface D460 were at least four other surfaces (from the bottom: D453, D449, D437, D428) that cannot be exactly allocated to sub-phases of the house. Again, similar to floor D621, these later surface layers were reddish in color. The ashy deposit on top of the last hard, red surface D428 seems to belong to the destruction or abandonment phase D3a2/1 (D429 = ash; D424 = wall fall).

In summary, at least 12 replasterings could be recognized on the threshold between the vestibule and the rear area of House 10. In the front of the house, at least three floors were identified that belonged to this phase of use, in the back area only two. This may mean that partial replasterings were carried out without a complete overhaul. Furthermore, the observation of various layers on the mud-brick threshold suggests that

Fig. 4.12. House 10, end level D3b2.

over time there was a change in the technology of floor applications, from thicker plasters to thin colored coatings with less clay. This raises the question of why such a change took place. When a new floor was laid did one try to avoid raising the height of the step further with a thick basal layer? Or perhaps it proved easier and equally stable to lay a thinner flooring? Did the coating on the threshold wear especially quickly because of the circulation patterns in the house, and was it for that reason relatively often renewed? Also the color design of the house interior is important: white walls and especially red floors seem to have been the dominant colors (including the invisible core of the walls), even if both may have been covered by organic materials (see below).

At this early stage of residential use, the floors were laid and portions of the fixed features built. It is not clear why initially at least one post may have supported the roof, but this was no longer necessary later. In Jeitun House A a similar pit was interpreted to mean that someone had camped in the house during a period when it was temporarily not in “normal” use (Harris et al. 1996, 431). Such a scenario appears odd in our case, because House 10 had just been built. It could also be that at some point the type of roof was changed or a new, more stable main beam was installed so that the roof held without additional support.

The next use phase was initiated when people again laid rubble on the old floors of the house in order to create a new level of floors.

Main and later use (D3b1)

This phase was defined by the construction of floors D343 (= D609, east) and D445 (west), both of which consisted of a thin sequence of hard layers of mud (Fig. 4.14). The last fixed installations were also constructed during this phase (see Table 4.2).

In the front part of the house, floor D343/D609 was laid down over fill layer D612. It had a grayish-reddish color and corresponds to the 10-cm-higher floor D445 in the rear of the house. This floor ran up to and over the

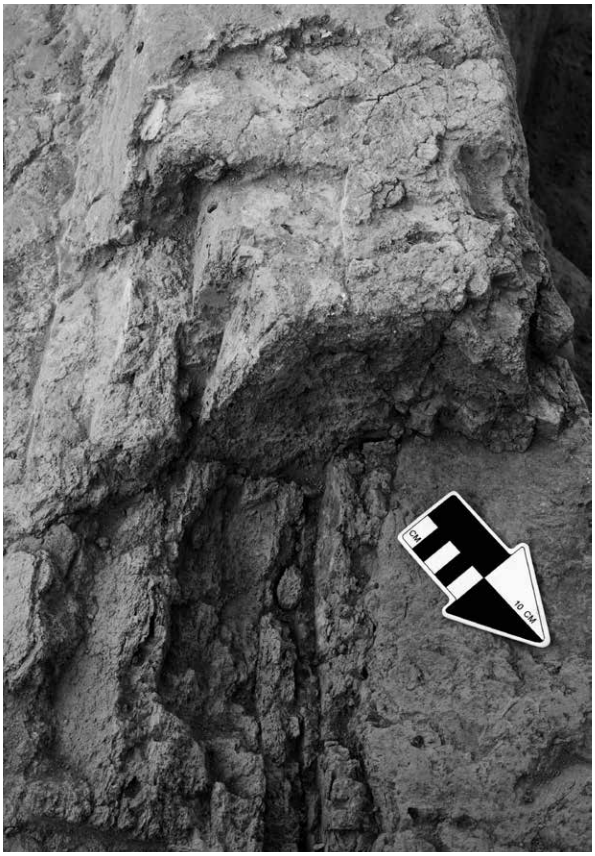

Fig. 4.13. Layers of plaster, D610, over threshold D625, seen from above. The north arrow rests on one of the bricks of the threshold.

threshold of the house as well as over the mud plaster of bench D606. Three floor layers were attributed to D343 (from the top: D343.1, D343.2, D343.3), consisting of chaff-tempered mud plaster on each of which was a thin, soft coating that in some areas could be seen to have been ocher-covered, although less well preserved than in the back of the house. Surface D343.2 seemed to run up to the step under floor D445. Oven D475/D611 was built in and on floor D343.

At the end of the use of floor D343, a relatively large grinding stone (see Fig. 4.18) and a stone ring were placed or left lying on the surface. In addition, at least two large bones lay on the last floor, one a fragment of a cattle pelvis. This is unusual; otherwise, remains of slaughtered cattle within houses at Monjukli Depe were a rarity, and investigations point to the special significance of cattle in feasting (Chap. 7). All these objects lay amidst a collection of at least 53 small, fractured stones with soot traces that were spread across the surface; similar collections were present on the western floor D445 and the southern outdoor surface D470. These appear to have initiated the phase of abandonment of House 10 (D3a2).

Locus	Installation	Since level:
D475/611	oven	D3b1
D606	bench	D3b1
D552	corner construction: bin	D3b2
D476	grinding installation	D3b2
D466	NE buttress	D3c
D426	SW buttress	D3c
D465	NW buttress (small)	D3c
D625	brick threshold	D3c

Table 4.2. Construction levels of the fixed installations in House 10.

The oven FI 44 (D611/D475) in the vestibule on floor D609/D343 consisted of two adjacent chambers (Fig. 4.15).[39] The northern chamber was broader and higher than the southern one. On the open, western side of the oven the bulging, semi-circular outer edge of the firing chamber extended ca. 24 cm into the room beyond the main portion of the oven. It is a feature reminiscent of the ovens at Jeitun as well as later types of “raised-box hearths” (see Chap. 6) and probably served to facilitate refueling. The walls of the oven were thicker in their upper parts, indicating renovations. The oven dome was no longer intact. Further down on the inner wall, two plaster layers could be clearly distinguished. The inner surface of the larger chamber consisted of seven relatively thin layers that all rose slightly toward the rear wall of the oven and three of which showed traces of burning. Possibly the form of the interior had something to do with a vent that was no longer identifiable. Between the surface on which the oven was constructed and the uppermost oven surface was a distance of ca. 18 cm. The oven had an exterior coating in the form of a white, limey mud plaster consisting of at least three different layers. Between wall D290 and the back of the oven there was an accumulation of objects including stones, bones, ceramics, and shaped clay (locus D618, a “corner deposit,” see Table 2.4 and Fig. 4.14). Apparently at some point the south side of the oven was connected to wall D290 to form a small southern wall of the oven (loc. D346). Due to the poor preservation of this structure directly next to the entrance to the house, it is not possible to state for sure whether it should be understood as a thin enhancement wall or a structure that connected the oven and the outer wall.

For Stratum III and thus for House 10, a maximum duration of 69 years was extrapolated from the radiocarbon analysis (Table 3.3). This means for the five phases (Table 4.1) a mean duration of 14 years. However,

39 For the complex pyrotechnical installations of Aeneolithic Monjukli Depe, see Chap. 6.

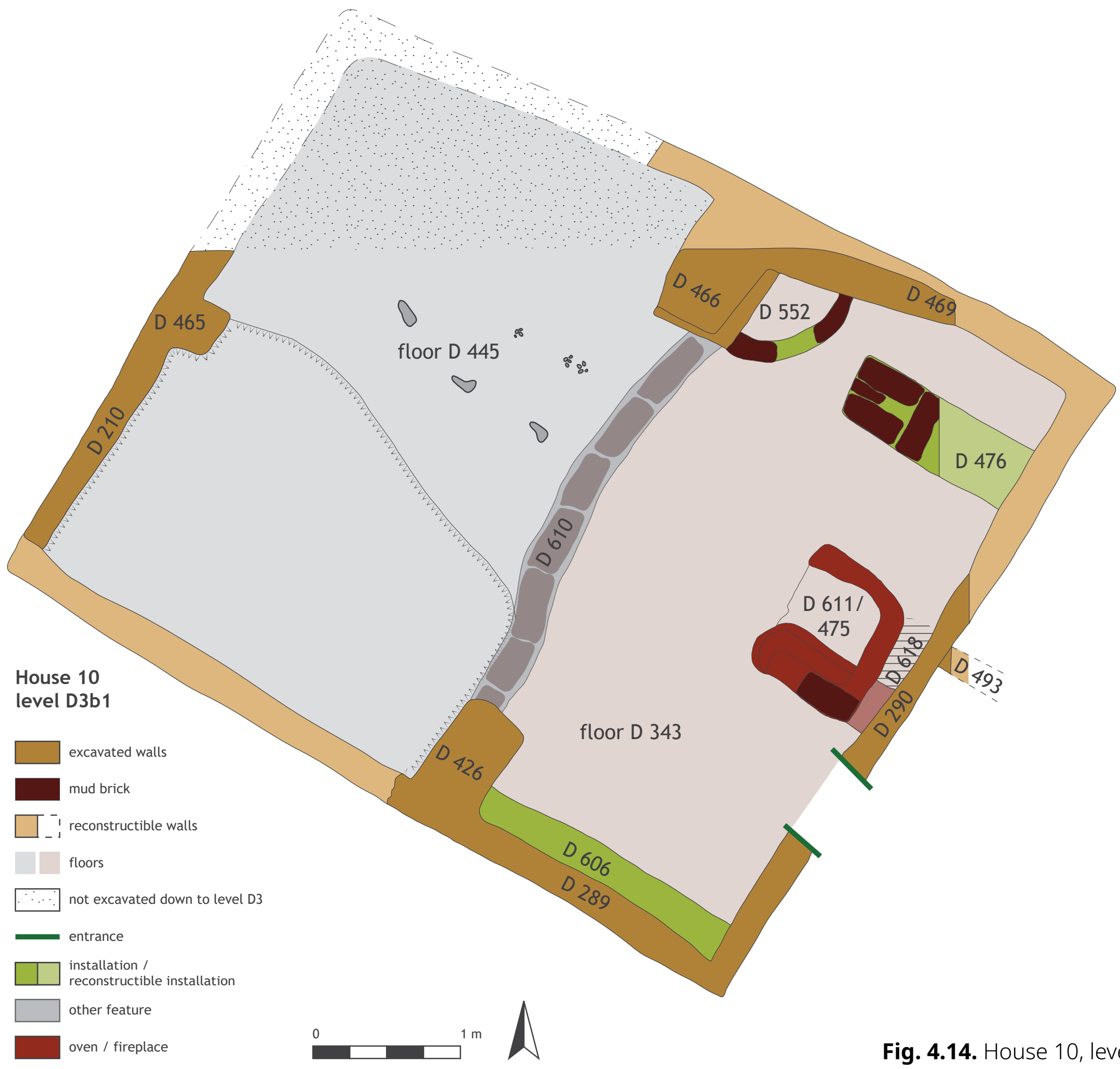

Fig. 4.14. House 10, level D3b1.

some of them, such as the founding and abandonment, were likely very short-term events, while "early," "main," and "late" use phases were likely to have lasted for some time. The many oven replasterings indicate that this phase may have been the longest one, and an estimation of 40-50 years seems reasonable, with renewal of the plaster minimally every five to seven years.

In the western part of the house under the main floor D445, there was not only the fill layer D608. In the profile of the Marushchenko sounding an additional gray surface (D551) was identified between D608 and D445 that could not be traced during excavation. D445 itself consisted of four to five individual, directly superimposed floors. Each one was a 0.5-1-cm-thick mud plaster with straw inclusions and a very soft, red coating. The same was true of floor D343 in the front of the house. Interestingly, only the last floor of D445 was not red, but white, with the exception of some red dots in the westernmost corner. Could it be that the floor was prepared as something happened that led to abandonment of the house?

Another important detail for the floor layers D445 is that they did not continue up to the small buttress D465 and wall D210 in the west, but broke off ca. 2-2.5 cm before it (Fig. 4.16). In the neighboring House 9 a similar gap between floor and wall was observed; in that case it measured 15 cm. This could be an indication that before the floor was laid, some kind of casing was constructed out of perishable material such as wood, leather, or reed mats. This distance between the floor and outer wall was observed in all layers of D445, but otherwise for none of the other floors nor in the front part of the house. It is an interesting question what purpose such a casing could have served. There are several options:

Fig. 4.15. The oven (Loc. D475/D611, FI 44) in the front part of the house. The detail on the bottom shows the plaster layers of the oven floor.

- Aesthetic: Plaited or woven material on the walls may have simply been regarded as attractive. Or perhaps boards were mounted into which something was carved or attached.
- Functional: Perhaps something was used to cover defects in the plaster or bricks of wall D210 rather than repair them. Speaking for this possibility is that at the time of floors D445, the wall was already in use for some time, and such a distance was not observed at an earlier time when the wall was still new. At the time of excavation, however, the plaster appeared to be in very good condition.
- Aesthetic-functional: It is also conceivable that, for example, boards were set up on which soft leather or furs were fixed. If people sat in this part of the house to chat or engaged in some kind of seated activities, the covering would have made it more comfortable to lean on the wall. The grinding stone found in situ on floor D445 near the rear wall lying in a pool of ocher makes a case for this: it is a tool that could only be used

Fig. 4.16. Detail of floor D445, showing the gap between the floor, buttress (D465, left) and wall (D210).

sitting or kneeling. Such a construction on which to lean could meet both practical and aesthetic requirements. The wall paintings exposed in House 14 (see Fig. 5.4) are an indication that residents were quite concerned with the aesthetic appearance of the walls. The findings in House 10 imply that wall decoration per se may not have been exceptional, but the type varied between houses.

Another special element of floor D445 were tracks that had been impressed into the moist clay, similar to the previous case of finger impressions in D621 in the vestibule. In this case, there were three to four dog pawprints as well as three small footprints of a child (Fig. 4.17; one pawprint was also found in House 1). The footprints ran in a relatively straight line from northwest to southeast, in the sequence left foot – right foot – left foot, with a stride length of 36-38 cm. This rather large distance between the footprints might be interpreted as a sign that the person was jumping. The feet themselves measured 17.5-17.8 cm in length (with faintly recognizable toe imprints), 4.9 cm wide at the heel, and 6.5-7.1 cm wide at the ball.[40] The pawprints were about 6 cm wide. Two of them pointed in the direction of the footprints, but at least one in the opposite (western) direction. For this reason, one could assume that either more than one dog left the pawprints or one was jumping back and forth. The single pawprint pointing in the opposite direction to the others appears to be slightly larger, which might support the hypothesis of two dogs, one a bit smaller than the other. All of the impressions – in particular, the human footprints – were relatively deep. There could be several reasons for this: either the dog(s) and the barefoot child ran over the fresh, moist clay, or a new floor dried very slowly. Suggestions can also be made regarding the movement of the child. Maybe she/he jumped or ran through the room, carried something heavy, or was him/herself heavy, thus producing the clear footprints. Or perhaps the child was trying to balance on an imaginary line, as on a beam. The running or jumping direction allows us to suspect a sudden change of course, because the second (right) foot is very far to the left. It seems as if at first the buttress D426 was the aim, but the child changed course to steer toward the oven. Of course, the pattern of the footprints could have been associated with the dog(s), as the prints were with high probability made at the same moment. It can be concluded that both dogs and children were allowed in this area of the house. This assumption stands in contrast to the apparent human-dog relationship in Neolithic Jeitun: Kasparov interprets the skeletal material found there to mean that there were dogs in the settlement but that they were not wanted in the houses (Kasparov 1992). It is interesting to ask when and why this relationship changed.

On this last floor of the sequence D445 lay various objects that can be divided into two categories: objects of use and burnt stones. The first category includes bone, a painted pottery sherd (Meana Black on Red ware), a large siltstone core, and a spindle whorl. One of the grinding stones had clearly been used for processing ocher and lay surrounded by a thick accumulation of ocher. A small translucent chalcedony blade core was also recovered. This complex find situation could be interpreted, according to Geoff Bailey's terminology, as a temporal palimpsest (Bailey 2007, 203-208). Accordingly, the objects would all have been part of the last use phase of D445, but they would have had "lifetimes" of different lengths. The grinding stone was already in use for some time, whereas the chalcedony core, for example, was probably the remnant of a more briefly occurring activity. It could be that mobile objects from earlier phases were stored or collected in some spot in the house, and only when leaving the house for good was a decision reached about what to do with the accumulated inventory, whether it should be taken along or remain in the ruins of the house. The phase of abandonment (D3a2), not appreciably later than floor D343 and D445, was initiated by the appearance of the burnt stones.

In the southern area outside the house, between Houses 10 and 3, there was a use surface, D470, attributable to level D3b1. Its condition pointed to simultaneous use with floors D343 and D445 inside the house, although stratigraphically the relationship was inconclusive. The surface was extensive and grayish, and on it, too, lay numerous small stones. This strengthens the presumption that the surfaces immediately outside these houses were perceived and treated as part of the house.

40 Based on the estimate of Dawnie Steadman, this would have been an 8-12-year-old; today, however, the foot length would correspond to a German shoe size of 28/29, which 4-5-year-old children wear.

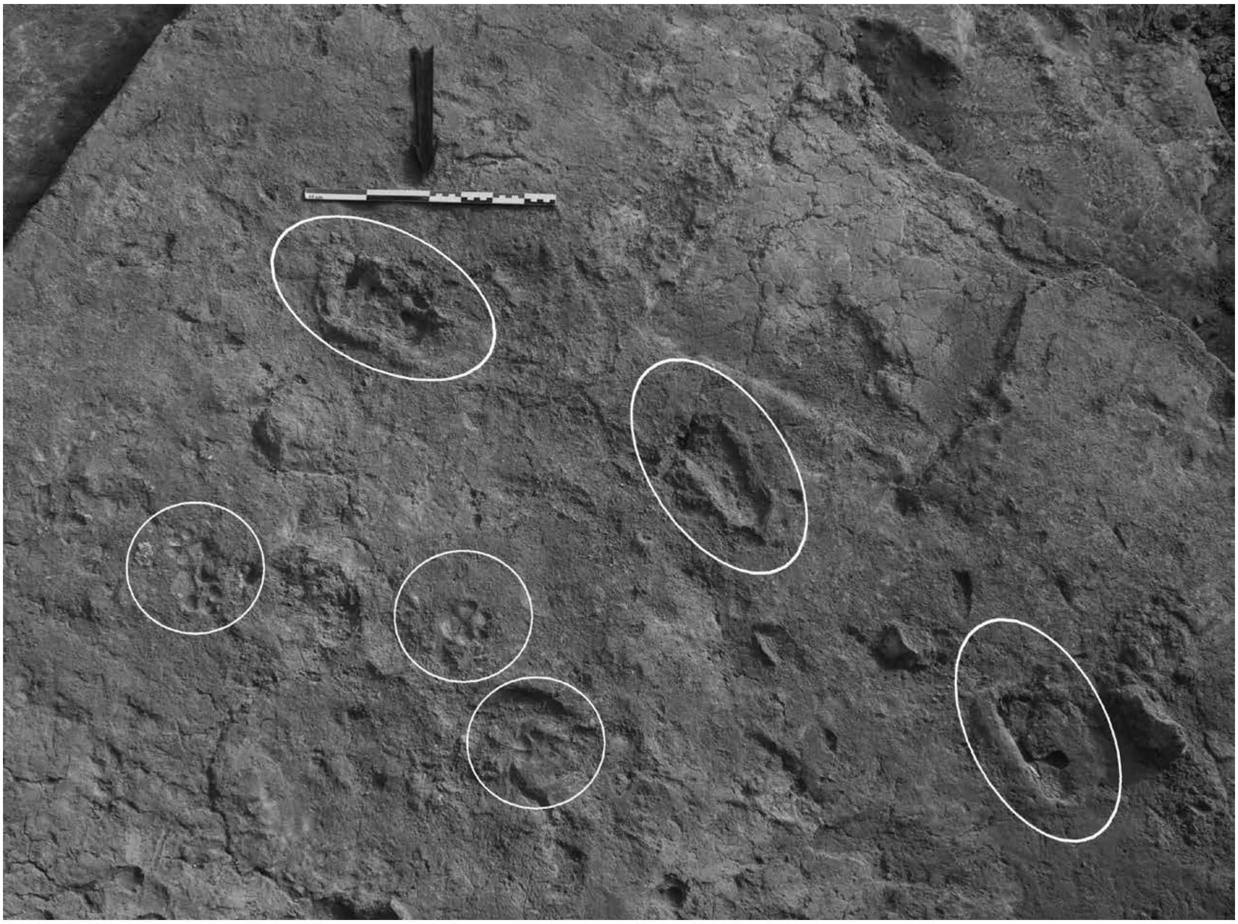

Fig. 4.17. Pawprints and footprints in floor D445 in the rear portion of the house.

Following this intensive phase of residential use, during which renovations took place and the house was elaborated by the construction of installations such as the oven, it turned into a ruin.

Abandonment (D3a2)

The complex decay and abandonment process began with the aforementioned deposition of numerous small stones on the floors in and around House 10 along with the blockage of the door with mud bricks (D499). The stones on the floor were on average slightly smaller than fist-size and up to 8-10 cm in diameter, very varied in shape, and in many, if not all, cases burnt and often split from the heat (Fig. 4.18). Especially in the back of the house (D459), in the southern outdoor area (D462), and above the door blockage (D337), there was a layer of ash. In the former vestibule the stones were covered by a thick layer of wall fall.

Although the many stones undoubtedly marked the end of the use of the house as a residence and thus constitute a significant event in its "life," the question arises of how and why the stones got there. If they were originally on the roof in order to weigh it down in this windy region, there must also have been an overhang south of wall D289 because stones were also found there, unless parts of the roof slipped over wall D289 as it collapsed. Did it have a particular meaning that the small stones were almost all burnt? And should not more remnants of the roof have been found than only two fragments (loc. D444; Fig. 4.20)? A possible scenario would be that the house was abandoned for some reason, and the door was blocked. Shortly thereafter, the roof collapsed and with it the stone weights, which were left lying where they fell. Or the house was abandoned and the roof dismantled because of its reusable materials, in particular the long, straight wooden beam(s), which are rare in the region. Only the stone weights would have been left behind, because they were not in short supply and reusing them was unnecessary. The stones in the outdoor area could have been tossed there, depending on the sequence of dismantling and the question of whether there was a roof over the outside area. After the roof was gone, the ash could have blown or been thrown in. In her examination of House 14, on the last floor of which many stones were also found, Hana Kubelková considers such a scenario to

Fig. 4.18. View of the stones on floor D343 in the front portion of the house (southern part, with a large grinding stone visible in the upper left).

be very unlikely (Chap. 5). As that house met its end in a fire, she argues that roofing material would have to have been found under and between the stones.

A second option would be that something lying on the floor was weighed down with the stones. It is conceivable that the intention was to leave the house only temporarily. To preserve the quality of the flooring, mats were placed on it and kept in place by small stones – if in fact the floors were not regularly covered with perishable materials such as reed mats, as appears to have been the case for at least one floor (E186) of House 2. Then the doorway was closed. If the residents had returned, they could have removed and/or replaced the mats and used the house again easily. For some unknown reason, no one ever came back to the house, the stones remained on the floors, and the organic material decayed. In this case it would not be easy to explain how the thin layer of ash ended up on the stones before the layers of wall fall. Was the ash scattered there, perhaps against vermin? A similar scenario is also imaginable for House 14, although Kubelková points to the fact that no traces of burnt mats were discovered (Chap. 5).

A third option would be an abandonment ritual. The end of the house was thereby marked symbolically, as is known from other places.[41] For some reason, people decided to abandon the house, and the last residents gathered stones, possibly those that had been previously used in ovens or fireplaces and therefore were sooted. They placed them on the floors of their old house, to consciously and collectively initiate the transition from house to ruin. Perhaps all of the people who lived in the village at that time were involved. Each person may have brought some stones and celebrated together the impending change. Depending on the reason for abandoning the house, such a ceremony might have served several purposes. There might have been purely practical reasons, such as the wish for more space in the center of the village, and for that reason House 10 had to be given up. Or the people who lived in House 10 had built a new house elsewhere. Then a “closure” ritual of the house would have had the character

41 For example, Ruth Tringham (1991) analyzed such destruction rituals at the Neolithic site of Opovo, Serbia.

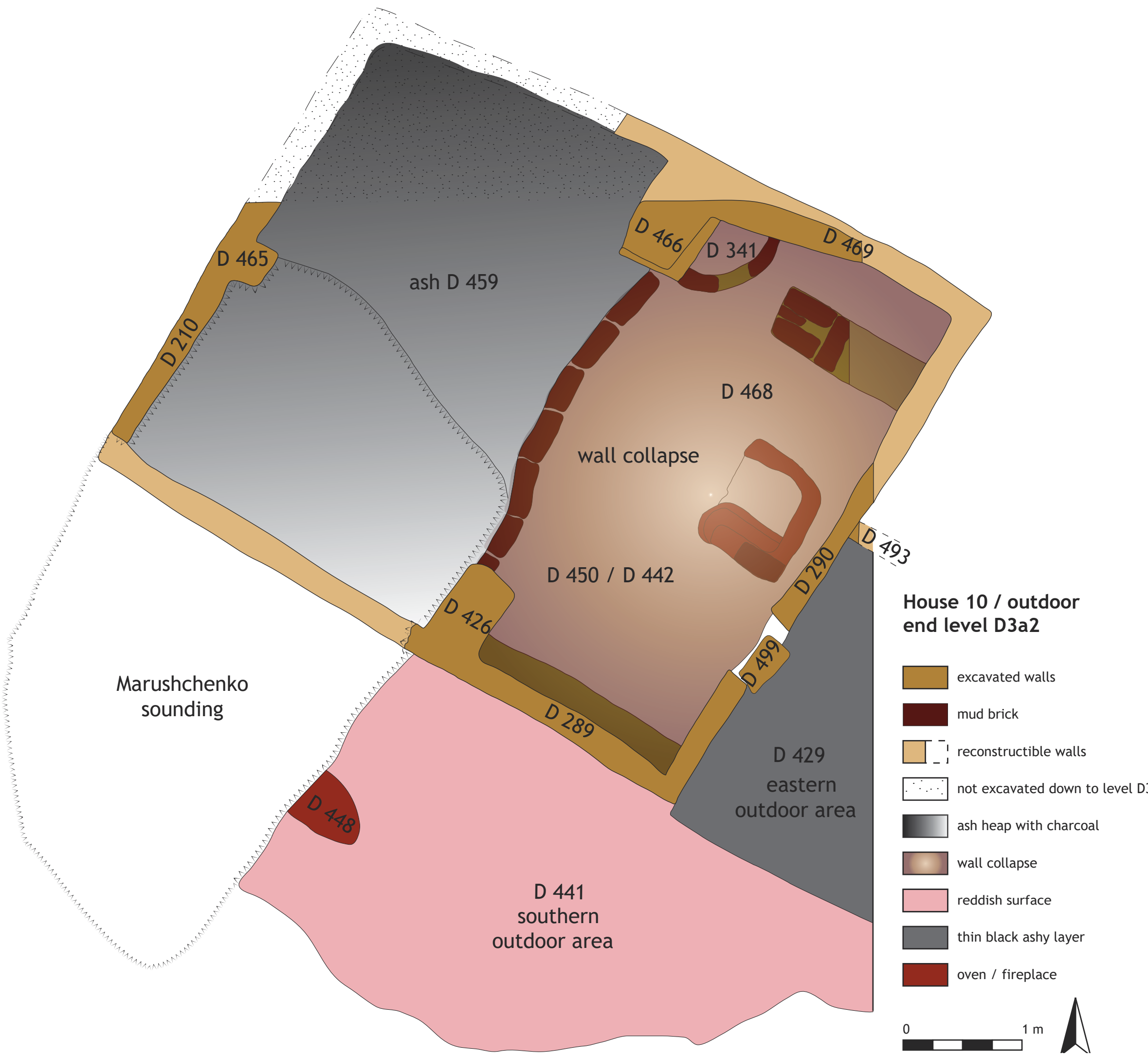

Fig. 4.19. House 10 and outer surfaces at the end of level D3a2. Stratigraphic connections among the different areas cannot be specified definitively.

of a farewell and conversion from house to ruin or open space. It could also be that there had been a bad omen or even a fatality in connection with the house, such as the death of one or more members of the household from disease, violence, or the like. Afterwards, the scattering of the stones might have served to bury the calamity that was associated with this place. They closed the door and left the uninhabited house to decay. Soon after, the collapse of the walls began.

In the former vestibule there was a layer of wall fall up to 56 cm thick over the stones, almost empty of finds (Fig. 4.19). In the lower layers – loci D468 (north), D450 and D442 (remaining area) – immediately above the last floor D343 and just north of the buttress D426 were two fragments of roof fall in loc. D444, white in color and unmistakable due to impressions of thin, parallel branches of roofing material in them (Fig. 4.20).

Above this layer came mud-brick debris (loci D440, D342, D329/330). The various hard clayey layers of the decayed house show that the upper part of the walls and the associated mud bricks must have had the previously described white coating.

The installations such as oven, bin, and bench in the front portion of the house were also covered by the fallen debris, filling the corner installation D552 with very hard mud-brick debris (D341).

In the higher back area of the house, the situation was slightly different: on the former floor D445 and its stones lay a ca. 20-cm-thick layer of ash interspersed with charcoal, which rose steeply to the northwest (D459,

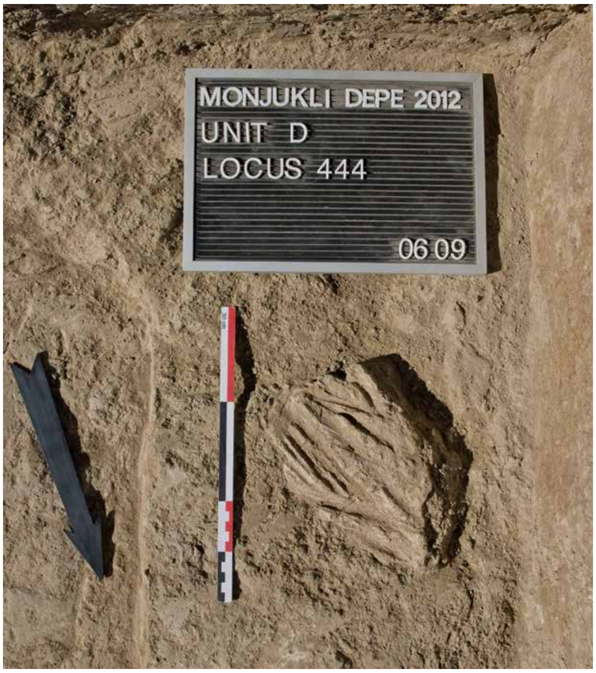

Fig. 4.20. Fragment of roof fall in situ. Note the white color and impressions of thin branches.

Fig. 4.19). In the far northwestern corner this ash was particularly thick. It lay under and next to very dense wall fall (D455, D456), suggesting that House 10 had stood empty without a roof and was used a trash dump for a while before the walls fell in. Within the wall fall a token, among other things, was found (Chap. 13, Cat. 13.62). Although the corner at which walls D210 and D469 most likely met has not been excavated down to this level, one can nonetheless conjecture about the nature of the ashy deposit. It seems that after the roof was no longer present, the ash was thrown from the corner over the walls into former House 10, resulting in a heap near the wall and less to no material in the front section of the house. If already in this stratum a "public" or at least openly accessible area existed northwest of House 10, it would be easy to imagine that the ash was thrown over the wall stumps from this side. The exact street or surface level from which the house was approached is, however, unknown.

Also in the eastern outdoor area right outside the entrance, ash lay over the last hard, red surface (D428). It consisted of a thin, black ashy deposit (D429) and thus appeared different than the aforementioned locus D459 (Fig. 4.19). Above it was, once again, wall fall (D424). The deposition on the outer surfaces to the south were somewhat different than the collapse inside and next to its door. Following surface D470 and the stones south of wall D289 came, first, ash of variable thickness (D462, thicker in the west near the Marushchenko sounding). Subsequently, there was a very uneven, reddish surface (D441), which shows that people continued to walk – and possibly work stone, according to the microdebris analysis – in the area between House 3 and the remains of Houses 14, 9, and 10. On surface D441 was a simple hearth in the form of an oval pit (D448), and likely the pit of the grave MDB11 was dug from there. Later on, mud-brick debris (D439) from wall D289 fell onto this surface and was in turn covered by a gray-blue layer of soft, fine material without finds (D326). Above locus D326 was once again a thick layer of wall fall that thinned out toward the south (D322) and therefore clearly originated from House 10.

Later use (D3a1-D2)

After the end of its residential use and the subsequent collapse of the roof and walls, the ruins of House 10 were turned into a dumping ground with a large fireplace. This has been defined as level D3a1. A large amount of ash was thrown into the area of the former house (D316, at the location of the former threshold). Directly on top of the thick mud-brick collapse a sandy, pink to chalky white thin surface formed, probably through the construction of one large or several small adjacent hearths. This fire installation(s) was located directly on top of the wall collapse of level D3a2 and was excavated in several loci (D435 as the "master locus," containing loci D431, D430, D335 [south], and D432, D425 [north]). In this area, approximately in the middle of the former house, were burnt pieces of mud brick, stones, including some that were worked, black ash, pottery, and large animal bones, including two cattle skulls.

What followed was the uppermost and final layer of wall fall in the area of the former vestibule (D311). It consisted of bricky material, burnt clay, animal bones, and stones, especially in the northwest where the amount of ash and stones point to the existence of a small hearth. On this very uneven layer or surface of stones and bricky collapse lay once again a gray-beige ashy deposit (D297, D298), which was recognizably deposited *within* the wall stumps of House 10. Only the layers above this deposit (D296, D281-D284) ran partly over the ruined walls D289 and D290. They are the lowest layers of a large rubbish pit containing much burnt debris, and thus they mark the transition to the next use phase of the area: from the existence of a house to a large, presumably public feasting area, the Eastern Midden (Chap. 7). The same sequence is documented for the southern and eastern outdoor areas. There, a fill consisting of ash, stones, and mud-brick fragments (D321) covered the last wall collapse. This and the following fill layers point to the use of the area as the Eastern Midden from level D2 onwards. This did not occur immediately after the abandonment of House 10, as waste, ash, and mud-brick fragments run over the remains of wall D289 and buttress D426 (D416-418, D421-423). It is unclear whether the later occupants of Monjukli Depe were aware of the structural remains beneath the feasting area, and if so, how long it remained in the general consciousness. House 14 seems to have been remembered for some time, as is suggested by a burial (MDB11) in which the skull lay on the buttress of the abandoned house (Chap. 8).

The possibility that House 10 as well as Houses 7 and 8 had to cede their place to a planned, communal feasting area appears unlikely due to the complex and protracted process of House 10's decay. Otherwise the house would probably have been completely cleared away or filled with rubble relatively quickly to prepare the next surface. It is certainly conceivable, however, that feasting had already begun on top of the ruins of the house in level D3a2.

"Hiatus," the present, and a summary

The "life" of House 10 should not, however, be considered to be complete. The Eastern Midden emerged where the house had been, and the area and indeed the settlement continued to be inhabited for some time. With the abandonment of the village, the knowledge of this specific house was certainly lost. Only in the year 2011 did it once again see the light of day when it became an object of archaeological research. In 2013 the building was almost completely excavated and thereby destroyed, at least materially.

In this way, the house went through a 7000-year history, in which its physical state corresponded to a sequence of particular uses (cf. Kopytoff 1986, 67):

1. design and planning
2. construction
3. use as a residence
4. internal transformations (new installations, floors, etc.)
5. abandonment: symbolic(?) end, fireplaces in the ruins, garbage dump
6. object of memory(?) at the time of the Eastern Midden
7. forgotten ("hiatus") until 2011
8. archaeological object
9. excavation/destruction
10. virtual existence as the object of a 2015 Master's thesis and a book chapter

Scenarios

In this section I turn to two fictional – but data-based – scenarios that extend the interpretation of the previous results. They are used to connect the information about House 10 as a "biographical object" with subjects who dealt with the house differently in each of its states and projected their ideas into it.

My experimentation with alternative forms of writing in archaeology was inspired by critiques of the language traditionally used in scientific discourse (cf. Tringham 1991; Spector 1993). This critique begins at two levels: not only were and are women (or marginalized groups in general) neglected in the reconstruction of the past, but the canonical narrative form of archaeological discourse demands that we take a seemingly omniscient, objective, neutral, but at the same time male-dominated perspective.[42]

Deviations from this standard way of writing should not be dismissed as speculative and unscientific (cf. Tringham 1991, 102), but rather should be understood as an alternative. They allow us to impart faces to archaeological sites while drawing on scientific knowledge,[43] as shown in the following section. This approach therefore stands in stark contrast to post-factual knowledge generation where emotional interests are judged higher than factual rebuttals.

The objection, as voiced by Reinhard Bernbeck (2015, 261), that experimental narratives and the invention of a necessarily fictitious past brings with it a patronizing attitude toward past subjects applies in my opinion in the first instance to archaeology as a whole. By creating it, archaeology is necessarily patronizing toward the past. Secondly, precisely this form of writing and interpretation can contribute to an understanding that every scientific work involves a colonization of material and people. By trying to make an individual visible, one encounters the limits of one's research in a productive way that may open up new questions (Gibb 2015). Did the people in Monjukli Depe give themselves names? What feelings did the former residents connect with their buildings such as "House 10?"[44] To what extent did people think of themselves as selves, as coherent subjects?

While my previous analysis is conveniently impersonal and linguistically distanced and in that respect fits well into a scientific discourse, the following section drove me out of this "comfort zone" and reminded me of my own gender-, age-, and social-status-related[45] constraints of thought.[46]

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42 Cf. Bernbeck 2015, 258-259. This male perspective is often also used – without reflection – by women in science.

43 Cf. Van Dyke and Bernbeck 2015, 10.

44 For example, a definition of "house" and its distinction from terms such as household, corporate unit, or the like requires an engagement with the problem of implied meanings, such as nuclear family, kinship, etc. Only with the description of House 10 from a first-person perspective did I become aware of *feelings* that I associate with the word "house" – namely, security, family, privacy. A "neutral" definition of the word at the beginning of a scientific paper does not convey these subconsciously thought or felt associations, or it does so inadequately.

45 Tringham suggests with reference to Michael Shanks that our imagination is active throughout the entire archaeological process. The problem of the inevitably modern worldview of the archaeologist should, in her opinion, be addressed transparently (Tringham 2015, 37-38).

46 That experimental projects have the positive effect of bringing the boundaries of archaeological knowledge to light is noted by Ruth Van Dyke (2015, 83) and James Gibb (2015, 165).

I respond to Bernbeck's further objection that history in general and fictionalized scenarios in particular try to reconstruct the past as coherent with the presentation of two scenarios rather than just one. In that way I wish to make clear that the performance of all events, both real and imagined, always depends on the temporal and spatial location of the viewers and participants.

Mindful of the above critiques, the following two scenarios are short, fictional segments constructed around the appearance of the foot- and pawprints in floor D445 in the rear of House 10. They are fictitious, but based on empirical data from the previous section (cf. Tringham 2015, 30). I chose these impressions of paws and feet, since they open a very small time window into the history of House 10, thereby facilitating the writing of the scenarios. A narrative of an everyday occurrence would also have been suitable.

Tracks in the wet clay

I had just turned the corner into the open area on the way to the house on the other side when I heard loud, excited voices. I had not expected that. After his sudden death a sad silence hung over the house, which is why I had rarely been over there lately. I could not bear this oppressive atmosphere, and I tried as best I could to avoid the village gossip. Well, I had evaded a part in ridding the house of his ghost and bringing water for the new plaster, so I had at least to admire the result, in the place where I had formerly spent so much time… Why suddenly this noise? In front of the entrance, up against the little wall were a bunch of older women. It was cold, and they held their coverings close. As soon as they saw me coming, they waved at me to hurry. I ran a step faster, but stopped abruptly. Suddenly I was scared. What if someone else had become ill? I started again – this time more slowly. As I came up to the group, one of the women laughed and said, "Go on in, you'll like it!" Now I was curious. I sank down on my knees and crawled into the house. Here it was a lot more comfortable, the oven radiating a pleasant warmth. I blinked a few times to get used to the darkness and the smoke in the air. The smell of wet clay rose to my nostrils and triggered a bad conscience. I should have helped to put down the new floor over the one on which he had lain until the end, a new one for a life without him. A loud whimpering brought me back from my thoughts. To my left on the bench sat the little girl whom I had been trying for weeks to teach to plait baskets. The result – three unfinished, already disintegrating pieces – lay in our small junk room behind the house. She is still too wild and playful to concentrate for long or work conscientiously. Now she was crouching there quietly; beside her were piled up skins and mats that were left there until the back part of the house could be used again. I got up and turned my head to the right, where I made out three figures in the semidarkness. One of them, the head of the house, held her dog tightly by the neck – hence the whining! They seemed to have hardly noticed that I had come in and spoke passionately. "… That's why I say, it must remain so! It is no coincidence that the marks are visible right there," I heard one of them say, and I looked in the direction in which he pointed. Directly behind the step, in the middle of the room, one could see clearly in the still gleaming clay the imprints from the dog and the girl. I let out a loud laugh. The others turned to me, startled. "What are you doing here? I didn't hear you come in!" "I only wanted to come and see how it looks here, the others said I should come in," I replied, only with difficulty suppressing a grin. "How did it happen?"

The woman sighed and began to speak. One of the men had started this morning to make the red pigment. While he was squatting next to the oven at the grinding platform and rubbing the red-brown stone into powder, it came to his mind to celebrate the occasion by using the good, painted bowl to hold the powder. It stood on the mud shelf, directly behind the buttress, where the horn was. Despite the oven, the freshly laid floor was drying slowly because of the damp, cold weather. That's why he said to the girl that she should carefully slide along the buttress and the wall and bring him the bowl, so that he would not destroy the surface with his weight, even though the edge already looked more stable than the center. So she headed off, and he turned back to his work. "For fun," as she said, she grabbed the bowl, and, instead of turning around, slid further along the wall to circle the room. She had not gotten very far when one of the dogs came in.

"This one," the woman said, lightly shaking the animal in her grip.

The man had noticed nothing of all this, until he heard the barking and could only look on as the dog lunged elatedly toward the child. The dog had just reached the threshold when the girl hopped away to prevent him from coming onto the wet clay of the floor. The dog, animated by the child's movements, jumped and landed beyond the threshold. Meanwhile the man had realized what was going on and stood up in a split second to call the dog back. Child, dog, and bowl arrived simultaneously in the front of the house.

"… And now we're considering what we should do," the woman finished the story, while she looked hesitantly at the foot- and pawprints, and then turned to me. Only now did I notice the barely visible remains of crumbly clay in the dog's coat, as he looked around with sad eyes, not understanding what was happening to him. I could no longer help laughing out loud. That did me good! "Is that not exactly what the house wanted? A new beginning and, moreover, one with joy after all the mourning?!" I said to the others and felt it to be that way.

Naptime[47]

She looks up at the sun and then at her watch. Only 20 more minutes, then the rickety excavation bus will finally bring them all back to the house. Sweat stands on her forehead, and her knees hurt; a romantic excavation looks different than this… Now one of the damned sandflies stung her in the neck. She rubs her hand over the itching place and leans back on the profile, while the two others take pictures of the impressions that she spent the entire morning exposing. "Crazy," it runs through her mind, "how for thousands of years somewhere in the desert the footprints of a person have been preserved for whom what we are studying here so scientifically may have been home. What did this person think and see? And what will I find at some point? Oh, home, in one's own bed and shower, mhmm…"

Suddenly she hears a menacing growl from a distance that makes her cringe. "Fortunately I have a rabies vaccination," goes through her head as she notices that something else is different. She looks around and can scarcely believe her eyes: around her, walls are sprouting out of the ground, where she had just been sitting there is now a large, completely intact oven, and above her the sky darkens while with the blink of an eye the roof covers the walls like a blanket. The air has also changed. It is much more humid and saturated with a smell that she cannot quite place – perhaps a mixture of some dried plants and smoke? Before she really understands what is going on, she hears again the growl, this time much closer and more aggressive. Anxiously, she looks around. The smooth white walls make the interior of the house appear less dark. She stands in the middle of the front room, the "vestibule" as they always say during the excavation. Directly behind her in the back, a little boy presses himself against the wall and stares full of fear at the big dog that already has his front paws on the step between the two buttresses. Now I see whom the dog is growling at with bared teeth: in addition to the child, and obviously just as scared, is a large puppy with his tail between his legs. It is a heart-rending sight, but even though the big dog stands right in front of her, she cannot move, she feels paralyzed and invisible. Helplessly she looks around and notes that the area of the house in which she is standing is full of clutter, while in the back everything seems to be empty. From the thick roof beams resting on the buttresses hang reed mats, rolled and knotted with thick twine. On the floor there are similar mats that yield slightly under her weight. To her left, directly in front of the bench, is a loom from which loom weights dangle. While she looks in that direction, it becomes briefly brighter. In the doorway someone pushes the leather curtain aside and crawls in. The person seems not to notice the student, but goes immediately after the dog, which leaps towards the two little ones, barking loudly. Apparently following a defensive instinct, the puppy also jumps in – and the child behind it. The child staggers for a moment as the two dogs land on top of each other, but catches itself and runs sobbing into the outstretched arms of the adult. With a free hand the adult grabs the big dog at the nape and pulls him brutally back. In the meantime, someone else has come into the house: the loud barking must also have been clearly audible outside. Swiftly, the second adult comes closer and gives the dog a whack on the nose. It looks as if the dog belongs to her, and loudly cursing, she pulls him into the open away from the puppy. Completely distraught and whimpering, the puppy snuggles up to the leg of the child.

The three of them look at the spot where the mini-attack has just occurred. The student slowly begins to understand: the front is full, because in the back a new floor was being prepared! And there she also sees the traces that she had uncovered that day. And even more! Sometimes easier to see, sometimes less, depending on how dry the plaster was, and further to the left small foot- and pawprints can also be seen. The puppy and the little boy must have run to the back along there. Aha! She wants to take a step toward the three, but suddenly somebody is shaking her shoulder.

"Hey! Hello! Want to stay here? Can't get enough, huh?"

She squints into the wide grinning face of a fellow student. "Oh no, how embarrassing!" she thinks, as she realizes that she had simply dozed off. Already more awake, she proclaims loudly, "I just had a vision."

"Oh yeah?" the other one looks at her with amused doubt.

"Yes! They left the impressions there because they put mats on the ground anyway."

"Haha, I don't think so. In my vision I saw a ritual in which a child and a dog *had* to walk there to mark that this was a purely adult house where animals and children were never again allowed to go," she responded, still grinning.

"Hm, we will probably never find out the truth…" replies the other, rubbing the sleep from her eyes.

"You may be right. But you know what you can find out? What there is for lunch today. Because I already asked yesterday." Laughing, both run to the excavation bus.

Summary

This paper offers an example of the presentation of a biography of one of the houses from Monjukli Depe. Such an investigation, isolated from the rest of the architecture, is focused on small-scale changes and allows the

47 I would like to thank my fellow students in the Near Eastern Archaeology Department in Berlin, who gave me inspiration for these fictional narratives through joint brainstorming regarding story ideas and with their general support.

reconstruction of specific events in connection with one house. The approach I used could be employed for each of the houses at Monjukli Depe with its own particular sequence of events.

The analysis of House 10 in the form of a biography was conducted for the different house areas and use phases. Although not always clearly definable, these “biographical sections” were combined in order to create as far as possible *one* life history. The analysis was based on the study of the complex building sequence and formation processes of the house, as reconstructed from the excavation field diaries, photos, and plans. In this way, not only could several phases be identified – from the construction, through modifications during the main usage, to abandonment and conversion to a dump – but also changes in construction techniques (flooring) or interior design (wall covering in the back) were identified. The different phases were visualized through photos of finds and features and corresponding plans. Each phase description was followed by a materially based interpretation, set within the context of the prior and subsequent situation. The results should be complemented by ongoing micro-archaeological investigations of everyday practices at Monjukli Depe as well as by phytolith analyses in order to delve deeper into changes and developments in the use of the house.

One episode from the “life” of House 10 was taken a step further. It was a short-lived, single event, the traces of which had been literally impressed into one of the floors. Using the foot- and pawprints of a child and dogs that were found in the back of the house, I developed two scenarios in which the situation that produced them was examined fictionally. The goal was less to find the “true” sequence of events than to visualize people and animals from the past who lived in and with House 10. These stories emphasize that the results of the actions that were carefully recorded in House 10 were not produced by faceless entities, but are rather testimonies of many individual biographies of real people. Most of the processes associated with Building 10 in Monjukli Depe go back to their decisions and activities.

Chapter 5

“Fire is a Good Servant but a Bad Master”

The Burnt House 14 at Monjukli Depe

Hana Kubelková

Keywords: *architecture; conflagration; house burning; burnt bone; fire investigation*

Introduction

In this chapter, I examine a burnt house, so far the only completely burned one out of 20 excavated from the early Aeneolithic settlement in Monjukli Depe.[49] The title of my contribution is based on a common Czech idiom that expresses the ambivalence of fire.

Most of the fill of House 14 consisted of ashy layers or layers with ashy inclusions, and in some cases the walls show traces of burning. This chapter addresses the question of how this house burned down and possibly why. By combining three different approaches to this question, I hope to reach a more realistic outcome than by using a single line of evidence. The three approaches consist of (1) description of the archaeological stratigraphy, with deductions based on observations recorded during the excavation, (2) estimations of temperature changes based on the color of fragments of burnt bones from flotation samples taken from the fill of the building, and (3) calculations by fire investigators based on a tentative reconstruction of the building.

Burnt houses in archaeology

A burnt house carries within it a great deal of information about a unique set of archaeological conditions that allow materials that would otherwise perish without a trace to be preserved. Twiss et al. (2008, 50) point out that the question of why or how a house burned down is an important one to investigate, as the reason behind the fire has interpretative implications for the material contents of the house. For example, accidental fire is more likely to preserve a “snapshot” of the quotidian spatial distribution of material than an intentional conflagration that did not result from violent actions (Chapman 1999, 118). Good preservation is the reason why house conflagrations have been a part of archaeological discussions, both methodologically and theoretically. Theoretically, it is a question of how to view the house itself – for example, as a complex artifact (e.g., Stevanović 1997) or a set of practices (Brami 2014) – or the significance of fire in society in general (see overview in Tringham 2005; Chapman 1999). Methodologies for the study of

49 This chapter summarizes my Master thesis, which is available at https://is.muni.cz/th/383287/ff_m/Kubelkova_MA_FINAL.pdf. I would like to thank Dr. Inna Mateicuicová for her helpful insights.

burnt houses have been based mostly on fire investigation techniques (e.g., Stevanović 1997; Harrison 2004) and experimental archaeology (e.g., Bankoff and Winter 1979; Dennis 2008). Structures made of clay (pisé, mud brick, wattle-and-daub) are of interest for the purposes of this chapter, and therefore I will limit myself to ideas and methodologies developed for these types of structures. They stem mainly from the area of southeastern Europe and western Asia.

Burnt wattle-and-daub structures from the Neolithic and Aeneolithic/Chalcolithic in southeastern Europe have received a great deal of attention; in fact, this phenomenon has been named a "burnt house horizon" (Tringham 2005, 98). In 1978, in the wake of a debate that was starting about burnt structures in the region (for an overview, see Tringham 1991; 2005), Arthur Bankoff and Frederick Winter conducted an experiment on a wattle-and-daub house in former Yugoslavia. They set a house on fire by deliberately letting a cooking fire get out of control. After 20 minutes the fire subsided enough for someone to be able to enter the house. They observed that this kind of spontaneous fire would not result in the quantities of clay and daub burnt to a point of vitrification that was found in ancient settlements (Bankoff and Winter 1979, 14; Stevanović 1997; Chapman 1999; Carneiro and Mateiciucová 2007). The occurrence of these highly burnt structures has been studied in detail by Mirjana Stevanović (1997), mainly at the Vinča site of Opovo. Using a thorough analysis of rubble fragments, she came up with a set of conditions (e.g., multiple ignition points, high temperature fire)[50] that, when met, should indicate an intentional fire. In her work she concluded that the houses in Opovo must have been intentionally set on fire. She argued that, apart from utilitarian functions, houses also had a symbolic meaning that had the potential to remain visible even after the end of their use-life. In her words, "Even though a burned and collapsed house becomes invisible by being covered by humus and/or by another house on top, it retains its visibility and its mnemonic potential" (Stevanović 1997, 388).

John Chapman, also mainly working in southeastern Europe, summarized and discussed six explanations for burnt houses that had been advanced up to the time of his writing (Chapman 1999, 115): (1) invasion, (2) accidental fire resulting from pyrotechnical activities (e.g., cooking or baking), (3) burning a house to make its construction stronger and water-resistant, (4) enabling reuse of clay in other constructions, (5) cleaning purposes/fumigation to get rid of insects or other animal pests, and (6) deliberate destruction as a completion of the life-cycle of the house and its contents. These six explanations are still considered to be valid options, and the general possibilities for a conflagration in prehistoric houses fall within this range. However, the possibility of accidental fire in a clay structure has been shown to be highly unlikely (Bankoff and Winter 1979; Stevanović 1997; Harrison 2004; Dennis 2008).

In western Asia, where buildings were traditionally constructed mostly of clay (mud brick or pisé), some sites also exhibit multiple burnt buildings, for example, Çatalhöyük (Turkey) and Tell Sabi Abyad (Syria). In Neolithic Çatalhöyük the burning of buildings starts around Levels VII to VIB (Cessford and Near 2005, 175). In three case studies from the site, Karl Harrison (2004) has shown the benefits of incorporating forensic fire investigations in analyses of traces of burning of structures. Craig Cessford and Julie Near summarized what has been observed regarding burnt structures at Çatalhöyük and further argued that, "the site's inhabitants undertook the burning of buildings at Çatalhöyük deliberately and … the burning was related to the abandonment of buildings" (Cessford and Near 2005, 171). The key aspect in their work was contextualization of the phenomenon – looking at fire itself and the multitude of relationships the inhabitants had with it, as visible in the beginnings of use of fire on the site, the placement and use of fire installations, and burial practices. In a further analysis of another mud-brick building from Çatalhöyük dated to the mid-7th millennium cal BCE, the authors discussed two possible reasons for deliberate burning, either „insect infestation and/or to ritually 'close' the house" (Twiss et al. 2008, 51). Designation of the burning as deliberate was based on the recognition of multiple ignition points and deliberately introduced fuels and/or accelerants.

Maxime Brami (2014) has tried to tie together the burnt houses in Anatolia and southeastern Europe. He suggests that "parallels in the material record between Anatolia and the Balkans, such as countless mentions of burnt houses, call attention to similar attitudes to residence and construction across vastly distant sites" (Brami 2014, 163, Figs. 1 and 2). Key in his work was a practice approach and emphasis on "the definition, origins and chronology of each practice." Practices, as defined in his paper, are "marked […] by repetitions in the material record" (Brami 2014, 162), and he looked for these repetitions by comparing sites from a given region in three contexts that he viewed as linked to different stages of the life-cycle of buildings – the burning of houses, vertical superimposition of houses, and intra-settlement burial.

Another site with multiple burnt buildings is Tell Sabi Abyad in Syria. The transitional pre-Halaf to Early Halaf settlement known as the Burnt Village was composed of rectangular, multi-roomed buildings and circular structures, both made of pisé (for the burning, see Verhoeven 1999, 59-64). These structures were built up against each other (see Akkermans and Verhoeven

50 The conditions have been discussed in detail by John Chapman (1999, 117-119).

1995, Figs. 2 and 3). The cause of the final destruction of the Burnt Village remains unclear. Peter Akkermans et al. (2012) examined the wholly burnt Building V6 (Late Neolithic) that closely resembled the Burnt Village in terms of destruction by fire and the richness of the material found within. They noted that,

> "the stratigraphic sequence in the burnt building of V6 is very much in agreement with modern experimental conflagrations of clay-made, flat-roofed structures: first, a layer of highly burnt fine ashes on the floor, then lumpy compact deposits representing later roof and wall collapse, and, finally, a layer of charred roof timbers, burnt-out reed imprints and clumps of mud." (Akkermans et al. 2012, 310)

They concluded that the burning was deliberate and further specified it as possibly a "part of a ritual associated with the burial of a young woman, prior to the fire, on the floor of the building" (Akkermans et al. 2012, 321).

Other Neolithic and Chalcolithic sites from the Near East have also yielded burnt structures. The whole settlement of Early Neolithic Aşağı Pınar was burnt (Özdoğan 2011). Eylem Özdoğan concluded that it was an intentional, controlled fire and possibly ceremonial. The Burnt House from Tell Arpachiyah in northern Iraq was reexamined in 2000 by Stuart Campbell. He identified three characteristics that supported the idea of a ritual destruction: "It is a collection of specifically the finest objects. Some objects may well have been deliberately smashed. Burning was involved" (Campbell 2000a, 23). In her 2008 dissertation, Samantha Dennis used experimental archaeology to reexamine issues surrounding architectural remains. One of the experiments she conducted involved a conflagration. She documented not only the behavior of fire in a clay, flat-roofed structure, but also the resulting debris and the way it was affected if left uncovered for one to twelve months (for details see Dennis 2008, 163-179).

In these studies there seem to be four common questions that researchers ask when dealing with burnt structures:

- What is the significance of the building in the community?
- Was it an accidental fire or perhaps a conscious act of destruction?
- Was the building still in use for daily living and work at the time of the conflagration, or was it specifically prepared to be burned?
- And, finally, a methodological issue: How can we reach answers to the above questions?

From the studies mentioned here, it is clear that there is an array of options regarding the interpretation of burnt structures; a reconstruction will be dependent on particularities of local contexts. The difficulties lie mainly with the limits of what the material can reveal. Past weather conditions and subsequent post-depositional processes affect to a great extent what an excavation yields. Many of the methods incorporate fire investigation and analogies to similar archaeological contexts in a given region. Unfortunately, there is no reported analogy for burnt houses in early Aeneolithic southern Turkmenistan. With regard to fire-investigative approaches, it is important to bear in mind that the current methodological guide for fire investigators puts the utmost emphasis on being at the site of the fire as soon as possible. Two main reasons for this are that eye-witnesses might still be present to be questioned and that the fire investigators can see for themselves how the fire was put out or managed (what had to be moved, where the fire was the fiercest, etc.). The rest of the procedure – a thorough documentation of finds and contexts – corresponds quite closely to a typical archaeological one (Pekar et al. 2011, 19-24). It is even possible to reconstruct a prehistoric fire via up-to-date software used by fire investigators; however, the accuracy of the reconstruction is highly dependent on the information we as archaeologists are able to provide (Miloš Kvarčák, 2015, pers. comm.). The precise calculations needed for a definitive rather than a probable reconstruction of how a building burned down are dependent on accurate data concerning the dimensions of the building, shape of the roof, routes of access for air, and flammable contents of the house – what they are, their weight, and their positions.

An approximate idea of how long it would take for a house to burn down and destruction to have occurred can be achieved through cooperation with fire investigators, as demonstrated in existing archaeological literature (e.g., Harrison 2004) and as will be shown here using the example of House 14 from Monjukli Depe.

House 14 at Monjukli Depe

House 14 is situated slightly to the southeast of the center of the mound in excavation unit D. The building was stratigraphically confined to Stratum IV, the oldest Aeneolithic level (Chap. 2). It is part of a row of houses with minimal space between them (Fig. 2.17).

The house is nearly square, following the general pattern at Monjukli Depe. It is divided into two parts by T-shaped buttresses (Fig. 5.1). There was an opening in the northeastern wall, D467, that was at some point blocked. Unfortunately, the building could not be fully exposed, as part of it was cut by the Marushchenko sounding and a smaller part of the southern corner lay outside the excavation unit. However, during the excavation seasons 2012 and 2013, its complete stratigraphy was documented.

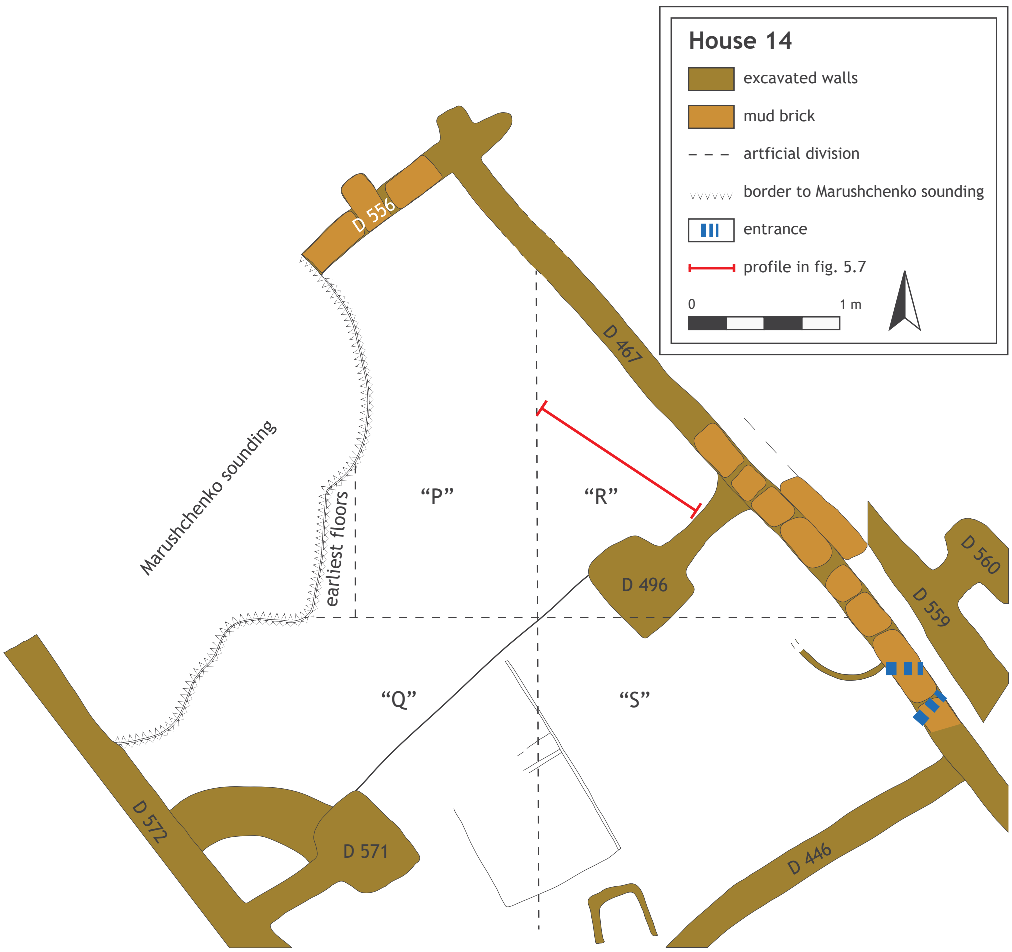

Fig. 5.1. House 14, extent of excavation at the end of 2013. Dashed lines indicate arbitrary divisions into areas made in the 2012 excavation season.

Excavation of House 14

The house was first encountered in the 2012 season. Because of the difficulties in excavating the loose, ashy fill, it was divided into four artificially defined parts – areas "P", "Q", "R", and "S". Area P, situated to the northwest of buttress D496, provides the longest stratigraphic sequence, as it reached down, albeit in a small area, to the first floor of the house. In the 2013 season, the upper floor was exposed over the whole area of the building within Unit D.

The following section deals in detail with the internal stratigraphy of the house. I start my narrative from the bottom (the earliest attested phase) and move upwards.

Construction and earliest use phase of the house – level D4d

Level D4d, the stratigraphically oldest sublevel of the house, was reached only in a small area in the western part of Area P next to the Marushchenko sounding. A compact ocher-covered floor overlaid by a fill layer was followed by a set of five successive floors. All of them were ocher-covered and followed one another in close succession with little fill between them.

Latest use phase – level D4c

The oldest exposed level in the house was designated level D4c. The inner space of the house was divided by two T-shaped buttresses. In addition, the perception of a change in space was enhanced by a step situated between the buttresses. The step divided the building into an upper and a lower part (with a ca. 4-7 cm height difference, the lower part being the southeastern "room"). The interior of the house was covered by a mud floor.

As can be seen in Fig. 5.2, wall D467 is the longest exposed wall. It is approximately 5 m long and 25 cm wide, the width of one mudbrick. The wall was preserved up to 1.5 m in height but was lower towards the north. There was mud plaster on the wall, although the number of attestable plaster layers varied, with the northwestern portion having four layers and the southeastern portion only two. The color of the latest plaster layer is buff to light

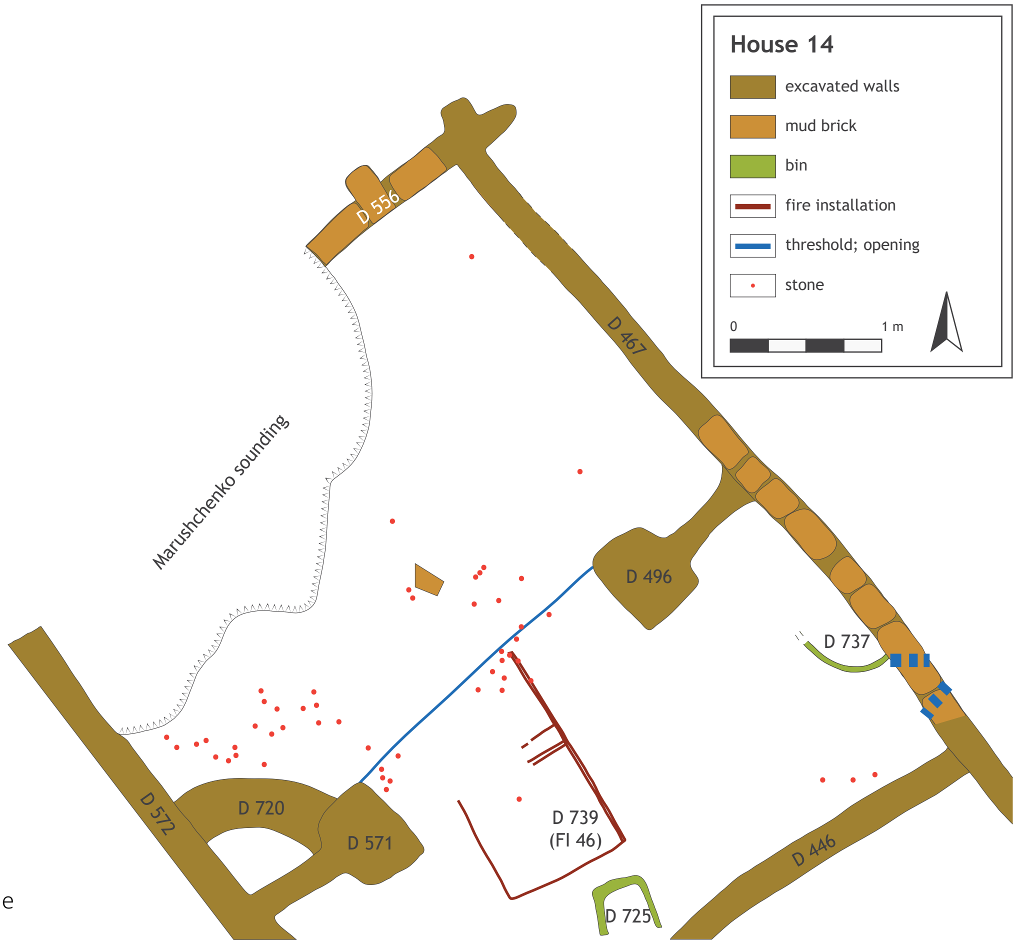

Fig. 5.2. House 14, the latest floor level.

red. In the southeastern portion of the wall there was an entrance. It was 0.56 m high and roughly conical in shape (Fig. 5.3, with its location indicated on Fig. 5.2.). At the floor level, there was a threshold associated with this entrance.

Wall D446 was exposed only partially, as its southwestern end lay beyond the limits of the excavation unit. It was preserved to an approximate height of 1.3 m although somewhat less towards the west. Four mud plaster layers were observed on this wall. The color of the top plaster layer varied from brown to reddish brown. Along the upper part of the southwestern portion of the wall there were visible traces of fire; these will be discussed in more detail below. Wall D572 was also exposed only partially: The northern part was cut by Marushchenko's sounding, and the southern part runs beyond the limits of Unit D. It is the highest preserved wall in the house, reaching up to approximately 1.8 m. This wall, too, was plastered with mud, of which there are two discernible layers. The top plaster layer on the wall was buff in color.

Wall D556 was the least exposed as Marushchenko's sounding cut away most of it. It was possible to discern three individual mudbricks. The one in the middle was laid at a 90° angle to the line of the wall, creating a protrusion on the northern side. With a height of approximately 0.8 m, wall D556 was not as well preserved as the others. The plaster is buff in color.

Fig. 5.3. Entrance in wall D467.

Buttress D496 remained standing to a height of 1.4 m. On two faces of the buttress there were paintings. On the northwest side, facing the back of the house, was a red design consisting of two anthropomorphic figures (Fig. 5.4;

see also Fig. 2.20). On the southwestern face, opposite the second buttress, was a second painting, also in red with a tree-like motif set above a net pattern. Apart from the painting itself, the buttress was also plastered with at least five distinct layers. Buttress D571 was not as well preserved, having been cut down at the time of burial MDB11 (see Chap. 8). It was covered with four layers of plaster (Bernbeck and Pollock 2016, 73-75).

The interior of the building was covered by a mud-plastered floor. Its characteristics, mainly color and slope, differ throughout the house. In the southeastern corner at the junction of walls D467 and D446, the floor was light pink, but in the vicinity of the entrance light brown. The floor slopes markedly downwards towards the west. Towards the center of the room, it was less clean with less material lying on the floor, in color greenish-gray to pinkish. In the southwestern portion of the house, the floor showed a pinkish color, in the northwest greenish with traces of red, towards the northeast buff-white to pinkish. The pinkish/reddish color may have been a remnant of a once ocher-

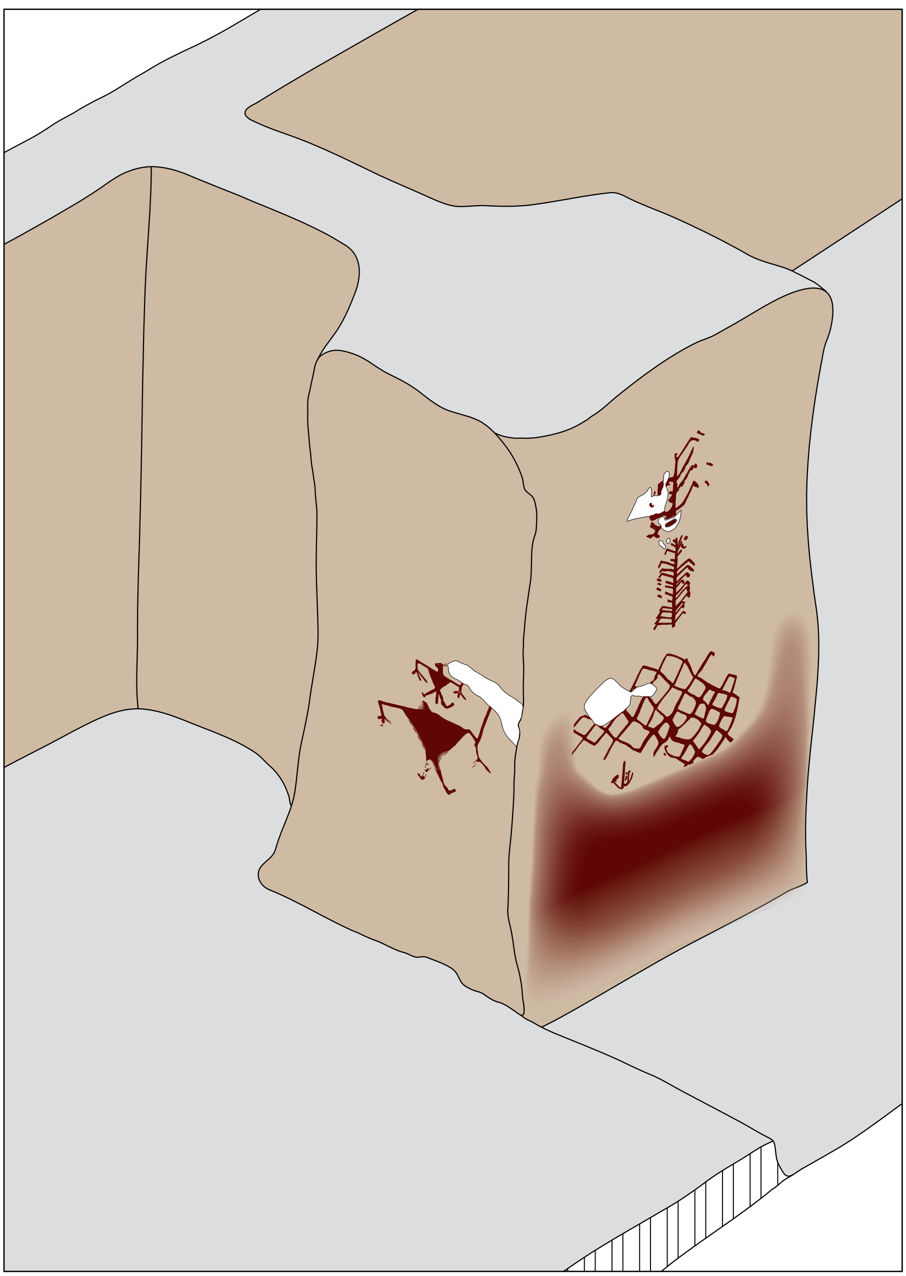

Fig. 5.4. Painting on buttress D496. Reconstruction by Nolwen Rol.

colored floor, with the fading of the color a consequence of living in the house and extensive use of the surface (cleaning, walking, sliding/shoving items, etc.). The light brown color near the opening, in conjunction with the sloping of the floor in that area might also have resulted from the ocher wearing off, if the opening had been used for sliding/shoving/rolling objects that would have been otherwise more difficult or labor-intensive to get into the house. A similar pattern of use wear near the door was observed in House 10 (Chap. 4, D3b2). The greenish shade is more enigmatic – it occurs only in the center of the house and in the northwestern parts, varying from greenish gray to greenish. Traces of this color were also encountered near wall D446 as compact green-grayish silt and in the lower deposit in bin D725 (Fig. 5.2) in the form of compact greenish-brown to brown deposit. Did something stand there and weather/decay in a special way that led to this color? Or is it an indication of fire? The greenish coloring was observed on mud plaster in Sabi Abyad, and in burnt building V6 it was attributed to fire. It was also noted that "the ash layers in the rooms were covered with significant deposits of hard-burnt crumbly clay pieces (probably parts of the mud roof cover) and wall fragments, grayish-brown to greenish in colour, intermingled with ashes" (Akkermans et al. 2012, 309).

Based on these parallels I am inclined to see the greenish areas on the floor and in the deposits near wall D446 and in bin D725 as indicative of how the building burnt down. The greenish color of the plastered floor is, as also noted by Akkermans et al. (2012, 309), likely the result of the interaction between the fire and the plaster. The color might indicate either places where burning roof material fell or offer potential clues towards the ignition point for the onset of the conflagration within the house.

In the subsequent description, I discuss the house in two sections. The southeastern one is delimited by walls D467, D446, and the step that runs between buttresses D571 and D496. The northwestern section refers to the area within walls D467 and D556, the Marushchenko sounding, and the step.

In the western part of the northwestern section near buttress D571, there were numerous stones. Many lay directly on the latest floor (Fig. 5.2), while some were incorporated into the bricky layer covering this part of the floor. Adjacent to wall D572 and buttress D571 is a bin formed of a curving wall, locus D720 (see parallel examples in House 3, Fig. 2.22, and House 10, D552, Fig. 4.12). This wall formed some sort of bin or shelf. Within the bin was a thick layer of plaster that curved up from the floor to the buttress D571. In the eastern part of the northwestern section, there were stones on the floor, including a heavy, broken ground stone, and one animal bone. There were also some animal bones on the floor near walls D572 and D720 as well as a fragmentary spindle whorl. Otherwise the floor was clean.

In the southeastern section there were some more stones in front of the northeastern face of buttress D571 and others along wall D446 (Fig. 5.2). In the center of the room was a more or less rectangular fire installation, FI 46 (locus D739). It is marked by a dark brown line, continued by a line of small pebbles, and surrounded by a compact, greenish silty deposit with some orange burnt patches and charcoal. Towards the step between the buttresses there was a brick and right next to it a concentration of burnt stones. To the south of the fire installation a rectangular bin was exposed (locus D725), 0.5 x 0.4 m and approximately 0.2 m high. Its inward-leaning walls were thickly plastered and colored red on the northern face. The base of the bin was not recognized during excavation and had to be deduced from the profile. The bin contained no finds. In the easternmost part of the house, attached to wall D467, was a small, shallow, rounded installation that may also have been a bin (locus D737). It may once have had a semicircular form, but only half of it was preserved. The bin's walls were only 4 cm high.

This concludes the list of installations and artifacts constructed on the latest house floor and directly tied to the final use phase of House 14. Intriguing are the stones lying in clusters on the floor. House 14 was not the only one in the settlement with such a distribution of stones: There were also fist-sized stones on the last floor of Houses 10 (Stratum III; Fig. 4.18) and 11 (Stratum I; Fig. 2.52). Their distribution may be an indication of the intentional abandonment of these houses.

Also important with regard to fire of any kind is access to air. There is only one attested opening, in the southeast of the building. The excavations yielded no evidence for any other opening, such as doorways or windows, in the house. How did the inhabitants get in and out? Was the entry situated in the area cut by the Marushchenko sounding or in the southwestern part beyond the boundaries of the excavation unit? A door in the area of the Marushchenko sounding would be unexpected, based on the layout of other excavated houses at the site. The possibility of an entry in the southwestern wall remains to be investigated. Alternatively, could the inhabitants have entered through the roof? The shape and structure of the roof are uncertain, making it questionable whether an entry through the roof would have been possible.

Burning and destruction of the house – level D4b

To understand the burning and destruction of the house, a division into southeastern and northwestern spaces is useful. The events seemingly took a different course in those two areas of the house (Figs. 5.5 and 5.6). The following description attempts to capture the complexity of the deposition by referring to locations in both horizontal and vertical dimensions.

Northwestern section

The fill in the northwestern – or back – part of the house was a mixture of ash and wall fall/bricky material (for a schematic sequence of deposition, see Fig. 5.5). These two components were sometimes found in an alternating sequence, elsewhere mixed. In general, the more compact bricky material was found in the western part, whereas more evidence of burning (burnt bricks, ash, etc.) was observed towards the center and eastern portion of this space, especially in the vicinity of buttress D496. In this area the sloping layers of ash and other deposits were the steepest (Fig. 5.7).

The floor was covered by ashy to bricky deposits. In the first five cm, the bricky material – likely wall fall – was concentrated near the walls, i.e. to the northeast and southwest. Towards the east the wall fall became mixed with ash and burnt brick. The layers directly above the floor contained a few stones and large quantities of unfired clay rings, ca. 2-5 cm in diameter with an unknown function. The stones were located in the same areas as the clusters shown in Fig. 5.2. This might suggest that they were part of the wall fall in this area or intentionally laid on the floor. The clay rings were found among burnt bricky material, but they were also incorporated into the dark ash adjacent to it (Fig 5.5A).

The step area was partially covered by a mixture of silt and clay on the higher level and very compact bricky material in the lower area (Fig. 5.5A). The eastern part of the back section of the house occasionally showed a thin yellow to green silty layer directly over the floor.

Higher up in the stratigraphy, the northwestern portion of the house was filled with ash and bricky material, with the ash more pronounced towards the east (Fig. 5.5B). The center of the room contained a sequence – moving from the base upwards – of 1) red to buff, possibly burnt deposit, 2) thin white, soft material, and 3) a buff, bricky deposit. The eastern portion contained mostly dark gray

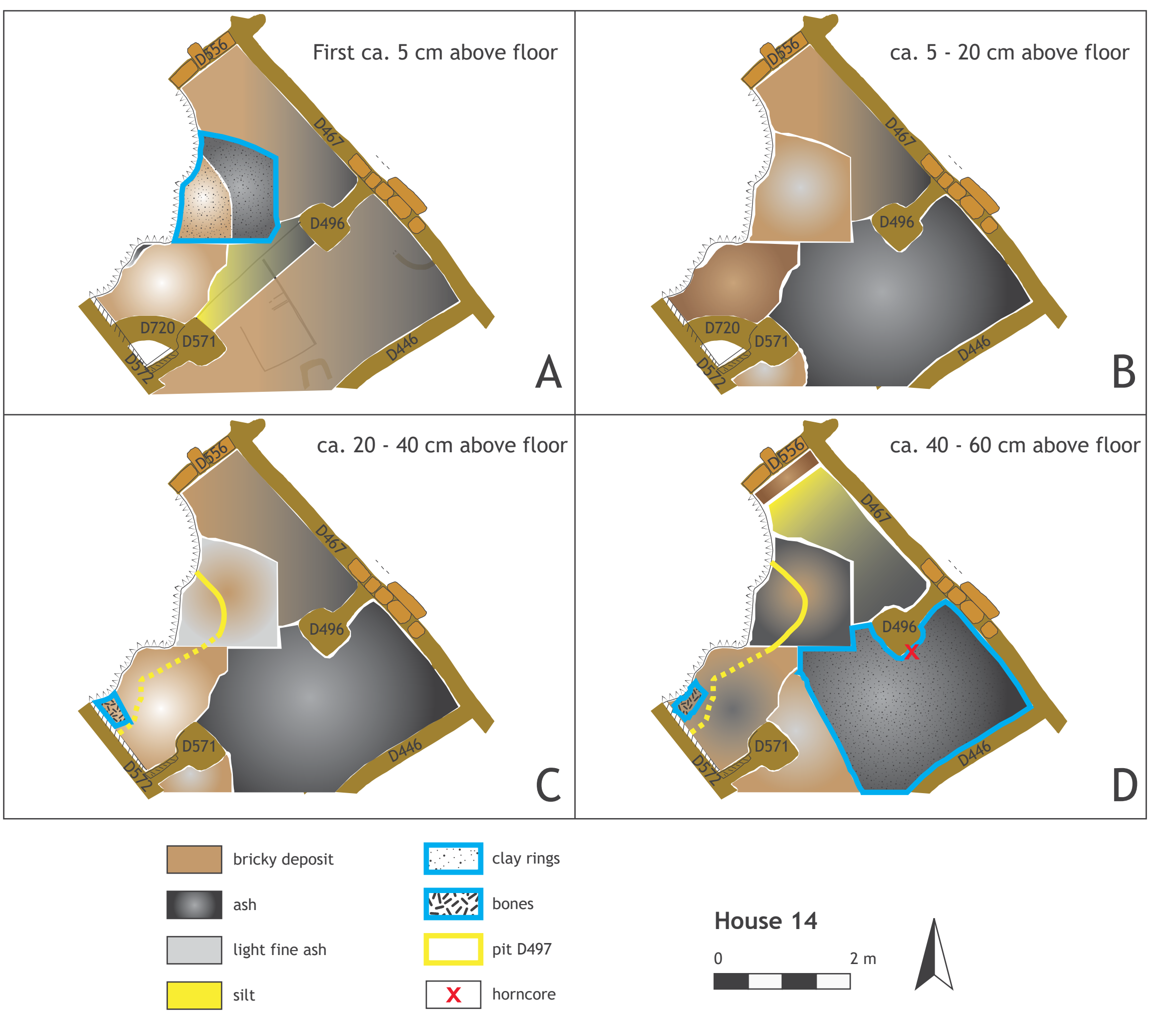

Fig. 5.5. Visualization of the deposits in House 14 up to 60 cm above floor level.

ash, although it was brickier towards wall D556. Above it was whitish-buff ash (Fig. 5.5C). Towards buttress D496 and wall D467, the ash became much darker, with small bits of burnt clay and charcoal. Near wall D556 there was a massive, dense packing of beige to white and one burnt orange brick as well as hard, crumbly material. The ash ran between and under the bricks.

The 20-cm-thick upper deposit in the eastern portion of this space was very heterogeneous, consisting of compact, whitish-buff, silty material with more pronounced ash near buttress D496 (Fig. 5.5D). Towards the northwest it became harder and beige-colored with some light brown to gray ash containing much chaff. Near the wall the deposit was darker in color.

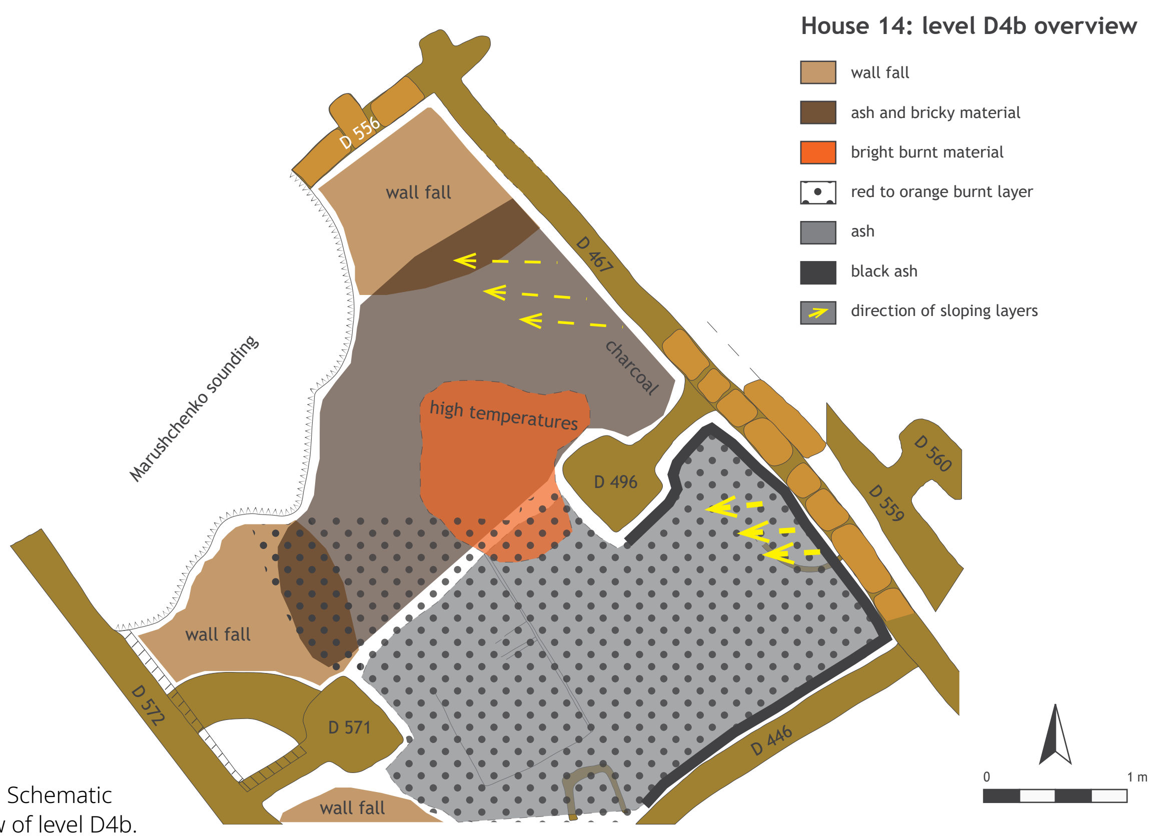

Fig. 5.6. Schematic overview of level D4b.

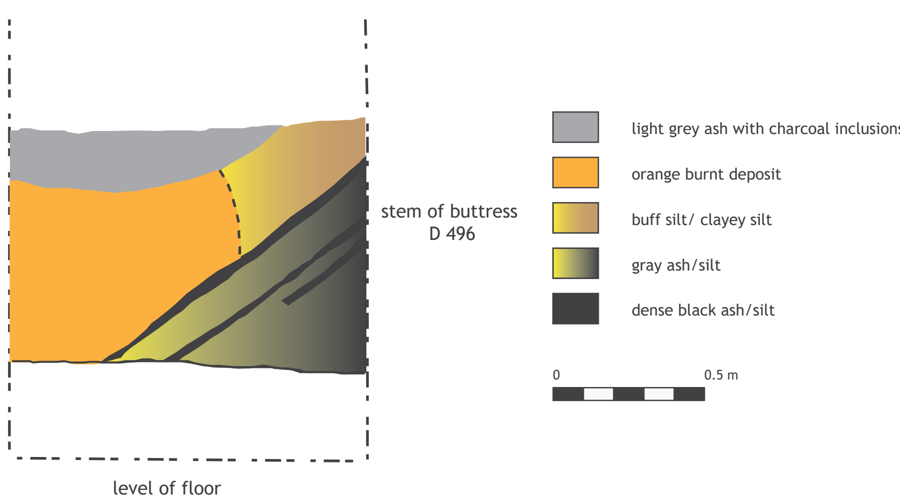

Fig. 5.7. Profile in the back of the house near wall D467 showing the steeply sloping layers. For the location of the profile, see Fig. 5.1.

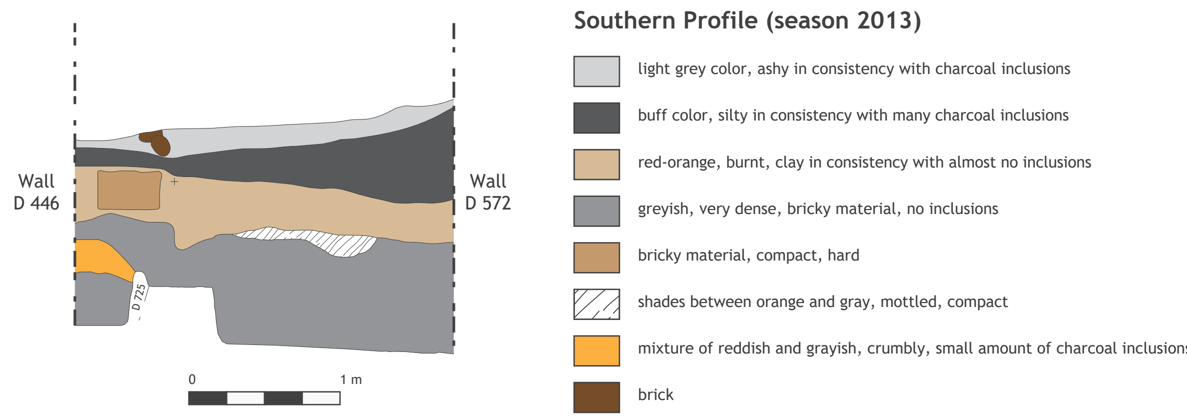

Fig. 5.8. Southern profile in House 14.

Southeastern section

Some aspects of the two sections of the house are similar, but the east or front part shows many more signs of burning than the west. The layers do not show a slope similar to those in the northwestern part of the house (compare Figs. 5.7 and 5.8).

Above the floor there was a 10-cm layer of bricky material except in the area near buttress D496, which consisted of a softer deposit with burnt orange patches. The bricky deposit was covered by brown to reddish-brown ash with silty and clayey inclusions and pieces of unfired pottery, followed by more dark ash. The dark ash was quite thick, and towards the east there were signs of variation in the burning as indicated by a range of orange to brown burnt material. Near the southwestern face of buttress D496 were several dark brown burnt bricks lying obliquely. The dark ash contained numerous figurines, spindle whorls, and pieces of shaped clay, among which were many clay rings (Fig. 5.5D). In front of the opening to the house in the southeastern corner was a roundish area of dark brown to black ash (FI 45, see Chapter 6). The whole front part of the house was overlain by a red to orange burnt deposit that sloped markedly from wall D467 towards wall D572 and extended into the northwestern and central part of the back area. However, along buttress D496 and walls D467 and D446 there was black ash rather than orange burnt deposits. Either materials burned differently in this area, or perhaps something organic was hanging on or near the walls. The situation was the same in the western area near the south baulk and buttress D571. The burnt orange deposit contained almost no artifacts.

Abandonment of House 14 – levels D4b/4a

Higher up in the stratigraphy, the division into two areas loses its analytical relevance, and henceforth I will discuss the house as a whole. Generally speaking, the situation is similar throughout the building, with a mixture of wall fall and ash in varying proportions (Fig. 5.9). In the final phase of abandonment, some walls or portions of them were covered by building material or more ash.

At the presumed beginning of the abandonment, the center of the house was covered by ash, very fine and bluish in color. Around the buttresses was primarily wall fall and bricky debris. In general, the eastern portion of the building contained more ash than the western part. In the center of the back of the house, a pit was dug into the earlier layer of dark ash (Fig. 5.5 C & D). The pit was approximately 0.3 x 2.0 m and 0.4 m deep with a fill of extremely hard material consisting of stones, ash, and mud; the northeastern part contained 218 animal bones, mostly sheep/goat but also some cattle.[51] The pit was closed with a setting of upright bricks. Its uppermost elevation was 286.79 m, the lowermost 286.43 m. The southwestern part of the pit approximately 25 cm above floor level contained two pieces of human maxilla with teeth. Slightly above them was a partial human skull (see Table 8.4). There were also large quantities of animal bones, including the upper part of a sheep skull, a horn (probably of a sheep), and several nearly intact animal scapulae (Fig. 5.10). The northeastern portion of the pit was then covered by approximately 0.6-0.7 m of debris, changing gradually from ash with brick fragments to gray ash, dark red burnt earth with ash, and followed by loose, brownish to gray ash (Fig. 5.9). The western portion of the pit near buttress D571 was again covered by wall fall with sizeable pieces of mudbrick, among which were also large amounts of bone and much shaped clay. Above this lay a gray ash layer that contained the impression of a basket in the form of a thin, burnt clay coating that must once have lined its interior. The basket was surrounded by ash, charcoal, and large quantities of burnt sheep/goat dung as well as fallen bricks (Fig. 5.11). North of buttress D571 there was dark ash that gave way to reddish buff silt towards the

51 A portion of the pit was identified during the excavation in 2012, the remainder recognized after the fact (Ilia Heit, pers. comm., 2018).

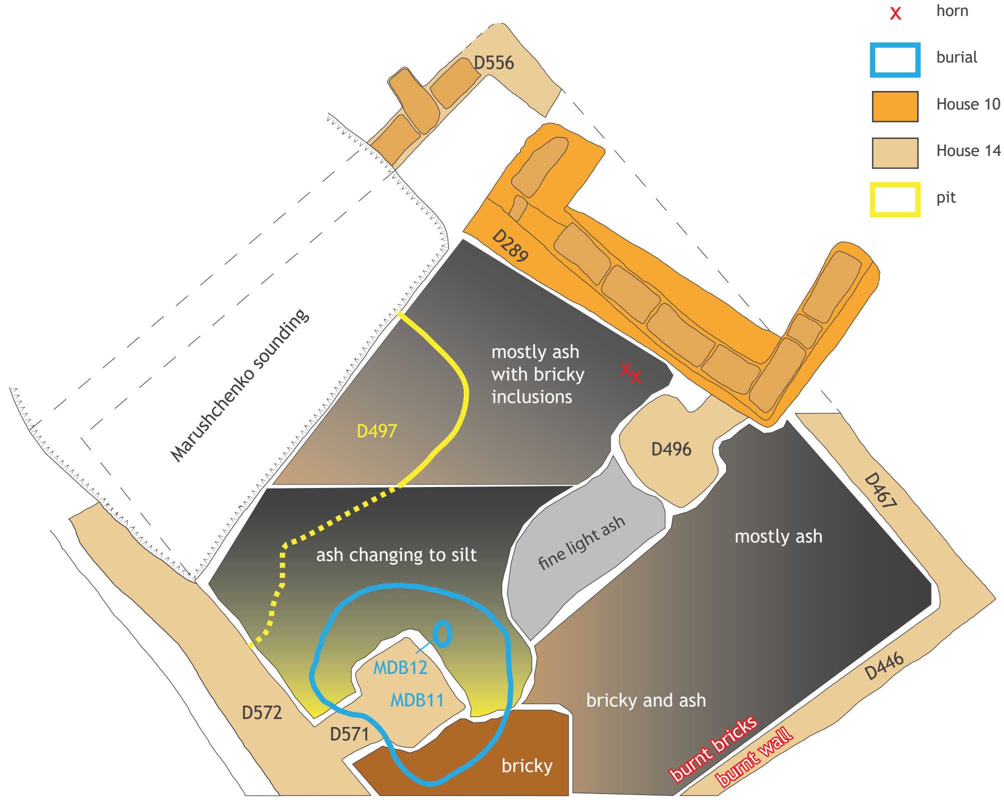

Fig. 5.9. Overview of the abandonment level. Toward the end, buttress D571 was covered by ash.

Fig. 5.10. Cluster of bones in locus D708.

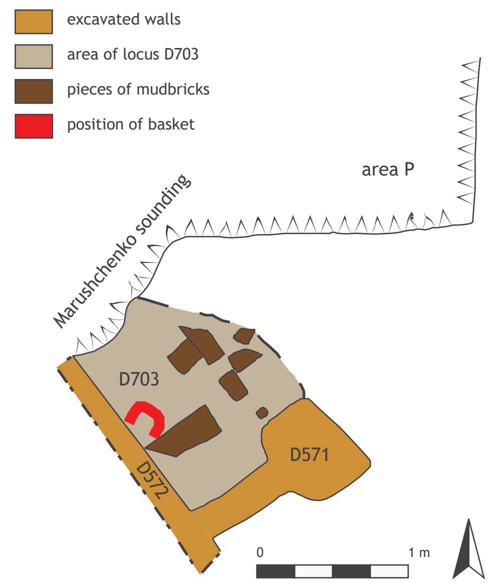

Fig. 5.11. Impression of a basket as found and its location.

west. Into the dark ash next to buttress D571 a burial of an infant was dug (MDB12; Chaps. 8 and 9). The deposit in the southwestern corner of the house retained its mostly bricky texture, but in the upper layers buttress D571 was covered by ashier material. Dug into this ash and resting on top of buttress D571 was the burial of an old man in a flexed position and covered in ocher (MDB11, Chaps. 8 and 9).

Near walls D467, D446 and buttress D496, the deposit changed into bricky to silty material with ash (Fig. 5.9). The eastern part of the house was covered by a mix of ash and wall fall that was ashier to the south. The ash was darker near the walls, with occasional interspersed whitish deposits. Near the top of buttress D496 next to its northwestern face, two unburnt goat horns were found. At the southeastern face but approximately 0.6 m below the top of the buttress in the dark ash was a part of a burnt animal horn (Fig. 5.5D). Towards the south the debris shows signs of higher temperatures, as indicated by bright red burnt bricks. Wall D446 was highly burnt to the southwest, but less so to the northeast. The southwestern corner included a concentration of bones and stones. Hard whitish to light gray material containing stones ran over the burnt brown remains of wall D446 and was therefore deposited after the walls of House 14 ceased to be visible.

Discussion

House 14 is the only completely burnt building that has been excavated in the settlement.[52] The question of how the house burned down depends on many factors such as the weather conditions at the time (windy, hot, stormy, or a combination of these), airflow, and quantity and position of flammable material.

An area near the floor to the northeast of fire installation FI 46 contained debris burnt at high temperatures, ranging from burnt red bricks to the finest and lightest ash. In general, the eastern part of the house showed much more burning activity throughout the stratigraphy – ash, burnt brick, burnt walls – than the west where there was mostly wall fall. The burnt material in the eastern part of the house sloped steeply downwards towards the northwest, and the dark gray ash contained most of the unfired pottery, figurines, spindle whorls, clay rings, and shaped clay. The only attested route of air flow in the house is the small entrance in wall D467. The available information leaves us with several interpretive options.

In her experiments at Beidha, Dennis constructed a building similar to one documented in excavations at the site (Dennis 2008, Fig. 6.56). It was an oval, semi-subterranean structure with internal measurements of 4.7 x 5.2 m. Walls were 1.3 m high. Within the structure were 23 timber posts, one located in the center of the entrance. Walls were made of mud and stones and subsequently plastered. The roof consisted mostly of organic material (wood and reeds) and was also plastered with mud. Dennis aimed to create a flat radiating roof. Part of the roof was covered by stone slabs. Prior to the burning, "objects including baskets, a grinding stone, clay pots, figurines, and bundles of reeds [...] according to the excavation plan of B-48" (Dennis 2008, 166) were placed on the floor of the house. The baskets were of different types and contents (pistachios, seeds, reeds, foliage). The experiment followed three plans (Dennis 2008, 168-170), two of which were supposed to simulate

52 Other contexts contain evidence of burning but without resulting in the abandonment of a whole building. See especially House 15 where fire led to the destruction and rebuilding of one wall (Chap. 2, Figs. 2.51 and 2.53) and House 2, room 2c, which contained substantial quantities of burnt fill (Chap. 2, Fig. 2.42).

accidental fire and the third one a deliberate conflagration. The first two attempts to simulate an accidental fire failed. Both times a cooking fire was lit and allowed to burn out of control, first inside the house, then on the roof. Both attempts resulted in minimal damage to the structure or even to the surroundings of the fire. The third experiment introduced more flammable material to the house in the form of brushwood stacked along the walls and on the roof. This was set on fire from several points at the same time. Approximately 4.5 hours elapsed from the time the roof caught on fire until the fire burned out. The length of the burning was to a great extent affected by wind. After eleven minutes, the wind that until then had been blowing moderately from the east died down abruptly, and a minute later a moderate to strong wind picked up again. The changes in its direction further determined the level to which parts of the building were burnt. The fire was classified as very slow based on her calculation of the rate of heat release (Dennis 2008, 170-171).

The material was excavated afterwards as eight deposits, including the original surface at the time of construction (Dennis 2008, Table 7.4). The sequence above the floor consisted of three layers of roof collapse – burnt reeds, silty sand with charcoal flecks, and large lumps of mud, charcoal, stone slabs and modern plastic rubbish – covered by wind-blown deposits of small leaves and charred organic material as well as further material from the collapsing roof consisting of burnt and unburnt reeds, lumps of mud, and burnt timbers. The debris accumulated up to 35.5 cm, almost 50% less than the amount found in the archaeological Building 48 at Beidha (Dennis 2008, 176). From the stratigraphy of the experimental house, it is clear that the majority of the deposit derived from the roof. That is not surprising, since it was the roof that contained the most flammable material.

Direct comparison of Beidha exB-48 to House 14 in Monjukli Depe is not possible. However, some of the principles can be applied. The stratigraphic sequence in House 14 suggests at least two consecutive fire events. The first one, which resulted in the original destruction of the house, produced the lower ca. 0.6 m of deposit. The rest of the burnt deposits was likely a result of multiple small fires and/or burnt village garbage deposited there (see below, final discussion) or other forms of post-abandonment activity, with the divide starting latest at the level of the pit. House 14 very likely had a roof at the time of its destruction and one that very well may have had an opening of some sort. Alternatively, there may have been openings (windows) high up in the walls. This can be concluded from the fact that there was no soot on any of the preserved walls and that residents would otherwise have been asphyxiated from the fire installation in the room. Based on the experiment at Beidha, approximately one-quarter to one-half of the burnt material present results from the collapse and destruction of a roof. In House 14 only two small fragments, ca. 3.5 x 2 cm and 3 x 2 cm, of clay with linear impressions were found that may be interpreted as roofing material. They derived from steeply sloping ash layers near buttress D496 (Fig. 5.7). This leads me to propose several possibilities: (1) the roof consisted only of organic material and was not plastered; (2) the roof was plastered only near the junction with walls; (3) the roofing material decayed into unrecognizable masses of clay during rainy winters; or (4) the roof was too thinly plastered to be recognized in the archaeological record. Dennis observed that only the pieces of mud with impressions of roofing material that fall face down during the destruction retain these impressions (Dennis 2008, 171). In other words the impressions need to be covered in a relatively short period of time in order to be preserved. All four interpretations are therefore possible.

The walls of the installations within the house, namely bins D725 and D737, were preserved to relatively low heights. In the case of bin D725, it is possible that its original walls were not much higher, although for bin D737 this is unlikely. This would imply either that bin D737 was destroyed by the collapsing roof, or that it was no longer in use when the fire broke out. The fill of the bins did not indicate any organic contents at the time of the conflagration.

Large quantities of stones were found on the floor of House 14. House 10 also contained clusters of fist-sized stones, interpreted by Vera Egbers as markers of the end of the use of the house (Chap. 4). She discusses several potential reasons for their conspicuous placement. One is that they could have been stone weights for the roof. Alternatively, they may imply a temporary abandonment of the house, during which the floor was covered with mats in order to preserve its surface. In this latter scenario the stones would also have functioned as weights. As a third alternative she suggests a ritual abandonment of the house.

For House 14 the possibility that the stones served as weights on the roof seems very unlikely. In the sequence discussed by Dennis, the stone slabs that had been placed on the roof landed higher up in debris layers rather than on the floor level. If the stones in House 14 were indeed roof weights, one would expect to find them atop collapsed roof material, in this case probably above a burnt layer. But the stones lay directly on the floor. An argument can be made that the stones rolled off the partially destroyed and perhaps pitched roof. However, their distribution near the center of the room and around buttress D571 (Fig. 5.2) would indicate that either half of the roof was torn away prior to the fire (otherwise one would expect to find some debris on the floor), or the fire burnt through the center of the roof very quickly and the stones fell through the holes that thereby formed. I think that this scenario is too complicated to be likely. If the second possibility discussed by Egbers were applied to House 14, it would indicate that only parts of the floor were covered with mats, based on the uneven distribution of the stones, or that the stone weights were placed only on the outer edges of the mats. In either case, one would expect to find some trace of the matting in the archaeological record, especially since the house burned. The floor near the center and in the northwestern part of the house was greenish in color, likely a result of interaction between fire and mud plaster. Had there been a cover on the floor made of reed mats, the fire would have reduced them to ashes. This ash layer would have been thin and easily transported by wind, unless the roof collapsed quickly. Small areas of thin ash might not have been recognized in the excavation. If the stones had the function of weights for a floor covering, it would mean that the house was not in use prior to and possibly also during the onset of the fire. The third alternative mentioned by Egbers is ritualized abandonment. In this scenario the stones would have been deliberately placed on the floor prior to destruction of the building. Scenarios 2 and 3 seem the more likely ones with regard to House 14.

In summary, three main points can be made: (1) it is very likely that House 14 had a roof at the time of the conflagration; (2) the stones found on the floor of House 14 were deliberately placed there – either as weights for some form of cover during a temporary abandonment of the house or as a part of ritualized and permanent abandonment; (3) at the time of the conflagration, the house contained a significant amount of flammable organic material, or such was added to it to ensure that it burned.

A second very important question is *why* the house burned down. As previously discussed, Chapman (1999) summarized six possible reasons for destruction of a building by fire. Two of them involve accidental fire, either as a result of pyrotechnical activities such as cooking or fumigation to exterminate insects or other pests. These do not seem likely in the case of House 14, mainly because of the deliberate placement of stones on the floor that point towards planned abandonment of the house prior to the fire. Even though fumigation might call for a brief abandonment, the activity itself probably would not call for weighted mats on the floor, since the aim is to allow fumes to enter all cavities in the house in order to drive out pests hiding there. Nevertheless, as was demonstrated by Dennis, accidental, out-of-control fire caused by poor use of a hearth is highly unlikely to be the source of a conflagration leading to the destruction of a mud-brick house. Deliberate causes of a house conflagration include violence, to strengthen and further reuse a clay structure, and ritualized abandonment to complete the life-cycle of a house and its contents. Violent causes for house conflagration can be divided into foreign attacks and intra-settlement violence. There is no evidence at Monjukli Depe for an attack coming from outside the settlement. However, although there is no evidence for intra-settlement violence, it cannot be ruled out completely given the fact that the house may have been abandoned at the time and thus could have been an easy target for someone wishing, at least symbolically, to take revenge on another person or household. There is also no indication of reuse of fire-strengthened mudbricks. A ritual abandonment is also a possibility. The question then would be, if the stones on the floor are indicators of ritual abandonment, why it is that out of the three houses (10, 11, and 14) with stones on the floor only House 14 is so severely burnt. Was there a change of customs afterwards? Did House 14 possess a special social importance?

What about post-abandonment treatment? Was there a second major fire in the house afterwards, or was there a series of smaller fires that resulted in a further 0.7-0.8 m accumulation of burnt debris? The fact that several activities took place within the house area, such as digging a pit (possibly for cooking) and burial, seems to point to a gradual process of filling in the area still delimited by standing walls. It is also possible that the area acquired a new function as a location for waste disposal.

When all evidence is taken together, the house seems to have been deliberately set on fire. The reason for this action cannot be ascertained. Had it been part of a custom of ritualized abandonment of houses, one would expect to find more burnt houses at the site. Had it been an act of intra-settlement violence, the situation might have been rare, and the house might indeed be the only burnt one in the settlement. However, there is no other indication of intra-site violence. House 14 might have had a special social status that called for a more spectacular "closing" such as one that a fire provides.

The question of how the house burned down will be addressed further using two analytical approaches. First, based on an analysis of the color of burnt bone fragments from flotation samples, the suggested divide between the first destruction by fire and the secondary use of the space will be evaluated. Second, based on calculations made by professional fire investigators, the likely causes of the conflagration already discussed will be examined in more detail.

Burnt bone analysis

Almost all of the flotation samples retrieved from House 14 contained bone fragments, many of which showed variable coloring. This led me to think that analyzing the color of the burnt bones might help to produce a plausible scenario for how the house burned down by allowing me to specify the temperatures reached in different deposits. Analyzing the color of burnt bones is by no means a new approach (see, for example, Bonucci and Graziani 1975; Shipman et al. 1984). When exposed to fire a number of characteristics of a bone change. Shipman et al. (1984, 308) summarize the possibilities for reverse estimation of fuel type based on the extent to which a bone is burnt.

The color of bones exposed to fire may be related to temperature. Color charts have been established that connect the color of burnt bones to temperature ranges reached.[53] There are only slight differences based on how long the bone was exposed to fire, although length of exposure does affect characteristics such as crystallinity of bioapatite, the main bone mineral (Slavíček 2015; Karel Slavíček and Lukáš Zacheus, 2015, pers.comm.). Rather, the color of the bone represents the highest temperature reached (e.g., Shipman et al. 1984; Munro et al. 2007). However, this "highest temperature indicator" does not necessarily correspond precisely to the temperature of the fire or a part of it (e.g., a flame tip):

> If a flame is exchanging heat with an object which was initially at room temperature, it will take a finite amount of time for that object to rise to a temperature which is 'close' to that of the flame. Exactly how long it will take for it to rise to a certain value is the subject for the study of heat transfer. (Babrauskas 2006)

As it is not my intention to reconstruct the precise temperature of the fire but rather to try to ascertain the way it burned and to compare temperatures in the available loci, the relative temperatures indicated by the color of burnt bones are sufficient.

However, it is important to mention that the available flotation samples were not taken primarily with the aim of finding out how House 14 burned, but rather in accordance with the research questions underpinning the project as a whole (Sturm 2011, 228-230). The samples used for this analysis come from the 2012 season only,[54] and they are not all part of a single stratigraphic sequence. The samples come mostly from the destruction and abandonment layers of the building. They may therefore be more helpful in untangling the point at which the destruction by fire stopped and the area became reused for post-abandonment activities.

Methodology

The flotation samples were processed in the field in 2012. The heavy fraction was later sorted in Berlin in graded size categories following the methodology used by Peter Sturm (2011, 229). Each sample was screened through two sieves resulting in two categories, one of material larger than 5 mm and the other consisting of material within the 2-5 mm range. In the first category the following materials were distinguished: bones (burnt, unburnt, and worked), botanical matter, clay (burnt orange, other burnt, and shaped), metal, ocher, pottery, shell, stone (unworked, chipped, and ground). All other material was labeled as unsorted residue. However, for the smaller category (2-5 mm) the sorting was limited to bones (burnt and unburnt), botanical matter, pottery, and chipped stone. It proved to be sufficient for my research question to consider only the categories of burnt bone, unburnt bone, botanical matter, burnt clay,[55] shaped clay, and unsorted residue. I also made the decision to merge the two size categories, because keeping them separate offered no additional information that was useful for my analysis. Therefore, in the subsequent tables and graphs the quantities of bones, botanical matter, and residue are the sum of the >5 mm category and 2-5 mm category. The burnt clay and shaped clay, however, represent only material >5 mm, because they were not separated out in the smaller category.

The quantities of each category were recorded both as number of fragments and as weight in grams. This information was later transformed into densities for better comparison (Table 5.1).

I expected that high temperatures would have been reached close to the floor and then slowly subside or there would be an interleafing of layers of rubble and layers of ash. The hypothesis was that the conflagration event would be divided from the abandonment period by a layer of sediment with little to no indication of fire, possibly windblown material that was deposited right after the conflagration. Another division in the material was expected around the level when House 10 was erected, as a depression next to the building could have been hazardous, thus calling for its rapid filling. The goal of the analysis was to try to find at least one of these divisions.

The fragments of burnt bone (mostly small pieces with dimensions in millimeters) consisted of both cortical (or compact) bone and cancellous (or trabecular) bone. The color was read only from the cortical fragments, whereas cancellous fragments were labeled as unknown, since the tables of relationships of color to temperature (e.g. Shipman et al. 1984; Munro et al. 2007) were created using cortical bone. There was also a significant quantity of tooth fragments; these were not included in the analysis.

53 The tables were established based on heating modern bones in controlled environments (Shipman et al. 1984; Munro et al. 2007). The samples used for these experiments were substantially larger than the fragments I had at my disposal for this analysis.

54 More samples were taken during the 2013 season, but unfortunately those could not be exported.

55 Previously separated categories of burnt orange clay and other burnt clay were put together because the division did not carry any definitive information about the temperature, as it is only one factor determining the final color of burnt clay (Rice 1987, 333).

Stratum	Locus	Description	RN	Density (g/l)					
				Burnt bone	Unburnt bone	Botanical matter	Burnt clay	Shaped clay	Unsorted residue
II or III	D458	supporting wall	8832	0.97	2.03	0.23	8.10	0.00	42.95
III	D457.1	ashy fill	8694	1.71	0.03	0.03	53.87	3.76	56.76
III	D457.2	ashy fill	8799	1.50	0.04	0.07	26.46	1.39	103.36
III	D457.3	ashy fill	8801	1.70	0.22	0.04	45.93	2.07	93.00
III	D457.4	ashy fill	8802	0.46	0.13	0.08	27.25	0.00	118.75
III	D457.5	ashy fill	8814	0.55	0.36	3.09	15.73	0.00	46.73
IVa	D563	bricky material mixed with stones and ash	10084	0.44	0.11	0.06	4.83	0.00	49.00
IVa/b	D474	orange-red to black ash	8829	0.19	0.12	0.00	0.74	0.00	14.19
IVa/b	D479.1	orange-red to black ash	8854	3.84	0.16	0.02	3.80	0.00	48.02
IVa/b	D578	wall fall	10080	0.57	0.36	0.02	44.91	7.98	38.78
IVa/b	D480.1	black ash	8859	0.86	0.04	0.00	9.18	0.25	65.71
IVa/b	D480.2	black ash	8860	0.91	0.55	0.00	4.82	0.00	43.39
IVa/b	D580	dark gray ash	10085	1.22	0.15	0.02	20.22	0.06	82.72
IVa/b	D482.1	black to dark gray ash	8866	0.64	0.15	0.01	44.09	0.96	56.61
IVa/b	D482.2	black to dark gray ash	8867	1.15	2.47	0.04	9.11	0.16	76.98
IVa/b	D485.1	gray ash	8878	0.51	0.06	0.03	21.94	1.83	91.06
IVa/b	D485.2	gray ash	8879	0.74	0.03	0.03	14.15	0.00	88.79
IVa/b	D486.1	gray ash	8890	0.22	0.06	0.00	56.08	1.02	65.92
IVa/b	D486.2	gray ash	8891	0.92	0.13	0.00	15.29	0.00	272.58
IVa/b	D488.1	mix of gray ash and brick	9810	0.81	0.86	0.00	7.46	2.86	59.62
IVa/b	D488.2	mix of gray ash and brick	9811	0.57	0.11	0.04	7.00	0.00	176.68
IVa/b	D489.1	mix of gray ash and burnt brick	9813	8.71	9.96	0.29	0.00	0.92	23.42
IVa/b	D498	black to dark gray ash	9847	2.79	22.43	0.43	0.00	0.00	11.71
IVa/b	D497.3	pit	9881	9.57	13.04	0.13	0.00	0.00	12.78
IVa/b	D494	blue ash	9824	1.63	0.00	0.00	0.00	0.00	56.09
IVb	D555	black to dark gray ash	9901	4.53	0.73	0.00	0.00	0.00	48.65
IVb	D557	reddish-orange to gray	9973	0.03	0.03	0.00	42.49	0.00	108.24
IVc	D576	gray ash	10050	0.30	0.01	0.01	2.72	3.46	22.52

Table 5.1. Weight densities (grams per liter) of materials in the heavy fraction samples. Burnt and shaped clay were only identified in the >5 mm size category. All other materials represent the combination of 2-5 mm and >5 mm categories.

Stages	Range of temperatures	Description of bone color
I	20 to <285°C	shades of white and yellow
II	285 to <525°C	mostly shades of red-brown, dark red-brown, dark gray
III	525 to <645°C	black, blue, with possible red-yellow areas
IV	645 to <940°C	mostly white, locally could be light blue-gray and/or light gray
V	≥940°C	bright white, locally gray, and/or red-yellow

Table 5.2. Simplified description of bone colors in relation to temperatures, based on Shipman et al.1984 and simplified after Slavíček 2015, 19.

For the color analysis I examined each sample macroscopically and divided the bones using a simplified sorting methodology (Table 5.2). A macroscopic analysis was chosen due to the size of the fragments. Color was judged by naked eye, because the aim was to record lower or higher temperatures rather than attempt to specify precise temperatures (see the more precise methodology of Shipman et al. 1984 and Munro et al. 2007). The findings were reported both as weights of bone fragments per category and percentage of each category in the sample. The findings from the flotation samples are compared to percentages of burnt and unburnt bones retrieved by hand and by dry sieving during the excavation as well as other indications of burning, such as signs of fire on shaped clay and amounts of burnt clay, in order to support or reevaluate the readings of the burnt bone fragments.

Results and discussion

This kind of analysis has usually been conducted on larger pieces of bone that enable the researcher to observe more characteristics (e.g., shrinkage or changes in crystallinity) and shading or more complex coloring on the bone (color inclusions), affording more accuracy in ascribing a bone to a temperature category (e.g., Shipman et al. 1984). I have worked, however, with very small fragments of bones where such observations were not possible. This makes the results from the analysis relatively coarse. The fact that the fragments are so small might also be the reason why multiple temperature categories occur in the same sample. The burnt bone fragments likely resulted from heat impact on the bone, which subsequently cracked and created the fragments that I analyzed. These fragments would have fallen into a still burning or smoldering fire, leading to further burning. The burning of small fragments would take a different course than larger ones due to the dimensions of the bone (Babrauskas 2006). Discrepancies between bones retrieved by hand during excavation and burnt bone fragments, at least in terms of the amount of burnt bone (Fig. 5.12), could be explained in this way. This “double burning” of the fragments may be further supported by the fact that the temperatures do not correlate with observations of fire traces on shaped clay. It was assumed that shaped clay with traces of fire would be present in loci that showed high temperatures. The degree of correspondence between burnt materials will be discussed below.

Prior to the analysis my assumption was that the temperatures would be highest near the floor, decreasing as one moved upwards, as the fire gradually subsided and then died out completely. The analysis seems to show this assumption to be true, although not conclusively because of the rather large unsampled area of the last use and destruction phase. Only three samples derive from the phase described here as last use and destruction, but these do show the highest temperature near the floor and lower temperature in the layers above, based on the color of the burnt bones (Fig. 5.13).

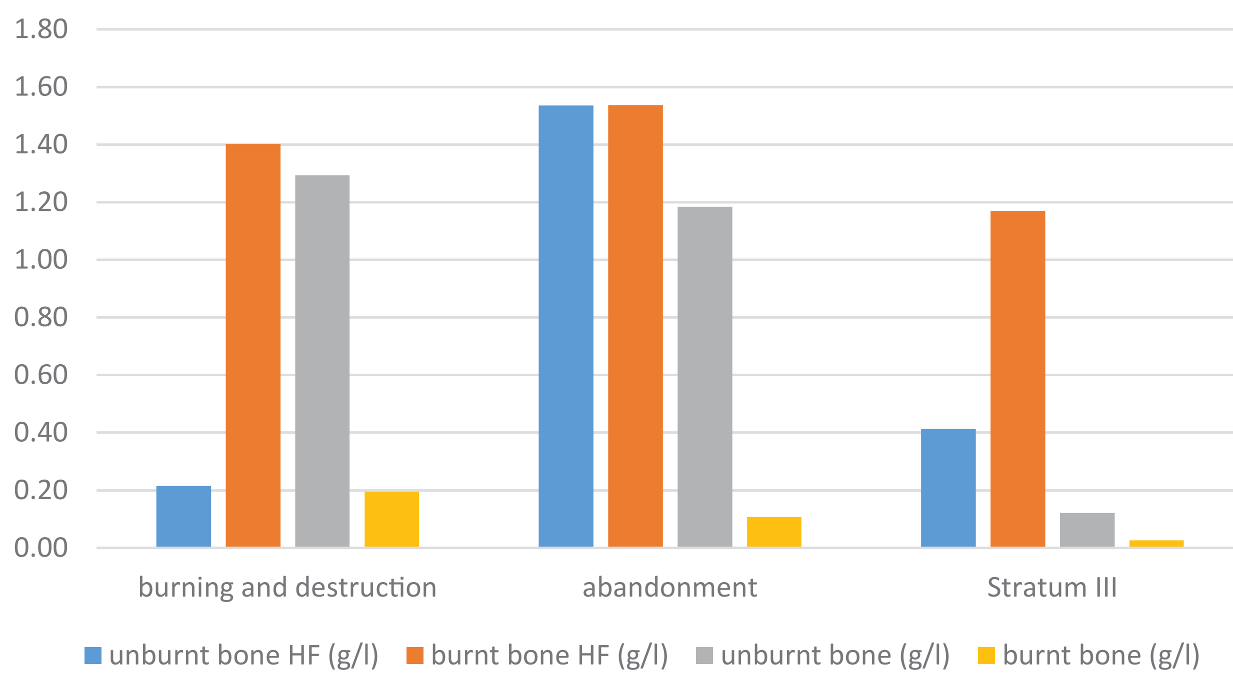

Fig. 5.12. Comparison of mean densities (g/l) of unburnt and burnt bones retrieved during excavation and from heavy fraction samples.

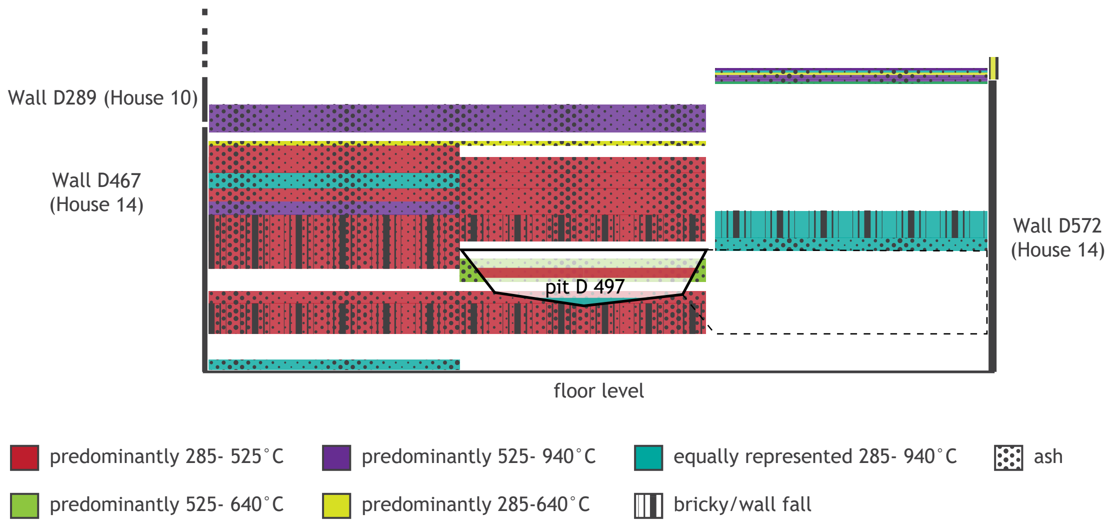

Fig. 5.13. Stratigraphic visualization of the results of the burnt bone analysis.

Based on the samples available, I expected the analysis to show a division between the burning/destruction and abandonment use of the remains of House 14. However, this was not conclusively the case.[56] Pit D497 was surrounded by burnt material both below and above it, and it remains the sole indicator of post-conflagration activity on the premises. There are two possibilities to explain this observation: (1) The end of the destruction phase was at the base of the material into which pit D497 was dug. In other words, there was a time gap between the conflagration and the digging of the pit that was long enough to allow for more material to be deposited; (2) the end of the destruction phase corresponds stratigraphically with the top of the pit. In this case the digging of the pit would have happened not long after the conflagration. The material surrounding pit D497 consists mainly of ash (Fig. 5.13). Had the deposit at the base of the pit been the boundary between the destruction of the house and the abandonment, it would mean that the ash layers were brought there intentionally as waste or to level the area, or that they represent windblown material, possibly derived from other open spaces in the settlement. Generally speaking, the samples (n=8) above House 14's destruction and reuse levels show higher temperatures than those from above and below pit D497 (Figs. 5.12 and 5.13).

A sample from material the pit was dug into (RN 9824; dotted green background of the pit in Fig. 5.13) also indicates higher temperatures. The layer from which the sample comes was described by the excavators as an ash heap. The higher temperatures could be the result either of primary (burnt prior to deposition) or of secondary burning (material that has undergone thermal changes after its deposition). Bennett examined thermal alteration of buried bone and came to the conclusion that the type of deposit in which the bones are located is key to heat transfer. She found that "clay is usually heated up faster than sand", but "heat [radiates] more evenly through sand deposit" (Bennett 1999, 7). Thermal alteration of bone has been documented up to 10 cm below the surface with a heat source that burned for 48 hours. On the other hand, "moderate distortion has been noted on bone buried at 0-5 cm in the presence of rapidly rising high intensity fires of short duration" (Bennett 1999, 7). Table 5.1 shows that sample RN 9824, like all others, contained clay/silt (unsorted residue); therefore, heat transfer may have been rapid, based on Bennett's observations. The ashy material where the sample was taken was not, however, deposited under the source of heat but next to it. Nevertheless, if the same principle of heat transfer is applied, it is possible that the bones within the ash heap were thermally altered after their deposition. The fire in the pit was very likely an intense one of short duration that would have been capable of altering bones up to 5 cm from the source. However, the highest temperatures in the pit seem to be at its base (Fig. 5.13), which is situated lower than the ash heap sampled as RN 9824. The possibility of post-depositional alteration of the bone fragments should not be dismissed entirely. However, at this point it does not seem likely that bones in the ash heap were altered by the fire in pit D497. The area surrounding pit D497 was not sampled in more detail, which might be why no alteration is visible in the layers below the base of the pit. Unfortunately, the analysis cannot offer a definitive answer to the question of where the division of destruction and abandonment layers in House 14 lies.

56 See Chapter 3, where Heit shows "clear division [of contexts] into use phase, destruction, and after-use" through Bayesian modeling of ^{14}C data.

	Locus	RN	Most commonly attested temp. (oC)	Bone (g/l)	Shaped clay (g/l)		Locus	RN	Most commonly attested temp. (oC)	Bone (g/l)	Shaped clay (g/l)
EAST	D479.1	8854	285 – 525	4.00	7.98	WEST					
EAST	D480.1	8859	285 – 525	0.89	0.25	WEST	D480.2	8860	285 – 525	1.45	0.00
EAST	D482.1	8866	285 – 940	0.79	0.96	WEST	D482.2	8867	285 – 525	3.62	0.16
EAST	D485.1	8878	285 – 525	0.57	1.83	WEST	D485.2	8879	285 – 525	0.77	0.00
EAST	D486.1	8890	525 – 940	0.29	1.02	WEST	D486.2	8891	285 – 525	1.05	0.00
EAST	D488.1	9810	285 – 525	1.68	2.86	WEST	D488.2	9811	285 – 525	0.68	0.00
EAST	D489.1	9813	285 – 525	18.67	0.92	WEST					

Table 5.3. Densities of bone (both burnt and unburnt) and shaped clay in pairs of samples taken from the same locus.

The layers above the pit are representative of the use of the space after the conflagration (Fig. 5.13). More can be said about the eastern part of the house because more samples come from this area. Some samples were taken in pairs, one from the western and one from the eastern part of a given locus, and the heavy fraction results and in some cases also the analysis of burnt bone color show that the area near wall D467 (eastern samples) differed from that towards the center of the house (Table 5.3).

The variations within pairs of samples could mean that different material was dumped next to the wall of uninhabited House 14 or that smaller fires were made along wall D467, although some of the bones point to a fire stronger than an outdoor campfire. Shaped clay is present in different densities in the paired samples, and not all of it showed traces of fire. Therefore, the absolute temperatures should not be the center of attention but rather the tendency for the temperature to increase or decrease. Two of the eastern samples show higher temperature ranges of burnt bone fragments (Table 5.3, RN 8890 and 8866). Sample RN 8890 also contained baked shaped clay, supporting the indication of high-temperature burning. The reason for the high temperatures in these samples is, however, unclear.

The samples from Stratum III (Fig. 5.14) also exhibit evidence of high temperatures. Even the adobe-like wall or support D458 contained burnt bones that indicated elevated temperatures. These samples from a period of time when House 14 was no longer visible seem to be clearly different from the rest. However, it must be noted that they come from the southwestern area of former House 14; the only others from the same area are from D580 and D578 (Stratum IV). These latter two samples show a lower temperature than in the eastern part of the house, but the difference is not great (Figs. 5.13 and 5.14), as they both contain burnt bones in at least three temperature categories.

The stark difference between Strata IV and III is perhaps even more visible when the three phases – burning and destruction, abandonment, and Stratum III – are directly compared (Fig. 5.12 and 5.14). The graph shows temperature fluctuations. The phase representative of the conflagration ("burning and destruction") shows that burnt fragments exceed unburnt pieces and the majority of the burnt bones falls within the range of 285 to 645 °C, the temperature of a campfire. Interestingly, the conflagration shows lower temperatures than samples from the Stratum III. The abandonment phase contains the highest percentages of unburnt bones, and less than 15% of the burnt bones in the higher temperature categories (above 500 °C).

A comparison of the heavy fraction, dry-screened, and hand-collected samples shows that all of the heavy fraction samples contained bones even when none were retrieved from a given locus by hand or dry screening. The burnt bones collected during excavation are mostly from the lower legs of animals (Table 5.4), but there are also some from the head, spine, and ribs. The derivation of the bones, and especially the burnt fragments, remains an open question. Are they a result of waste-disposal practices? Why are ash and bone fragments so common? Further sampling of fire installations or established waste-disposal areas might help to answer some of these questions.

To conclude, the analysis of burnt bone color was not able to identify a clear division between the conflagration/destruction and abandonment of House 14. Nonetheless, it raised new questions regarding the presence of burnt bone fragments in samples. The results seem to point toward gradual filling of the upper part of House 14 rather than another fire event. I conclude this based on the highest density of unburnt bones in the heavy fraction (see the average values in Fig 5.12) and stark shifts in temperature in the abandonment layers (Fig. 5.14). Although the divide between the conflagration and later use of the premises could not be definitively ascertained, it is safe to assume that all layers above pit D497 were not part of the conflagration.

The final approach to investigating the burning of the house is an analysis of fire hazards in a virtual reconstruction of House 14.

Fig. 5.14. Overview of the burnt bone color analysis, showing the stratigraphic placement of the analyzed contexts.

	Locus	Animal taxa	Element	Number of bones	Weight (g)
Stratum III	D458	sheep/goat	femur	1	2
		sheep/goat	mandibula	1	2
		sheep/goat	rib	3	3
		indeterminate	-	16	14
Abandonment	D563	sheep/goat	tibia	1	3
	D474	sheep/goat	mandibula	1	1
		indeterminate	-	1	12
	D479	sheep/goat	femur	1	3
		sheep/goat	phalanx 1	1	1
		sheep/goat	radius	1	3
	D482	sheep/goat	metatarsus	1	3
		sheep/goat	tibia	2	8
	D485	sheep/goat	cranium	1	1
		sheep/goat	mandibula	1	2
		sheep/goat	pelvis	1	3
		sheep/goat	rib	1	3
		sheep/goat	tibia	3	15
	D486	sheep/goat	femur	1	1
		gazelle	metatarsus	1	6
		sheep/goat	radius	1	1
		sheep/goat	rib	2	1
		indeterminate	-	8	5
	D488	sheep/goat	epistropheus	1	1
		sheep/goat	incisivus inferior	1	1
		sheep/goat	metapodium	1	1
		cattle	metatarsus	1	6
		sheep/goat	phalanx 1	1	1
		sheep/goat	phalanx 2	1	1
		sheep/goat	pelvis	1	2
		sheep/goat	radius	1	2
		sheep/goat	rib	3	4
		sheep/goat	lumbar vertebra	1	1
	D489	cattle	femur	1	2
		cattle	mandibula	1	6
		gazelle	phalanx 2	1	1
		kulan/onager	radius	1	37
		cattle	radius	1	2
		cattle	rib	2	3
		cattle	sacrum	1	3
		cattle	tibia	2	8
		cattle	lumbar vertebra	1	1

Table 5.4. (continued on next page) Taxa, element, number, and weight of burnt bones retrieved by hand and dry screening. Bones were identified at the Department of Natural Sciences of the German Archaeological Institute in Berlin under the direction of Norbert Benecke.

	Locus	Animal taxa	Element	Number of bones	Weight (g)
Burning & destruction	D497	sheep/goat	carpalia	2	2
		sheep/goat	cranium	1	2
		sheep/goat	humerus	1	5
		sheep/goat	phalanx 2	1	2
		sheep/goat	radius	1	3
		sheep/goat	rib	1	1
		sheep/goat	ulna	2	2
		sheep/goat	thoracic vertebra	1	1
		sheep/goat	scapula	1	22
		indeterminate	-	4	11
	D555	sheep/goat	crania	1	1
		sheep/goat	horncore	1	1
		cattle	phalanx 1	1	6
		sheep/goat	phalanx 1	1	1
		sheep/goat	phalanx 2	1	1
		sheep/goat	pelvis	1	1
		sheep/goat	radius	1	1
		indeterminate	-	21	23
	D557	sheep/goat	cranium	1	1
		sheep/goat	femur	4	7
		sheep	humerus	1	11
		sheep/goat	humerus	1	3
		sheep/goat	metapodium	1	1
		sheep	phalanx 2	1	2
		sheep	pelvis	1	10
		sheep/goat	rib	5	5
		sheep/goat	tibia	2	4
		indeterminate	-	6	5
	D576	sheep/goat	atlas	1	5
		sheep/goat	phalanx 1	1	1
		sheep/goat	patella	1	1
		sheep/goat	pelvis	1	6
		sheep/goat	radius	3	7
		sheep/goat	rib	1	1
		goat	talus	1	4
		sheep/goat	tibia	1	4
		sheep/goat	thoracic vertebra	1	1

Table 5.4. (continued).

Fig. 5.15. Roof structure in a shepherd's hut in the vicinity of Meana. A: view of ceiling; B: the hut; C: detail of the ceiling: compact mud fill with vegetal material inside an iron mesh with a thin asphalt coating.

Fire investigators' view

In order to gain further insights into the initial conflagration of House 14, I approached fire investigators at the Faculty of Safety Engineering at the Technical University of Ostrava. Miloš Kvarčák, Kamila Kempná, and Jan Smolka kindly agreed to prepare an evaluation of the course and parameters of the fire based on known characteristics from the archaeological material (ground plan, finds, and deposits within the building) and assumptions about the roof (material, shape, opening) and organic contents of the house.[57] They developed four models of the course of fire that differed in terms of airflow.

The fire investigators were given information about the building, including construction material, height of preserved walls, attested and hypothetical openings, and the nature of deposits found within the first 60 cm above the floor. They also had information about the flora and organic materials that could be expected either within the house, as part of the construction, or both. The most common type of wood found at Monjukli Depe was tamarisk, although both willow and poplar are attested (Miller 2011, 218). Also considered likely to be within the house were cereals, grasses, reeds, and meat, the latter based on the clusters of meat-bearing bones found within the first 60 cm of fill. The roof structure was adopted from a modern shepherd's hut found in the vicinity of Meana (Fig. 5.15).

Fire evaluation and parameters of the fire

The origin of an unwanted fire is conditioned by the presence of flammable material and a source of ignition. Based on the available information, flammable material could be found in the construction of the roof of House 14 and also within the building in the form of stored goods such as fuel and food. There are two likely origins of the heat energy essential for ignition of the flammable material – open fire or atmospheric discharge, i.e. lightning. The same characteristics associated with lightning can be anticipated if the roof were deliberately set on fire.

57 The full text of both reports is translated into English in Kubelková 2016, 65-80.

Time (sec)	0	250	500	750	1000	1250	1500
Temperature of gasses (°C)	20	196.4	371.2	553.00	712.4	847.3	972.6

Table 5.5. Theoretical changes in temperature of gasses over time in House 14.

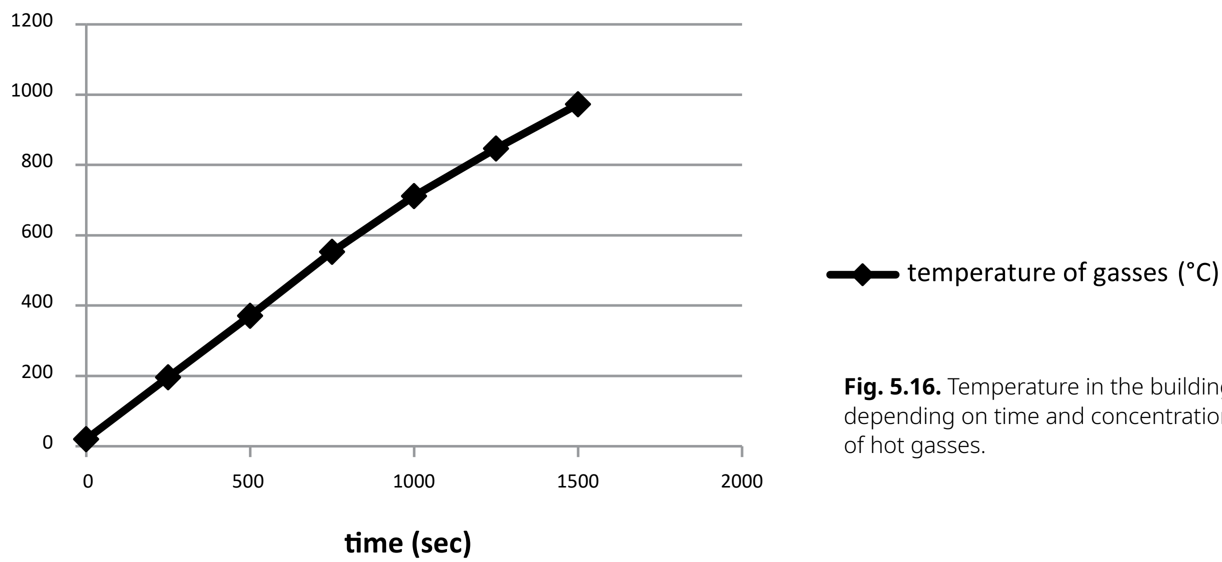

Fig. 5.16. Temperature in the building depending on time and concentration of hot gasses.

The dimensions of the building were ca. 4.5 x 5.25 m. The load-bearing structure of external walls was made of mud bricks covered with plaster, with an attested height up to 1.8 m. In one external wall there was an opening of 40 x 56 cm; another one of approximately 70 x 70 cm is, for the purpose of this modeling,[58] hypothesized in the roof. The amount of flammable material in the building was estimated as a fire load of 15kg/m^2.

The basis for calculating the parameters of the fire is heat release through burning. In concrete conditions the heat release is characterized by a growth constant that is dependent on the use of the space, mainly on the type, amount, and manner of storing flammable material, i.e. the value of the fire load. In this case the calculation of the heat course was done in time intervals up to 1500 seconds, with a value for the growth constant of heat release during fire equal to 516.4 s x MW$^{-0.5}$, where “s” stands for seconds and “MW” for megawatt.[59] The origin of the fire for the purposes of modelling was arbitrarily set to be within the building in the area of the hearth. The calculation includes ventilation via both openings, one near the floor, the other in the roof. The external walls are considered to be inflammable, the roof flammable.

Temperatures of gasses were determined by calculating the temperature course of the fire in the area of the building where the hot gasses were concentrated. The values are presented in Table 5.5 and in Fig. 5.16.

The temperature values obtained for the layer of gasses under the roof show that it was a small building with low fire risk and limited ventilation of gasses between the inner and outer area.

During a fire the released heat is shared with the surroundings. Most of the heat is absorbed by the combustion products which rise and accumulate under the roof. There, hot gasses transfer heat to the roofing material. The temperature of the roofing material rises, and, after reaching ignition temperature, the material ignites. In the case of House 14, it is anticipated that the roof contained flammable material in the form of wood (tamarisk), grasses, and reeds. Of these, the lowest ignition temperature is reached by grasses and reeds, with tamarisk regarded as hard wood. The grasses and reeds would be set on fire when the temperature of hot gasses reaches 200°C. This temperature would be attained four minutes after the onset of the fire. Burning with visible flames on the roof would spread quickly to its whole surface, due to preheating of the roofing material. At the

58 The number and position of all openings within the house cannot as yet be reconstructed. For the purpose of 3D modeling, a minimum of two openings was postulated, given that the attested one most likely did not function as an entrance to the house due to its small size.

59 In other words, it was calculated that the conflagration would be constantly growing by 516.4 s x MW$^{-0.5}$. This number is based mainly on the value of the fire load, i.e. how much flammable material was available per square meter (comment by the author).

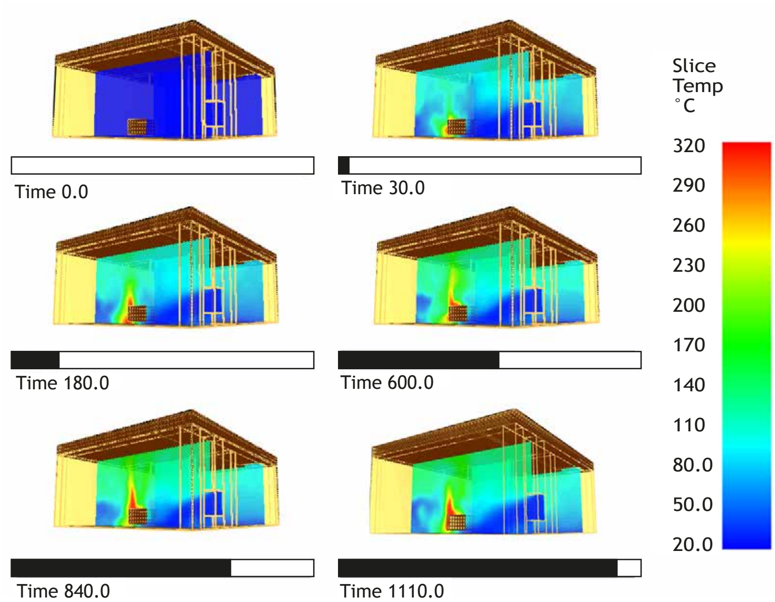

Fig. 5.17. Behavior of the conflagration in scenario I. Time indicated in seconds.

same time, burning pieces of roof would fall off, damaging its integrity. Within moments the fire would spread to the whole building.

Models of the course of the fire

To create the fire models, the four most likely scenarios were chosen. These anticipate a flammable roof and comprise options with openings in the building open or closed. For purposes of the modeling, the fire was initiated with a torch situated under the fuel. The torch was kept on for a period of 15 seconds, then it was turned off, and the behavior of the conflagration was recorded for a period of 25 minutes. The fuel was situated close to the center of the house, approximately where a fire installation was found. The fuel in all four scenarios consisted of 0.075 m^3 of wood in the shape of three boards. Two openings were considered for the purposes of modeling, the one attested in the southeastern wall of the house and a hypothetical one in the roof directly across from the opening in wall D467.

Scenario I – two openings, both open

In this scenario, fresh cool air is sucked in through the lower opening. The air is heavier than the gasses inside the house. At the same time, combustion products exit from the upper opening, creating a chimney effect.

During the conflagration the roof construction is heated, leading to its combustion. It therefore contributes to the development of the fire (Fig. 5.17).

Scenario II – two openings, lower one open, upper one closed

In this scenario the suction and drainage of combustion products happens through the same opening (Fig. 5.18). The development of the combustion is limited by access to fresh air. The restricted exchange of air leads to heating of the structure and combustion products within the house. This heats the roof to a critical temperature, due to which it ignites, and the conflagration also develops on the roof.

Scenario III – two openings, upper one open, lower one closed

Conflagration with only one opening in the upper part of the structure is a still unexplored and complicated phenomenon for fire investigators (Jan Smolka, pers. comm., 2015). The flame oscillates and often other rare phenomena occur. Generally speaking, the development of conflagrations in structures with only a roof opening is characterized by limited airflow and has thereby a restricted development. This is due to the pulsating drainage of combustion products, i.e. alternating suction of fresh air – drainage of combustion products, leading to "conflagration breathing." This confirms the development of fire in this case also. Initiation of the fire happens in the first minute, but because there is little fresh air, it does not develop into a full-blown combustion; instead, the fuel glows with heat, and hot gasses generated within the house cool down (Fig. 5.19).

Scenario IV – two openings, both closed

If all openings are closed, oxygen within the house is depleted. Drainage of the combustion products is possible only through leaks in the construction, and the same applies for airflow. Subsequently, there is a rapid onset of heating of the roof construction and flammable materials within the house, and the roof construction burns very quickly before collapsing (Fig. 5.20).

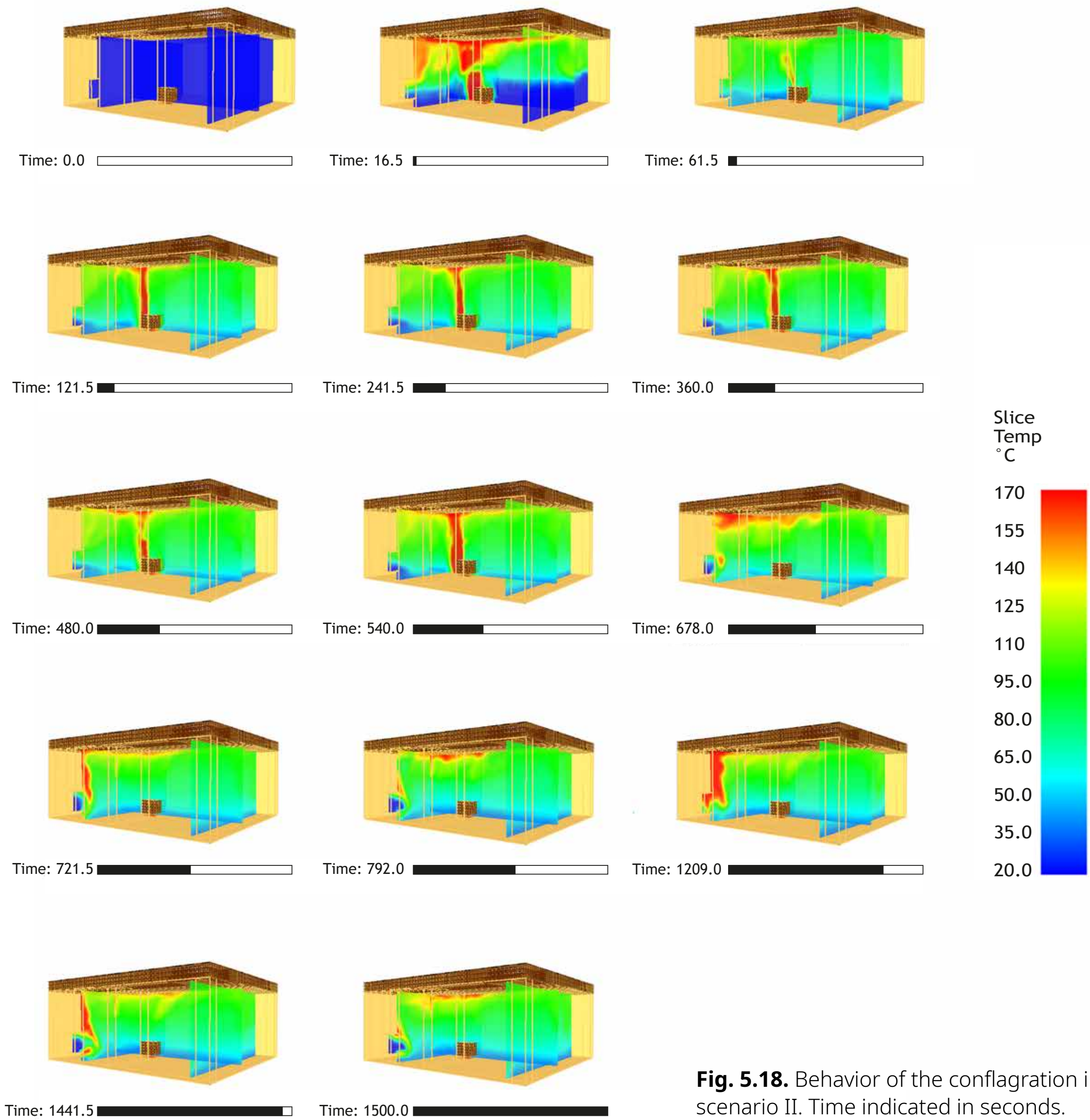

Fig. 5.18. Behavior of the conflagration in scenario II. Time indicated in seconds.

Commentary

The course of burning as described by Kvarčák confirms observations by Dennis in her experiment at Beidha. What differs is the estimated duration of the conflagration. The fire investigators estimate a period measured in minutes, whereas Dennis observed a much longer-lasting fire. This discrepancy might be due to the amount of flammable material that was thought to be in each building. Based on the report of the fire investigators, House 14 must have contained at the time of the conflagration at least 354 kg of flammable material, including the material forming the roof. Combining the results of the reports by Czech fire investigators and the experiment at Beidha, some conclusions about House 14 can be reached. (1) If the house contained less than 15kg/m^2 of flammable material, setting the house on fire would have been very difficult. This figure includes flammable material incorporated into the roof of the house (Miloš Kvarčák, 2015, pers. comm.). (2) Possible roof beams, in the models considered to be tamarisk,[60] would not be destroyed by a fast fire and therefore could be salvaged and re-used afterwards. This depends, however, on the thickness of the roof beams and the type of wood. In

60 Tamarisk, identified only to genus, is the most common taxon found thus far in the charcoal from the site. Typical for dry areas of the Middle East, *Tamarix aphylla* can grow up to 10 m tall and has bare, deep green branches (Hageneder 2005, 194). Poplar and willow, also attested at the site, are soft woods. That means that they catch on fire more easily and quickly, and they also burn faster than tamarisk.

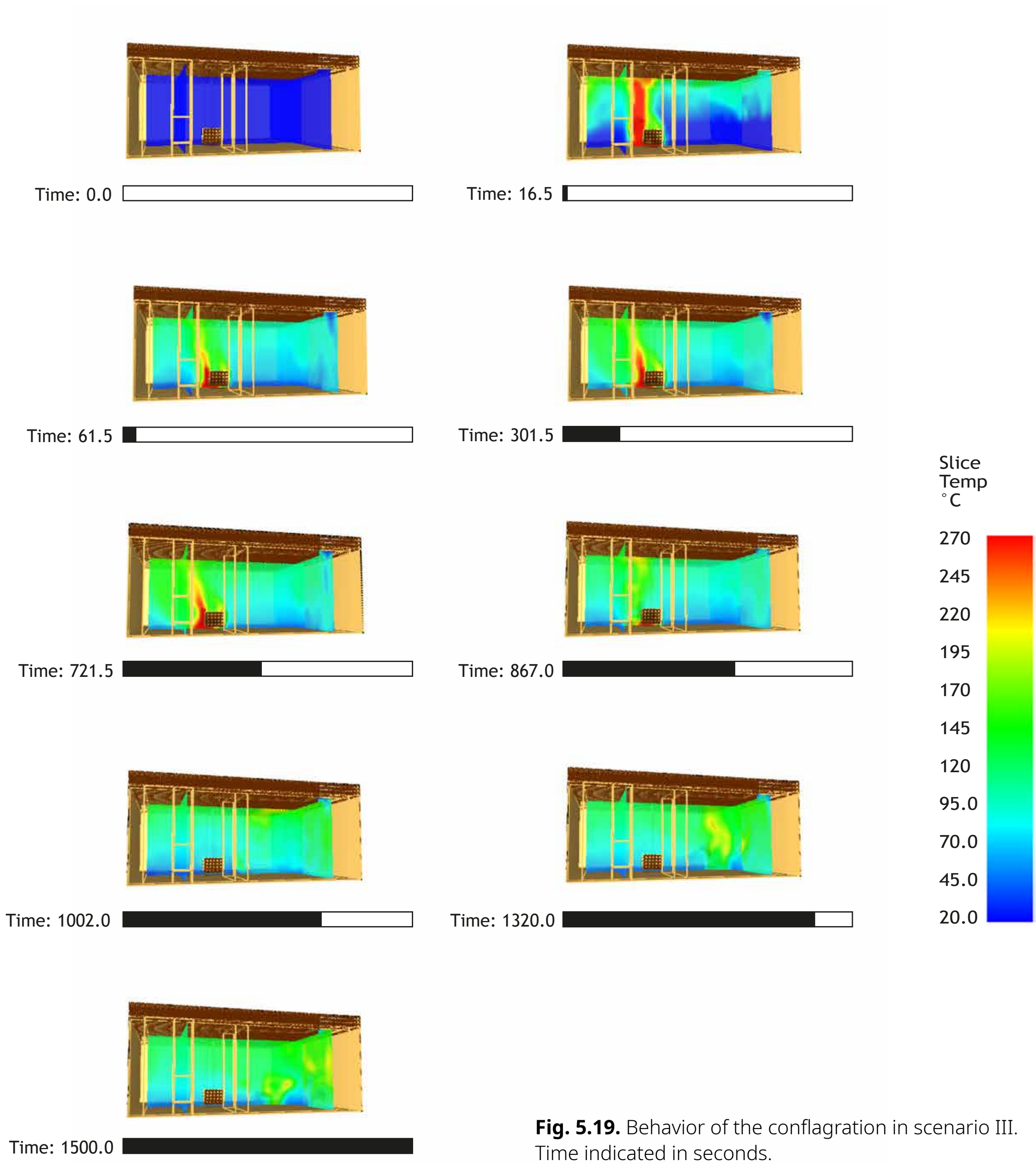

Fig. 5.19. Behavior of the conflagration in scenario III. Time indicated in seconds.

other words, if the roof was made out of organic material, such as reeds or grasses and tamarisk, and not plastered with mud, there is a high possibility that there would be no remaining wood in the burnt remains other than substantial amounts of ash and possibly charcoal. (3) When the models for the conflagration are compared to the documented situation in House 14, it is possible to conclude that the house had a roof with no opening or one that was closed at the time of the fire. This can be deduced from the places that exhibited greenish tones, mainly the floor in the vicinity of wall D446. Their locations would be in agreement with scenarios II and IV, where the temperature within the house rises quite rapidly, and the hottest areas are approximately in the places where the greenish color was found. Currently these two scenarios can be seen as possibilities. Both of them seem to point towards a source of air coming from the house walls rather than the roof, at least at the time of the conflagration.

Summary

The first approach I used to investigate the conflagration in and subsequent fate of House 14 drew on the archaeological material recorded during the excavation. From that I concluded the following:

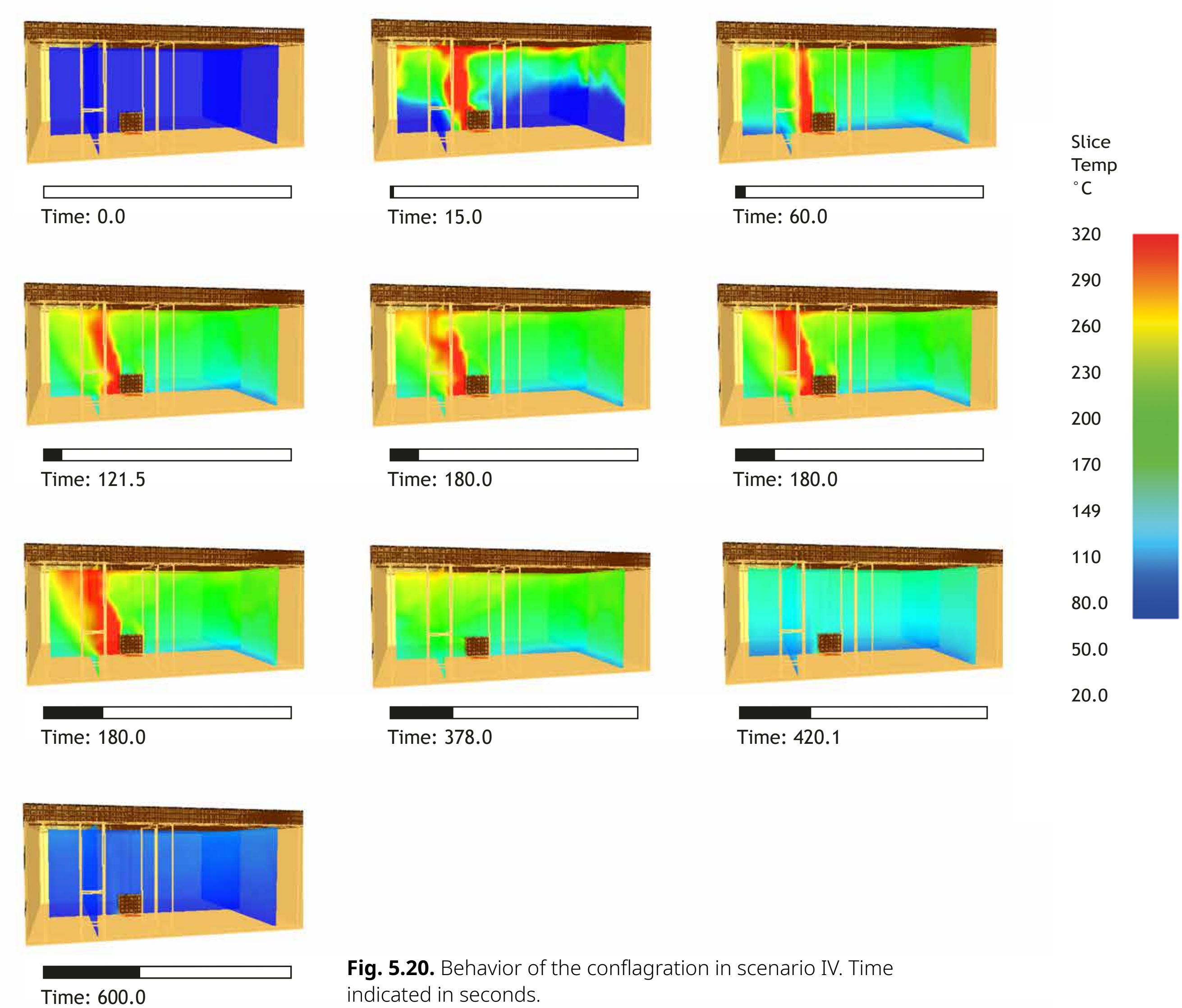

Fig. 5.20. Behavior of the conflagration in scenario IV. Time indicated in seconds.

1. The material accumulated within House 14 resulted from at least two fire events, with the first one the original destructive conflagration and the subsequent one(s) the result of further use of the premises. This conclusion is based on study of the stratigraphy of House 14 as well as on analogy to an experimentally produced stratigraphy of the burnt house exB-48 at Beidha. Within House 14 there was approximately 1.4 m of debris (from the latest floor level upward) that pointed to some form of conflagration. At approximately 60 cm above floor level the top of the pit (Fig. 5.5D) points to a division between two events. Thus, I suggest that the first 60 cm of debris represent the conflagration in House 14, whereas the additional 70-80 cm derive from pyrotechnical activities of a later date. Analysis of burnt bones retrieved from flotation samples does not show any evidence to the contrary.
2. House 14 very likely still had a roof at the time of its burning, possibly with an opening. Two small fragments of clay, both less than 4 cm in maximal dimension, with linear impressions were found in House 14; they may be interpreted as roofing material. The opening in the roof could have been an access point, however it is also possible that there was a door or window(s) in parts of the walls that were not excavated. If there was an opening in the roof, it was likely blocked or closed at the time of the conflagration.
3. Stones on the floor were placed there intentionally and likely mark a planned temporary or permanent abandonment of the house. The placement of the stones on the floor of House 14 is peculiar (see Fig. 5.2). Three possibilities have been proposed by Egbers for a similar situation in House 10 (Chap. 4), one of which, roof weights, seems unlikely in the case of House 14.

This leaves the second and third option, weights for mats in the house or intentional placement, which can be neither confirmed nor refuted at present.

4. Prior to the conflagration the building contained significant amounts of flammable, organic materials or such materials were added to it. As already mentioned, the material derived from the conflagration amounted to an approximately 60-cm-thick deposit. The conflagration at house exB-48 in Beidha resulted in somewhat more than half as much debris (35.5 cm), most of which came from the roof. The experimental house was sparsely furnished prior to the fire, with only "baskets, a grinding stone, clay pots, figurines, and bundles of reed" (Dennis 2008, 166). Dennis also observed that less debris was left after the conflagration than was recorded in the original excavated Building 48 at Beidha. Together, these observations lead me to the conclusion that House 14 must have contained significant amounts of flammable material at the time of the fire. According to the calculations of the fire investigators, a house of these proportions must have included more than 350 kg of flammable material.
5. House 14 was set on fire deliberately, perhaps due to escalated intra-settlement conflict or as a part of a ritual practice. The experiment at Beidha demonstrated that an accidental fire in this type of structure, even one caused by lightning, is highly unlikely. Lightning has the energy to start a fire, but several conditions would have to be met. First, the roof of the building would have to be made from a highly flammable material and later collapse into an area with sufficient additional such material (hundreds of kilograms). This would probably have to happen while no inhabitants were around to smother the fire in its beginnings. It can therefore be concluded that there was some form of intention behind the conflagration in House 14 in Monjukli Depe. Possible reasons for deliberate conflagration remain unclear, although reuse of the fire-hardened material – as has been suggested for Neolithic sites in southeastern Europe – seems unlikely. Either ritual practices or conflict are plausible explanations. Further archaeological work is needed to be able to assess the likelihood of these alternatives.

Analysis of the color of burnt bones raised the question about the composition of the material found within House 14, because all analyzed samples contained burnt bones regardless of the context in which they were found or whether burnt bones were present in the macroremains. Further analysis of flotation samples from open spaces, fire installations, and other similar contexts might give us more clues for the origins of the small fragments of burnt bones in the house. Additional archaeological work could show the extent to which a burnt house was actually a rarity in the community, which in turn can offer further indications about the social status of the house residents and why the house was set on fire in the first place.

In the case of House 14, fire was used as a good servant, but it remains unknown for what cause.

Chapter 6

The Fire Installations from Monjukli Depe

Indicators for Social and Technological Change

Julia Schönicke

Keywords: *fire installation; oven; hearth; pyrotechnology; fire keeping*

Introduction

My focus in this chapter is on the sociocultural usage of tended fire. I distinguish between controlled and uncontrolled fires, considering the latter to be natural phenomena that may, for example, be caused by lightning or bush fire. Tended fires can also become uncontrolled ones, since fire is omnipresent in most areas of daily life and at most times. Indeed, the tending and keeping of fire is integrated into everyday life. As a source of light, fire lengthens the day, it can be seen as a signal over long distances – at night as light, by day as smoke – and it provides protection against wild animals. It is used as a heat source in both indoor and outdoor areas as well as for preparation of food to make it more easily digestible and tastier. Pyrotechnology uses fire to transform materials, as, for example, in the melting of metals or firing of clay. In modern motors, fire burns fuel and allows us to move. In times of war fire is used as a weapon, becoming a means of destruction. For this reason, I distinguish between useful and harmful fire. Due to its destructive force, targeted control of fire is essential. The domestication of fire is associated with the disciplining of the body (e.g., carefully handling fire to avoid accidents), which in turn has an impact on people's everyday practices. Handling fire involves time-consuming activities, since fuel must be collected and stored; likewise, fire installations must be cleaned and the ash disposed of.

A fire installation is an intentionally chosen, often prepared place for generating and/or keeping fire. It must be distinguished from locations where uncontrolled fire spreads accidentally. However, controlled fire cannot be equated with fire in a fire installation, as is exemplified in the case of slash-and-burn agriculture, in which fire is used in a controlled fashion to deforest an area. Likewise, controlled fire can be helpful in hunting. Here, the boundaries between controlled and uncontrolled fire become fuzzy, as the use of fire for land clearance or as a hunting instrument often brings devastating conflagrations with it (Goudsblom 2000, 45-46, 48). The momentary destruction results, however, in a long-term advantage. Generally, open controlled fires can be distinguished from open uncontrolled ones.

My focus is on fire installations, and I confine my discussion to installations constructed out of mud or mud brick. I distinguish three forms of fire installations:

ovens, hearths, and fireplaces. Ovens are closed structures, in which high and constant temperatures can be reached. They are associated with heating, baking, roasting, drying, and smoking. Clay ovens often have a rounded superstructure (Coockson 2009, 114). The base is frequently constructed from a layer of pebbles that ensures uniform heat distribution and retention. Over the pebbles one or more layers of clay may be applied, which tend to cover the interiors of the walls. Because ovens are closed, high temperatures can not only be reached but also maintained. In cases of extreme heat development, the inner walls of ovens will be burnt to a hard, reddish to greenish-yellow layer due to the oxidation process (Coockson 2009, 113). Within the oven wall less oxygen is present, as a result of which a yellow or brown discoloration appears on the surface of the wall, initially as a grayish or brownish-black discoloration due to the reducing atmosphere. Large ovens are often located outdoors, but smaller ones can also be found inside houses (Marciniak and Czerniak 2007, 118; Coockson 2009, 116).

With an average surface area of less than 1 m^2, a hearth is generally smaller than an oven (Coockson 2009, 114). It also frequently has a fixed construction but without a closed superstructure. The basic shape of a hearth is often rectangular or round. Since in a hearth lower but constant temperatures can be achieved, they are generally associated with cooking activities. Hearths are less clearly visible archaeologically than ovens. The primary indicators of a hearth are ash containing charcoal and sooted interior walls. Sometimes, however, red burnt clay is also found on the interior hearth walls. Firing temperatures can vary depending on air supply and fuel. Hearths may be located inside houses as well as outdoors.

An open fireplace contains no architectural elements and is usually used for only a short time. In archaeological context it is apparent as a round or oval, dark brown or dark gray burnt, ashy spot or as a lenticular layer ("ash lens") in profile. In an open fireplace only low temperatures can be reached, often fluctuating because of the difficulty of controlling the fire. External factors such as targeted air supplies can increase the temperature. Large stones are often used as expediently constructed borders of fireplaces on which traces of soot or cracks may be visible depending on the temperature reached.

Archaeologically, fire makes an important contribution to the preservation of finds and features. Impressions of vegetal temper or parts of plants are often well preserved in burnt clay, just as the traces of wooden beams in baked clay can assist in the reconstruction of houses (Regenye 2007, 33). Fire affects originally unfired clay objects, such as tokens and figurines, as they will be much better preserved in ashy contexts than in others (see Chaps. 12 and 13).

Fire installations in Monjukli Depe

In the excavation seasons 2010-2013 a total of 49 Neolithic and Aeneolithic fire installations were identified.[61] I focus on those fire installations that have been defined as such by the excavators. The numbering of fire installations is arbitrary and does not imply any stratigraphic or functional relationships. Summary information for the installations can be found in Table 6.2.

At Monjukli Depe, ovens, hearths, fireplaces, and a chimney have been documented. I present them here, followed by a diachronic comparison of the two periods. In Aeneolithic layers 45 fire installations were documented. The four fire installations dating to the Neolithic come from Marushchenko's deep sounding or from Unit C. Since the Neolithic features constitute only a limited basis for a meaningful comparison, I also include evidence from the Neolithic sites of Jeitun and Chagylly Depe. In addition, I discuss the fire installations of Aeneolithic Level II at Chakmakly Depe, Anau North IA, and Gonur Depe in a consideration of long-term continuities in the use of fire.

Use of fire in Neolithic Monjukli Depe

The Neolithic of southern Turkmenistan is characterized by apparently unplanned settlements with free-standing houses and chaff-tempered ceramics. House ground plans are uniformly square, and fire installations are regularly present inside them (Müller-Karpe 1982, 145).

In Monjukli Depe Neolithic layers were excavated in Units C, D, H, I, and K. The Neolithic fire installations of Unit C are found in Strata V-VII and lie close to the presumed center of the Jeitun-period settlement mound. The fireplaces in the outdoor areas most likely served as light sources or for preparing food. In the small area of Neolithic occupation excavated, buildings with indoor fire installations were not found.

Due to the small size of the soundings, only very few fire installations have been completely exposed, so that an exact size specification is usually not possible. Ash lenses are recognizable in the Neolithic layers of Marushchenko's deep sounding. A comparison with the Aeneolithic levels in the sounding shows a significant increase in the intensity of the use of fire from the Neolithic to the Aeneolithic, as in the younger layers the number of ash lenses increases (Bernbeck 2018, 27-30).

Strata VII-V: FI 6-9

The oldest excavated fire installations at Monjukli Depe are located in Unit C and come from a series of external surfaces that followed one another in a rapid succession of

61 Since results of the botanical analyses, both macrobotanical and phytolith, from the relevant contexts are not currently available, it is not possible for the most part to identify the material used as fuel.

only 25 years (Table 3.3). The thus far earliest evidence of interaction with controlled fire is **FI 9** at the southwestern edge of Unit C. It is an up to 1.0 x 0.7 m fireplace of highly irregular shape, the fill of which consisted of a whitish ashy center with no discernible pieces of charcoal. Around this spot was an orange burnt deposit mixed with gray ash and charcoal. On the bottom of the fireplace, underneath the white ash, were layers of gray ash with charcoal and pieces of burnt clay.

FI 6, south of FI 9, measures 0.45 x 0.4 m and also showed no construction elements. It can be described as a simple fireplace. **FI 7** is slightly smaller; it extends into the northwestern profile of the Unit C sounding. This possible fireplace may have been in use for some time or was perhaps reused, as suggested by a second, overlying layer of ash.

FI 8 consists of an up to 1.0 x 0.55 m irregular area running into the western baulk of Unit C, south of FI 7. Under a pinkish to brownish ashy layer, white ash mixed with charcoal was visible. Again, two layers of ash indicate repeated use. Compact material in the northeast suggests an installation that may have been connected to a fireplace.

The exposures in Units H and K were not extensive, and no fire installations were identified in these soundings. Indirect evidence for dealing with fire and isolated areas of ash were, however, present. In Unit H ash, charcoal, and burnt stones were encountered. In Unit K, a setting of stones, composed of a mixture of used, burnt, and worked stones was excavated (Fig. 6.1). The material between the stones consisted of fine sand in which small charcoal flecks were identified. The installation seems to have been located in the interior of a construction made of pisé. Surface K11 and K12 also contained charcoal flecks trampled into it that may have been related to the fire installation.

None of the Neolithic fire installations exposed in Monjukli Depe have construction elements, and they are

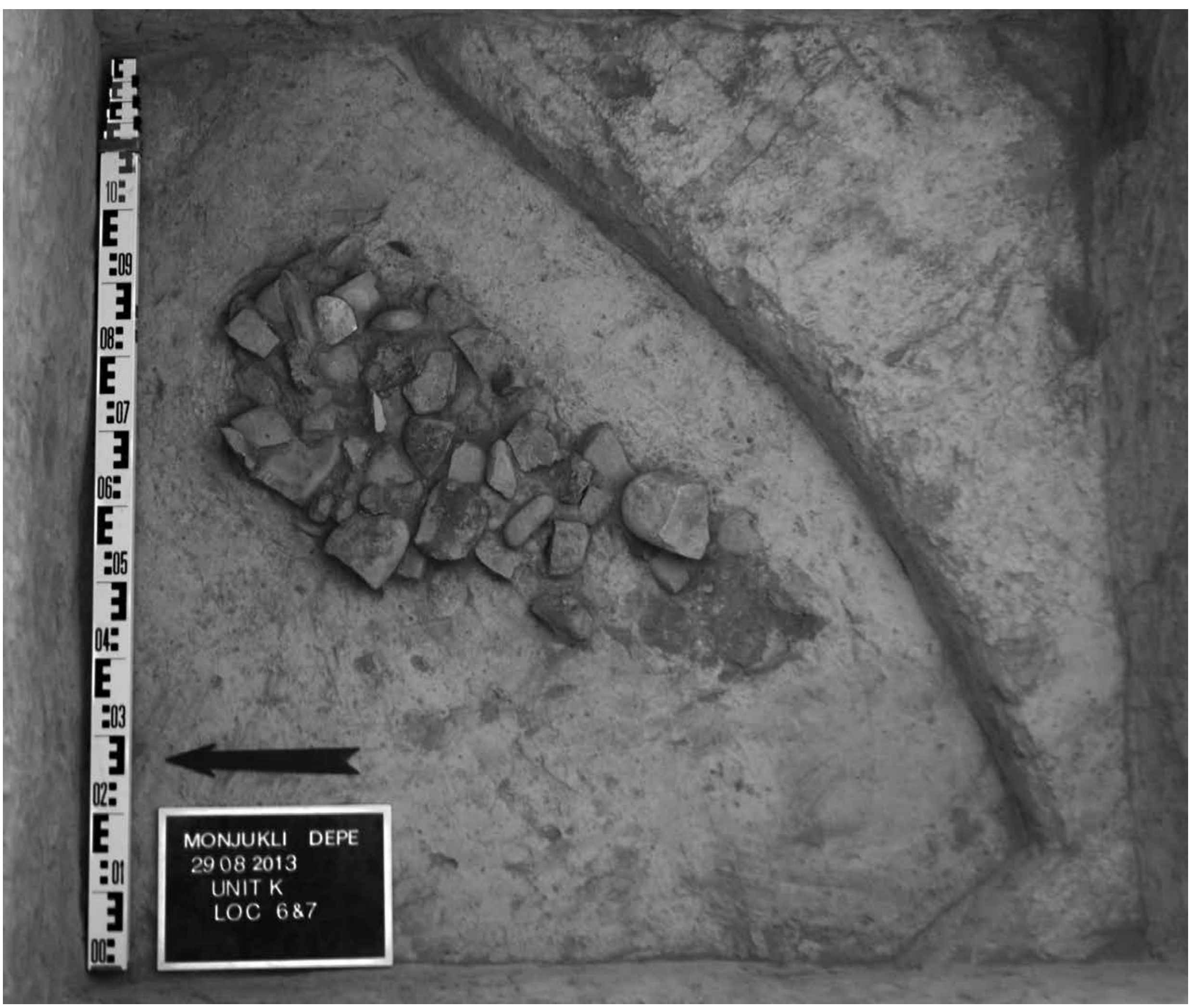

Fig. 6.1. Stone setting in Stratum VII-V north of a Neolithic wall in Unit K.

therefore all categorized as fireplaces. However, this may be partly a product of the current status of excavation rather than an actual absence of ovens and hearths. A comparison with other Jeitun-period sites shows that fire use inside buildings, including ovens, was quite common (see below).

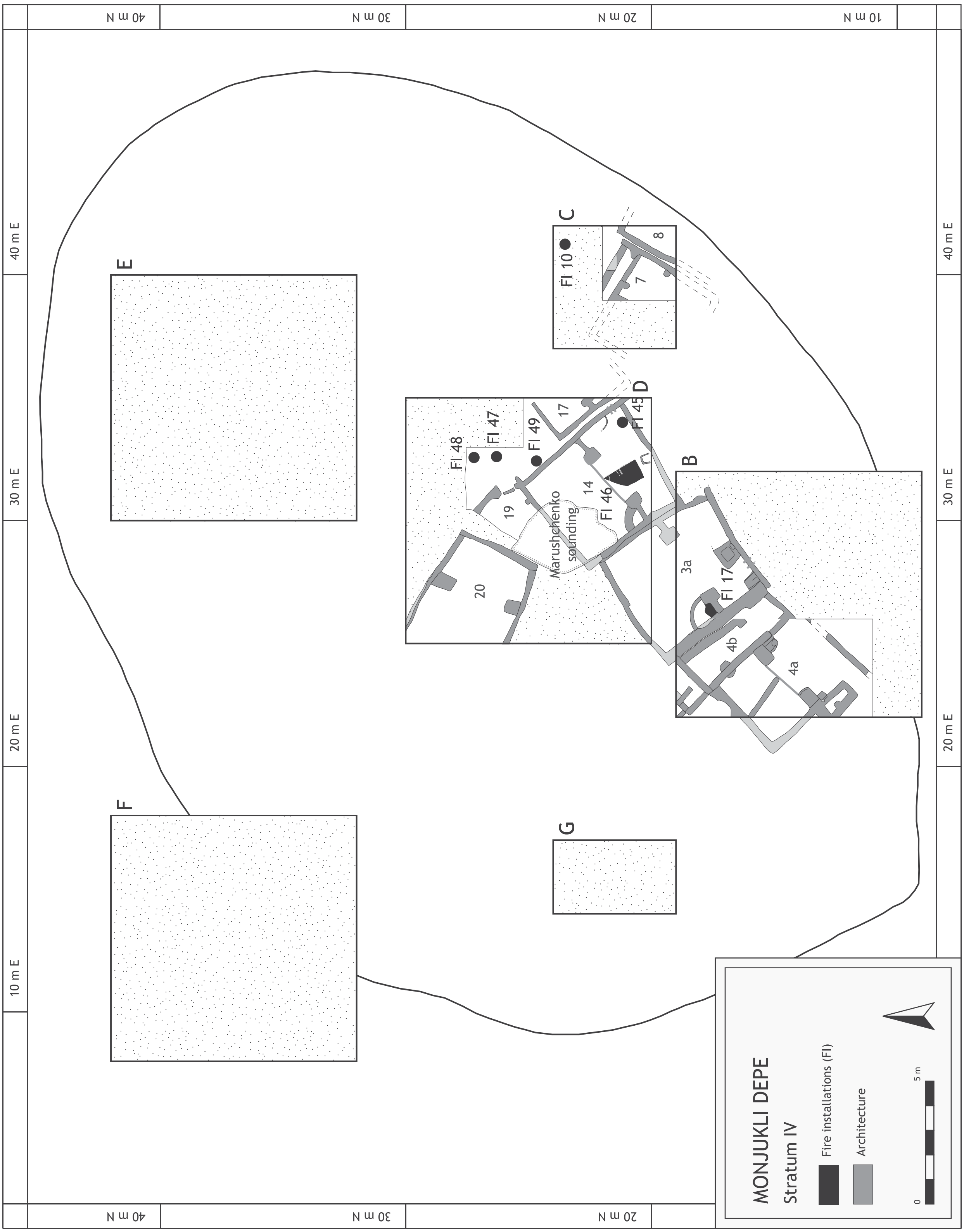

Fig. 6.2. Locations of fire installations in Monjukli Depe Stratum IV.

Fire use at Monjukli Depe in the Aeneolithic period

The Aeneolithic fire installations at Monjukli Depe are characterized by high variability in their construction. Ovens, hearths, and fireplaces are located both indoors and outdoors, with certain of these types of installations typically found in particular locations. I present them in stratigraphic order, that is, from oldest to youngest.

Stratum IV: FI 10, 17, 45-49 (Fig. 6.2)

Among the oldest documented Aeneolithic fire installations at Monjukli Depe are fireplaces located in the outdoor area northeast of Building 19. **FI 47** measures 0.8 x 0.6 m, is irregular in shape, and includes gray ash and burnt material. **FI 48** was identified within a sloping layer of ash to the northeast of Building 19. This irregularly rounded, 0.9 x 0.5 m fireplace contains reddish to gray ash and pebbles that may have been part of a constructed base.

Fig. 6.3. Chimney FI 17 in Building 3. The curved wall is part of an older construction phase and does not belong to the fire installation.

Directly north of the north wall of Building 14 and west of Building 17 is **FI 49**. In the fill of this small fireplace of only 0.2 x 0.15 m were gray ash and pebbles.

North of Building 7 is **FI 10**. This 1.2 x 0.4 m outdoor hearth with an irregular shape has a foundation of greenish, burnt mud bricks. The fill consists of gray ash.

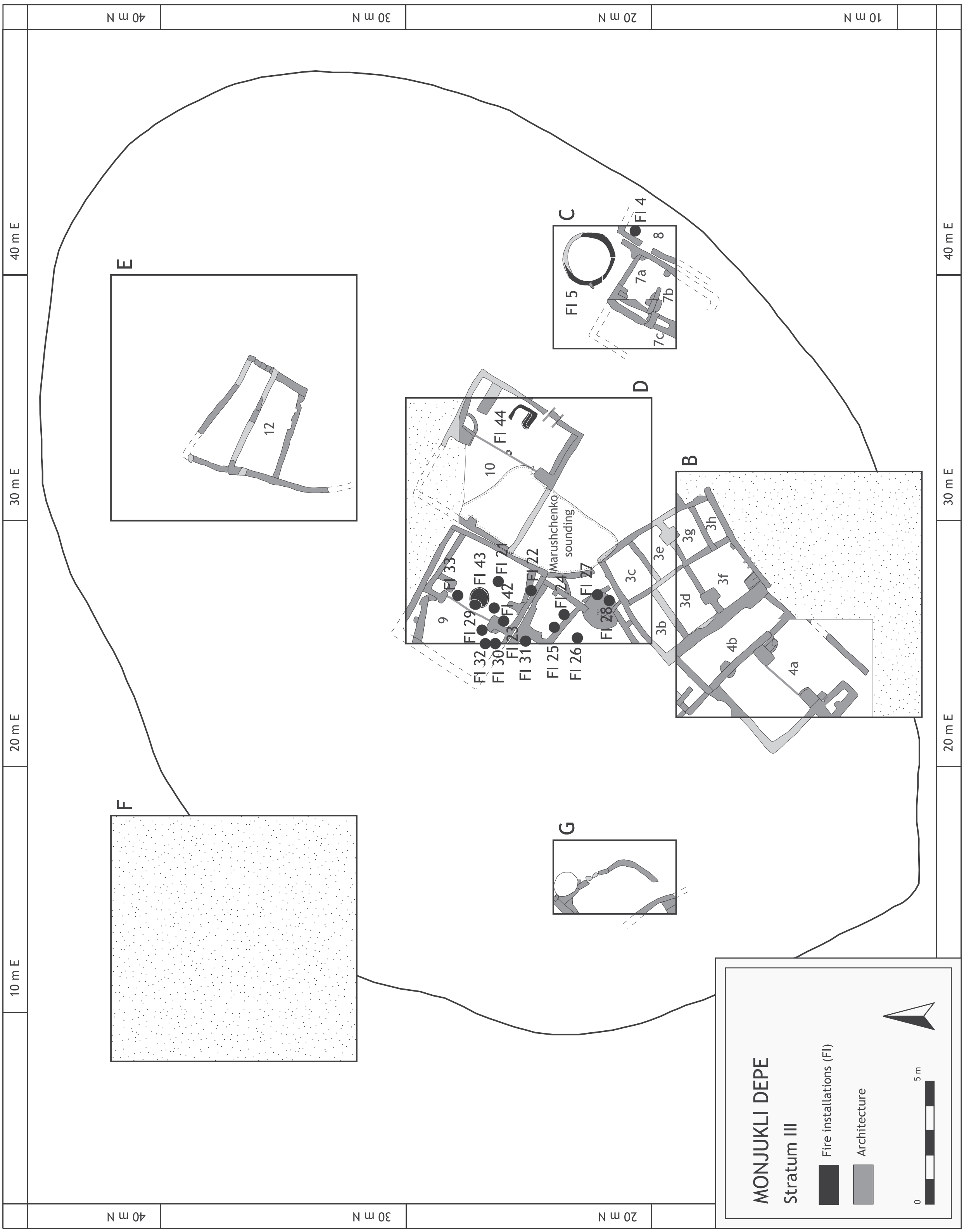

Fig. 6.4. Locations of fire installations in Monjukli Depe Stratum III.

FI 46 is situated in the middle of Building 14 in the front portion of the structure (see Figs. 2.18 and 5.2), similar to FI 43 in Building 9. FI 46 is a more or less rectangular hearth of 1.4 x 0.8 m. It was traced in its outlines but not excavated. A band of pebbles enclosed by brown ash surrounds an area with a compact surface of greenish silt, interspersed with burnt orange spots and charcoal. It was probably used for cooking and as a source of light. Maybe the fire one day got out of control and was responsible for burning down Building 14 (for alternative scenarios, see Chap. 5).

FI 45 was documented within the ashy destruction horizon that followed the use phase of Building 14. This 0.4 x 0.35 m fireplace is irregular in shape and appeared as a burnt area with brown and black ash. Most likely, the fireplace was in use after the abandonment of the building either for incineration of rubbish and/or as a light source (see Chap. 5, 142).

FI 17 in Building 3 room 3d is a hitherto unique feature (Fig. 6.3). This installation consists of a chimney that was placed in the niche created between the stem of a T-shaped buttress and the wall to which it was attached. The 1.44 m high and 1.11 m wide chimney was thickly plastered with chaff-tempered clay and has a large opening near its upper end and two smaller ones at the base. The elongated oval upper opening was closed, probably intentionally, with a stone. Fine ash filled the chimney, but the installation itself showed few signs of burning. Perhaps it was used for smoking or drying something at low temperatures such as herbs, resins, or small amounts of meat. Although apparently located within a room of the house, the chimney was most likely an outdoor installation connected to the abandonment phase of Building 3 (see Chap. 3). This raises a number of questions: When making fire in an unroofed space, why is a chimney needed? If located in an indoor space, what use does the chimney have when there is no escape for the smoke towards the outside? Was the abandoned space still roofed? And could the chimney have been useful without any associated feature in which a fire was burning? Unfortunately, these questions must remain unanswered for now.

	Oven	Hearth	Fireplace
Building 8		1	
Building 9, room 9a		1	7
Building 9, room 9b			3
Building 10	1		
Outdoor area		1	4

Table 6.1. Distribution of types of fire installations in Stratum III.

Stratum III: FI 4, 5, 21-33, 42-44 (Fig. 6.4)

The largest number of installations used for fire comes from Stratum III, with a total of 18 in both indoor and outdoor areas (Table 6.1).

Fireplaces

A small, 0.25 x 0.20 m hearth, **FI 4**, was documented in Building 8. It is a pit with burnt edges that may have been used for cooking, storing embers, disposing of ash, and/or as a source of light.

FI 21 in Building 9 room 9a is oval in shape and measures 0.75 x 0.52 m. The fill of the fireplace contained orange and brownish clayey material and numerous pebbles. In the same room **FI 22** was filled with dark ash and measured 0.56 x 0.45 m. Again in the same room, **FI 23** is a circular fireplace with dimensions of 0.55 x 0.45 m and containing dark ash with large pieces of charcoal. A small rectangular room to the southwest of and adjacent to room 9a contains two fire installations. The fireplace **FI 24** measures 0.91 x 0.82 m and was filled with dark gray ash and large pieces of charcoal. **FI 25** is a brown, ashy spot with dimensions of 0.60 x 0.10 m. All of these fireplaces were located within different parts of the room fill and were probably used – at the same time or in rapid succession – during the abandonment phase of the building. They may have served as light sources in this area or represented the remains of the spontaneous incineration of rubbish. Since these fireplaces were found within the room fill, they cannot be directly connected to the use of the building. Perhaps the house was left open for some time and used for temporary storage or as a place for rubbish disposal. The central location of Building 9 might

Fig. 6.5. FI 43 (hearth) in Building 9 room 9a. The smaller fire basin is superimposed over a larger one.

support this assumption, since presumably more people passed by here than at the edge of the village.

FI 33 is located in room 9a and is directly associated with a clay plaster floor that was colored red with ocher. The floor of this small (0.48 x 0.45 m) fireplace has traces of burning. It was filled with dark brown ash. **FI 42** is a similar feature. The 0.45 x 0.40 m oval fireplace was also located directly on the floor in room 9a. The surface contains dark gray to orange traces of burning. Both fireplaces may have served as light sources in the otherwise presumably dark building as well as having been used for small cooking activities where high temperatures did not need to be reached.

Fig. 6.6. Hearth FI 5 in an outer area north of Building 7. The full height is preserved in some places; no roof was documented.

Fig. 6.7. Double-chambered oven FI 44 in Building 10. As is the case for FI 1, the higher, rectangular chamber is separated by a later wall from the long, lower one that was filled with ash.

FI 29, 30, and **32** are located in room 9b. Fireplace 29 (0.50 x 0.41 m) contained brownish ash, whereas a gray, ashy filling was documented in FI 30 (0.39 x 0.10 m). Fireplace 32 stands out because of its size (1.00 x 0.37 m) as well as its heterogeneous filling, consisting of brownish to gray ash, stones, animal bones, charcoal, and pebbles.

Fig. 6.8. Locations of fire installations in Stratum II as well as those attributed to Stratum II/III.

Fig. 6.9. Single-chambered ovens FI 38 and 39 in the eastern profile of Unit G. The two construction phases are separated by a fill layer (indicated by the arrow).

Fig. 6.10. FI 38 and 39. Detail of the oven wall. The yellowish-green burnt interior is a clear indicator of high temperatures.

FI 26 is located in an outside area south of Building 9. The 0.50 x 0.15 m fireplace was filled with dark gray ash and pieces of charcoal. In the vicinity were two additional fireplaces, **FI 27** (0.35 x 0.25 m) and **FI 28** (0.50 x 0.45 m). They contained brownish to dark gray ash. It is unclear whether **FI 31** (0.40 x 0.30 m) is a fireplace or simply an ashy fill layer.

Hearths

FI 43 is a hearth sunk into the floor of Building 9 room 9a, consisting of two interlocking basins of different sizes (Fig. 6.5). The installation measures 1.95 x 0.82 m. Both basins and the clay floor below them exhibit gray-violet to orange burning traces. The traces on the smaller basin, which overlaps the larger one, indicate a higher temperature – perhaps the embers of the fire were kept there, or the two basins were used for preparing two different kinds of food. As this open fire installation was centrally located in the building, it was probably secondarily used as a light source. A smoke exhaust may have been present in the roof. No fill was documented; like the building itself, the hearth was left in a clean condition after its last use.

FI 5 is located in an outside area of Unit C (Fig. 6.6). The diameter of the outer wall of the large hearth is 1.5 m. The upper part is smoothed and has no broken edges, so that it can be assumed that the installation is almost completely preserved. Under red burnt clay on the floor is a dense layer of pebbles over black-brown earth. Macrobotanical analysis confirmed the use of wood as fuel, while the

Fig. 6.11. FI 38 in Unit G and surrounding ashy layers.

phytolith analysis indicates that grasses and/or dung were also burned (Miller and Ryan 2011, 227). However, the small quantity of phytoliths in this context suggests that the hearth was thoroughly cleaned. Due to the size of this fire installation and its location outdoors, it may have been accessible to many residents of the community.

Ovens

FI 44 is located near the northeast wall of Building 10 (Fig. 6.7). This well-preserved oven went through two construction phases. In the older phase it consisted only of a combustion chamber, in the younger there was an elongated narrow and deeper chamber surrounded by a U-shaped raised edge on the side that extended beyond the oven into the room. The oven has a kind of exterior casing, perhaps because the older single chamber oven was larger than the more recent one with two chambers. The modification of the oven may have been accompanied by a changed use. This deeper, elongated chamber which sloped slightly upwards towards the back of the oven was filled with fine ash. The higher and wider chamber is rectangular with a floor consisting of seven thin layers of clay with a combined thickness of 18 cm and a gravel layer underneath for storing and distributing heat (Fig. 4.15). The embers and ash were probably kept in the lower chamber after starting the fire, so that the higher chamber could be used for baking. A similar kind of construction is also found in FI 1 in Stratum I, suggesting a similar usage. The oven, FI 44, was preserved to a height of approximately 80 cm. The inwardly sloping walls indicate a domed superstructure. The orange burnt interior plaster points to high temperatures, although the oven appears to have been open towards the middle of the room. The opening of the fire installation could also have served as a light source for what otherwise may have been a dark building interior. There must have been a duct

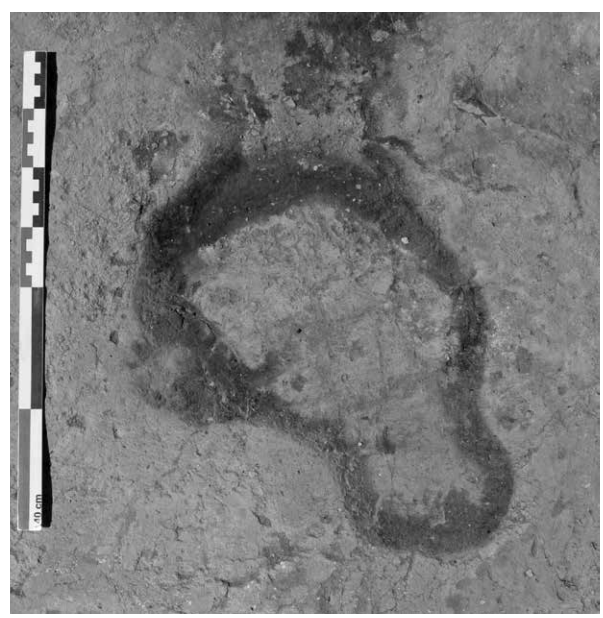

Fig. 6.12. Fireplace FI 41 in Unit G, northwest of FI 38/39.

Fig. 6.13. FI 18, a hearth or container for glowing embers, in Building 1. The hollowed area of the podium was filled with ash.

or hole in the dome of the oven to let the smoke out through the roof or an opening in the adjacent wall.

Stratum II/III: FI 38-41 (Fig. 6.8)

In some cases, features could not be unambiguously assigned to a single stratum. That is the case for the four fire installations grouped here as Stratum II or III.

Unit G showed a high degree of pyrotechnic activity. **FI 38** and **39** consist of a large, 2-m-diameter oven with two use phases. They run into the eastern profile of the unit (Fig. 6.9). **FI 39** is the earlier phase of the oven. The greenish-white clay plaster on the inner wall indicates that very high temperatures were reached. The upper edge of the oven was cut by the overlying, later oven, but it can be reconstructed on the basis of the angle of inclination of the oven wall. With a height of about 0.5 m, the oven was rather low in relation to its diameter (Fig. 6.10). It was filled with fallen brick that probably comes from the oven wall itself. The wall in combination with the brick fragments indicate a dome-like structure.

Immediately on top of this destruction horizon is **FI 38**. The existing oven wall of FI 39 continued to be used. The clay plastered inner wall is orange-red in color, indicating a firing temperature lower than in the earlier phase. The oven was cleaned after the last use, leaving no ash inside it. The contrast between the “cleanliness” of the installation and the surrounding ash layers running up to the oven wall is striking (Fig. 6.11) and corresponds

Fig. 6.14. Rectangular hearth FI 36 in the older construction phase of Building 2 room 2b.

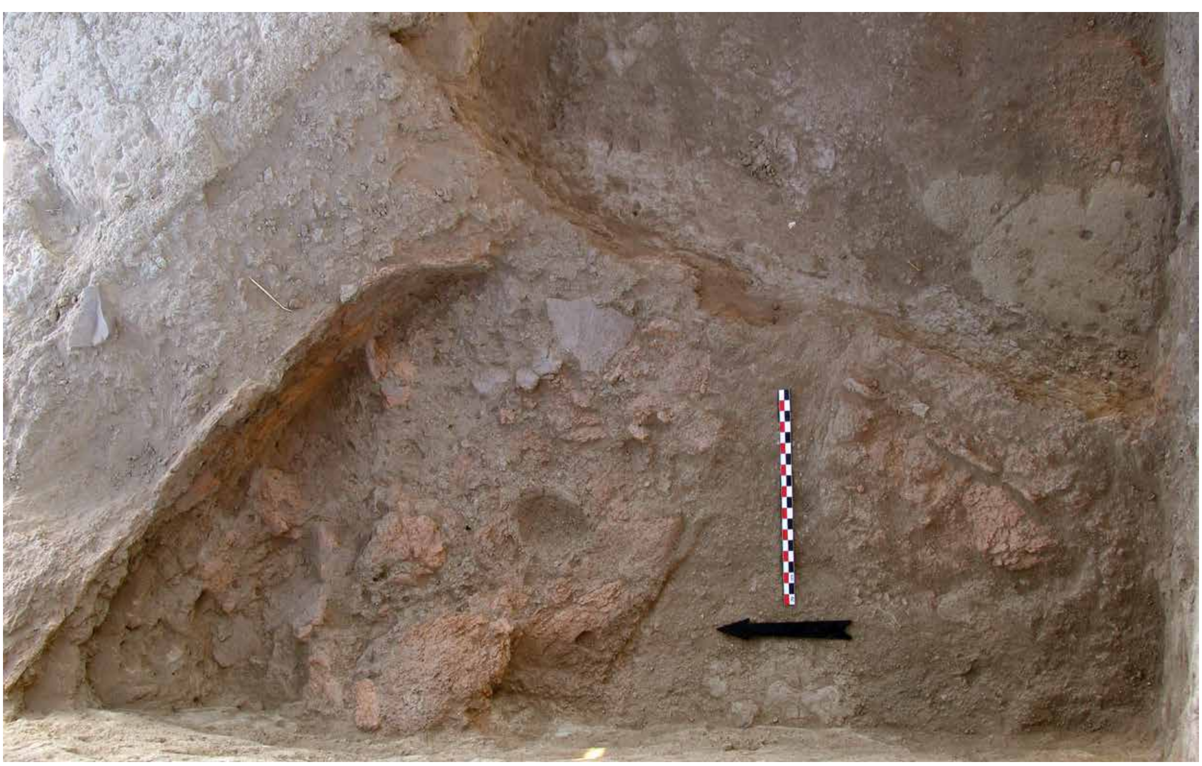

Fig. 6.15. FI 11, a double-chambered oven, in Building 23.

Fig. 6.16. Hearth FI 12 cut into the northwestern wall of Building 4. The small hearth FI 13 is located adjacent to it to the east.

to the state in which the single-chamber FI 5, also located in an outdoor space, was found.

Northwest of the oven are two fireplaces belonging, however, to an earlier phase of use. Although they are not directly connected to the oven, they indicate continuity of use in this area. **FI 41** is the stratigraphically younger of these two fireplaces. It is characterized by an irregular, pear-shaped form with black edge and a light gray ashy filling (Fig. 6.12). As can be seen in plan view, the fireplace turned the surrounding sediment slightly red, indicating relatively high temperatures. The more northerly and stratigraphically older **FI 40** measures 0.64 x 0.32 m. Due to the small amount of light gray to dark gray and reddish ash it contained, it can be characterized as an ephemeral feature.

Stratum II: FI 18, 36 (Fig. 6.8)

Two hearths are located in Stratum II. **FI 18** (Fig. 6.13) in Building 1 is a highly unusual fire installation, the exact function of which remains unclear. It consists of a podium 0.9 m long, 0.5 m wide, and 0.5 m high. Its upper surface is finely plastered. The eastern 0.5 m was encased by one row of bricks and a small hole of 0.2 m diameter cut into the podium. The hole has a stepped opening. It was found covered with an unfired clay stopper made from a piece of broken brick. The interior was filled with ash and charcoal pieces. No traces of fire were found on the plaster of the podium's surface. The function of this installation remains unclear. We can assume, however, that fire played an essential part and that the use was a highly specific one, on a smaller scale than other fire installations encountered in the Aeneolithic levels of Monjukli Depe. It may have been an installation for storing glowing embers.

In room 2b of Building 2 the remains of a rectangular hearth, 1.40 x 0.90 m, was found below the red floor levels in the southeastern corner of the room (Fig. 6.14). This hearth, **FI 36**, was lightly burned on the inside and filled with fine reddish, yellowish, and brownish ash. The area around the hearth was also very ashy. Numerous unfired clay objects were present in the immediate vicinity of the fire installation.

Stratum I/II/III: FI 11, 12, 13, 16, 37

Several fire installations can only be attributed to Strata I/II/III. Many of these installations were found directly

Fig. 6.17. Double-chambered oven or hearth FI 37 northwest of Building 16.

under the modern surface with their upper parts missing. Their locations are shown in Fig. 6.19.

FI 11 located in Building 23 is very similar to FI 1 in its construction (Fig. 6.15). This oven may have had a domed superstructure, as characteristically shaped pieces of burnt clay were present together with ashy fill. The visible extent of the oven, which ran into the western profile of Unit B, is up to 0.6 x 0.3 m.

Two small hearths are located in the northwestern portion of Unit B. Both are cut into the inner edge of wall B29 of Building 4 (Fig. 6.16). The somewhat elongated, irregularly shaped hearth, **FI 12**, 0.52 x 0.41 m, has a base of pebbles under a smoothed, lightly burnt clay surface.

FI 13 is semicircular and was set somewhat deeper into the wall B29 of Building 4. Here again there is a reddish clay plaster layer and marks of burning but no pebbles. Both hearths are indoor installations and most likely served as light sources.

The oval **FI 16** in Building 3 room 3h measures 0.62 x 0.51 m. Dark gray ash and burnt clay were documented. The fact that the feature stands out only slightly from the surrounding matrix suggests that the fireplace was not in situ. It may have been in use when the room was left open after the abandonment of the building in order to light the surrounding outdoor area.

A small, triangular double-chamber oven or hearth, **FI 37**, was found in a narrow corridor between Buildings 15 and 16 in Unit F (Fig. 6.17). A superstructure was not found but can be assumed due to the hard-baked clay interior. The oven measures 0.76 x 0.60 m and contains gray ash and some brick fragments. Despite the poor preservation, the partition wall between the two chambers is clearly visible. Compared to the other double-chambered ovens from Monjukli Depe (FI 1 and FI 44, as well as an oven in Building 16 that was excavated by Berdiev: see Fig. 2.46) the small size and the difficult-to-access location are noteworthy. It is unclear whether the installation was in an indoor or outdoor space.

Stratum I/II: FI 15; possibly FI 14

FI 14 is a 0.41 x 0.36 m oval fireplace excavated in Building 3 room 3f, consisting of gray ashy material (Fig. 6.19). No associated surface was identified. It may be that this is a feature located within the Soviet excavation and that it therefore dates to recent times.

The rectangular, 0.70 x 0.45 m hearth **FI 15** is located in Building 5. It was built against a wall, from which two

Fig. 6.18. FI 15 was built against a wall in a room of Building 5.

plastered side arms extended. An ashy and charcoal-filled deposit emerged from a small, snout-like projection consisting of hard burnt silt at the northern end of the hearth (Fig. 6.18).

Stratum I: FI 1, 2, 19, 20, 34, 35, 36 (Fig. 6.19)

A high concentration of features connected to the use of fire was documented in the northwestern portion of Unit E. The ovens **FI 1**, **2**, and **34** were found there. I describe them here in the order of their successive use, which can be established because the installations overlap. The stratigraphically oldest oven is FI 1, the southern end of which was cut by the construction of FI 2. The pit excavated in order to construct FI 2 cuts FI 1 and 34, making FI 2 the youngest of the three.

FI 1 (Fig. 6.20) is a large, double-chambered oven with a completely preserved base. It consists of at least two chambers separated from one another by a low, T-shaped partition wall. The portion of the oven within Unit E measures 1.36 x 1.62 m. The oven walls consist of partially unburnt mud bricks, whereas the dividing wall was made of several layers of mud plaster, indicating repair and a prolonged use of the oven. The floor of the eastern chamber also consists of several layers of clay that run up on the partition and side walls. The insides of the walls have an approximately 0.5-cm-thick, red burnt layer of mud plaster. The lowest layer of the floor is comprised of pebbles, offering insulation and even heat distribution. The western chamber, which runs into the western baulk of Unit E, is lower than the eastern one and filled with fine ash. No pebble layer was found there, and the floor was covered by only one layer of clay plaster. The outer edges of both chambers are completely preserved. It can be assumed that the lower chamber was used for making fire and the upper chamber for that which was heated (e.g. bread), or the lower chamber was used as a container for embers and ash, since it was full of ash when it was excavated. Since the oven floor lay just below the modern surface, no information could be garnered on the architecture of the superstructure. Approximately 1 m east of the oven, a wall running in NW-SE direction parallel to the oven's eastern wall was identified. Remains of a floor were detected between the oven wall and the mud-brick wall. This wall and the associated floor might have originally belonged to a house to which the oven was connected. The house was destroyed by the younger ovens built in this area. All this leads me to the assumption that FI 1 was originally an indoor oven, but it cannot be ruled out that it was in use after the house was destroyed and FI 34 and FI 2 were constructed, which turned the space into an outdoor area. In that case, FI 1 would have changed from being an indoor to an outdoor installation.

Fig. 6.19. Locations of fire installations in Stratum I. FIs attributed to Strata I/II or I/II/III are also shown on this plan.

Fig. 6.20. Double-chambered oven FI 1, with a slightly elevated rectangular chamber and a lower, narrow one containing ash.

Berdiev describes a fire installation in the western part of the mound in Building 16 (room/building 7 in Berdiev's numbering) that is very similar to the construction of FI 1 (Berdiev 1972, 12-13; Sarianidi 1963, Fig. 31).[62] In Building 10 in Stratum III, FI 44 is a similar, fully-excavated, double-chambered oven (see above). Given the position and the morphological similarities to the oven in Building 16, plus the wall and the floor remains associated with FI 1, we may tentatively propose that FI 1 was an indoor installation as well (cf. Berdiev 1971, Fig. 1), although such ovens could have existed both inside and outside buildings.

FI 34 used the wall originally associated with FI 1, indicating that it is younger than FI 1. Approximately one quarter of this single-chambered oven was preserved. The remains measure 2.15 x 1.60 m (Fig. 6.21). The floor of the oven consisted of orange-colored clay plaster, and the oven was filled with bricky remains. Ash was not attested. In the western part the oven was cut by the construction pit of FI 2.

FI 2 is a single-chambered oven in the form of a large oval, 1.75 x 1.26 m. Inside the oven numerous curved pieces of burnt clay were found, which can be attributed to a domed superstructure (Fig. 6.22). The floor of the oven consisted of an approximately 3-cm-thick layer of mud plaster, which was also found on the inner walls (Fig. 6.23). There it was fired into a hard, red layer. In the northern part of the wall a one-brick-wide vent hole is present close to the oven floor. No ash was found, so it can be assumed that the fire installation was cleaned after its last use. This installation is very similar in its construction to the aforementioned FI 38/39 in Unit G.

Adjacent and to the east of this area of high pyrotechnic activity are the remains of a semi-circular wall belonging to an installation that may originally have been almost 3 m in diameter. The semi-circle encloses a heavily ashy area. So far it has not been possible to establish a direct stratigraphic connection to the aforementioned fire installations, but it seems likely that ash from the fire installations was moved and perhaps stored in this area. Within the ashy deposit were numerous unfired tokens and pieces of shaped clay (Chap. 13).

This area may have been used by several households, or it was at least accessible to a larger group of people. This might be an explanation for the clean state of the fire installations, which had to be left ready for the next users. The ovens were not of a single type, indicating different

62 During the scraping conducted in 2014, the oven was identified as having a bifurcated structure with heavily burnt fill.

Fig. 6.21. Single-chambered oven FI 34 north of Building 2. Only the northern end of the oven is preserved.

Fig. 6.22. Single-chambered oven FI 2 northeast of Building 2 during excavation. The brick fragments in the fill probably belong to the superstructure of the oven.

Fig. 6.23. FI 2 after removal of the bricky fill. The eastern portion of the fire installation is cut by a later construction, and in the southwest it is disturbed.

kinds of pyrotechnical activities. Possible functions might have been baking, roasting, smoking, or drying of bulk goods.

Near the area of the ovens at the northwest corner of Building 2 and facing the exterior space was a small hearth, **FI 35**. It consists of a 0.30 x 0.25 m circular depression with a base of pebbles and filled with brown ash. It is possible that this hearth served additionally to illuminate the outside area at night (Fig. 6.24).

FI 19 was located in room 1a of Building 1 just under the modern surface, so that its original form cannot be reconstructed. However, a floor of pebbles was documented along with a mud-plastered base with traces of red and white paint. The surrounding matrix consists of orange burnt earth.

FI 20 is a 0.3 x 0.28 m fireplace with gray, ashy filling, located in an abandoned room (1c) of Building 1.

Summary

The detailed documentation of Aeneolithic fire installations at Monjukli Depe allows an appreciation of the diversity of the installations themselves as well as their locations within the buildings and in outside areas and their distribution across the settlement. The variability of the installations, the different temperatures reached, and their construction details indicate highly diverse uses of fire for a number of different purposes that are so far unspecifiable.

A spatial analysis shows that certain types of installations are located in specific areas. Large round or oval ovens are found in outdoor spaces (FI 2, 5, 34, 38, 39). Rectangular, single- and double-chambered ovens are located in indoor spaces (FI 11, 44, and perhaps FI 1 as well as the oven in Building 16), as are flat fire basins (FI 43). Ephemeral fireplaces and the chimney (FI 17) are found both indoors and in outside areas as well as in (temporarily) abandoned buildings. The same is true for the semicircular installations in walls, which may have been used for lighting purposes (FI 12, 13, 35). In each use phase buildings housed between one and three fire installations, presumably for a variety of purposes. Several fire installations contain separate chambers that might have been used for keeping fire or cleaning the fire chamber, before disposing of the ash in a midden. By preserving the glowing embers and preventing the fire from expiring, the labor of ignition could have been avoided. This practice saves time and resources and in addition shows careful planning related to the handling of fire. When kept within the ash with some dry moss or

Fig. 6.24. Hearth FI 35 at the northern outer wall of Building 2.

something similar, the embers are protected from air and therefore keep glowing. A bin or second chamber is most suitably used for that task.

Indirect indications for dealing with fire

Dealing with fire involves not only the process of burning itself, but also the procurement and storage of fuel, the preserving of embers used to kindle other fires, and the disposal or removal of ash and other by-products of fire (e.g., cracked cooking stones). Everyday practice associated with fire is therefore reflected not just in the installations themselves, but also in the indirect evidence of fire use. Such evidence identifiable in the archaeological record can provide important clues about everyday practices associated with fire.

Two large ash-filled accumulations were identified in the eastern and central parts of the mound, the Eastern and Central Middens, respectively (see Chaps. 2 and 7). The Central Midden, attributed to Strata III-I, was recognized in the framework of the scraping program conducted on the mound, so we have an estimate of the extent of this feature. The large ash accumulations in Unit G are likely part of this midden. The Central Midden is delimited by Buildings 1 and 22 to the north and northeast, Buildings 3 and 4 to the east and southeast, and Building 24 to the south (Fig. 2.46). One access point was probably between Buildings 1 and 3 via Gate 2.

The Eastern Midden, attributed to Strata II-I, extends over an oval area approximately 10 x 15 m and reaches a depth up to 0.5 m. The layers of the midden contained mostly ash mixed with other sediment, charcoal, stones, and various kinds of artifacts. There were also numerous animal bones, including several cattle skulls, and it is likely that the layers in this area include the remains of multiple feasts (Chap. 7).

These two middens may have been used as places to dump daily waste (mainly from the use of fire) as well as for depositing the remains of large festivities. But why were areas near the center of the village selected for the disposal of ash and waste? Furthermore, ash accumulated not just in the middens, but also in abandoned buildings and in the streets. The enormous quantities of ash raise the question of the purpose of disposing of it in prepared locations such as the midden at the end of a street with a closable gate.

Fist-sized, fire-shattered stones with traces of soot were found in many different contexts at Monjukli Depe. Most of them were siltstone, a kind of stone that can be found in a nearby wadi.[63] Unfortunately, these stones were not found in identifiable contexts of original use. However, the use of heated stones to cook is known from various ethnographic sources. In the example of indigenous prairie cultures in North America, the stones were heated directly in the fire and then placed in water, which was collected in a taut animal skin (Odgaard 2007, 11). Transposed to Monjukli Depe, this scenario may be a possible analog for the large number of fire-cracked stones as opposed to the small number of ceramic sherds (Chap. 10).

Diachronic continuities

In order to set the diachronic development of fire installations within a regional and interregional context, in this section I examine some other Neolithic and Aeneolithic sites in southern Turkmenistan. Since fire installations often tend to be neglected in archaeological documentation and especially in the older publications on which I rely, this comparison remains somewhat imprecise.

As a comparison for the Neolithic fire installations from Monjukli Depe, I consider the sites of Jeitun and Chagylly Depe. Jeitun is regarded as the main reference site for this period due to the large-scale and comparably well-documented excavations conducted there. In addition, I selected Chagylly Depe because of its proximity to Monjukli Depe, making a comparison within a single subregion possible.

63 See Öğüt 2018. This observation is based on an investigation of types and sizes of stones in the Wadi Meana that was conducted during the 2011 excavation season.

Fig. 6.25. Building B in Jeitun. In the middle of the far wall is an oven and to the right a platform. Source: Harris 2010, Fig. 8.11, used by permission.

Fig. 6.26. Oven in Building A in Jeitun. The red burnt interior and the enclosed chamber for keeping the embers are clearly visible. Source: Harris 2010, Fig. 8.8, used by permission.

Jeitun was excavated extensively in the 1950s and 1960s by Masson and his team, providing a detailed architectural picture (Masson 1971); subsequent excavations took place in the 1990s (Harris 2010). Within the settlement houses were constructed in a freestanding fashion. No street could be identified. Striking is the uniform appearance of the architecture, consisting of one-room, nearly square houses (Fig. 6.25). In the middle of the northern or eastern wall, almost all houses display a massive, oval or rectangular oven (Fig. 6.26). In the case of the one excavated by Harris and team, the two side arms of the oven are slightly concave toward the interior of the room, due to which the oven opening assumes an oval shape. Perhaps this served to prevent the embers from spreading onto the floor of the room; vessels of different sizes could be positioned along the elongated oval opening. To the right next to the oven there is often a rectangular platform and to the left of it a pit dug into the floor of the room.

In the interior of some ovens, burnt mud bricks were present that were probably part of the oven roof (Gosden 2010, 240). A pebble layer as part of the oven floor is not documented. On color photographs a red burnt clay layer is clearly visible inside the ovens (Figs. 6.25 and 6.26). In one oven fragments of figurines were found. The Jeitun ovens are quite massive and found in a similar location to those in Monjukli Depe's Aeneolithic Buildings 10, 16 and perhaps 3. The enclosed oval shape of the Jeitun fire chamber suggests that preserving embers was already practiced in this way in the Neolithic.

Chagylly Depe is located eight to nine kilometers southeast of Meana, between the rivers Meana and Chaacha. Berdiev exposed a large area of architecture in his excavations there in the 1960s (Berdiev 1966; 1969). In the Late Neolithic settlement plan, the northeast orientation of the houses and the division of the settlement by two streets are striking. Similar to Jeitun, rectangular to square, one-room houses with a massive oven on the northeastern or southeastern wall were also found at Chagylly Depe (Berdiev 1969, 30-31, Fig. 3; Hiebert 2002, 31, Fig. 4.3). However, some multi-room houses were also discovered that differ from the "typical" Jeitun plan. This architectural shift is perhaps related to changes in material culture and cultural contacts with the northern Iranian plateau in the transition to the Aeneolithic (Hiebert 2002, 32).

In the settlement plan of Chagylly Depe, oval structures were documented and depicted on the published plan, but rarely described. One of these near Building 9 is described by Berdiev (1966, 4) as a fireplace.

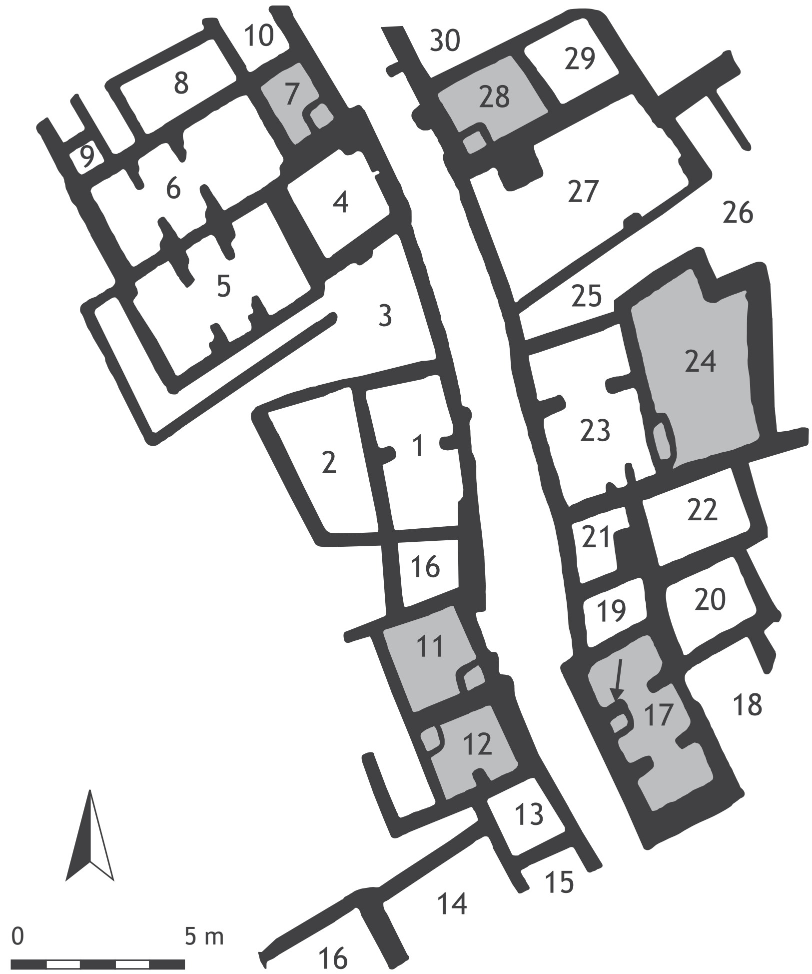

Fig. 6.27. Plan of Chakmakly Depe Level II. Similar to Jeitun, the massive, single-chambered ovens are found in the corners of the rooms indicated in gray. In one case, a platform is visible (arrow). After Berdiev 1968, Fig. 1.

The most striking characteristic of architecture at other Neolithic sites is the unified plan of one-room houses with standardized single-chamber ovens (Gosden 2010) or hearths (Masson 1971). This may indicate that the handling and use of fire was confined to the "private" space of house interiors in Neolithic Jeitun societies.

To examine (dis-)continuities in dealing with fire, I turn to the Aeneolithic occupations of Anau (Anau IA) and Chakmakly Depe (Level II) as comparisons to Aeneolithic Monjukli Depe. It should be noted that the Anau and Chakmakly Depe occupations date slightly later than Monjukli Depe (for the dating of Anau IA, see Chap. 3).

Anau IA layers (19 and 20) in Anau North were excavated by Hiebert in a small deep sounding. No fire installations were documented, which is most likely explained by the small size of the trench and not due to their actual absence. In the lists of soil samples taken by the excavation team, there are mentions of ash lenses in various contexts on floors and therefore inside buildings (Hiebert with Kurbansakhatov 2003, 38, Tab. 4.4).

The large area of Level II excavated in Chakmakly Depe can be attributed on the basis of ceramic comparisons to the Anau IA horizon (Fig. 6.27; Berdiev 1968, 27). Berdiev describes various fire installations inside the buildings that are visible on the settlement plan. A fireplace that is not further described is located in Building 2, a rectangular fire installation in the western corner of room 12, a rectangular fireplace in the southeastern corner of room 11, and another one of the same type in the eastern corner of room 7, which was interpreted by Berdiev as a kitchen because cracked stones with soot residue were found next to the fire installation (Berdiev 1968, 29). It is not possible to determine whether these installations were hearths or ovens or whether their constructions differed. The settlement plan shows similar installations in rooms 17, 24, and 28 (Berdiev 1968, Fig. 1). The fire installations described by Berdiev and those potential installations shown on the settlement plan are, with the exception of the one in room 17 (which was constructed at the corner of a buttress), in the corners of rooms, but they are not uniformly distributed. In size and shape the installations appear very similar, a fact that may point to similar functions of these installations.

Long-term continuities in the plans of ovens in southern Turkmenistan into the 3rd millennium are evident. A good case in point is Gonur Depe, located approximately 80 km north of Mary in the river delta of the Murghab, today in the Karakum Desert. The approximately 55-ha city dates to the middle of the 3rd through the 2nd millennium BCE (Sarianidi 2005). Situated in the area of the centrally located citadel are several double-chambered ovens, the construction of which is strikingly similar to those from Aeneolithic Monjukli Depe. A higher, wider chamber is separated from a deeper, more elongated one by a mud wall (Fig. 6.28).[64] This observation of technological continuity from the 5th to the 3rd millennium BCE indicates that the construction of double-chambered ovens changed little in southern Turkmenistan over a period of two thousand years. This does not exclude the possibility that their uses changed over time. The double-chambered ovens in Shahdad (Iran), for example, were likely used for metal production (Meier in press), something that is unlikely, although not fully excluded, for Monjukli Depe on the basis of the extant material culture. In the future microarchaeological analyses may provide further information on the uses of these ovens, which bear similarities to the "raised-box hearths" known from the literature on the Iranian highlands (Desset 2014).

In conclusion: the need for an analytical method

In the stratigraphic sequence at Monjukli Depe, changing cultural techniques of keeping and using fire become clear. The Aeneolithic fire installations were not located exclusively in houses as, for example, were those in Jeitun. Furthermore, a development within the Aeneolithic is clear, in which standardized fire installations no longer belonged to the regular furnishings of a house. Although fire installations were documented in most buildings, they differ considerably from one another. A standardized room arrangement such as that documented for the Jeitun period was no longer present. The increased variability of fire installations indicates a multiplicity of different uses, if we assume that certain actions and modes of production call for specific types of installations. Similarly constructed fire installations may have been used for different purposes, but to me it seems more likely that the features were modified for specific ends.

From my analysis, I conclude that pyrotechnology played a central role in Aeneolithic Monjukli Depe. This is reflected in an overall increase in the use of fire, as is evident in both Unit C and in Marushchenko's deep sounding. Although the excavated evidence for Neolithic fire use in Monjukli Depe is not comparable to the Aeneolithic layers, a comparison based on the Jeitun-period layers from other sites makes the differences to the Aeneolithic Meana horizon clear. The diachronic change and the variability of fire installations reflects changes in building techniques on a large scale: different constructions were designed for different purposes, large outdoor fire installations are associated with communal pyrotechnical activities, whereas smaller ones may indicate the use of lighting in the night to extend the day; on a smaller scale, at the level of actual construction practices, there are many similarities, for example in the use of clay plaster and pebbles. However, installations of the same type are not identical, so it can be assumed that different people were responsible for the construction of either specific groups of installations or, what seems more likely, each fire installation was potentially built by a different person or a different group of persons. Accordingly, an overall knowledge of the need for specific installations for specific practices associated with fire must have been widespread within the community at Monjukli Depe; the particular building practice, however, was specific to individuals.

Due to their location in the settlement, fireplaces contribute to the reconstruction of *Handlungsräume*, spaces of action,[65] since fire must be understood as an element of social life. Through their size and location, the large installations, FI 2, 5, 34, 38, and 39, in outdoor areas point to communal use. There are indications that these collectively used fire installations were kept clean and ready for the next use. This is a social-structural difference with respect to Jeitun-period settlements, in which such installations have not been documented. The double-chambered ovens in buildings at Monjukli Depe (FI 44 and perhaps FI 1), the unexcavated oven in Building 16, and possibly also FI 37, due to its location in a narrow corridor, indicate activities such as roasting, drying, smoking, or maybe also burning of resins carried out by a closed group of persons in a private field, if it is assumed that not all residents had equal access to all buildings and there was a division into households.

The transformation of fire installations, as documented in the archaeological record, is an indication of social change, as they can be observed over the transition from the Neolithic to the Aeneolithic (cf. Kohl 1984; Harris and Gosden 1996; Hiebert with Kurbansakhatov 2003). However, such a development must not necessarily be accompanied by vertical social differentiation. Rather, it is equally possible that horizontally differentiated societies existed that were characterized by divisions into areas of responsibility. Formal multiplicity means pyrotechnical diversification but not necessarily specialization.

In the evaluation of these features, we are faced with some inconsistencies. On the one hand, the number and variability of fire installations in Aeneolithic Monjukli

64 Observations by the author during a visit to Gonur Depe in 2011. See also Meier in press.

65 On the production of social space, see Lefebvre 1991, for the formation of space in human geography, Werlen 1993.

Fig. 6.28. Double-chambered oven at Gonur Depe, 3rd millennium BCE. Photo: J. Schönicke, taken with permission.

Depe indicate intensely used activity areas. On the other hand, the overall low density of finds, particularly within buildings, allows no direct conclusions about activities performed. By means of microarchaeological investigations (Sturm in preparation) and phytolith analyses (Ryan 2011, 221-222), however, the uses of fire installations can be analyzed even where interpretation via macroartifacts reaches its limits due to the scarcity of finds. All the more important, therefore, is a systematic sampling of the fills and constructed elements of fire installations, for analysis of macrobotanical remains, radiocarbon dating, phytoliths, and spherulites. In that way, differences and similarities can be worked through on a small-scale level, providing a nuanced picture of past societies.

As the cultural history of fire use shows, social and technological change manifest themselves materially in dealing with fire, fire installations, and the practices associated with them. Analysis of the stratigraphic change in fire installations may be drawn upon as an indicator of changing cultural techniques and everyday practices. Accordingly, the study of the Neolithic levels at Monjukli Depe is essential for a more detailed understanding of this process, as it will allow us to directly compare the two horizons in one settlement despite a gap of many centuries. For regional and interregional comparisons, small-scale excavation, sampling, and documentation methods are required, which recognize the context of fire installations as part of changing everyday practices.

FI No.	Stratum	Unit	Loci	Period	Location	Size (m)	Shape	Type	Content	Remarks
1	I	E	E218 (= E30, E38, E87, E94, E98, E103, E119, E134)	Aeneolithic	poss. indoor	1.62 x 1.36	rectangular	oven	bricky fall, lumps of burnt clay, fine gray ash	double-chambered installation; see Fig. 6.20
2	I	E	E198 (= E31, E78, E109)	Aeneolithic	outdoor	1.75 x 1.26	oval	oven	bricky fall, ashy sediment, parts of oven walls	single-chambered; see Figs. 6.22-6.23
3		E	E25, E28	recent	outdoor	0.95 x 0.90	round	fireplace	piece of iron, charcoal, burnt fill	remains of fireplace from herders, prob. using a modern tire
4	III/IV	C	C10	Aeneolithic	Bd. 8	0.25 x 0.20	round	pit or hearth	slightly burnt reddish-pinkish sandy clay	
5	III	C	C35, C36, C38, C247, C237, C257, C260, C263, C271	Aeneolithic	outdoor	1.5 m diameter	round	hearth	clayey/silty material, dark brown deposit	Fig. 6.6
6	V-VII	C	C243	Neolithic	outdoor	0.45 x 0.40	irregular	fireplace	dark brownish ash	
7	V-VII	C	C266	Neolithic	outdoor	0.3 x 0.3 (max.)	irregular	poss. fireplace	ashy	
8	V-VII	C	C273	Neolithic	outdoor	0.6-1.0 x 0.20 x 0.55	unclear	fireplace	pinkish-brown and whitish ashy	
9	V-VII	C	C307	Neolithic	outdoor	0.15-1.0 x 0.2-0.70	round	fireplace	top: white ashy center, charcoal, orange burnt sediment and grayish ash; base: charcoal and reddish clay	
10	IV	C	C319	Aeneolithic	outdoor	1.2 x 0.40	irregular	hearth	gray ash, greenish brick base	
11	I/II/III	B	B15, B57, B64, B65	Aeneolithic	Bd. 23	0.50-.60 x 0.22-0.33	rectangular	oven	ash and burnt clay	Fig. 6.15
12	I/II/III	B	B62	Aeneolithic	poss. outdoor	0.52 x 0.41	irregular	hearth	brown deposit	Fig. 6.16
13	I/II/III	B	B63	Aeneolithic	Bd. 4, room 4a	0.36 x 0.12	round	hearth	burnt orange clay, mostly brown deposit	
14	I/II	B	B102	recent?	Bd. 3, room 3f	0.41 x 0.36	oval	fireplace?	gray ashy deposit, not in situ	
15	I/II	B	B113	Aeneolithic	Bd. 5, room 5a	0.70 x 0.45	rectangular	hearth	ashy soil, charcoal	Fig. 6.18
16	I/II/III ?	B	B131	Aeneolithic or recent	Bd. 3, room 3h	0.62 x 0.51	oval	fireplace?	dark gray ash, burnt clay – not in situ	
17	IV	B	B170, B171, B191, B222	Aeneolithic	outdoor/ abandonedBd. 3, room 3d	1.44 x 1.11	round	chimney	inside: soft ashy material mixed with chaff; around: dark choco-late-brown ash	located in room 3d but in use during abandonment phase of Bd. 3; see Fig. 6.3
18	II	A/D	A43, D231, D234, D235	Aeneolithic	Bd. 1	0.90 x 0.50	rectangular	hearth	gray to black to buff ashy material	podium-like construction with hole; see Fig. 6.13
19	I	A	A62	Aeneolithic	Bd. 1, room 1a	0.9 x 0.6	irregular	hearth/ oven?	orange and burnt brown deposit, mixed with pebbles	broken/poorly preserved
20	I	D	D225	Aeneolithic	room 1c	0.3 x 0.28	irregular	fireplace	gray ash	

Table 6.2. (continued on next page) Fire installations from Monjukli Depe.

FI No.	Stratum	Unit	Loci	Period	Location	Size (m)	Shape	Type	Content	Remarks
21	III	D	D324	Aeneolithic	Bd. 9, room 9a	0.75 x 0.52	rectangular to irregular	fireplace	orange to brown clayey material with numerous pebbles	
22	III	D	D328	Aeneolithic	Bd. 9, room 9a	0.56 x 0.45	round	fireplace	dark ash	
23	III	D	D338	Aeneolithic	Bd. 9, room 9a	0.55 x 0.45	round	fireplace	dark ashy material with large charcoal pieces	
24	III	D	D345	Aeneolithic	outdoor	0.91 x 0.82	round	fireplace	small pebbles at base	used during abandonment
25	III	D	D350	Aeneolithic	outdoor	0.60 x 0.10	oval	fireplace	brownish, ashy	used during abandonment
26	III	D	D357	Aeneolithic	outdoor	0.50 x 0.15	round	fireplace	dark ash, charcoal	
27	III	D	D360	Aeneolithic	outdoor	0.35 x 0.25	round	fireplace	brownish to dark ash	
28	III	D	D361	Aeneolithic	outdoor	0.50 x 0.45	round to figure 8-shaped (at base)	fireplace	brownish to dark ash	
29	III	D	D362	Aeneolithic	Bd. 9, room 9b	0.50 x 0.41	round	fireplace	brownish ash	
30	III	D	D365	Aeneolithic	Bd. 9, room 9b	0.39 x 0.10	round (as far as visible)	poss. fireplace	gray ash	maybe part of room fill
31	III	D	D370	Aeneolithic	outdoor	0.40 x 0.30	roundish	poss. fireplace	dark gray ash	maybe ashy layer
32	III	D	D374	Aeneolithic	Bd. 9, room 9b	1.00 x 0.37	roundish	poss. fireplace	brownish to grayish ashy material, stones, bones, charcoal, pebbles	maybe ash pit
33	III	D	D513	Aeneolithic	Bd. 9, room 9a	0.48 x 0.45	roundish	fireplace or hearth	dark brownish ash, burnt surface	
34	I	E	E228	Aeneolithic	outdoor	2.15 x 1.60	oval	oven	bricky fall; hard-baked orange surface	Fig. 6.21
35	I	E	E257	Aeneolithic	outdoor	0.30 x 0.25	round	hearth	brown ash, pebble base	Fig. 6.24
36	II	E	E281, E284	Aeneolithic	Bd. 2, room 2b	1.40 x 0.90	rectangular	hearth	reddish, brownish, and yellowish fine ash	Fig. 6.14
37	I/II/III	F	F29	Aeneolithic	outdoor?	0.76 x 0.60	rounded triangle	oven or hearth	ashy to compact bricky material	double-chambered; Fig. 6.17
38	II/III	G	G11, G14, G16	Aeneolithic	prob. outdoor	2 m diameter	round/oval	oven	cleaned after use, no ash detectable	single-chambered, highly burnt wall and floor plaster; see Figs. 6.9-6.11
39	II/III	G	G11, G24, G25	Aeneolithic	prob. outdoor	2 m diameter	round/oval	oven	mixed bricky (roof parts) and ashy fill	single-chambered, greenish white burnt inner plaster indicating high temperature; see Figs. 6.9-6.10
40	II/III	G	G83	Aeneolithic	outdoor	0.64 x 0.32 (contin-ues into profile)	circular	fireplace	light to dark gray and reddish material	probably only short usage
41	II/III	G	G55	Aeneolithic	outdoor	0.25 x 0.2	irregular roundish	fireplace	black and grayish ash	Fig. 6.12

Table 6.2. (continued on next page).

FI No.	Stratum	Unit	Loci	Period	Location	Size (m)	Shape	Type	Content	Remarks
42	III	D	D538	Aeneolithic	Bd. 9, room 9a	0.45 x 0.40	round	fireplace	no fill, beneath orange/black burnt floor plaster	attributed to floor D531/D530
43	III	D	D540	Aeneolithic	Bd. 9, room 9a	1.95 x 0.82	oval	hearth	no fill, burnt floor plaster below	oval hearth consisting of two shallow overlapping bowls; see Fig. 6.5
44	III	D	D611, D624	Aeneolithic	Bd. 10	1.3 x 1.1	rectangular	oven	hard bricky wall fall, fine gray ash, brown crumbly fill, buff to red ash	large double-chambered oven; see Fig. 6.7
45	IV	D	D724	Aeneolithic	after-use phase of Bd. 14	0.4 x 0.35	irregular round	fireplace	brown to black ash	small burnt area within the fill
46	IV	D	D739	Aeneolithic	Bd. 14	1.4 x 0.8	partly rectangular/ irregular	hearth?	dark brown with orange and greenish silt, pebbles	poorly preserved
47	IV	D	D653	Aeneolithic	outdoor	0.8 x 0.6	irregular round	fireplace	gray ash and burnt material	fireplace north of Bd. 19
48	IV	D	D677	Aeneolithic	outdoor	0.9 x 0.5	irregular round	fireplace	grayish to reddish ash with pebbles	within sloping ash layer NE of Bd. 19
49	IV	D	D809	Aeneolithic	outdoor	0.2 x 0.15	round	fireplace	gray ash with pebbles	small external fireplace just N of wall D476 of Bd. 14

Table 6.2. (continued).

Chapter 7

Remains of the Feast Days?

A Comparative Study of Faunal Remains from Aeneolithic Monjukli Depe

Jana Eger

Keywords: *faunal remains; carcass treatment; Eastern Midden; feasting*

Introduction

This chapter analyzes the animal bones from Monjukli Depe in terms of a comparative osteological examination of animal processing in different contexts within the Aeneolithic settlement.[66] The impetus for this comparative contextual analysis came from the finding of an unusual feature in the settlement that hinted at ritualized practices in connection with communal feasts. This feature, which we refer to as the Eastern Midden, already stood out at the time of its excavation. It is located in an area surrounded by domestic buildings and contained many relatively complete animal skulls and other animal bones still in articulation. The feature did not fit into the otherwise usual house and outdoor contexts but rather seemed to be a special place for dealing with parts of animals. We discussed the possibility that it contained remains of feasting, something that could be examined through a contextual analysis of the animal bone assemblage by drawing on interpretive possibilities of archaeozoological, archaeological, and ethnographic case studies. The large quantity of animal remains at Monjukli Depe provides a good basis for a critical examination of the social phenomenon of ritual commensality, which I define as an event that takes place in groups larger than those that share everyday meals. The analysis of animal remains with reference to commensal activities at the household as well as communal level has not previously been addressed in the archaeology of early villages in southern Turkmenistan.[67]

The zooarchaeological material under investigation consists of a sample selected at the excavation site, due to limitations on the export of bones. The sample consists mostly of bones from well stratified contexts from the 2010 and 2011 excavation seasons.

Overall, the excavation context of the Eastern Midden and its associated finds suggest two alternative hypotheses: 1) the animal bones from the Eastern Midden are remains

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66 I wish to express my sincere thanks to Norbert Benecke and his assistant Michael Hochmuth for making available the identifications of the bone assemblage and for their expert support.

67 For other approaches to analyzing animal bones from prehistoric sites in southern Turkmenistan, see, *inter alia*, Kasparov 1992; 1994; Legge 1992; Harris et al. 1993; Moore, Ermolova and Forsten 2003.

of feasts, as they differ significantly from the remains in household contexts, or 2) the Eastern Midden was a large rubbish disposal context, and the animal bone assemblage from it is distinct from the bones in settlement contexts due to specific waste disposal practices. My investigation of the faunal assemblage is intended to provide information on the nature of differences between contexts and ultimately to address the question of how important feasts were at Monjukli Depe.

In the last 20 years, the sociocultural significance of feasts has received special attention. Theoretical and methodological studies of the characteristics of feasts as powerful and variable phenomena have become an important focus in archaeology (see, *inter alia*, Potter 1997; Dietler 1998; Dietler and Hayden 2001; Wiessner and Schiefenhövel 1998; Wiessner 2001; Bray 2003; Helwing 2003; Horwitz and Goring-Morris 2004; Mills 2004; Twiss 2007a; Pollock 2012a; Russell 2012a). The systematic examination of the archaeozoological material from Monjukli Depe contributes to this literature by focusing on the role of meat consumption in feasts.

Theoretical approach

Food and meals are not only part of the physical needs of people but may also be instrumentalized for other purposes. The consumption of food can represent important culturally and ideologically influenced occasions that play a significant role in the social life of a community. Arjun Appadurai (1981) argues that food serves as a means to mobilize strong emotions associated with positive memories or negative experiences in a person's life. In particular, influential mnemonic associations are involved that can reawaken memories of past social situations. Furthermore, "[t]he daily pressure to cook food (combined with the never-ending pressure to produce or acquire it) makes it well suited to bear the load of everyday social discourse." Food is an important means of interpersonal contact, and "in a society that rests on the regulation of such contact, food is a focus of much taxonomic and moral thought" (Appadurai 1981, 494-495). The pressures rise still further during the preparation of a feast and the associated need to provide a large amount of food. The reasons for organizing feasts as well as the practical advantages resulting from the communal sharing of a meal achieved through such events are numerous. They include the mobilization of labor, the crafting of collegial relationships or alliances between as well as within social groups, and the generation of non-solidary relationships by a construct of social exclusion. Political power relations may be generated and ideologies strengthened. Feasts can involve an integrative or competitive, prestigious character, material goods can be exchanged, social alliances strengthened, and favors asked (Hayden 2001, 29-30).[68] These various motifs and definitions of what makes a meal a feast as well as the occasion of festivities can be highly variable (Russell 2012a, 377-378, 381-383).

Georg Simmel already pointed out that eating is one of the most basic satisfactions of needs and an essentially egoistic activity, due to the fact that what is eaten by one person cannot be consumed by someone else (Simmel 1910). In his view, it is for this reason that eating in the company of one or more persons is so important: the physiologically individual activity is overcome by the social construct of consuming a meal together:

> That we must eat is such a primitive and lowly fact in the development of our life values that each individual unquestionably has it in common with every other individual. This is precisely what makes the coming together for a shared meal possible, and the socialization mediated thereby promotes the overcoming of the sheer naturalism of eating. (Simmel in Symons 1994, 350)

Even in today's fast-paced world, the common meal contributes to temporal regularity and social interaction. For Monjukli Depe I presume that the regular organization of festivities and collective feasts was connected to living out and strengthening community and the social characteristics associated with it. Eating and drinking together create and connect social norms and values that are partially reflected in the principles of hospitality. However, hierarchical relations can also emerge, leading to social differentiation. "[P]eople share in a different way in alimentary consumption. Acts of shared consumption consist of partaking together of food or drink, while at the same time a separation occurs through the apportionment of food or drink to others" (Pollock 2012b, 3).

In some competitive festivities the principle of reciprocity is used to gain prestige and a higher social position by staging large feasts, accompanied by the sharing of precious items or gifts of food and non-edibles. Such events show not only the hosts' wealth and generosity, but they can also leave guests in an inferior position of debt relative to the hosts. The dimensions of this form of reciprocity can be extreme, as Russell explains: "This can be reversed only by reciprocating with an even more sumptuous feast, leading to a cycle of increasing production driven by spiraling consumption, until one side is defeated

68 Dietler explains that, "Both food and drink are also a highly perishable form of good, the full politico-symbolic potential of which is realized in the drama of public-consumption events that constitute a prime arena for the reciprocal conversion of what Bourdieu metaphorically calls symbolic capital and economic capital. […] More importantly, however, consumption is played out in the extremely powerful idiom of commensal hospitality" (Dietler 2001, 73).

(unable to reciprocate)" (Russell 2012a, 382). This highly competitive kind of special meals, which can be subsumed under the term "diacritical feasts,"[69] is very unlikely to have taken place at Monjukli Depe where we have little to no evidence for hierarchical relations. It is, however, conceivable that communities in the region followed a custom of inviting each other to celebrations in which some degree of competition played a role, but without necessarily an aim of achieving a durable, hierarchically superior position. In contrast to what Dietler claims, one can argue that there is nothing inherently competitive in large-scale feasts; they can also serve for the public display of norms and hospitality rather than competition.

Not all of the strategic motives that stand in the background during celebrations and feasts are based on a principle of inequality. In many cases, they are outweighed by elements that invoke a sense of solidarity and a strong feeling of cohesion among participants (Russell 2012a, 379). Sarah Kansa (Kansa et al. 2009a) and Katheryn Twiss (2008) have contributed to research on the sociohistorical and cultural contexts of the widespread phenomenon of feasting in societies with little hierarchy. For Aeneolithic Monjukli Depe a solidary starting point can be assumed. Given the deposition of relatively large wild animals, such as onager, wild sheep, and gazelle, and the fact that in the Eastern Midden there was evidence of several individual animals that point to multiple meals (see below), it is possible that in some cases there were joint hunts, with the bodies transported to the settlement, followed by communal consumption. The indication of hunting is already by itself something special when one examines the Monjukli faunal assemblage, which contains over 90% domesticated sheep and goat bones as sources of meat.

Archaeozoologically, evidence for feasts can be found in a tendency toward use of adult animals, because these are first of all valuable animals. Secondly, the decision to raise large animal species is accompanied by the choice to rear an animal that is larger than a household alone can consume at once (Halstead 2007, 27; Russell 2012a, 387). Moreover, the butchering, cooking process, and disposal of domestic animals require the cooperation of a group of people larger than that of one household. Feasts also involve mobilization of labor for the feast itself. The coming together of people from the local community as well as a larger regional context serves to facilitate the exchange of food and other goods and offers the opportunity to exchange information and partners (Goring-Morris and Horwitz 2007, 911). But one of the most important points of feasting that develops and reproduces itself as a matter of course may have been communication, i.e. conversation as communicative action.

Some characteristics that have been suggested as identifiers of feasts in the archaeological record can be recognized in the Eastern Midden at Monjukli Depe. Brian Hayden mentions that animals, especially domestic ones that were rare and labor intensive to rear, played important roles in feasts. The amount of food and evidence of food waste, for example, and the disposal of articulated skeletal elements or bone that was not further processed also provide hints of feasting (Hayden 2001, 40-41, Table 2.1). Specific contexts for disposal of food remains that arise from very large meals with many participants (feasts) may be middens and especially burnt layers within rubbish pits (Hayden 2001, 40). In addition, large fire installations – especially a large number of hearths or ovens – might be an indication of feasts and the preparation of large meals (see Chap. 6).

According to Hayden (2001, 40), special places such as burial sites and "remote locations" may be spots where feasts took place rather than within an inhabited settlement. Although it is within the village, the Eastern Midden was a "special location," as the area could be closed off (see Chap. 2, 54). In addition, the organizing of festive events is dependent on the sociocultural reasons underlying them, and, accordingly, the venue can vary. For example, if in a regional event competitive feasts, social exchange, or other regional celebrations such as weddings stand in the foreground, one's own village may be chosen by the hosts for strategic reasons. Michael Dietler notes that in societies that are characterized by egalitarian social relationships, self-serving, manipulative kinds of festivities may be hidden and even overcome through socially accepted and integrative principles of hospitality (Dietler 2001, 79). Twiss (2008, 436) adds that the deliberate suppression of this competitive character of a feast may itself lead to social advancement. Certainly, feasts can also have served to maintain egalitarian relationships by upholding norms of mutual hospitality.

Large, organized festivities and the conventions associated with them are symbolically important, precisely because they seldom occur in the social context of everyday food consumption. They therefore stand out as exceptional. Archaeozoological investigations are important because they reveal functions and sociocultural dimensions of such feasts, especially for sites and periods where no written records exist. Important new considerations come to the fore, especially with respect to regional relations among neighbors and the ideological integration of feasts and their associated festivities.

69 Dietler's usage of the term diacritical feasts to describe one of the principal forms of commensal politics, "involves the use of differentiated cuisine and styles of consumption as a diacritical symbolic device to naturalize and reify concepts of ranked differences in the status of social orders or classes.… [T]he emphasis shifts from an asymmetrical commensal bond between unequal partners to a statement of exclusive and unequal commensal circles: obligations of reciprocal hospitality are no longer the basis of status claims and power" (Dietler 1998, 98).

Contextual analysis of faunal remains

Outline of the animal assemblage from Monjukli Depe

The first results of the studies of the animal bones from the 2010 excavation season already made clear that domesticated sheep and goat dominated the assemblage, followed by domesticated cattle and dog in much lower numbers; among the wild taxa, primarily onager and gazelle were identified (Benecke 2011). In addition to the cultivation of plants (Miller 2011; Ryan 2011), the residents' subsistence production was thus based on herding. The low number of cattle bones can be understood as related to the fact that although cattle provide a large amount of meat, they are much more "expensive" to raise and are economically riskier animals, due to their high demands for food and water and their lower birth rate compared to sheep and goats (Kansa et al. 2009b, 907). In economic terms the slaughter of the mass of meat provided by a single cow is associated with the risk that raw food spoils, unless resources are available for meat preservation or the weather is cool (Halstead 2007, 30-31).

In addition to domestic animals, some non-domestic taxa also provided significant food resources at Monjukli Depe. Although minimal in percentage, the wild animal component of the assemblage was nonetheless represented by large game such as camel and bear[70] as well as fox, wild sheep, wild boar, hare, large cat, and tortoise. In addition, various kinds of birds and one type of fish have been identified (Benecke 2011, 209, Table 13; Benecke 2018).

The Eastern Midden versus settlement contexts

A complex settlement structure can be recognized at Aeneolithic Monjukli Depe: houses are located along village lanes, but also lead into open, extensively used, and relatively large areas characterized by, among other things, trash disposal. One of these open areas is located in the middle of the settlement (Central Midden), the other in the eastern portion of the village and hence is referred to as the Eastern Midden. The latter is central to my analysis. It lies next to several buildings and stands out because of a nearby, symbolically marked gate that could be used to close off the midden area from the village streets (Figs. 2.43a and 2.44). The Eastern Midden extends south from a short way beyond the southeastern part of Unit D to the middle of Unit C and as far north as House 13, with an area of approximately 10 x 15 m and a depth of up to 0.5 m.[71] Given its location surrounded by houses and its size, a communal use can be suggested. In an ethnoarchaeological study, Margaret Beck and Matthew Hill (2004) argue that the use of waste disposal sites can be connected to certain households or groups of households, even when these disposal areas consist of open spaces. Rubbish pits are frequently shared by several households, the members of which may be related to one another (Beck and Hill 2004, 298). Accordingly, it seems reasonable to assume that in a village such as Monjukli Depe, the Eastern Midden was used communally by a neighborhood (Fig. 2.48).

The Eastern Midden consists of a variety of ashy, waste-filled layers with intervening more compact deposits in which there were some skeletal parts in articulation as well as a large number of fragmented animal bones from butchery and food waste. Striking were the well-preserved skull and horn cores of large mammals and entire sections of contiguous vertebral elements (Figs. 7.1-7.3). In addition to the bones, there was also a large number of chert tools, one intact, but otherwise mostly broken grinding stones, fragments of stone vessels and mortars, as well as spindle whorls, animal figurines, other artifacts made of clay, pottery sherds, and a lapis lazuli bead. Also noteworthy are the four burials in this area (MDB2, MDB5, MDB7, MDB13; Chaps. 8 and 9). Since it was no longer possible to determine whether they had been dug into the midden from a use-level of the midden or from some later use of the area, the graves can only be interpreted as an indication that this part of the settlement had a special meaning, especially since access to the area could, as noted earlier, be opened or closed.

While many of the artifacts were well preserved and occurred in large quantities, it is the specific selection and the processing of bones that speak for feasts that may have been connected with the creation of the midden. Large mammals were apparently slaughtered successively over a relatively brief period of time. The short time and large number of processed carcasses suggest that preparation and consumption of those meals may have reached beyond the local community to include neighboring settlements.

Twiss outlines a series of indicators from ethnographic and ethnohistorical sources that correlate with feasts and can be used to identify them in archaeological contexts (Twiss 2012, 60).[72] The identification of feasting activities requires a combination of analytical methods,

70 These two taxa are represented by only a single tooth each. These animals were not necessarily used for food; rather, the teeth might have been utilized for something else, for instance, to show off, similar to jewelry.

71 Approximately one-third of this area has been excavated.

72 Twiss points out on the basis of ethnographic data that there are certain practices as well as specific attributes that are often associated with feasts cross-culturally. They leave traces in the archaeological record to a greater or lesser extent, thus providing evidence of past feasting practices even without written or pictorial sources (Twiss 2008, 419).

Fig. 7.1. Mixture of ashy layers and skeletal elements in the Eastern Midden.

Fig. 7.2. Accumulations of skeletal remains in the Eastern Midden.

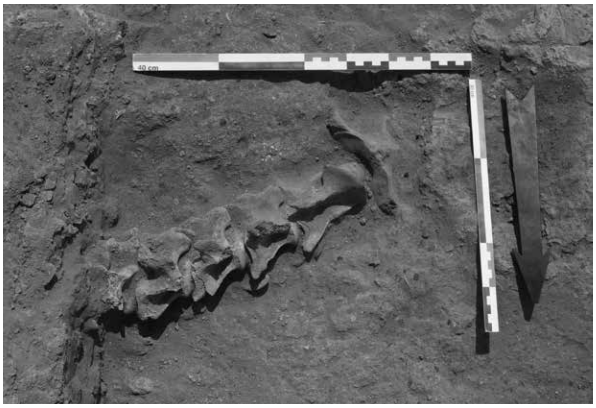


Fig. 7.3. Articulated vertebral elements in the Eastern Midden.

a multi-proxy approach applied to archaeological data, because one criterion alone is not necessarily a diagnostic indicator. According to Twiss's criteria feasting is, for instance, identifiable through unusually large amounts of food remains and high concentrations of garbage disposed in a distinct place. Further archaeological signatures can be rarely-eaten and labor-intensive species or simply faunal remains of large wild and/or domestic animals. Likewise, food remains spatially associated with a distinct structure can point to feasting. Another criterion is the distribution of prestige objects, such as food or gifts, during a feast. Willfully wasted food is a common aspect of feasting and may become apparent through the discard of articulated segments of carcasses. Twiss also mentions the practice of displaying commemorative items, such as trophy bones and memorial constructs, as an indicator of feasting (Twiss 2008, 420-422, Table 1).

In order to further evaluate the evidence for feasting at Monjukli Depe, the faunal material from the Eastern Midden will be juxtaposed to the animal remains from various contexts in the rest of the settlement that differ both spatially and in their formation processes from the Eastern Midden. For this purpose, selected Aeneolithic contexts from the 2010 and 2011 excavation seasons categorized as primary and secondary deposits are included.[73] Primary contexts include floors, use surfaces, or surfaces of installations, whether indoor or outdoor. Secondary contexts are garbage pits or other containers for rubbish, ashy layers, and room fills consisting of everyday trash, as well as the fills in ovens and fire installations. An understanding of archaeological deposits as primary and secondary contexts, which I combine for this study and henceforth refer to as "settlement contexts," derives from Michael Schiffer's systematization of deposits and interpretation of formation processes; these studies allow properties, organizational characteristics, and settlement histories of sites to be discussed systematically (Schiffer 1991; Needham and Spence 1997, 77). Schiffer distinguishes "primary refuse," referring to objects that remain in or near the place where they were used; "secondary refuse," which is the deposition of objects in areas where they were not used or processed; and "de facto refuse," which is material that still has a use value but is no longer present at the place of its use (Schiffer 1976, 30, 33; Hardy-Smith and Edwards 2004, 255). These can also be supplemented by "provisional discard" that includes objects that are potentially recyclable but are in the way; they may therefore be placed, for example, along walls (Hayden and Cannon 1983, 131). As practitioners of post-processual approaches have noted, these categories should also be examined critically. Cultural practices regarding the disposal of waste or removal of dirt – or even the classification of what is dirt or waste – are not uniform. For that reason it is important to be attentive to patterns in garbage that arise in the context of waste production and that can vary from society to society (Martin and Russell 2000, 57-58).

In order to assess whether a substantial part of the remains from the Eastern Midden actually originate from the disposal of waste in the wake of feasting rather than from regular, successively discarded food consumption and butchery events, various aspects of the faunal samples will be investigated. The analyses presented here examine the range of taxa, their distribution, and post-depositional processes. Together, these serve to assess more closely the nature of the differences between the two context categories and thereby to evaluate to what extent the Eastern Midden contains the remains of feasts.

Densities of animal bone

In this section I turn to statistical analyses of bone densities, considering the bones in the whole assemblage as well as comparisons of the two context categories (Eastern Midden and settlement contexts). The data used for the calculations derive from the systematic documentation of volumes (in liters) per screened context (locus) (Chap. 2). By using density data, different types of contexts can be compared, permitting inferences on the intensity of particular past activities independently of others. This cannot be achieved with percentages, which are by definition interdependent, although they are often used for statistical analysis in archaeology (Pollock 1999, 35-39). From the density data, it is possible to draw conclusions about the extent to which there are significant differences in animal use between the Eastern Midden and aggregate data from other contexts.

Table 7.1 shows a variety of parameters of bone density across contexts. These include the count and weight per cubic meter of the full animal bone assemblage (2010-2011

73 Since the individual contexts generally consist of very small samples, I have grouped these for comparative purposes.

		Total		Sheep/Goat			Cattle			Total	Sheep/Goat	Cattle
Context	**Vol. (m³)**	**NISP/ m³**	**g/m³**	**NISP/ m³**	**g/m³**	**MNI/ m³**	**NISP/ m³**	**g/m³**	**MNI/ m³**	**g/ NISP**	**g/ NISP**	**g/ NISP**
Eastern Midden	10.37	1054.9	4640.8	274.6	1236.4	4.5	26.0	1716.0	0.7	4.4	4.5	65.9
settlement context	40.45	476.7	895.2	89.8	351.2	1.2	2.9	110.9	0.1	1.9	3.9	38.0
total	50.81	594.6	1659.2	127.5	531.8	1.8	7.6	438.3	0.2	2.8	4.2	57.4
ratio Eastern Midden: settlement contexts	-	2.2:1	5.1:1	3:1	3.5:1	3.7:1	9:1	15.5:1	7:1	2.5:1	1.2:1	1.7:1

Table 7.1. Bone density and fragmentation according to context.

seasons), the number and weight of bones of the most common taxa[74] per cubic meter, the average minimum number of individuals (MNI)[75] of sheep and goats (which comprise over 80% of the animal bone in both context categories) and cattle per cubic meter, as well as the average weight of bone fragments (g/NISP) as a measure of degree of bone fragmentation.[76]

Both the count and weight densities of animal bone in the Eastern Midden are much higher than in settlement contexts. This pattern is found among sheep and goat as well as cattle. The comparatively low densities in the settlement contexts may be the result of different depositional processes, such as the loss of bone by trampling or cleaning of house floors and outdoor surfaces as well as by the removal of larger pieces of bone from installations. Surfaces and floors constitute a relatively high proportion of the primary contexts. It can be argued that the intensity of use of these areas was high, even if information on specific activities has been lost due to pre- or post-depositional formation processes, and that they were – relative to the Eastern Midden – kept clean.

Differences between the two context categories are also evident in the number of individuals per cubic meter of the most abundant taxa, sheep and goats. The MNI in the Eastern Midden is almost four times higher than in the settlement contexts. The relatively small number of cattle bones in all contexts leads to MNI values per cubic meter that are less than 1.0, but the MNI density is nonetheless seven times higher in the Eastern Midden.

Striking differences from the previous observations emerge when calculating the ratios of individual parameters between the two context categories (Table 7.1). In particular, the ratios of count densities and minimum number of individuals of sheep/goat and cattle show marked differences. The ratios were calculated by dividing the densities for count (NISP/m³), weight (g/m³), and minimum number of individuals (MNI/m³) in the Eastern Midden by those for the settlement contexts. For sheep and goat the resulting ratios are approximately 3 to 4:1, meaning that the intensity of discard of slaughtering remains of sheep/goat was several times higher in the Eastern Midden than in settlement contexts.

The difference between the Eastern Midden and settlement contexts is much more striking for cattle bone. Here the density ratios vary between 7:1 (MNI/m³) and 15.5:1 (g/m³). This is due to a much lower fragmentation of cattle bones in the Eastern Midden than in settlement contexts. Major differences in the processing of cattle bone compared to sheep and goat point to the special status of cattle in the activities that led to the creation of the Eastern Midden. The reason for the 7:1 density ratio for cattle MNI should be sought in the lower fragmentation of cattle bones in the Eastern Midden compared to sheep and goats, which also allows a more accurate determination of MNI. In short, the Eastern Midden includes a greater number and weight of animal bones than the primary and secondary contexts in the settlement.

Fragmentation of bones

In the previous section I have shown, albeit indirectly, that the degree of bone fragmentation in the two context categories differs. Another method to examine fragmentation evaluates the extent to which butchery patterns of specific animal taxa are context-dependent. This approach is based on the assumption that the intensity of bone fragmentation reveals species-specific butchery methods.

The degree of bone fragmentation can be calculated as the average weight per bone fragment (g/NISP). More or less equivalent samples can be compared when the range

74 Due to the difficulty of distinguishing sheep and goat on the basis of fragmentary remains, they are considered collectively as “sheep/goat” here.

75 The MNI was calculated using Bökönyi’s method – considering, where possible, age class, sex, the most common element, and the side of the body (Bökönyi 1970).

76 The method for calculating bone density uses the following parameters: count and weight per cubic meter of the full animal bone assemblage, the number and weight of bones of the common taxa per cubic meter, and the average weight of bone fragments. This method is taken from Melinda Zeder and Susan Arter’s work (2008, 340-344).

	NISP (%)		Weight (g) /NISP	
Skeletal parts	**Eastern Midden**	**settlement contexts**	**Eastern Midden**	**settlement contexts**
Region				
horn	1	1	27.3	30.1
skull	17	17	7.6	7.6
axial	25	23	2.3	1.5
limb	56	59	4.5	3.7
Individual elements (without horn cores)				
crania	7	8	4.3	2.3
maxilla	3	3	11.0	13.9
mandible	12	11	9.0	10.0
vertebra	4	5	5.8	1.7
scapula	5	4	6.1	5.3
humerus	8	8	5.9	4.4
radius	9	8	4.7	4.1
ulna	2	2	2.6	2.4
carpals	2	2	1.7	1.3
pelvis	3	3	6.7	4.5
femur	9	9	4.4	4.5
tibia	9	9	6.5	5.3
astragalus	1	2	5.2	3.9
calcaneus	1	1	2.3	4.0
other tarsals	0	1	2.1	2.0
metacarpal	5	5	3.9	3.9
metatarsal	10	7	4.0	3.2
metapodial	2	3	1.8	1.6
phalanges	7	10	1.5	1.1
Total NISP	1965	2505	5.3	4.5
Total weight (g)	10386	11167	-	-

Table 7.2. Skeletal part distribution of sheep and goat.

	NISP (%)		Weight (g) /NISP	
Skeletal parts	**Eastern Midden**	**settlement contexts**	**Eastern Midden**	**settlement contexts**
Region				
horn	1	3	109.0	55.0
skull	25	20	104.7	44.5
axial	22	25	43.1	31.0
limb	52	52	64.0	41.6
Individual elements (without horn cores)				
crania	19	13	70.9	11.8
maxilla	3	0	256.7	0.0
mandible	8	15	127.4	71.8
vertebra	11	5	80.2	14.0
scapula	3	9	91.9	54.0
humerus	7	5	96.7	110.0
radius	6	5	103.2	81.0
ulna	3	3	52.7	42.5
carpals	4	1	16.0	22.0
pelvis	2	4	97.6	64.3
femur	5	9	77.4	48.9
tibia	4	10	90.2	35.0
astragalus	3	3	47.8	21.0
calcaneus	2	1	86.2	60.0
other tarsals	1	1	120.7	11.0
metacarpal	3	3	63.7	35.0
metatarsal	9	4	38.2	7.3
metapodial	0	0	15.0	0.0
phalanges	5	11	21.3	12.8
Total NISP	211	80	79.6	42.7
Total weight (g)	16787	3419	-	-

Table 7.3. Skeletal part distribution of cattle.

of taxa and skeletal elements is similar; a higher average bone weight points to lesser fragmentation (Zeder and Arter 2008, 342-343).

The Eastern Midden not only contained proportionally far more bones than settlement contexts, but the bones recovered also tended to be larger pieces than those from settlement contexts. This pattern is especially visible among the cattle bones which are on average nearly 75% heavier in the Eastern Midden than in settlement contexts (Table 7.1). In the case of sheep and goat, the result is not as striking, with an average weight of 4.5 g per bone in the midden and 3.9 g in the other contexts, although the tendency for the Eastern Midden to contain larger/heavier bone fragments is clear. Furthermore, the average weight of individual skeletal elements of the most commonly occurring domestic taxa shows that for most skeletal regions and elements, larger fragments are found in the Eastern Midden than in the settlement contexts (Tables 7.2 and 7.3). Exceptions occur in the case of four elements[77] of sheep and goats: (1) the mandible (lower jaw), which occurs on average as larger fragments in settlement contexts, (2) the upper jaw (maxilla), (3) horn cores, and (4) calcanei. The latter three elements occur rarely in relation to others but are noticeably less fragmented in settlement contexts than in the Eastern Midden. Calcanei are small but robust bones and thus less susceptible to fragmentation. Although mandibles are also very robust, their occurrence in distinct

77 For orientation and the location of the most important skeletal elements, see Schmid 1972, 71, Taf. I.

	Weight (g) /NISP Sheep/goat	Weight (g) /NISP Cattle
Skeletal regions	**Eastern Midden: settlement contexts**	**Eastern Midden: settlement contexts**
horn	0.9:1	2:1
skull	1:1	2.4:1
axial	1.5:1	1.4:1
limb	1.2:1	1.5:1

Table 7.4. Ratios of weight densities of skeletal regions by context.

archaeological contexts in the settlement leads me to consider other possible interpretations for their being less fragmented. This situation for horn cores is also perhaps a function of the fact that horns seem to have been mounted on walls as decoration and were recovered archaeologically where they fell; alternatively, they may have been placed on the roof. These issues are discussed further below.

As a whole, bone density in the Eastern Midden is higher both in count and weight, meaning that bones in the Eastern Midden are on average larger and more numerous than in other contexts. The lower bone density in the settlement contexts may result in part from keeping indoor floors clean, as has been ascertained through examination of closely-spaced floor sequences (Sturm 2011, 232).

The general tendency for there to be larger bones in the Eastern Midden is more striking for cattle than for sheep/goat and especially for skull parts; the differences for sheep and goat are comparatively small (Table 7.4). The horn core ratio of sheep and goat shows a slight tendency toward larger pieces in the settlement contexts, which might be the result of their function there. The overall density of animal bones in the Eastern Midden supports the assumption that they derive from a different functional background in which no regular removal of bone took place.

By examining the distribution of different skeletal parts of the most commonly occurring taxa, I consider to what extent differences in the nature of their treatment can be recognized. Tables 7.2 and 7.3 display the ranking of skeletal parts for sheep/goat and cattle in the Eastern Midden and settlement contexts as percentage of NISP and average bone mass. Elements from the extremities of all three animals are almost evenly distributed in both context groups. For sheep and goats, the extremities are followed by the axial elements (vertebrae, ribs and sternum) and skull fragments (crania, mandible, maxilla), respectively, in a relatively uniform distribution between the context types. Horn core fragments constitute just 1% of the sheep/goat elements by count in each context group.

The situation is similar for cattle but with two notable differences: the average number of skull fragments of cattle in the Eastern Midden and of horn core fragments in settlement contexts. Cattle skull elements are more common than axial elements, and they are also more strongly represented in the midden than in the settlement contexts; there are also more cattle horn core fragments in settlement contexts than in the midden and more than for sheep and goats.

Striking is also the uneven representation of cattle vertebrae, considering that vertebrae (atlas, axis, cervical, thoracic, lumbar) comprise roughly 22% of the bones of a bovid skeleton (Lyman 1994, 98, Table 4.1). The representation of vertebral elements of sheep and goats in both context categories (4% and 5%) and of cattle in settlement contexts (5%) is very low, and they are more fragmented taking their weight into account. One might suggest that these results are attributable to their greater fragility and thus to taphonomic processes in these two context types. However, the high percentage (11%) and less fragmented cattle vertebrae in the Eastern Midden speak against such an explanation. Moreover, the occurrence of cattle cranial fragments (19%) stands out markedly in comparison to sheep and goats in both context categories and to cattle in settlement contexts, again showing the symbolic importance of cattle and particularly their skulls.

Preservation of skeletal elements

In this section I consider individual skeletal elements and their preservation status, specifically the extent to which bones were differently preserved in the two context categories. This leads me to conclusions about depositional processes within the settlement, but it also permits examination of carcass treatment and possible underlying intentions prior to deposition.

The strikingly good preservation of individual skeletal elements and the numerous animal skulls and articulated bones in the Eastern Midden raises questions about comparative bone size and density. The food value of skeletal parts must also be considered. In order to avoid distortion, phalanges (toe bones) are excluded because of their extreme variability in number in the skeletons of different animal species. Skeletal elements that are not represented in every mammalian species, such as the fibula, are also excluded from the analysis.

The skeletal elements are described in terms of the relative minimum number of elements (MNE, minimum number of complete skeletal elements[78]) in order to detect possible biases or tendencies toward missing or

78 For a detailed explanation of the quantitative properties of MNE, see Lyman (1994, 102-104) and Reitz and Wing (2008, 226-229).

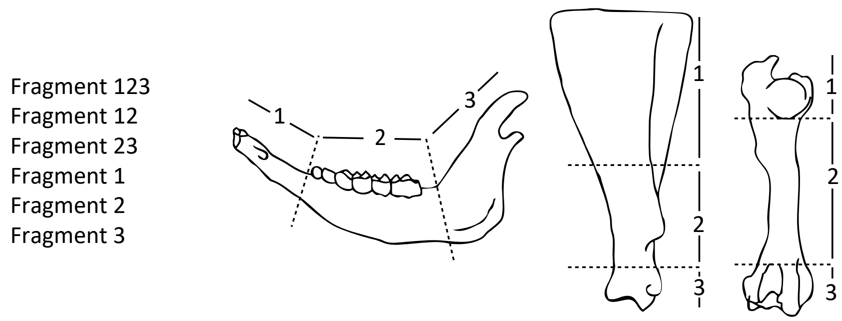


Fig. 7.4. Coding of fragment parts (criteria after Norbert Benecke, DAI).

disproportionately over- or underrepresented elements.[79] In addition, degrees of fragmentation per bone element are calculated for each animal taxon to determine whether there were differences in the processing of bone prior to its deposition, for example, whether certain bone elements received specific treatments. This method is also borrowed from Kansa et al. (2009a), but due to the documentation of the Monjukli bone data, it is not possible to categorize degrees of fragmentation into five percentage intervals. Instead, the categorization was carried out according to the coding of the subdivisions of elements, following N. Benecke, and then added together (see Fig. 7.4). Then, fragments 123, fragments 23, fragments 12 were summed as better preserved bone elements, whereas fragments 1, fragments 2, fragments 3, and indeterminate fragments were combined as more highly fragmented bones. In the case of limb elements, fragment 1 stands for the proximal (close to the body) and fragment 3 for the distal (far from the body) end. In the case of mandibles, fragment 3 would rather be the oral position (in the direction of the mouth) and fragment 1 rostral (in the direction of the snout).

Comparison of the relative MNE of bone elements, apart from cranial components, of sheep/goat and cattle from the Eastern Midden and the settlement contexts leads in the first place to the observation that all bones are present in approximately equal proportions, with smaller and more fragile elements less well preserved, as expected. The latter include ribs and vertebral elements, some of which, such as the lumbar spine (*Vertebra lumbalis*) of cattle, are not present at all (Figs. 7.5 and 7.6). The post-cranial elements of sheep/goat and cattle are approximately equally represented in the two context categories. For this reason, it can be assumed that both context categories reflect all operations of the treatment of carcasses, from slaughter to post-consumption (Kansa et al. 2009a, 168).

These observations also apply broadly to the post-cranial bones of onager. Due to their much smaller number, especially in settlement contexts (settlement contexts = 28; Eastern Midden = 50) and the complete absence of elements such as cervical vertebrae, radius, and ulna (lacking only in settlement contexts), some elements appear to be either over- or underrepresented. In settlement contexts metapodia (metacarpal and metatarsal) and tibia (shin) are overrepresented, whereas in the Eastern Midden particularly metapodia and pelvis stand out. Whether these peaks signal different intentions in processing is difficult to judge.

What is, however, striking in the Eastern Midden is the MNE of cervical vertebrae (*Vertebra cervicalis*) of cattle. The fragmentation of these parts is relatively low. If it is assumed that small and more fragile bones are more poorly preserved – insofar as processing (for example, slaughtering or cooking) or taphonomic processes (open storage with bones exposed to trampling and carnivores) are the cause of fragmentation – then the cervical vertebrae of cattle in the Eastern Midden point toward special handling. The aforementioned observation that many vertebrae were still in articulation (Fig. 7.3) supports the proposition that the Eastern Midden contains the remains of feasts. This is not only the case for cattle but also for an adult wild sheep and an adult domestic sheep or goat. That these skeletal elements of the animals were not prepared for consumption might also be related to the part of the body, since the vertebral region contains only a small amount of meat, in contrast to the quantity of bone marrow for which vertebrae are a preferred source. The observed depositional pattern might therefore occur in connection with a wasteful handling of nutritionally valuable parts containing quantities of bone marrow at a feast in which the event was marked by the slaughter of large numbers of animals with meat as the goal.

Some differences become apparent in the elements of the skull in the two context categories when comparing the approximately equally fragmented post-cranial elements

79 I follow the procedure of Kansa et al. (2009a, 165). As in their study of the human and animal bones from the Domuztepe "Death Pit," the MNE for the animal bone collection from Monjukli Depe is determined by counting the highest number of a specific part of every element from the most frequently occurring taxa. Age categories are integrated into the calculations: for example, all distal left and right femurs in the age class "juvenile" are counted together, and to them are added all distal femurs, both left and right, of the age class "adult," etc.

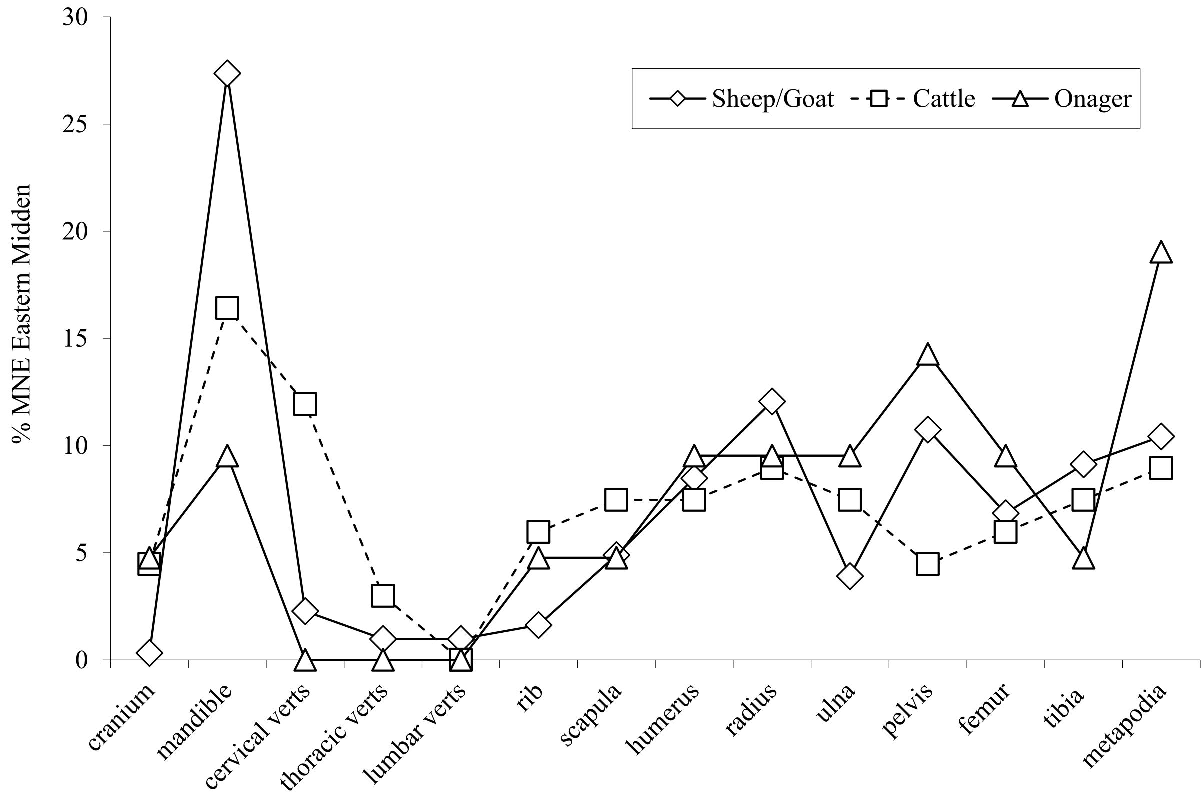


Fig. 7.5. Relative MNE of major taxa in the Eastern Midden, arranged from the head to the hind leg.

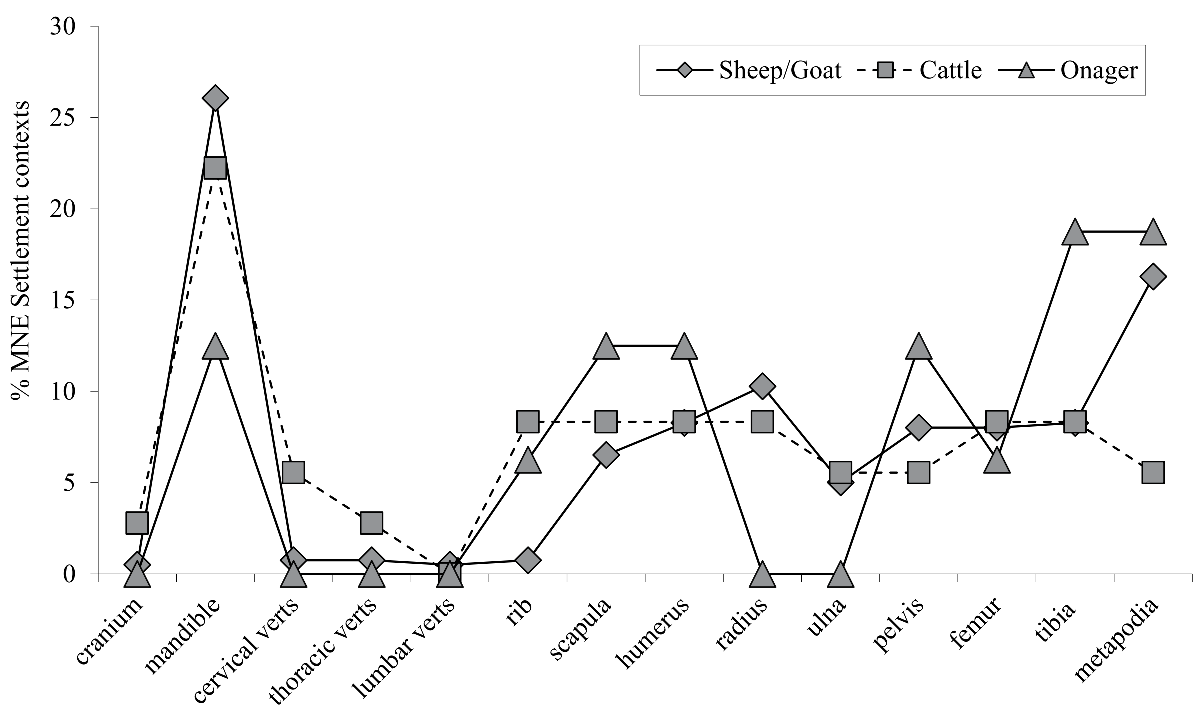


Fig. 7.6. Relative MNE of major taxa in settlement contexts, arranged from the head to the hind leg.

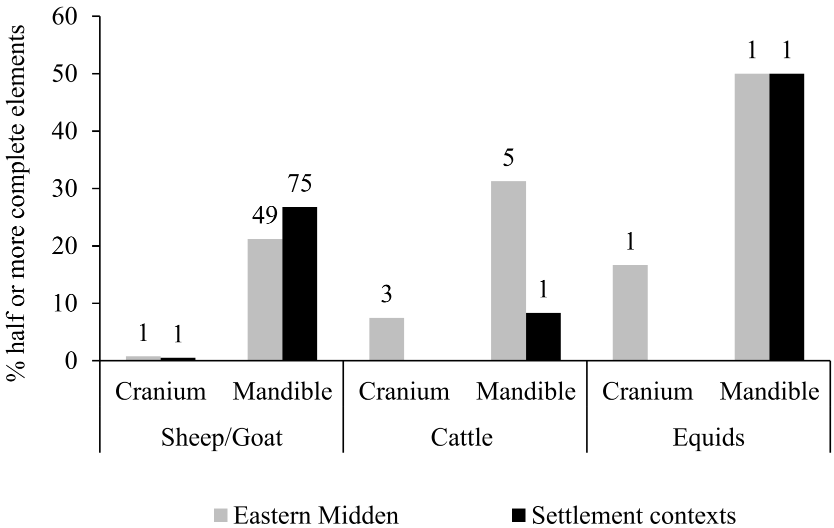


Fig. 7.7. Comparison of the relative skull preservation of sheep/goat, cattle, and onager in the two context types.

of sheep/goat, cattle, and onager (Figs. 7.5 and 7.6). On the one hand, the disproportionate preservation of mandibles in relation to post-cranial elements, especially of sheep/goat but also of cattle, is striking. Onager mandibles also exhibit this trend in both context categories. On the other hand, in the Eastern Midden the crania of cattle and onager show a noticeably better degree of preservation than crania of sheep/goat (Fig. 7.5). The preservation status of crania and mandibles of the dominant taxa are shown in Figure 7.7.

The graph shows the percentage of specimens that are half or more complete. Unlike the post-cranial elements that are for the most part similarly fragmented, there are marked differences in the relative completeness of crania among sheep/goat, cattle, and onager as well as between the context categories. Mandibles and especially crania of cattle and onager in the Eastern Midden present fewer signs of processing than in settlement contexts or than crania of sheep/goat in both context categories – this latter observation at least applies for crania of cattle.[80] It is also worth remarking, although it is not shown in the graph, that there is one half or more complete cranium of a wild sheep in the Eastern Midden, whereas in the settlement contexts only small fragmented cranial elements of wild sheep were documented. The brain is an important by-product that can complement the diet (Reitz and Wing 2008, 215). But more generally, the preservation of the skulls of the largest taxon in the Monjukli faunal spectrum, cattle, and of two wild taxa, onager and wild sheep, is also telling in terms of communal social relations.

As is apparent from ethnographic as well as archaeological studies, cattle are widely regarded as a sign of wealth beyond their milk or meat production (Russell 1998), and their slaughter or consumption has a high symbolic value. Their skulls as well as other skeletal parts may be specially treated or exhibited. These symbolic or trophy-like uses are most likely attributable to slaughter sacrifices, especially when they involve domesticated species (Russell 2012a, 127). Cattle crania in western Asian sites are often charged with an extraordinarily rich symbolism, due to the contextual relationship of archaeological contexts but also to the historical contexts in which archaeological research has been conducted and interpretations made. Cattle are sacrificial animals par excellence. It is often argued that wild cattle represent a cult of masculinity, and cattle as a male symbol are sometimes overly emphasized in reconstructions of prehistoric worldviews (Cauvin 2000, 123-125, 132-134; Twiss and Russell 2009, 20-21).

The symbolic value of cattle skulls is often reflected in their visibility in domestic contexts, as seen at sites in the Levant, northern Mesopotamia, and Anatolia from the Neolithic onwards (Russell 2010, 248). This seems to have been different in Monjukli Depe. Cattle skulls deposited in the Eastern Midden became invisible after only a short time due to their rapid burial under ash layers. It is also of note that, unlike cattle horns, those of sheep and goat were more often found in houses where they were in at least some cases visible. These observations point to a different symbolic value than in the previously mentioned cases. At

80 The data on the skull parts of onager are highly affected by the small sample size. Nevertheless, the presence of these relatively meatless parts of a hunted animal, which had to be transported to the settlement, must imply a special importance. An interpretation of the skull as a prestigious trophy, as "… the human triumph over the powerful Wild" could be considered here (Russell 2012a, 45, see also 58-60). However, onagers are not particularly dangerous wild animals. It may be that it was simply important to bring skulls back to the village, regardless of which animal they represent. They could have been presented at feasts, "as a feast is likely to have accompanied a successful … hunt or sacrifice" (Russell 2012b, 83).

Monjukli Depe direct visibility apparently did not matter. Furthermore, the Monjukli cattle were not wild animals, and in four cases from the Eastern Midden for which sex could be identified, three were pelvic elements that could be assigned to female animals and one horn core to an ox. No male cattle have been identified in the archaeological bone collection, and age determination shows that the slaughtered cattle were dominated by subadult[81] and adult animals. Ultimately, the sex of the animal may have played no appreciable role, but rather the consumption of food and especially social interactions were more important components of a feast.

A large number of complete mandibles from sheep and goat are present in both context categories, whereas the number of intact mandibles from cattle is much higher in the Eastern Midden than in the settlement contexts. Although mandibles are very compact bones and therefore more resistant than many others to taphonomic processes (Lyman 1984, 273-280; Zeder and Arter 2008, 347), the average number, especially of sheep and goat mandibles, nevertheless appears too high to be due to the robustness of these bones alone. A use for food cannot be deduced from their relative frequency, because in comparison to other elements such as femora or humeri, mandibles are relatively meatless parts of the animal. Archaeological and ethnographic studies indicate that mandibles of various taxa were used for display as hunting and feasting trophies and for food processing, for example as graters to process maize (Zeder and Arter 2008, 347; Russell 2012a, 59-60). Some sheep and goat mandibles from Monjukli Depe exhibit a strong polish, suggesting that they may have been used as tools, whether as graters for food processing, as implements for working leather, fibers,[82] or similar materials, or for burnishing pottery. Traces of tool use can be recognized on the pottery of Monjukli Depe, but these are primarily smoothing marks presumably made by a wooden spatula or similar implement rather than by an animal mandible (see Chap. 10).[83] Another striking feature of the separate treatment of mandibles is the multiple occurrence of these bones in conspicuous contexts within buildings, including on floors[84] or in corner deposits (Table 2.4). These deliberate placements stand out clearly from ordinary waste and from the Eastern Midden.

Preservation of horn cores

Another notable aspect of the bone assemblage is the excellent preservation of horn cores. Figure 7.8 shows that there is no appreciable difference in the sheep and goat horn core preservation between the two types of contexts, probably because horn cores were also, like mandibles, often found in special deposits within buildings. Two gazelle horn cores in buildings and two in the Eastern Midden are nearly intact. A cattle horn core in the Eastern Midden is almost completely preserved; the same applies to two nearly complete wild sheep horn cores in different layers of the midden.

Two possible interpretations of this evidence can be suggested. One is that the deposition of horn cores in both context groups indicates activities in which feasting was involved. The display of certain body parts, in particular the skull and horns, may have been used mnemonically to remind people of a feast. This has been proposed especially for hunted animals (Russell 2012a, 388). The exhibition of such bone elements at Monjukli Depe from both wild and domestic horn-bearing taxa – domestic sheep/goat and cattle, gazelle, and wild sheep – may have pointed to the prestigious nature of a feast for the hosts. Twiss (2012, 62) argues that the presence of specific animal parts in buildings suggests not just an abstract symbol for the ritual significance of a particular kind of animal that was consumed at feasts, but rather an instrument for making visible memories of a particular feast. At least for the gazelle and wild sheep horns, it may also be presumed that the person or group that took such wild animal horns home at the end of a feast played a prominent role in the event, that is, a person (or group) who distinguished her- or himself in a particular way as hunter, esteemed person, or hostess and therefore legitimate owner of a trophy.[85] In this regard, the well-preserved horn cores might support the importance of communal feasting at the site despite the limited sample size. For Monjukli Depe the deposition of skulls in the Eastern Midden or of horns in houses may have occurred as a temporary acknowledgement and not a persistent elevation of the social status of a person in the community. An intentional placement in the Eastern Midden meant seclusion from a part of the village, since the area could be closed off by means of a gate, but also because the bones and horns were quickly hidden in the ash. In several of the installations in house corners, horns were partially or even completely covered by stones and bricks. A long-term gain in prestige brought about by

81 The slaughter age "subadult" used in archaeozoological analysis is an age-at-death category that lies between the stages juvenile and adult.

82 Changes in fiber use or processing are suggested by the high number of spindle whorls (Chap. 11), although the data on age at death and sex ratio of sheep and goat suggest meat and milk rather than wool production (Benecke 2017, 323; Eger 2018, 36).

83 So far, no microscopic use wear study has been conducted on the mandibles that could shed further light on such activities.

84 In total, 18 fragments of mandibles of sheep and goats were recovered directly from floors; of these, five were more than half complete and another two were completely preserved.

85 Twiss adds, "installation of […] trophy bones memorializes not just a feast, but a moment of prestige, of social prominence in the general community. These festal remains constitute "social storage" not in the economic sense, but in the sense of curating prestige, demonstrating status in the community" (Twiss 2012, 62).

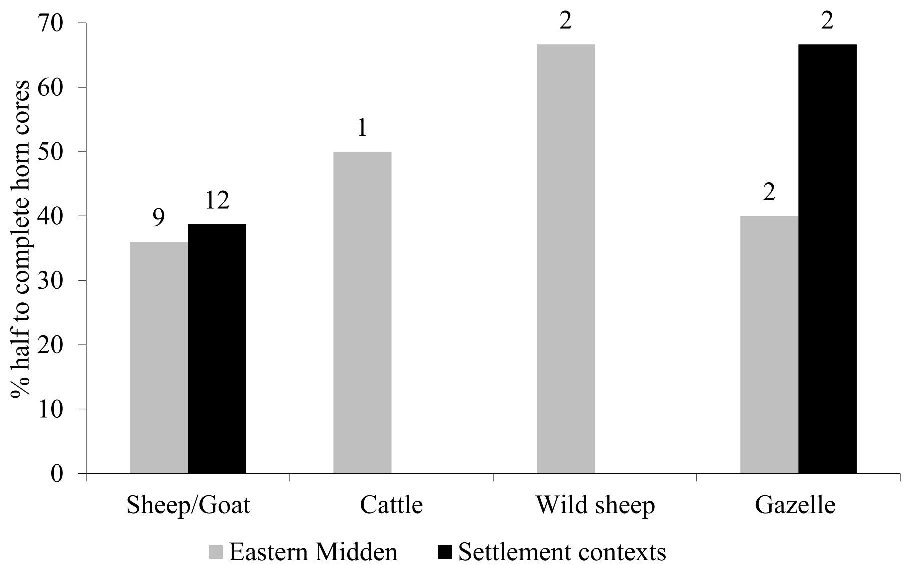


Fig. 7.8. Comparison of the relative horn core preservation of horned ungulates in the two context types.

an intended visibility that often accompanies feasting may thus have been prevented in order to avoid the emergence of hierarchical structures in the community. Russell, Martin, and Twiss (2009, 104, 106-107) refer to "commemorative deposits," a term they use to designate the integration of animal parts in less visible ways into inhabited buildings, for example, the placement of bones in pits under floors or in "remodeled features."

With reference to the first possible interpretation, the faunal remains from the Eastern Midden may display the properties of "ritual trash,"[86] whereas the deposition of mandibles and horns in buildings at Monjukli Depe could be designated as "building deposits."[87] The 21 documented "corner deposits" in Monjukli Depe (Table 2.4) need to be distinguished from these. Unlike building deposits, corner deposits could have been made after building construction was completed. A second potential interpretation is that the locations of certain body parts of animals do not necessarily have to do with feasting. Rather, the deposition of skulls and horns may have been references to the powers of animals, with the head an especially important body part and the horns perhaps serving metonymically to refer to the whole head or even the entire animal. Furthermore, the deposition of horn cores to symbolize power seems to show particular ontological elements, since there is a preference for the deposition of wild sheep and domestic cattle horns in the Eastern Midden and not in settlement contexts, where only sheep/goat and gazelle horns are found. At Monjukli Depe where some horn cores were displayed on walls and others hidden in corner deposits, there seems to be a complex visual regime connected to the symbolism of dominance over the animal world or, for the domesticates, to a balance between people and animals, similar to the depiction of domestic animals in the form of figurines (Chap. 12).[88]

Differential treatment of bones

In a further analytical step following the method of Zeder and Arter (2008, 348), I juxtaposed the combined densities of the three previously described skeletal parts that occur in notable quantities ("curated bones") in a comparison of contexts and in relation to remains considered to be food waste ("food-refuse bones") (Table 7.5). The NISP of elements that may have been treated separately (crania, mandibles, and horn cores) and the NISP from food waste (all other bones) were divided by the excavated volumes to yield densities.

The total density of curated bones and food-refuse bones of sheep, goats, and cattle in the Eastern

86 "Ritual trash [...], derives from the remains of ceremonies, including feasts. [...], ritual trash is deposited outside, sometimes in larger quantities. Ritual trash appears as pockets in midden or fill deposits, often at the interface of layers." (Russell et al. 2009, 106).

87 "Building deposits occur before or during construction, and are placed in a building's foundation fill, below walls, in foundation trenches, built invisibly into walls, or below the floor. They may contain feasting remains and often have scapulae and horns" (Russell et al. 2009, 106).

88 The symbolic value of a bone element does not necessarily exclude a utilitarian function. The possibility that some bones, especially horn cores, could also have been used as implements, for example, to make lithic tools, should not be excluded (Cotterell and Kamminga 1987, 690). Mandibles could also have served as tools. In Monjukli Depe there were also several bone objects with a hole that seem to have been made from the pelvis of a large animal; they may have been used as implements of some kind as well (Keßeler 2011, 210, Fig. 40).

	Eastern Midden		settlement contexts	
	sheep/goat	cattle	sheep/goat	cattle
NISP curated bones/m³	36.18	5.50	12.53	0.62
NISP food-refuse bones/m³	1018.76	1049.44	464.13	476.04

	Eastern Midden : settlement contexts	
	sheep/goat	cattle
curated bones	2.9:1	8.9:1
food-refuse bones	2.2:1	2.2:1

Table 7.5. Density and ratios of curated and food-refuse bones by context. The terms "curated bones" and "food-refuse bones" are used following Zeder and Arter (2008, 347-349).

Midden is strikingly higher than in settlement contexts. However, the density of curated bones in relation to food-refuse bones is low in all contexts, albeit with a tendency towards a higher proportion in the Eastern Midden: The curated bones of sheep and goat comprise approximately 3.4% of the total bone assemblage of the Eastern Midden, whereas they amount to only 2.6% in settlement contexts. Cattle curated bones make up only approximately 0.5% of all bones in the Eastern Midden, in the settlement contexts only 0.1%. Although the relative density of bones categorized as food waste dominates overall, there are some striking differences in the scope of activities performed in the two types of contexts in terms of specially treated bone elements. This is apparent when the ratio of curated and food-refuse bones of sheep/goat and cattle is compared between the context types. The ratios of sheep/goat curated (2.9:1) and food-refuse bones (2.2:1) do not show much difference whether between contexts or between categories (food-refuse and curated bones). A sharper difference can be seen in the ratios of cattle bones. The ratio of food-refuse bone density in the Eastern Midden to the settlement contexts is 2.2:1, the same as for sheep/goat. In contrast, the density of curated cattle bones in the Eastern Midden is almost nine times greater than in the settlement contexts. This difference relates to the importance of cattle in these contexts and is very likely connected to the use of the Eastern Midden during community feasts.

Dietary-related fragmentation of limb bones

In light of the previous results, I turn now to a detailed examination of the fragmentation of limb bones of various animal taxa in order to extract further evidence concerning specific patterns of usage. Were cattle treated differently than sheep and goat in this respect as well, as appears to be the case from the previous analyses?

In Figure 7.9 the relative NISP of the three dominant taxa[89] in the Eastern Midden and the settlement contexts is compared. Nearly all skeletal elements are present in both context types, although there are differences in number. Relatively low values are found among smaller and more fragile elements (vertebrae), as noted above for the relative MNE. In addition, minimum and maximum values for some elements of onager are based on a very low sample size. However, the data suggest that the carcass of the hunted onager was transported whole to the settlement rather than leaving certain parts at the hunting site; in particular, meatless elements such as metapodials (metacarpal and metatarsal) are present in both context categories. It was probably possible to hunt near the village, so transport distances were short. Karen Lupo (2006, 49) notes that "if transport costs do not influence carcass treatment and transport, one would [...] expect complete carcass transport or very minimally [sic] field processing for most medium-sized carcasses. [...] The solutions to carcass treatment described here are the results of balancing field processing and transport costs to achieve a primary goal (maximizing animal products returned to central places)."

The proportionally overrepresented ribs, especially of sheep and goats but also of cattle, in the Eastern Midden are likely due to quick closing of deposits. The relatively high numbers of metapodia are notable, perhaps having been used for such things as tools, bone glue, jewelry, or gaming pieces (Reitz and Wing 2008, 133, 215).[90]

In general, the relative NISP of postcranial elements shows no significant differences among the taxa in the two context categories. The proportionally similarly distributed fragments suggest that carcasses of different species were butchered in a similar way and that their processing was based on the same food-related interests. In order to obtain additional information about the comparative fragmentation of limbs, I draw on a method to ascertain relative completeness of elements used by Kansa et al. (2009a).[91]

Figure 7.10 shows the percentage of extremities that are less than 50% complete for the main domestic animals (sheep/goat and cattle) as well as for the principal wild animals (onager, wild sheep, gazelle, and fox). Because of the very limited sample size, the values for wild sheep, gazelle, and fox cannot be taken as representative. Extreme differences in average completeness of bones

89 No calculations of relative NISP for the uncommon species, such as gazelle, wild sheep, fox, or dog, are included, due to possible bias as a result of their far lower numbers.

90 Among the few worked bones at Monjukli Depe is at least one metapodial.

91 For a more detailed description of the method, see the section on "Preservation of skeletal elements" and Kansa et al. (2009a, 165).

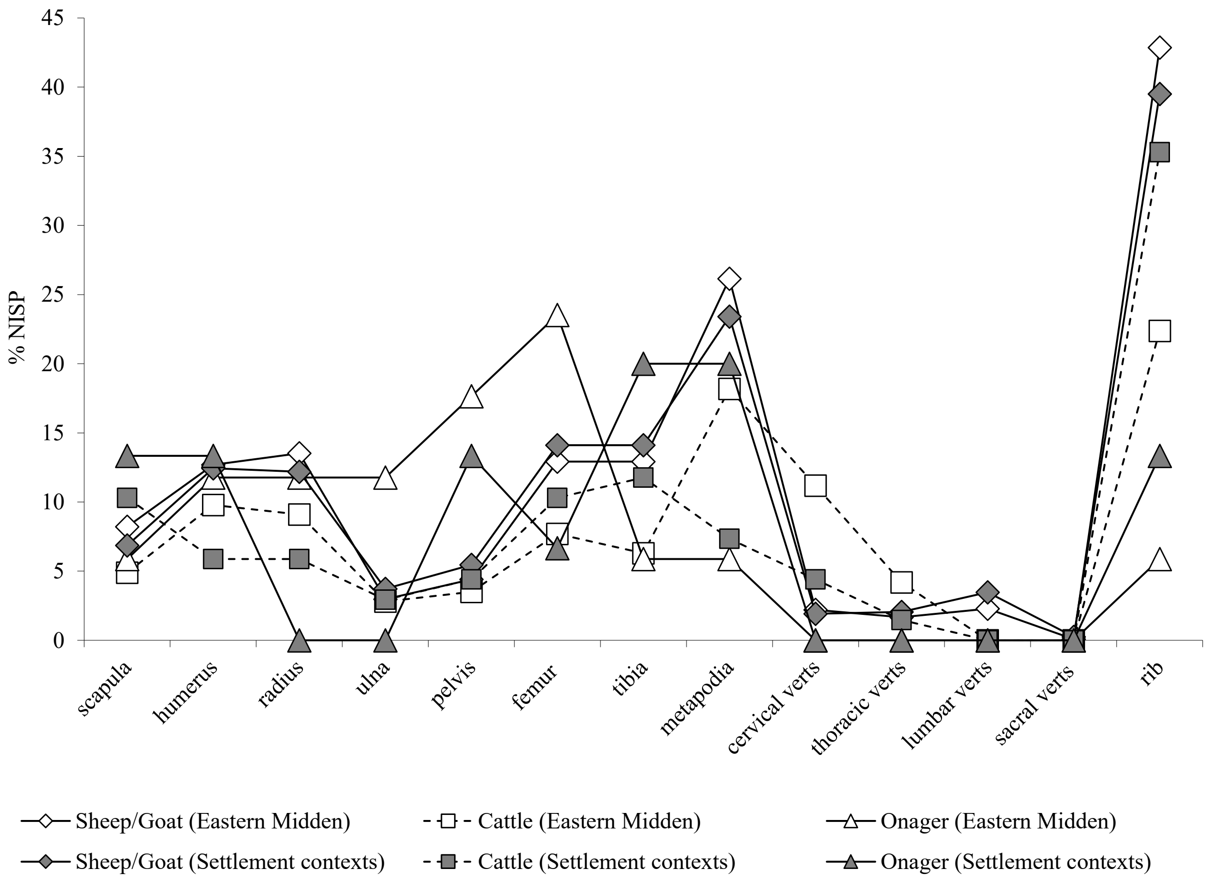


Fig. 7.9. Relative NISP of selected elements of major taxa in the Eastern Midden and settlement contexts, arranged from the foreleg to the hind leg to lower legs, vertebral body and costa.

per context type will therefore not be interpreted further. Based on the frequency of their bones, the fragmentation of sheep/goat and cattle extremities must be viewed as the most significant result. There is a larger quantity of more complete bones of both taxa in the Eastern Midden than in settlement contexts, although the difference between the context types for sheep and goat is very small and, I suggest, insignificant. The degree of processing and thereby of fragmentation of sheep and goat bones is somewhat higher than for cattle. On average, approximately 30% of the limb elements of cattle in the Eastern Midden are 50% or more complete. These specific skeletal elements (femur, humerus, tibia, radius, and ulna) may have been given a "gourmet treatment," pointing to a preferred consumption of meatier portions in contrast to "less useful" parts (Halstead 2007, 36). These may be due to processing methods and special treatments that are specific to the Eastern Midden.

The diagram in Figure 7.11 shows that the processing of bone gave priority to the fragmentation of sheep/goat extremities in both contexts. Bovine limb bones in settlement contexts were not targeted for use of the marrow; if that had been the case, there would be a positive correlation between the proportion of bone marrow in particular elements and the degree of fragmentation (Kansa et al. 2009a, 169-170). The extremities may have been fragmented into pieces that were as small as possible, for example, to chop portions of meat small enough that they could be cooked in vessels, although ceramic vessels are relatively uncommon in Aeneolithic Monjukli Depe, and pots used for cooking are absent (Chap. 10). Cooking in baskets, leather sacks, or in small pits using stones are possibilities for which the larger meat-bearing bones would have to have been crushed. Bone modifications may have resulted from multiple practices not just from a single one alone, including butchery, crushing after consumption, intensive bone-grease processing, and tool production (Russell 2010, 243).

No positive correlation between proportions of bone marrow and degree of fragmentation can be observed in cattle extremities in the Eastern Midden. Figure 7.11 shows that the upper limb elements of cattle, especially the humerus and tibia which contain high amounts of bone marrow (Kansa et al. 2009a, 170), were more highly

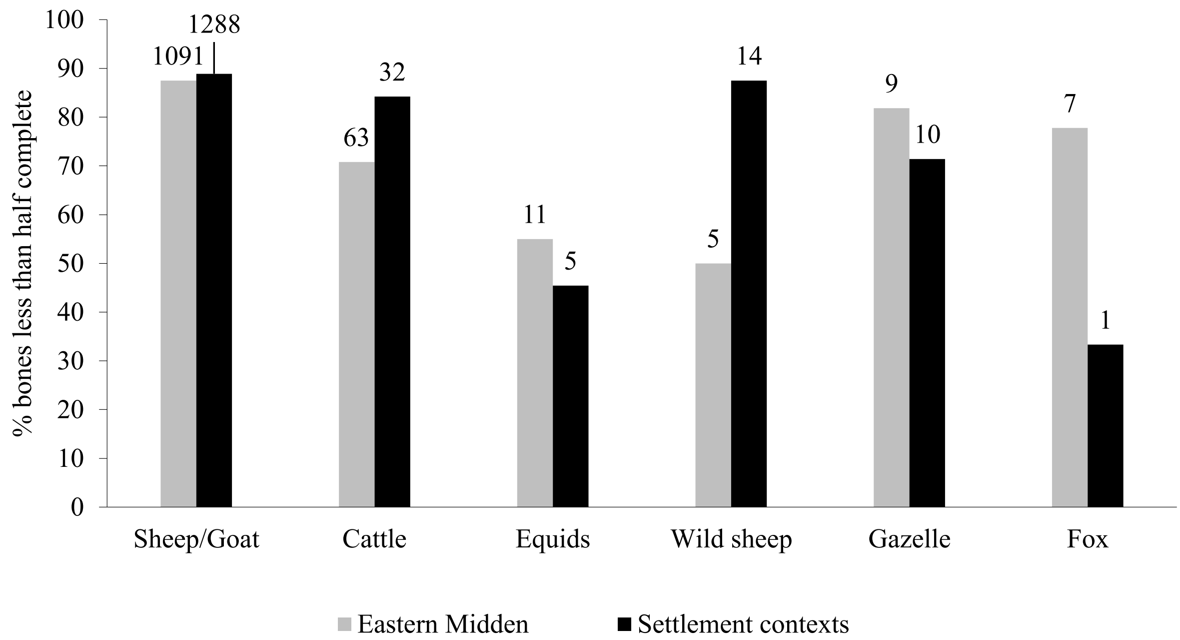


Fig. 7.10. Fragmentation of limb bones by taxa in the Eastern Midden and settlement contexts. Note that the graph illustrates bones that are *less than* half complete.

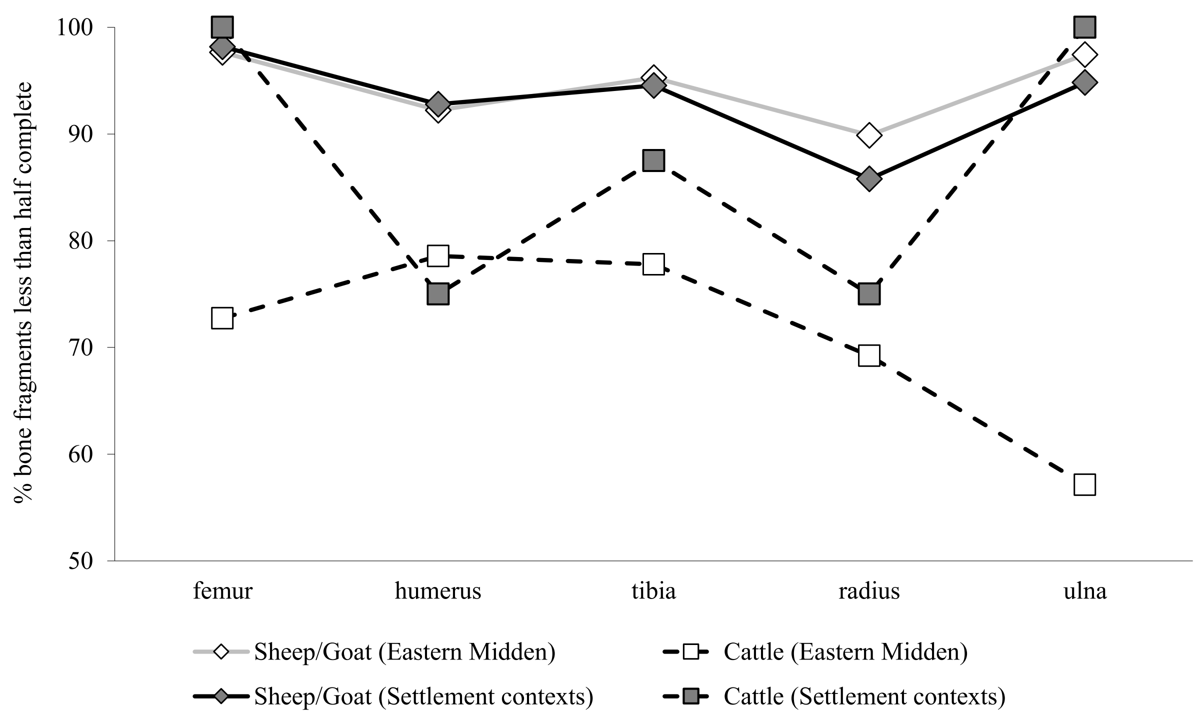


Fig. 7.11. Fragmentation of limb bones by taxa, in order of decreasing marrow content. Note that the graph illustrates bones that are *less than* half complete.

fragmented than the ulna, which does not contain marrow. For feasts with many participants, it may have been important to process the carcass so that it was particularly tasty by deliberately exploiting the bone marrow as well as the meat. Yet, speaking against this interpretation is, first, that the femora, which contain the highest amount of marrow, are less fragmented than the humeri and tibiae and, secondly, that cattle limb bones in the Eastern Midden are overall less fragmented.

The strikingly different trends in the graph in Figure 7.11 support the proposed thesis that there is a relationship between feasting, cattle, and the Eastern Midden. Only the curve for cattle extremities in the Eastern Midden displays an inverted U-shape; all others (bovine limbs in settlement contexts, sheep/goat extremities in both context categories) present a W-shape, which can be interpreted as a routine form of bone treatment involving the dismemberment of bones simply to fragment them. The graph shows clearly that cattle bones in the Eastern Midden, especially the femur and ulna, were treated very differently in comparison to the settlement contexts and to the sheep/goat pattern. Overall, the fragmentation of cattle limb bones in the Eastern Midden is substantially lower than of sheep and goat limb bones in both context types as well as cattle bones in settlement contexts. The one exception is the almost equal fragmentation of cattle humeri in both contexts, but this is due to the sample size of cattle bones in settlement contexts, and what was present was likely not everyday slaughter waste but rather a partly unprocessed deposit of especially meaty parts of cattle. This is particularly the case for the femora from which even bone marrow was not extracted. These clearly visible differences in the treatment of bones support the idea that cattle occupied a special role in the context of feasting events, with the less heavy processing perhaps pointing to a willingness to waste. Although evidence for hierarchical social relations at Monjukli Depe is very limited, it is often thought that less processed bones together with the consumption of high amounts of meat are indicative of competitive feasts such as a potlatch (Russell 2012a, 388-389; Twiss 2008, 424).

The spectrum and distribution of taxa

Feasts are typically characterized by food components that differentiate them from daily meals. If the majority of the meat consumed on a regular basis comes from herd animals such as sheep and goats, a higher taxonomic diversity may be an indication of feasting: "In general, a balance that differs from the typically found is often used to argue for feasting, especially if the putative feasting deposit is weighted toward taxa seen as higher value or symbolically linked to the context" (Russell 2012a, 386-387). To explore possible differences in the animal food spectrum and the treatment of parts of the carcasses, the diversity and distribution of taxa are examined in the following two sections as well as the distribution of skeletal elements of the predominant domestic animals.

Diversity and distribution of taxa

Sheep and goats are the overwhelmingly predominant livestock in Monjukli Depe, as the foregoing summary has already demonstrated. This is also the case when the material is divided into settlement contexts and Eastern Midden (Tables 7.6 and 7.7).

Some small differences can be observed in the relative proportion of bone derived from animals other than sheep or goat. In the Eastern Midden other animals constitute approximately 13% of all identified bones, in settlement contexts 9%. In addition, the relative MNI of other taxa in the Eastern Midden is slightly higher, although it should be borne in mind that the more uncommon taxa are generally overrepresented in the calculation of MNI. A very striking divergence between the context categories becomes clear when cattle are considered. The MNI is almost twice and NISP nearly three times as high for the Eastern Midden as for the settlement contexts.[92]

The fact that there are cattle bones in the settlement contexts but only in low numbers may be tentatively interpreted to mean that after a feast some parts of the slaughtered cattle were distributed to households in the village. With their large body size, cattle are generally only slaughtered when considerable numbers of people assemble to consume the meat, and it is reasonable to assume that there was an important reason for doing so. Given the quantity of meat, which was far too much to be consumed by a single household, it is likely that many participants were expected, unless the meat was preserved by salting or drying (Halstead 2012, 29).

MNI percentages for uncommon medium to large wild taxa, such as onager, gazelle, and wild pig, are not much higher in the Eastern Midden than in the settlement contexts (Tables 7.6 and 7.7). The wild sheep MNI percentage is even a little bit higher in settlement contexts. MNI densities for onager, gazelle, wild sheep, and wild pig are significantly higher in the Eastern Midden than in settlement contexts, with similar ratios for onager, gazelle, and wild sheep (Table 7.8).

The higher MNI densities may be due to the fact that the bones in the Eastern Midden were better protected and thus better preserved than in settlement contexts. But they also may reflect real differences in the treatment of some types of animals.

A slightly greater diversity of taxa is found in settlement contexts, with 19 types of animals identified but only 17

92 Cattle is the only taxon in the Monjukli faunal assemblage that shows such a difference between the contexts, supporting the presumption that cattle carcasses were specially handled (Eger 2011, 213).

Taxon	NISP		MNI	
	n	%	n	%
sheep/goat	2794	85.73	47	54.65
sheep	39	1.20	4	4.65
goat	13	0.40	5	5.81
cattle	270	8.28	7	8.14
dog	11	0.34	1	1.16
wild sheep	20	0.61	2	2.33
wild pig	2	0.06	2	2.33
onager	50	1.53	5	5.81
gazelle	18	0.55	3	3.49
lion/leopard/tiger	1	0.03	1	1.16
camel	1	0.03	1	1.16
fox	19	0.58	2	2.33
hare	6	0.18	1	1.16
goose	1	0.03	1	1.16
tortoise	2	0.06	1	1.16
hedgehog	1	0.03	1	1.16
rodent	10	0.31	1	1.16
frog	1	0.03	1	1.16
unidentified	7676	-	-	-
Total	10935	-	-	-
Total identified	3259	100	86	100

Table 7.6. Number of identified specimens (NISP), minimum number of individuals (MNI), and percentage of both parameters by animal taxa in the Eastern Midden.

Taxon	NISP		MNI	
	n	%	n	%
sheep/goat	3542	88.31	47	55.95
sheep	64	1.60	6	7.14
goat	27	0.67	5	5.95
cattle	118	2.94	4	4.76
dog	9	0.22	1	1.19
wild sheep	28	0.70	2	2.38
wild pig	1	0.02	1	1.19
onager	28	0.70	4	4.76
gazelle	22	0.55	2	2.38
bear	1	0.02	1	1.19
fox	10	0.25	2	2.38
hare	3	0.07	1	1.19
crane/stork	1	0.02	1	1.19
marsh sandpiper	1	0.02	1	1.19
starling	1	0.02	1	1.19
great bustard	1	0.02	1	1.19
carp fish	1	0.02	1	1.19
tortoise	13	0.32	1	1.19
frog	1	0.02	1	1.19
rodent	139	3.47	1	1.19
unidentified	15269	-	-	-
Total	19280	-	-	-
Total identified	4011	100	84	100

Table 7.7. Number of identified specimens (NISP), minimum number of individuals (MNI), and percentage of both parameters by animal taxa in settlement contexts.

in the Eastern Midden. Here sample size certainly plays a role. Some taxa present in the Eastern Midden suggest communal practices and consequently also communal meals, for example, hares, which can be hunted more efficiently in groups (Potter 1997, 359). It is not necessarily the case that the hare bones stand in direct connection to the slaughter of cattle; rather, it is more likely that smaller groups of people gathered after a hare hunt to share their catch. Individually occurring wild animals – in the Eastern Midden hedgehog, goose, large cat, and camel – could be a sign of feasting occasions, as they stand out from the daily diet.[93] Although there are individual finds of rare taxa in settlement contexts, including bear, crane or stork, marsh sandpiper, star, great bustard, and carp, they occur in a variety of places: on surfaces inside and outside buildings, in room fills, and in small pits. Such contexts are not at first sight associated with feasts, although waste disposal could occur in many places. In addition, occasional bones of rarely occurring taxa, especially of larger animals, can be chance finds that were collected as "interesting" objects and do not stand *pars pro toto* for the hunt of a whole animal. Examples are the camel and bear teeth. The fragment of a humerus of a large cat may, however, be interpreted as a random prey acquired by an opportunistic hunt. The diversity of bird species in Monjukli can also

93 "Feasts are often marked by foods that differ from everyday fare, so faunal assemblages that are notably different in composition from ordinary food waste may flag feasting activities" (Russell 2012a, 386). But that is not to say that in Monjukli Depe "ordinary food" was not used for festivities, and indeed the NISP values speak for a mixture of special and ordinary food in the Eastern Midden. The distinction between everyday and feasting contexts in this regard is not easy to make, as has already been shown elsewhere (Lev-Tov and McGeough 2007, 95-98). If the same kinds of food and drink are served, it is quite possible that the planning and type of preparation or the manner of serving played a role in distinguishing feasts from everyday meals (Hastorf 2012).

Context	Onager	Gazelle	Wild sheep	Wild pig
Eastern Midden	0.5	0.3	0.2	0.2
settlement context	0.1	0.05	0.05	0.02
ratio Eastern Midden: settlement contexts	5:1	6:1	4:1	10:1

Table 7.8. MNI densities (MNI/m^3) of uncommon medium to large wild taxa by context.

be explained as opportunistic catches. If fowling was an individual activity conducted on the side, the bones would probably end up in house areas, for which the 4:1 ratio of bird taxa (settlement contexts : Eastern Midden) is an indication. Ultimately, rarely occurring taxa in settlement contexts may be indications of small-scale rather than community-wide feasting, although they cannot be interpreted solely as such.

In summary, although sheep and goats are clearly the dominant taxa in all contexts, some differences in the importance and diversity of other domestic as well as wild animals can be observed. Assuming that settlement contexts reflect more or less regular diets, the differences between the number of cattle in the Eastern Midden and the settlement contexts as well as the higher MNI density of other taxa in the Eastern Midden likely point to communal feasts that may also have functioned to enhance group solidarity. Overall, it seems likely that it was not so much the kind of meat, but rather the quantity that was important for feasts, with, however, a specific emphasis on large quantities of beef that point to a symbolically valuable animal.[94]

Conclusion

This chapter has offered an overview of the animal remains from Monjukli Depe. The analyses conducted provide evidence not only for the distribution of faunal remains at this early Aeneolithic site, but also for the symbolic value of specific animals, the use of their body parts, and their place in feasting as well as daily food consumption. Three primary analytical steps were carried out as part of a multi-proxy approach to compare the bone assemblage of the Eastern Midden with that from settlement contexts, focusing primarily on the most common taxa, caprines (sheep and goat) and cattle:

1. Quantitative analyses of animal bone densities and fragmentation were based on the calculation of NISP, bone weight, and MNI and weight per NISP. The resulting figures showed a higher density and a lower fragmentation of bones in the Eastern Midden than in settlement contexts, especially striking for cattle bones.
2. Preservation and distribution of individual skeletal elements were analyzed using MNE, bone completeness, NISP, and bone weight. These demonstrated the good preservation of three particular skeletal elements – crania, mandibles, and horn cores – and the less heavily processed limb bones of cattle in the Eastern Midden.
3. Analyses of the taxonomic spectrum and distribution of taxa using NISP and MNI revealed that there were some differences in the importance and diversity of taxa, apart from the observation that caprines are dominant in all contexts. The differences in the numbers of cattle bones together with those of larger wild animals, such as onager, gazelle, and wild sheep, in the two context groups are striking, leading to significantly higher density ratios in the Eastern Midden compared to the settlement contexts.

There is sufficient evidence from this faunal analysis to identify feasts as a significant element in the life of the prehistoric village of Monjukli Depe. This evidence includes spatial relationships among houses, Eastern Midden, and gate, a selection of special meats consumed, particular treatment and utilization of animal carcasses, especially cattle, and activities involving larger than average quantities of food.

Significant differences between animal bones from domestic contexts and the Eastern Midden suggest, following the first hypothesis, an interpretation of the Eastern Midden as an accumulation containing the remains of feasts, while animal bones in the settlement represent mostly everyday commensality. It can be argued that the faunal remains from the Eastern Midden derive from communal, perhaps regionally based, feasting. The different modes of evaluation I have used support the thesis that the midden is not merely a large rubbish dump equivalent to other contexts in the settlement, but rather was a location for the disposal of feasting remains. The special character of these events is highlighted by the identification of a habitual feature – the slaughtering of domestic animals – while the preservation of cattle bones indicates the special role of these animals. The unusually high concentration of mammal bones as well as skeletal elements in articulation of both domestic and wild taxa point to very large amounts of meat and prepared food. They offer evidence for quantities of meat that may have been too much for even a large number of participants to consume – and were planned that way. This wasteful manner of dealing with food may have been a symbol of collective wealth.

Remains of taxa that were labor-intensive to raise, such as the skulls of cattle, or elements of rare but large

94 The symbolic importance of cattle is further emphasized by a remarkably high percentage of figurines that seem to be likenesses of cattle (Chap. 12).

wild animals, such as onager and wild sheep, also point to feasting events. In general, large portions of the animal remains from the Eastern Midden represent forms of handling and processing that differ from the regular slaughter and food waste both in the midden and in settlement contexts. Large carcasses of slaughtered animals, such as cattle, onager, wild or adult male domesticated sheep, were presumably divided among households or consumed by them together. This in turn supports the notion that meat of large animals, such as cattle or adult sheep, may have played a significant role in social relations, especially in creating solidarity and social cohesion in the early farming community of Monjukli Depe due to the relative rarity of such meat in daily consumption. The use of horn cores in the settlement represents an interesting additional symbolic dimension of specific animals and the value attributed to them. It does not, however, parallel the findings of the remainder of the faunal analysis.

The number of slaughtered sheep and goats clearly dominates, despite the focus on cattle in the Eastern Midden. Given the overall impression from the bone collection in the Eastern Midden, including bone texture and the occurrence of well-preserved bones together with small fragments, and judging by a distinct bone color (homogeneous whitish to beige complete bones vs. brownish, highly fragmented bones), it can be proposed that in addition to the remains of communal festivities, ordinary food-refuse bones were also discarded in the Eastern Midden. Likewise, it can be argued that some remains of sheep and goats were consumed without great ceremonial effort, as also suggested for societies in the Neolithic Levant (Twiss 2007b, 60). If this were not so, the slaughter and subsequent processing of sheep and goats could be expected to be different between the settlement contexts and Eastern Midden, so that significant variation in the degree of fragmentation of the limbs between the two context categories would be identifiable. This is not the case. However, a predominance of slaughtered caprines in the Eastern Midden does not invalidate the notion of communal feasts, especially because the amount of beef is significantly higher than the meat from sheep and goats. The slaughter of a cow provides roughly 400 kg of meat, whereas a goat yields only 47.5 kg (Twiss 2007b, 59). In addition, there is the possibility that caprines, which were an important part of the village economy and may once in a while have been used for domestic meals at a household or extended family level, were also used for feasts, since the quantity rather than the kind of meat may have stood in the foreground. Twiss notes that the structure of feasts may be similar to everyday meals, with feasts being only an extended version of an ordinary meal. The amount of food is increased and supplemented by other kinds (Twiss 2012, 66-67). On the other hand, both quantity and kind of meat may have been important, so that sheep and goats, just by virtue of their role as the prevailing domestic animals, were valued as a luxury food and played accordingly a role in feasts and sacrifices. It was mainly subadult and adult sheep, goat, and cattle that were slaughtered for consumption and the remains of which were discarded in the Eastern Midden, producing such a large amount of meat that it was almost surely too much even for a multifamily household. That is why I would not rule out that the bones of sheep and goats in the Eastern Midden reflect the disposal of waste from domestic consumption as well as including remnants of feasts.

As mentioned, events associated with the consumption and labor-intensive preparation of animals may have taken place at the communal level. Given the rather small size of the 5th millennium village with an estimated 280-330 inhabitants (Chap. 8), we should probably assume that there were regional feasts, especially since significant areas of the latest level of the village consisted of unbuilt space where such events could have taken place or the disposal of the refuse from them (Fig. 2.46).

The good preservation of some skeletal elements in the Eastern Midden and the occurrence of articulated skeletal parts consisting of some of the more fragile bones point not only to a lesser impact of taphonomic processes than in settlement contexts, but also to special practices with respect to certain parts and types of animals. The incorporation of almost complete skulls, mandibles, and horn cores in the ash layers of the Eastern Midden, particularly of cattle but also of other large animals (onager, wild sheep, gazelle), indicates that these remains were not regarded merely as food waste but had a specific symbolic value, although post-cranial elements were certainly fragmented for the greatest possible food use.[95] Cattle long bones containing the highest bone marrow content show a fragmentation pattern that hints at food-related choices, but the overall lower fragmentation of cattle limb bones accompanies a relatively wasteful use of particularly meaty parts of the body.

To achieve a better understanding of the internal social organization at Monjukli Depe, the reasons and mechanisms for the creation of the Eastern Midden must be investigated. The location itself and its accessibility could be considered as a prerequisite for organizing feasts. A systematic analysis of the microstratigraphy of ash layers, which has not yet been conducted, could potentially allow us to distinguish single feasting events. An issue that remains to be resolved is where exactly the feasts took place, since the Eastern Midden can only be

95 Similar results come from the investigations of the bones from the “Death Pit” at Late Neolithic Domuztepe (Kansa et al. 2009a, 171), apart from the fact that in the midden at Monjukli Depe no human bones were found except in the graves dug into it.

securely interpreted as the location for disposal of feasting remains. Additionally, the reason for the location of the Eastern Midden near the gate leading to – or out of – the residential area of the village remains unclear, as does the question of whether feasts or even slaughtering took place behind closed doors with only the meat distributed to waiting guests and the rest covered with ash. In that case the invited group would have missed distinct parts and maybe strategic motives of the feasting event. In contrast, I argue that the special treatment of some kinds of animals, the waste of meat, and the use of skeletal parts as commemorative deposits was of particular importance, with the result that the invitees would have been aware of at least some of the underlying processes and consigned them to memory.

The analysis of the animal bones gives us a deeper insight into the interactions among people at Monjukli Depe and potentially the region at large. The systematic processing of cattle carcasses and the intentional deposition of larger wild animals in the Eastern Midden offer an entry point into examinations of sociocultural practices that go beyond a single small settlement.

Chapter 8

Dealing with the Dead in Aeneolithic Monjukli Depe

Norms and *Handlungsräume* in Burial Practices

Nolwen Rol

Keywords: *burial; mortuary practice; Handlungsraum; taphonomic process; ocher; scattered bone*

Introduction

This study focuses on the human remains from the Aeneolithic period in Monjukli Depe and explores local burial practices in their sociocultural context. Using a practice-based approach, my purpose is to highlight the structural constraints that orient those practices as well as to show how practices in turn participate in the shaping of *Handlungsräume.* By *Handlungraum* I mean the potential for subjects – individuals or small groups – to act within a more tightly or loosely defined space of possibilities. The presence of both recurrent and idiosyncratic practices raises the question of choice and the actions open to individual or collective subjects when burying a member of the community.

A catalog of the burials serves as the basis for comparative analysis of the interments from an archaeological perspective. In view of the limited sample, it is important to reconstruct the particularities of each grave and burial event, to assess not only commonalities (as is often done in typological exercises) but also small-scale differences in practice. It is at the juxtaposition of commonalities and differences that we can expect to encounter the interweaving of socially shaped dispositions and individual incentives and thereby to explore past *Handlungsräume*. The results of the burial analysis together with an evaluation of scattered human bones found within the settlement form the basis for a discussion of the specificities of mortuary practices at Monjukli Depe.

Burial practices at Monjukli Depe show varying degrees of regularity, pointing to the presence of both strong dispositions toward specific actions and extensive *Handlungsräume* for dealing with the deceased. I argue that burial practices were closely related to the "lives" of houses and were negotiated on a collective basis. In a last step, I place the burials from Monjukli Depe in a chrono-regional framework to ascertain whether similar practices can be observed elsewhere in southern Turkmenistan or adjacent northern Iran.

What the dead tell us: practice-based approaches to mortuary practices

The meticulous search for similarities, patterns, and recurring elements – in other words, for a common denominator – is a fundamental aspect of much archaeological research and has been an especially popular approach in the study of burial practices (e.g., Andrews and Bello 2006; Bocquentin et al. 2010; Pollock 2011). The interpretation of those shared characteristics is, however, always conditioned by the researcher's own positioning within the field of theoretical discourses. The frequent use of expressions such as "burial customs" and "burial rites" illustrates that mortuary practices have been considered to be by their very nature "traditional" or "value-rational" types of social actions (Weber 1972 [1922], 12-13), governed mainly by conventions and continuity.[97] While processual archaeology moved away from this view of burial customs as the normative product of social and cultural behavioral rules to focus on the reconstruction of political, economic, and social organization on a macro-scale (Saxe 1970; Binford 1971; Stout 2013, 21-22), post-processual approaches of the last decades have come to understand burial practices as transformative processes where social relations are created, altered, and negotiated (Parker Pearson 1999). Scholars have highlighted the active role of individuals and collective actors in shaping social practices and have investigated burials in light of ritual, identity, embodiment, gender, emotions, memories, and more (e.g., Tarlow 1997; Arnold and Wicker 2001; Chesson 2001). They have attempted to approach an emic point of view and to interpret practices through the prism of the particular lifeworld of which the burying community was part (on the notion of lifeworld, see Habermas 1981). Along with other social practices, burial practices have been recognized as meaningfully constituted and resulting from agents' choices, social strategies, ideologies, worldviews, or philosophical-religious beliefs (Carr 1995). In this way, agency has been placed in the foreground. In this light, I analyze the burials from Monjukli Depe by exploring the interplay of inhabitants' choices with social expectations, asking to what extent specific mortuary practices were left to the discretion of individuals or groups.

Following the seminal works of Pierre Bourdieu (1972; 1980) and Anthony Giddens (1984), practice-based approaches have proven particularly useful in the study of the recursive and dialectical relations between social structures and individual actions and the ways they participate in the shaping of social practices.[98] Bourdieu's theory of practice relies heavily on the concept of habitus, a system of dispositions or "feel for the game" that is constantly incorporated by individuals and functions as a generator of practices. In an ongoing situation social actors tend to fall back on their command of the social rules to ponder the situation and develop their own specific strategy accordingly (Bourdieu 1972, 256-258). Such a process is neither reflected nor rationally thought through. Rather, it occurs on an unreflected level as actors rely on their "practical sense," which orients but does not determine their actions (Bourdieu 1980). In other words, practices emerge from individual or collective choices made within a subjectively perceived and objectively structured space of possibilities. Giddens understands practices as being monitored and supervised by agents who make use of their knowledge about the structures by which they live (Giddens 1984, 7-16). However, he makes a further distinction between a "practical consciousness," which is mostly reproduced in an unreflected manner in the routine of social structures, and a "discursive consciousness," which presupposes a reflexivity on the part of the agents and acts as a driving force behind the alteration of social practices (Giddens 1984, 41-45). Giddens thereby underlines the capacity of social actors to "act otherwise" (Giddens 1984, 14) and resist social pressures, making both the reproduction of old and the generation of new practices essential for the continuous shaping and reshaping of structures.

Practice-based approaches have been increasingly adopted in the field of mortuary archaeology (e.g., Gillespie 2001; Nilsson Stutz 2003; 2010; 2015; Epstein and Toyne 2016). Burials are thereby considered to be part of dynamic processes that do not so much represent as generate meanings and worldviews (Bell 1992, 123). Though differences of opinion persist as to whether burial practices differ fundamentally from other social practices in view of their infrequency and the assumed universal social importance of death as an event (compare Metcalf and Huntington 1991 and Bell 1992), I have followed Catherine Bell's approach. She sees ritual not as a separate category of action but as a form of social practices that are marked as significant or special through the process of "ritualization" (Bell 1992, 220). Though a

97 See Fehr (2010, 684-693) for a successful problematizing of the German equivalents "Begräbnis*sitte*" and "Grab*brauch*" and their underlying ethnic connotations in German prehistoric archaeology.

98 Bridging the gap between objectivist and subjectivist social theories and exploring the relation between individual actions and social systems are concerns at the core of the "turn to practice" initiated in the late 1970s (Ortner 1984; 2006). This "turn" continues to offer promising insights within an ongoing debate regarding macro versus micro scales (Robb and Pauketat 2013) and theories of agency (Dobres and Robb 2005).

strongly formal and homogeneous character is usually attributed to ritual actions, it is rather one's way of acting and awareness of the "specialness" of the situation that define practices as ritual (Thomas 2012, 127). In the case of burials, it is not necessarily a strict formalization of the material setting that makes the burial process ritualized, and indeed, as I will show, this formalization is often absent in Monjukli Depe.

A focus on practices allows us to illuminate both the reflected and unreflected choices of the burying group – officiants, participants, spectators – and to what extent they tended to uphold social expectations. The practical knowledge of what is appropriate and what a "proper burial should be" (Nilsson Stutz 2010, 36) can be explicit or internalized in a non-discursive form as part of an unquestioned doxa or a habitus largely shaped by embodied memories of past funerals (Bourdieu 1972, 164-169). As I will show later for Monjukli Depe, explicit or implicit rules can be more or less binding or open to interpretation. Fanny Bocquentin et al. (2010) make a useful distinction between *devoir-faire* – what must be done – and *pouvoir-faire* – what can be done – by identifying standardized and less standardized practices within a burial assemblage. Repeatedly reproduced gestures likely indicate "unreflected or non-negotiable responses to death" (Nilsson Stutz 2010, 37), while variability in practices points to options among which the burying agents can choose (Bocquentin et al. 2010, 159): *pouvoir-faire,* or what one *can* do, refers to a field of possibilities in which practices are anchored and can be considered the direct expression of a choice made by a subject. Here the concept of *Handlungsraum*[99] is particularly appropriate (Bernbeck 2008; Starzmann 2012; Pollock 2013). A *Handlungsraum* is understood as a material or immaterial space for and of actions and possibilities for action. The *Handlungsraum* includes all possible courses of action an actor can potentially take or choose to take. It is in turn limited by necessities and impossibilities, which do not leave room for choice (Pollock 2013, 148). Within a given *Handlungsraum*, the choice between possibilities, between what is doable or can be done, is, again following Bourdieu, steered by a logic of practice although not determined by it (Bourdieu 1980, 111). Preferences are similarly oriented, although not prescribed, by group-specific dispositions (Bourdieu 1979). The continuous interplay of societal structures and agency of subjects characterizes the construction and configuration of *Handlungsräume* and the degree to which social practices can be diverse. The funeral event can accordingly be understood as part of a *Handlungsraum* in which burial practices are actively shaped, maintained, and transformed by social actors. Those practices can reflect dispositions, preferences, or idiosyncratic choices regarding aspects of the burial setting, while upholding, metaphorically restricting, or widening the *Handlungsräume* in which they take place.

Building on the notion of a "total field of practices" encompassing "embodied, materially interwoven practices centrally organized around shared practical understandings" (Schatzki 2001, 3), fruitful insights can be achieved by examining the interactions of mortuary and other social practices, for instance, building construction. Variability and subsequent changes in practices can ensue from the necessity for actors to deal with a diverse and sometimes contradictory body of practical knowledge (Reckwitz 2003, 296).

To summarize, practice-based approaches offer several interesting avenues for exploring how people in Monjukli Depe responded to death:

- Standardization: How formalized were burial practices?
- Expectations: To what extent did inhabitants uphold particular rule-like expectations?
- Appropriateness: What must and what could one do with human remains?
- *Handlungsraum*: How broad were the possibilities for action on the part of the burying community?
- Negotiation: How and between whom were burial practices negotiated?
- Interwovenness: How were burial practices connected to other social practices?

Previous research on mortuary practices in southern Turkmenistan

In the Soviet Union mortuary archaeology focused primarily on the analysis of social organization, aiming to reconstruct family structures and assess social differences and hierarchical relationships (Alekshin 1983; see also Kradin 2011). While Vadim Alekshin's (1986) dissertation, *Social Structures and Funerary Rites in Early Agricultural Societies*, offers a comprehensive overview of regional burial practices in southern Turkmenistan for the Neolithic and Aeneolithic periods, a detailed description of burials is often absent in excavation reports, with mentions only *en passant*.[100] Soviet physical anthropology focused mainly on ethnogenesis, using cranial measurements

99 The concept of *Handlungsraum* – space of action – is not unlike Bourdieu's notion of *espace des possibles* (1994, 61) or Foucault's *champ des possibilités stratégiques* (1968, 29).

100 In the last decades, publications have become more detailed but concern mainly later periods (e.g., Khlopin 1997; 2002; Masson and Berezhkin 2005).

Burial designation*	Berdiev's building level	Location	Age at death	Ocher	Orientation (cranium-pelvis)	Position and deposition	Additional information
A	7	Msh sounding	adolescent	yes	SW-NE	on side, right hand to face, left hand on chest	in northern profile of Msh sounding
B	8	Msh sounding	child	yes	SE-NW	flexed	SE part of Msh sounding
C	9 ?	Yard 15	adult	yes	N-S	flexed, on right side	-
D	9 ?	Yard 15	adult	yes	NW-SE	flexed, on right side	-
E	9 ?	Yard 15	adult	yes	N-S	flexed, on right side	at northern wall
F	9 ?	House 16	adult	-	NW-SE	flexed, on right side	at southern wall
G	9 ?	House 17	adult	-	SW-NE	flexed, on side	above house floor

Table 8.1. Burials from Monjukli Depe published by Berdiev (1972). Locations refer to Berdiev's building and yard designations; Msh = Marushchenko. * Added by the author.

and identification of morphological variations to define human "types" believed to be representative of "races" and to metrically evaluate the homogeneity or heterogeneity of a population (Bendezu-Sarmiento 2004, 103-104; Marshall 2014, 31-34). The outcomes served to corroborate migration theories thought to account for observed changes in the archaeological record (Frachetti 2011, 204-205). Diffusionist explanatory models for the transition from Neolithic to Aeneolithic in southern Turkmenistan are no exception. In an equation of pots with people, Soviet scholars unanimously argued for the immigration of an "Anau IA" population from neighboring Iran, although the hypothesis of a local development from the preceding Neolithic Jeitun tradition seems equally likely (Kohl 1984, 67, 70-71; Hiebert 2002, 33; Coolidge 2005, 38).[101] Berdiev suggested a temporary coexistence of two populations in southern Turkmenistan, one in Chakmakly Depe originating from Iran, the other local to Chagylly Depe and Monjukli Depe. This, he postulated, would have soon resulted in the mutual assimilation of both cultures (Berdiev 1968, 32; 1972, 30-33). Osteological analysis of Neolithic and Aeneolithic skeletons from the region, undertaken by Tatiana Trofimova in the 1960s and 1970s, supported the migration hypotheses by allegedly distinguishing a local Neolithic and Early Aeneolithic population of "Eastern Mediterranean race" – found in the burials of Chopan, Chagylly, and Chakmakly Depe, Kaushut, and Ovadan Depe – and a "particular racial variant of the Eastern Asian Mediterraneans" in burials from Monjukli Depe, believed to result from the assimilation of the "Jeitun people" with an immigrant population of agriculturalists from the west (Ginzburg and Trofimova 1972, 37-47).[102] As the only site believed to possess a continuous archaeological sequence from the Late Jeitun to the Anau IA period, Monjukli Depe clearly stood at the center of this still unresolved "transition issue."

Marushchenko's and Berdiev's excavations at Monjukli Depe in the early 1960s focused on the uppermost architectural layer, which was exposed over 1125 m². Five burials were brought to light in the southwestern village area (Berdiev 1972, 14). Berdiev briefly mentions two others from Marushchenko's 1959 sounding in the center of the mound (Berdiev 1972, 19). Unfortunately, the burial descriptions take the form of passing references within a broader discussion of the architectural spaces in which they were found and provide little information about the grave structure or stratigraphic relationships. The publication nonetheless includes important information regarding the orientation of the graves, body position, presence of ocher, age of the deceased, and approximate location (Table 8.1). All of the deceased were laid on their side and, when specified, always flexed on the right side. Traces of ocher on the bones or in the surrounding soil were apparent in five of the burials. Grave orientation was variable. Five adult burials were found clustered in Berdiev's buildings 16 and 17 and in the adjacent outdoor area 15, possibly a yard. Two of them were next to a wall, at an unknown depth, and one was located directly on the floor. While Berdiev includes them in his description

101 Ceramics from Iranian sites dating to the "transitional Chalcolithic" including Cheshmeh Ali, Shir-i Shian, and Aq Tappeh show clear parallels to Anau IA pottery (Chapter 10). How to interpret these similarities in terms of cultural interactions and technology transfers remains nonetheless open to question.

102 Four human skulls originating from Monjukli Depe were analyzed and published by Trofimova in a volume on paleoanthropology in Central Asia. Two male and two female individuals were identified on the basis of cranial measurements and were used to establish highly questionable racial profiles of the Monjukli Depe population, connecting them to "races" found in Iran, Palestine, and southern India. While the human remains likely stem from graves excavated by Berdiev and Marushchenko (see below), the absence of burial numbers does not allow us to match information about biological sex with burial data.

of the uppermost architectural level, in the absence of documented grave pits it remains unclear whether they were interred when the site was still partially inhabited or after its abandonment.[103] The two burials from Marushchenko's deep sounding were assigned by Berdiev to his levels 7 and 8, likely corresponding respectively to our Strata IV and III (Heit, in preparation). An adolescent was found in level 7 at 1.5 m below the modern surface in the northern profile of the sounding, likely within the extensive ash layer on which House 10 was built. In Berdiev's level 8, a child burial was discovered in the southeastern portion of the sounding, probably part of an outdoor space roughly contemporary to the use of House 10.

Methodology, problems, and limitations

During the five seasons of work at Monjukli Depe, a total of 15 burials (MDB1 to MDB15), understood as *intentional* inhumations of human remains, were brought to light. There are in addition around one hundred fragments of isolated human bones and teeth throughout the settlement that can only in some cases be related to intentional burial actions (see below). Osteological data, including age at death and sex, are based on Dawnie Steadman's work (Chap. 9); isolated skeletal fragments were identified by Benjamin Irvine. The osteological results are discussed here in terms of their relevance for sociocultural practices, with bodies considered in their archaeological contexts and in terms of their broader significance for the community. Future osteoarchaeological studies, including paleogenetics, isotope analyses,[104] and paleopathology, may help to better specify elements of the burial practices at Monjukli Depe that I present here.

My analysis relies heavily on the excavators' documentation, including field diaries, trench summaries, photographs, plans, and archaeological drawings. I use these sources in order to provide, as far as possible, a detailed and accurate picture of each burial. The methodology of the French *anthropologie de terrain*[105], which explicitly places the human body at the center of burial analysis, is used to infer information about original burial conditions. *Anthropologie de terrain* focuses on post-depositional taphonomic processes taking place within the grave that can potentially be used to reconstruct initial body position and characteristics of the grave structure, to assess the presence of organic material in the vicinity of the cadaver, and to differentiate between primary and secondary inhumations (Duday et al. 1990; Duday 2009). Although the methods developed by *anthropologie de terrain*, including the three-dimensional recording of each bone's position, should ideally be used during excavation, the existing documentation from Monjukli Depe was in most of the cases of high enough quality to attempt a partial reconstruction of the taphonomic processes *a posteriori* (cf. Nilsson 1998; Nilsson-Stutz 2003).

Following interment, a cadaver does not remain static but undergoes a series of post-depositional transformations set off by the progressive decomposition of the body (Witzel 2000, 157-158). Connective tissues at the various joints tend to loosen at different rates and in a predictable sequence.[106] The articulations surrounded by ligaments and tendons that decompose at a very early stage are termed labile, i.e. they loosen in a matter of weeks, such as the interphalangeal articulations of the hands and feet or those of the cervical vertebrae, while the sacroiliac, knee or hip joints, so-called persistent articulations, hold for months or years (Duday et al. 1990, 31). Preserved labile articulations in tight connection are thus the most reliable evidence for identifying primary burials, as they indicate that the state of decomposition at the time of interment was barely advanced (Wilhelm 2000, 163-164; Duday 2009, 25-30).

When the system of ligaments and tendons loosens, bones that are in disequilibrium will tend to relocate within the available space in order to reach equilibrium. In a filled space, bones can only move within the temporary empty areas left by the decomposed soft tissues. When progressive infilling occurs, i.e. when sediments immediately start replacing the slowly decaying tissues, the secondary voids created will be minimal and movements of the bones will remain very limited, preserving most of the joint connections. Sedimentation may be delayed if the body is not in direct contact with the surrounding matrix, as when it is isolated by a shroud or clothing, and gravity will lead to more pronounced bone displacements within the initial volume of the cadaver, for instance the ribs will collapse into the space left by the thoracic organs. In contrast, if a void initially surrounded the body, as may be the case in a vault, a coffin, or with a rigid shroud, unbalanced bones

103 Berdiev (1976, 59) states that the majority of (the few) Anau IA burials in southern Turkmenistan are of children, which suggests that he did not include those adult graves in the Anau IA horizon. However, he makes no assignation to a particular time period.

104 Eger in preparation.

105 This school of physical anthropology termed "field anthropology" has developed in France since the 1980s, principally under the impetus of Henri Duday. It stresses the importance for physical anthropologists to be present in the field during excavation and advocates a meticulous observation, preparation, and documentation of every bone on site to allow an accurate interpretation of mortuary practices (Duday et al. 1990).

106 Although soil conditions (moisture, temperature, pH, etc.) influence the decomposition process, the relative chronology of anatomical dislocation remains generally similar except in extreme environmental conditions (Duday 2009, 27).

will tend to rotate and scatter outside the initial body space. For instance, if interred on the back, the iliac blades will usually fall laterally and cause the femora to rotate and displace the patellae. However, shrouds, coffins, or a particularly narrow pit may also have a constraining action and induce an *effet de paroi*, or wall effect, that maintains bones leaning against them in their initial position, in a manner similar to sediments during progressive infilling (Duday et al. 1990, 33-42; Duday 2009, 32-57; Nilsson 1998, 6-7; Witzel 2000, 158-160). The dynamic interplay between grave structure, soil composition, perishable materials, and cadaver thus determines the nature and range of bone displacements within a grave; the final location of skeletal parts informs conversely on the initial burial setting. This taphonomic approach allows a more comprehensive reconstruction of past burial practices.

The most problematic issue faced by this study of the Monjukli Depe burials is the difficulty of assigning them to a specific stratum. Despite meticulous excavation, the identification of the upper edges of grave pits, or of grave pits at all, remained in many cases tentative at best, a problem already noted by Marushchenko for the site of Chopan Depe (cited in Berdiev 1976, 58).

For burials located below architectural remains (MDB6, MDB8) or intact surfaces (MDB1, MDB11/12) dating to the Meana Horizon, the stratigraphy provides a definite *terminus ante quem*. In a similar manner, the presence of a substantial amount of bricky fill above the upper edges of a burial pit (MDB10) points to a burial event prior to or concurrent with the site's abandonment. The situation is less clear for burials without any recognizable pit that were found in the middle of trash or wall fall up to 1.15 m below the modern mound surface. Pits backfilled with the same material out of which they were dug are hard to identify, and for juveniles they are often very shallow. I therefore employed a case-by-case analysis to assess evidence for possible interments on surfaces (MDB3, MDB9) or unidentified pits (MDB4, MDB15). While the former can be easily included within the site's sequence, the dating of the latter remains more approximate. However, the depth of the interments and the similarities to other burials at the site fit with a general dating in the Meana Horizon.

Some of the skeletons (MDB7, MDB13) or preserved upper edges of pits (MDB2, MDB5) were found almost immediately below modern tertiary contexts, mostly stemming from previous excavation work at the site. As it is unclear how much of the upper architectural layer was removed by Berdiev and Marushchenko, and in view of the alternating deflation and sedimentation processes observed at the site (Berking and Beckers 2018), the question of the initial depth of the pits and the layers from which those burials were dug must be left open. They would either have been established when the now partly eroded architecture of Stratum 0 – attested by the poorly preserved remains of Building 18 (see Fig. 2.54) – was still in use or at a later time when the site was already abandoned but used as a burial ground. In that case, it is possible that the people from Monjukli, who had by then settled elsewhere, would have come back to their former village to bury some of their dead. A careful comparison with the remaining burial sample on the basis of shared characteristics such as body position, use of ocher, and burial context can support a date in the early Aeneolithic Meana or Post-Meana Horizon for MDB2, MDB5, and MDB7,[107] but I would certainly not exclude the possibility of a later interment[108] as those traits remained ubiquitous features of burial practices in the region for millennia (see below). The grave goods recovered do not provide sufficient information for intra- or inter-site comparisons, and the few Meana Horizon pottery sherds only provide a *terminus post quem* for the burial events. Only in the case of MDB14 did the presence of two complete ceramic vessels allow a dating in the Middle Bronze Age (see burial catalog). Radiocarbon dating of the human bones has not been attempted but may allow better specification of the chronology of the uppermost burials and address whether the site was later used as a burial ground.

In this chapter, I present the various burial contexts and investigate burial practices in terms of social dispositions and *Handlungsräume*. In Chapter 9 Dawnie Steadman provides a detailed bioarchaeological analysis of the human skeletal remains at the site and addresses larger paleodemographic and paleopathological questions.

Due to those different starting questions as well as the availability of the material at the respective times of study, the assemblages discussed by the authors do not coincide exactly. Although all burials are listed in the burial catalog at the end of this chapter, my contribution focuses solely on the 13 Early Aeneolithic burials; as a

107 MDB13 was recovered immediately below the backfill of the 1960s excavation. I consider it to date significantly later, an assumption supported by the extended body position and the absence of ocher or burial goods.

108 Especially the grave form of MDB5, an L-shaped pit with a narrow side cavity closed by two bricks, fits with grave types well known from Bronze Age sites such as Gonur Depe and the cemeteries in the Sumbar Valley (Khlopin 1983; Sarianidi and Dubova 2016), although not from nearby Altyn Depe (Masson and Berezhkin 2005, 473-474). Nonetheless, from other better stratified burials at the site (MDB10 and MDB11) it also seems clear that roughly L-shaped grave pits were used in the Meana Horizon, although they are not as elaborate as the one in MDB5. In the absence of further chronological evidence, MDB5 is provisionally included in the Early Aeneolithic assemblage for the purpose of this study. The situation for the multiple burial MDB2 is less problematic. Although collective inhumations are otherwise unknown for this time period on the northern side of the Kopet Dag, multiple burials dating to the Transitional Chalcolithic are present at the site of Sang-e Chakhmaq in nearby Khorasan and in Aeneolithic Parkhai II in the Sumbar Valley (Khlopin 1997; Tagaya 2014).

result, MDB13 and MDB14 are not included. Steadman studied the osteological material that had been recovered up to September 2012, i.e. all burials with the exception of MDB12, MDB14, and MDB15, as well as the few scattered human bones which were recognized as such at the time of excavation (D163 a/b). The ones identified later were analyzed *a posteriori* by Benjamin Irvine and are discussed in this chapter. As a result, although 16 individuals are analyzed in both contributions, they are not the same ones. In addition, the minimum number of individuals counted for burial MDB2 differs, as I consider some of the subsequently recovered scattered bones to belong to it on the grounds of their archaeological context.

Despite variation in the samples studied, the combination of an archaeological and a bioarchaeological approach to past bodies allows the authors to glimpse both individuals' lives and broader social and demographic issues.

Early Aeneolithic burials in Monjukli Depe – an overview of practices

I begin with an overview of the main practices encountered in the early Aeneolithic burials from Monjukli Depe, involving form of disposal, body position, burial location, grave form, age group, body orientation, use of ocher, presence/absence of a shroud, grave goods, and correlations among these features. Following Steadman's bioarchaeological analysis (Chap. 9), ages are categorized into six groups: fetal/infant (0-1 year), young child (1-5 years), child/adolescent (6-16 years), young adult (17-25 years), middle adult (25-50 years), and old adult (over 50 years). Biological sex could only be definitively determined for two individuals. Given the sample size, the limited range of variability in accompanying goods or in grave type, and the absence of comparative material, gender differences in burial practices – as opposed to biological sex – could not be addressed. The corpus of graves is summarized in Table 8.2 with locations in Fig. 8.1; a full description of each burial excavated in the 2010-2013 seasons can be found in the appended burial catalog.

Forms of disposal and individuality

With the possible exception of the disturbed remains of a minimum of three juveniles, the early Aeneolithic burials recovered at Monjukli Depe all take the form of primary inhumations. This conclusion is based on the degree of articulation of the skeleton and especially the preservation of the most labile joint connections, such as the interphalangeal articulations or those of the cervical rachis (Duday et al. 1990, 31). Ten single burials were identified, as well as one possible double (MDB11 and MDB12) and one multiple burial (MDB2); these latter probably consist of inhumations interred at the same time. While single burials include all age groups, the double and the multiple burial both contained an elderly individual interred in a shaft grave accompanied in the first case by a fetus/young infant and in the second by the remains of several, possibly secondarily interred juveniles.

Placement and body position

All individuals were, when ascertainable, buried with legs flexed: eight were placed on the right side, one on the left side, and three with their upper body on the back and legs flexed to the right. This clear preference for a flexed position to the right (92%) is also attested in Berdiev's documentation: where explicitly stated, all bodies were found flexed on the right side. The flexion of the legs varies from semi-flexed (> 90°) to flexed (90° – 45°) to tightly-flexed (< 45°), while the knees were placed at a right angle (≈90°) or tightly flexed (< 30°).

The position of the arms and hands differs strongly from one individual to another: bent with the hands to the face, at 90° angles in front of the body, placed above or under the thighs, extended along the side or in front of the chest, bent with one hand on the pelvis or resting on the right elbow. In this respect, no two burials are identical, although three (MDB2, MDB7, MDB10) of the four adults share certain parallels: their right arm is angled in front of the chest with the right hand raised to the face, while the bent left arm lies with the hand above or on the thigh. This might illustrate a favored position for adult burials. The head is straight or in extension when the deceased was placed on the side or turned to the right when the upper body was laid on the back.

Body orientation

The orientation of the deceased relative to the cardinal points is variable and does not seem to be related to any of the other criteria. A southwest-northeast orientation with the head towards the Kopet Dag was nonetheless somewhat preferred (37%), and there is a clear tendency to orient the head towards southerly directions (69%). Orientations along an east-west axis are not attested. The dead do not face a particular direction.

Burial location

Three types of burial locations can be distinguished according to their relationship to architecture: "house in use," when the dead were interred below inhabited houses; "abandoned house," when burials were dug into the fill of still standing but vacant buildings; and "outdoor area," when the location was an exterior space at the time of burial.

Adults were buried solely in outdoor areas (MDB2, MDB7, MDB10, MDB11) and never within occupied or still standing abandoned houses. In contrast, children and adolescents were interred in occupied (MDB1) or abandoned houses (MDB3, MDB4, MDB5), but not in

Burial number	Locus	Age *	Sex *	Stratum	Orientation (cranium – pelvis)	Facing	Body position	Placement	Grave form	Burial context	Dimensions of burial pit (L*W*D cm)	Use of Ocher	Disturbed	Time period
MDB1	A33	2-4 years	n.a.	I	NW-SE	SW	tightly flexed	on right side	simple pit	below house in use (Bld. 1)	50 x 40 x 20?	yes	no	MH
MDB2	C5/29/116	over 50 years	f	0 (?)	NE-SW	NW	tightly flexed	on right side	funnel-shaped shaft grave	outer area (EM)	min. 80 x 60 x 95	yes	yes	MH (?)
		1-2 years	n.a.		n.a.	n.a.	n.a.	n.a				(?)	yes	
		2-4 years ***	n.a.		n.a.	n.a.	n.a.	n.a.				no	yes	
		6-18 months ***	n.a.		n.a.	n.a.	n.a.	n.a.				no	yes	
MDB3	C23/50	14-16 years	n.a.	III	SW-NE	SW	tightly flexed	on back, knees to the right	covered surface disposal (?)	abandoned house (Bld. 8)	80 x 110 x 20	no	no	MH
MDB4	B87	2-4 years	n.a.	III	SW-NE	SE	flexed	on right side	simple pit (?)	abandoned house (Bld. 4)	60 x 40 x n.a.	yes	no	MH
MDB5	D70	5.5-7 years	n.a.	0 (?)	n.a.	n.a.	n.a.	n.a.	L-shaped shaft grave	abandoned house (Bld. 18)	140 x 90 x 75	yes	yes	MH (?)
MDB6	D278	36-40 weeks (prenatal)	n.a.	II	SW-NE	NE	flexed	on right side	simple pit	below house in use (Bld. 1)	25 x 25 x 15	no	no	MH
MDB7	D168	17-21 years	n.a.	0 (?)	S-N	E	tightly flexed	on right side	n.a.	outer area (EM)	min. 95 x 70 x 20	yes	yes	MH (?)
MDB8	E229	0-6 months	n.a.	II	SW-NE	SE	flexed	on right side	pit crowned with brick fragments	below house in use (Bld. 2)	40 x 40 x 10	yes	no	MH
MDB9	E237	0-6 months	n.a.	III	SE-NW	E	n.a.	on right side	covered surface disposal (?)	abandoned house (Bld. 12)	50 x 30 x n.a.	yes	yes	MH
MDB10	G66	17-25 years	f	I/II	SE-NW	NE	semi-flexed	on back, knees to the right	L-shaped shaft grave	outer area	120 x 100 x 75	yes	no	MH
MDB11	D564	over 50 years	m (?)	III	SE-NW	SW	flexed	on left side	L-shaped shaft grave	outer area	130 x 125 x 75	yes	no	MH
MDB12	D583	fetus/young infant **	n.a.	III/IV (?)	S-N?	n.a.	n.a.	n.a.	simple pit	abandoned house (Bld. 14)	35 x 35 x 10?	no	yes	MH
MDB13	A2	8-12 years	n.a.	n.a.	S-N	n.a.	extended	on back	n.a.	below modern deposits	80 x 45 x n.a.	no	yes	(?)
MDB14	L8	adult (?) **	n.a.	LMBA	W-E	S	flexed	on right side	simple pit (?)	n.a.	min. 95 x 50 x 25	no	no	LMBA
MDB15	G17	18-30 weeks ***	n.a.	II	n.a.	n.a.	n.a.	n.a.	simple pit (?)	outer area	n.a.	no	yes	MH

Table 8.2. Overview of burials excavated at Monjukli Depe from 2010-2013. Bld. = Building; EM = Eastern Midden; LMBA = Late Middle Bronze Age; MH = Meana Horizon; * as estimated by Dawnie Steadman; ** no osteological analysis performed; *** as estimated by Benjamine Irvine.

Fig. 8.1. Spatial distribution of human remains at Monjukli Depe (all strata combined).

outdoor areas except when accompanying adults (MDB2). Fetuses and infants were buried in all three types of location. Interestingly, most bodies seem to have been deliberately placed against, under, or immediately next to walls. This is not only the case when the deceased were interred within standing buildings, but also in outdoor areas. In that case, the choice of location often seems to be closely related to former architectural remains, the location and features of which were presumably remembered for decades. The bodies of the two elderly individuals were located above particular features within houses that by that time were buried and no longer visible: on a former buttress (MDB11) and above a former threshold (MDB2). The body of the young woman in MDB10 was similarly placed under the already buried wall of a former building.

Although doubts remain in the cases of MDB2, MDB5 and MDB7, which may have been interred after the village was abandoned, all of the other excavated graves fall within the category of settlement burials and were usually connected to past, present, or planned buildings. The majority were interred in unrestricted (outdoor) or semi-restricted areas (abandoned houses), making a large attendance at the burial event possible. Burials in more restricted areas, i.e. under occupied houses, seem to be a later phenomenon, appearing only from Stratum II onwards, although this impression might be due to the small sample size. They include "foundation deposits" (MDB6, MDB8), i.e. fetuses or neonates buried next to the base of walls. From the stratigraphic evidence, interment probably occurred in the last phase of the construction process, when the house was already standing but before the application of the first floor. Subsequently, a mudbrick platform, very small in the case of MDB8 and a large one with a small fire installation (FI 18, Chap. 6) in the case of MDB6, was built over the burials. Architecture and burial would in that sense have been interconnected: the platform can be considered an integral part of the grave or the burial an integral part of the house structure.

Grave form

Keeping in mind the above-mentioned difficulties of discerning the outlines of grave pits, four types of graves have been identified: shaft graves (MDB2, MDB5, MDB10, MDB11), simple earthen pit graves (MDB1, MDB6, MDB15, possibly MDB4), earthen pit graves with a crest of bricks (MDB8, G75[109]), and surface disposals in heaps of bricks (MDB3, possibly MDB9).

Simple earthen pit graves are very shallow, with a maximal depth of 30 cm, and seem to be backfilled with the same material into which they were dug, often hampering the tracing of their edges.[110] This type of grave seems to have been reserved for very young individuals, and it occurs in all types of locations. A more elaborate variation includes a crest of bricks or brick fragments arranged in a circle at the upper edge of the grave pit.

Under the rubric shaft-grave, I include earthen pits of at least 70 cm in depth that have a vertical shaft combined with a space for the deceased hollowed out to the side (L-shaped) or at the bottom (Fig. 8.2).

The L-shaped, 75-cm-deep grave MDB5 is the only one with well-preserved funeral architecture.[111] The pit is divided into three spaces: an upper, basin-shaped part leads through a circular hole in the center to a cylindrical entry shaft. From the western side of the shaft, a hole closed by two obliquely set mudbricks provided access to a lower, narrow cavity, in which the young deceased person was interred. Unfortunately, half of the cavity for deposition of the corpse was cut away by the Marushchenko trench.

In contrast, MDB10 and MDB11 seem to have been only simple, roughly L-shaped shaft graves with an oval entry shaft of 0.7-1 m in diameter and a widening to the southwest in the lower part of the shaft where the body of the deceased was placed.[112] MDB11 probably had a further deepening to the northeast at the base of the pit in which a fetus/young infant (MDB12) was recovered. Neither grave contained any brick installation. Their entry shafts were filled with ash.

The structure of the shaft grave MDB2 is more difficult to reconstruct due to post-depositional disturbances. It seems to have been more or less funnel-shaped, with a wide (1.2 m diameter), basin-like pit narrowing to a 0.8 x 0.6 m shaft, at the bottom of which the deceased was placed. In the upper part of the grave, remnants of a semi-circular arrangement of stones and bricks may have been a covering or stabilizing structure, from in and around which the partial remains of at least four immature individuals were recovered.

The use of shaft graves seems to have been favored for adults (MDB2, MDB10, MDB11), but was not restricted to them, as the L-shaped burial MDB5 was used for a child, and juvenile individuals were buried with adults (MDB2, possibly MDB11/12). The shaft grave was the only grave

109 This burial (locus G75) was not excavated and therefore did not receive a burial number.

110 In many cases, no grave pit could be identified at all. Nonetheless, the presence of distinct deposits in upper levels allowed me to estimate a maximum depth for the hypothesized grave pits. The absence of brick and stone heaps was used to differentiate this grave form from surface disposals. In the case of MDB7, found close to the surface, it cannot be excluded that it constituted the bottom portion of an unpreserved shaft grave.

111 See, however, note 108 regarding the potentially problematic dating of this burial.

112 The shape of these graves was not recognized when they were encountered; both entry shafts were first interpreted as garbage pits.

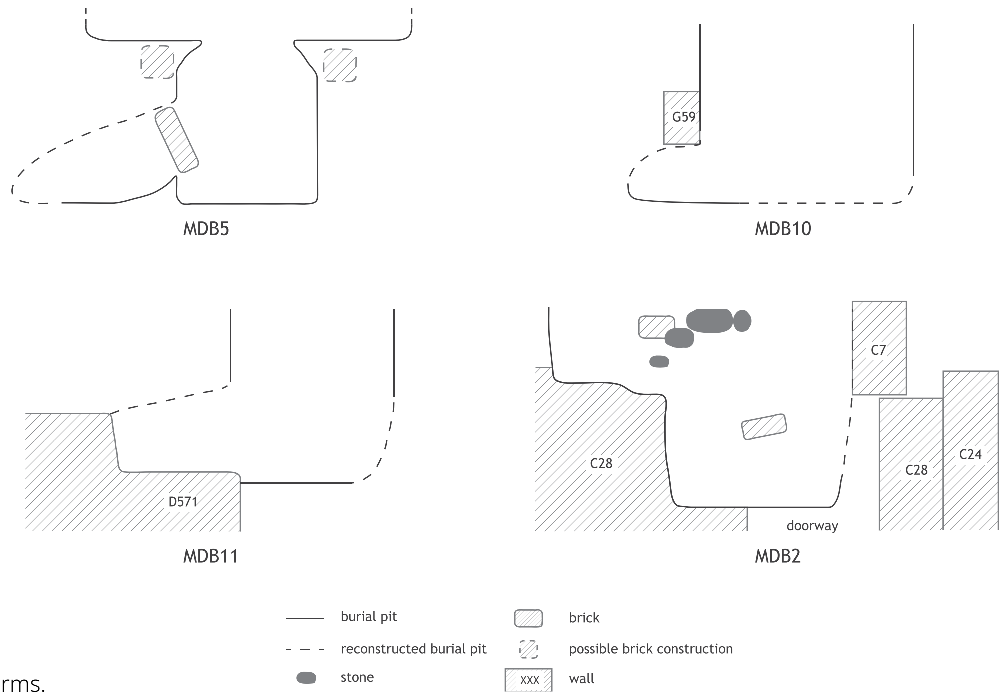


Fig. 8.2. Schematic reconstructions of the different shaft grave forms.

form used for double or multiple burials. Together with the greater work involved in such a construction, this might testify to the importance of those individuals to the living community.

Surface disposals seem to have occurred in two instances (MDB3, probably MDB9). The deceased were apparently laid on the fill in an abandoned building and covered by bricks or a mixture of stones and brick fragments.

Burial matrix

The contents of burial pits suggest that they were usually filled with trash similar to that in abandoned houses, consisting of loose earth mixed with bricky remains, discarded animal bones, lithics, pottery sherds, pebbles as well as burnt and ground stone fragments. A somewhat different, ashier fill was used in the shafts of MDB5, MDB10, and MDB11 as well as in the shallow pit for MDB12. In most cases, the grave pits were probably simply backfilled with the earthen material that was dug out to make them. The low densities of fecal spherulites[113] within the grave fills in comparison to surrounding contexts suggest that a comparatively clean earth was used for the burials of the two oldest adults, MDB2 and MDB11.

113 The presence of dung spherulites – microscopic calcium carbonate bodies found in animal dung – was analyzed with the help of Birgül Öğüt using an optical microscope with polarized light, following the method described in Portillo et al. 2012.

Use of a body wrap

In about one-third of the burials, the observation of bone displacements and ocher distribution points to the presence of an initial void surrounding the body, likely created by a shroud or a finely plaited mat.[114] Macroscopic evidence for a vegetal wrapping was found on the bones of the adult in MDB11, whose pelvis and right humerus showed numerous silica imprints of finely interwoven plants (Fig. 8.3). Based on the archaeobotanical remains, those imprints likely point to the use of sedges (*Cyperaceae*) for plaiting.[115] The materials used for enveloping the dead may, however, have varied, perhaps including reeds, spun fibers, or even leather, and may have taken various shapes. In burial MDB9, the deceased seems to have been placed in a bag closed with a bead string. There are no clear indications of other accessories such as clothing.

Use of ocher

The recurrent presence of red ocher is characteristic for the Monjukli Depe burials. Ocher was used in over two-thirds of the inhumations and seems to be partially connected to age groups. Three of the four burials without

114 Bendezu-Sarmiento (2013, 504) comes to a similar conclusion concerning the Bronze Age burials at the nearby site of Ulug Depe: a light vegetal container wrapped around the deceased would have created temporary empty spaces during the decomposition of the body. The practice of wrapping the body in a plaited mat is also attested at Middle/Late Aeneolithic Kara Depe (Alekshin 1976, 9).

115 Kimiaie pers. comm. 2016.

ocher traces were of fetal or perinatal bodies (MDB6, MDB12, MDB15). The use of ocher for the very young deceased is thus rare, but does occur for older individuals in this age group (MDB8 and MDB9). In contrast, all adults and children, except for one adolescent (MDB3) buried in an unusual manner, were surrounded by a layer of ocher. The burials documented by Berdiev corroborate these results, as at least five of the seven skeletons, ranging from children to adults, were also coated with ocher, although it is unclear whether the clothing or the body was ocher-covered (Berdiev 1972, 14).[116] The absence of red pigment correlates with an absence of grave goods, although the converse does not hold.

Ocher was not always applied in the same manner. Following Viviane Bolin (2012, 28), traces on the skeleton can generally be ascribed to sprinkling, pouring of colored fluids, the application of a colored paste or the use of a coated shroud, with the decay of the skin or organic covering leading to deposition on the bones. The presence of ocher on the walls of the grave pit may result from an intentional coloring of the pit or from indirect contact with the coating or shroud of the deceased. At Monjukli, the thinness of the ocher deposit indicates in most instances a sprinkling of powdered ocher over the body or shroud; for MDB5 the thickness suggests rather the application of paste to the body. An intentional coloring of the grave walls was evident in the majority of cases, for example, on a smooth plastered surface (MDB11), uniformly coated bricks (MDB5) or the presence of pigment in areas not in direct contact with the cadaver. Although their interpretation remains tentative, the differential ocher patterns point to a variety of gestures in the handling of ocher in funerary contexts: applied to the grave pit only (MDB4), to the pit as well as the body (MDB5, MDB8, MDB11), to the body only (MDB1, MDB7), to the shroud only (MDB9), or to the shroud and the grave pit (MDB2, MDB10). Specific body parts occasionally received a particular treatment: while ocher was applied only from the neck to the middle of the thighs of the adult in MDB11, elsewhere it tended to be spread in much higher quantity in the skull area (MDB1, MDB2, MDB8, MDB9). Pigment was also used as a grave good, as in the case of the 6 x 8 cm ocher lump placed in front of the face of the adult in MDB2. It could also cover artifacts deposited with the deceased, albeit probably an incidental result of sprinkling ocher on the body or pit walls. Ocher is found in central Asian burials over the millennia, but the motivations behind its use at specific sites need not have been the same (Ahlrichs 2015, 106-121). Covering the dead with ocher is often interpreted as both a symbolic and a functional gesture, due to its blood-like color and its anti-inflammatory properties that were perhaps believed to stop the decomposition of the corpse (Bahn 1998, 72).

Grave goods

The artifacts recovered from burials are rarely different from the content of other fill and trash layers at the site, and their status as grave goods, i.e. intentionally deposited, is often ambiguous (Table 8.3). This is particularly the case for animal bones, lithics, shaped clay, stones, pebbles, and pottery sherds. These artifacts are only considered grave goods if they were placed in the immediate vicinity of the body. Exceptions are horns, which have been interpreted as grave goods at Anau North (Hiebert et al. 2003b, 119), and chipped or other stone tools.

The distribution of potential grave goods in the burials shows that they are related to age: they accompanied all adults (MDB2, MDB7, MDB10, MDB11), two of the children (MDB1, MDB5), and only one infant (MDB9). In contrast, the other fetuses and infants as well as the adolescent were interred without (preserved) burial gifts. When present, the set of grave goods is small, unsystematic, and differs from one burial to another. Most frequent is the use of ecofacts (stones, animal bones and teeth, ocher) which are placed on, below, or just next to the body, particularly in front of the face. The few artifacts are only clearly connected to two juveniles: a zoomorphic token was located at the feet of the child in MDB5, while MDB9 yielded a seemingly more elaborate set of gifts, consisting of one or several strings of limestone beads plus a clay bead, found in the lower body area and in front of the infant's face, respectively. A small chalcedony blade was recovered in each of three adult and one infant burials, although their presence may be happenstance.[117] A further question is whether the partial human remains of juvenile individuals recovered in MDB2 and MDB11 were envisaged as "burial gifts" for the adults or as a burial of *personae*, these possibilities not being mutually exclusive.

Paleodemographic considerations

Although estimation of population in prehistoric settlements often proves difficult, an attempt to compare the number of burials and the total population of the village allows an assessment of the representativeness of the burials excavated.

The size of the Aeneolithic settlement can be roughly estimated on the basis of test soundings. It covers approximately 0.45 ha, of which only one-quarter in terms of area (ca. 0.12 ha) has been excavated. With a hypothetical population density of 100-200 persons per hectare, one would obtain an estimated number of 45-90 inhabitants.

116 No mention is made of ocher traces on two adult skeletons, but it is unclear whether they were absent or simply undocumented.

117 Chalcedony blades are quite common at Monjukli Depe, with approximately 400 having been found. In only one of the graves could the position of the blade next to the body be ascertained.

Fig. 8.3. Silica imprints of plaited grasses, likely sedges, recovered from the right coxal bone and right humerus in MDB11.

Considering, however, that the excavated area in stratum I, including Berdiev's work, already yielded 15 residential buildings (a residential function is ascribed to all rectangular buildings with two buttresses) in an area of 0.12 ha, an extrapolation would result in a village of 56 houses. This would mean fewer than two inhabitants per house, assuming a similar density of houses throughout the settlement. A population estimation based on the number of buildings seems in this case to be more fruitful; using a mean value of 5 to 6 persons per house (Aurenche 1981), the total number of inhabitants would be between 280 and 330. Compared to Masson's calculation of 150-160 inhabitants for the ca. 0.7 ha Neolithic Jeitun settlement (Masson 1971, 9, 102), the population density in Monjukli Depe would be substantially higher. This fits, however, with the plan of the Aeneolithic village exposed at Monjukli Depe, which is characterized by a much denser layout and fewer outdoor spaces than at Jeitun (Pollock et al. 2013).

Based on the number of inhumations encountered during excavation, a total number of 200 buried individuals (excluding fetuses) can be expected at the site: Assuming that the burial density and the site size remain constant throughout each stratum (*n*), the hypothetical number of individuals buried in each stratum can be extrapolated by multiplying the site area (0.45 ha) by the burial density (number of excavated individuals divided by excavated area). Taking all strata into consideration, the hypothetical number of individuals buried in the settlement would be

$$site\ surface * \sum_{n\in\{0;I-II;III-IV\}} \left(\frac{excavated\ individuals}{excavated\ surface}\right)_n = 0{,}45 * \left(\frac{11}{0{,}12} + \frac{3}{0{,}0390} + \frac{6}{0{,}0210}\right) \approx 200$$

Burial number	Grave inventory	Location
MDB1	1 unmodified stone, white (RN1122)	on right lower arm
	2 sheep/goat incisors (RN1151)	under the skull
	1 pottery sherd, Meana red wash (RN1233)	under the skull
MDB2 (lower part)	1 sheep/goat premolar (RN5063)	next to the left shoulder
	1 complete retouched chalcedony blade (RN5087)	behind the skull
	1 lump of ocher	in front of the face
	animal bone collection (RN5036)	
	1 snail shell (RN5027)	
	lithic collection (RN5029)	
	pottery collection (RN5028)	
	4 pebbles, white, red-brown and gray (RN5042/5095)	
MDB3	*lithic collection (RN5089)*	
	1 pebble, white (RN5090)	
MDB4	ø	
MDB5 (lower part)	1 sheep/goat metatarsal (RN332)	under the left foot
	1 peg-shaped, clay token with zoomorphic head (RN333)	next to the feet
	animal bone collection (RN311/341)	
	lithic collection (RN312/331)	
MDB6	*lithic collection (RN1841)*	
MDB7	1 incomplete tanged chalcedony blade (RN365)	?
	1 unmodified stone with ocher traces (RN836)	behind the back
	1 unmodified stone with ocher traces (RN837)	in front of the face
	1 unmodified animal rib (RN838)	next to the left arm
	1 disc-shaped bead, bone (?) (RN839)	?
	1 burnt lithic chunk (RN864)	at the left heel
	lithic collection (RN365/784)	
	pottery collection, Meana Black-on-Buff and Meana Plain (RN780/1381)	
	1 unmodified stone (RN865)	
MDB8	ø	
MDB9	4 biconical beads, limestone (?) + fragments (RN7564)	in the lower body area
	1 spherical bead, unburnt clay (RN7565)	in front of the face
	10 barrel-shaped beads, limestone (?) + 11 fragments (RN7598)	in the lower body area
	9 beads, limestone (?) + 34 fragments (RN7599)	in the lower body area
	1 incomplete, used chalcedony sickle blade (RN7665)	? (flotation sample)
	2 elongated pieces of shaped clay (RN7601)	
MDB10 (lower part)	1 unmodified stone, sandstone (RN7378)	under the chin
	1 unmodified stone (RN7379)	in front of the face
	animal bone collection (RN7386/7360/7436)	
	lithic collection (RN7384)	
	pottery collection, Meana Black-on-Red (RN7361)	
	1 unmodified stone (RN7619)	

Table 8.3. (continued on opposite page) Grave inventory of the Monjukli Depe burials. Finds not regarded as grave goods are indicated in italics.

Table 8.3. (continued).

Burial number	Grave inventory	Location
MDB11 (lower part)	1 complete horn core, cattle (RN9998)	?
	1 spherical hammerstone, dolomite, use-wear (RN9986.1)	?
	1 incompletely retouched chalcedony blade (RN10010)	?
	2 fragments of hammerstones (RN9986.2)	
	1 elongated piece of shaped clay (RN10012)	
	animal bone collection (RN9988/10027)	
	lithic collection (RN10028)	
	2 unmodified stones (RN10013/10026)	
MDB12	∅	
MDB13	*animal bone collection (RN72)*	
	11 burnt stones (RN74)	
MDB14	1 biconical bead or spindle whorl, steatite (?) (RN13025)	between thighs and chest
	1 complete small ceramic pot, wheel made (RN13026)	between thighs and chest
	1 copper pin (RN 13027)	above the right hand
	1 complete ceramic vessel, "perfume-jar," wheel made (RN13028)	between thighs and chest
	lithic collection (RN13020)	
	pottery collection (RN13021/13024)	
	2 unmodified stones (RN13022/13042)	
MDB15	∅	

Fetal remains have been excluded from the calculations as they are usually not taken into account for the calculation of mortality rates. Burials from Berdiev's excavation have been included as part of Stratum 0/I. With a potential annual death rate of 30 per 1000 (based on Morris 1987, 74), the expected number of individuals buried at the site would represent at least 7-8% of the expected number of dead over 300 years.[118]

These admittedly highly hypothetical calculations aim at demonstrating that intra-site burials are by no means as exceptional as they were believed to be for this time period (Hiebert et al. 2003b, 125), even though they definitely do not account for most of the village's population. The bulk of Monjukli's inhabitants must have been disposed in another place or manner. This has important consequences for evaluating the representativeness of the observed practices. It raises the question of how and why particular individuals were selected for burial within the settlement.

Scattered bones

In addition to burials, isolated skeletal fragments were also retrieved throughout the site, although most were not identified as human remains at the time of excavation. In total, 99 isolated human bones or bone fragments and 18 teeth came to light (Table 8.4), including a partial skull recovered in the fill of a pit in Building 14. The scattered bones are discussed here in terms of distribution patterns so as to assess the likelihood of their (un)intentional deposition.

The average density of isolated human bones in the excavated areas of the settlement is 0.65 skeletal fragments (SF)/m³. This calculation relies on the isolated human bones found in the 2010-2012 seasons, since only those collections have been systematically scanned for human remains. Teeth have not been included since their presence might be attributable to ante-mortem loss, or they are counted together with the maxilla/mandibula in which they are embedded. The density varies strongly by excavation unit but does

118 If the average number of inhabitants (between 280 and 330, as estimated above) stayed constant, the dead would amount to 2500-3000 individuals over roughly 300 years.

Loc.	RN	Skeletal parts	Age estimation*	Further information	Stratum	Context	Location	Context reliability	Related burial
				Bones with no connection to excavated burials					
C46	6933.1	femur (left?), condyle	adolescent /adult	post-depositional break with ocher	III	fill	House 7 (abandoned)	secondary	∅
	6933.2	spinous process of thoracic vertebra (?)		gnawing marks, 2 perimortal cut marks, healing infection, ocher traces					
C55	6932.1	body of lumbar vertebra	perinatal – 6 months		III	corner reinforcement	House 7 (in use)	primary	∅
	6932.2	body of cervical or thoracic vertebra	perinatal – 6 months						
	6932.3	vertebral arch of cervical vertebra	perinatal – 6 months						
C133	6919.1	radius (left)	perinatal, > 40 weeks		II	surface and fill below it	outer area	primary	∅
	6919.2	rib (right)	fetal, ca. 26 weeks						
D163	735.1	mandibula	juvenile, < 10 years**		II/I	animal burrow	Eastern Midden	tertiary	∅
D182	9220.1	metacarpal I (right)	adult, > 15 years		II/I	fill	Eastern Midden	secondary	∅
D208	9218.1	trapezoid bone (right)	adult		II/I	pit	Eastern Midden	secondary	∅
	9218.2	trapezium (right)	adult						
	9218.3	triquetral bone (ind.)	adult						
D214	9221.1	capitate bone (left)	adult		II	deposit above floor	House 1 (in use)	primary	∅
D236	9224.1	femur (right)	adult, > 15 years		II/I	pit	Eastern Midden	secondary	∅
D321	2095.1	occipital bone, fragment	2-5 years	ocher on parietal side	II	fill	Eastern Midden	secondary/ tertiary	∅
D416	2098.1	metatarsal III (right)	adult	ocher traces	II	pit	Eastern Midden	secondary/ tertiary	∅
D709	15140.1	skull, incomplete	adolescent/adult***		IV	fill	House 14 (abandoned)	secondary	∅
	15140.2	maxilla (right), fragment							
	15140.3	maxilla (left), fragment							
E251	2104.1	skull fragment	adult		II	fill	House 12 (abandoned)	secondary/ tertiary	∅
E276	2103.1	skull fragment	adult, > 15 years		I	surface and fill below it	House 2 (in use)	primary/ secondary	∅
				Bones possibly connected to excavated burials					
C41	6934.1	clavicula (left), distal and proximal parts	6-18 months		IV	fill	House 8 (abandoned)	secondary	MDB2 (?)
D153	9219.1	humerus (left), distal part	adult, > 16 years	post-depositional break	I	ash layer	House 3 (abandoned)	secondary	MDB 7 (?)
D335	2096.1	skull fragment	5-15 years	same individual	II	fill	Eastern Midden	secondary	MDB5 (?)
	2096.2	skull fragment	5-15 years						
D351	2097.1	skull fragment	fetal /perinatal	unspecific infection	III	ash pit at entrance	House 9 (in use)	secondary	MDB6 (?)
D439	2094.1	skull fragment	5-15 years	same individual	III	fill	outer area	primary/ secondary	MDB5 (?)
	2094.2	skull fragment	5-15 years						
	2094.3	skull fragment	5-15 years						
	2100.1	skull fragment	5-15 years						
	2100.2	scapula (ind.), fragment	adult		I	fill	outer area	primary/ secondary	MDB7 (?)

Table 8.4. (continued on opposite page) List of isolated human bones and teeth recovered at Monjukli Depe. * As estimated by Benjamin Irvine; ** as estimated by Dawnie Steadman; *** no osteological analysis performed.

Loc.	RN	Skeletal parts	Age estimation*	Further information	Stratum	Context	Location	Context reliability	Related burial
D580	2099.1	zygomatic bone (ind.), fragment	fetal	unspecific infection	IV	ash layer	House 14 (abandoned)	secondary/ tertiary	MDB12 (?)
	2099.2	occipital bone, pars basilaris	fetal (13.5-16.5 weeks)	unspecific infection					
	2099.3	mandibula (left)	fetal (18 weeks)	unspecific infection					
E212	2102.1	skull fragment	perinatal	ocher traces	I	fill between two floors	House 13 (in use)	secondary/ tertiary	MDB9 (?)
E290	2101.1	tibia (left), proximal part	0-1 year	unspecific infection, ocher traces	I	fill	outer area	secondary/ tertiary	MDB9 (?)
				Bones and teeth connected to MDB2					
C6	6931.1	humerus (right)	6 months-1 year		I	fill	Eastern Midden	secondary	MDB2
	6931.2	radius (left)	6 months-1 year						
	6931.3	rib (left)	2-3 years						
	6931.4	rib (right)	2-3 years						
	6931.5	ulna (left)	6 months-1 year						
	6931.6	ischium (ind.)	6 months-1 year						
	6931.7	rib (right)	6 months-1 year						
	6931.8	radius (left)	2-3 years						
	6931.9	rib (right)	2-4 years						
	6931.10	n.a.	n.a.						
	6931.11	vetrebral arch	6 months (?)						
	6931.12	vetrebral arch	6 months (?)						
	6931.13	vetrebral arch	6 months (?)						
	6931.14	atlas fragment	< 2 years						
	6931.15	1st rib (left)	2-4 years						
	6931.16	1st rib (right)	2-4 years						
	6931.17	vetrebral arch	6 months (?)						
	6931.18	vetrebral arch	6 months (?)						
	6931.19	skull fragment	ca. 1 year						
	6931.20	phalanx (ind.)	ca. 1 year						
	6931.21	vetrebral arch	2-4 years						
	6931.22	phalanx or metacar-pal (ind.)	ca. 1 year						
	6931.23	phalanx (ind.), fragment	ca. 1 year						
	6931.24	rib (right)	ca. 1 year						
	6931.25	skull fragment	ca. 1 year	porotical hyperosteosis					
	6931.26	vetrebral arch	ca. 1 year						
	6931.27	vetrebral arch	ca. 1 year						
	6931.28	rib (ind.)	ca. 1 year						

Table 8.4. (continued).

Loc.	RN	Skeletal parts	Age estimation*	Further information	Stratum	Context	Location	Context reliability	Related burial
	6931.29	skull fragment	ca. 1 year		I	fill	Eastern Midden	secondary	MDB2
	6931.30	phalanx (ind.)	ca. 1 year						
	6931.31	vetrebral body	ca. 1 year						
	6931.32	rib (ind.)	ca. 1 year						
	6931.33	maxilla fragment (right)	12-18 months	joins with 6935.12					
	6931.34	*right deciduous maxil-lary lateral incisor*	*12-18 months*	*ocher traces*					
	6931.35	*right deciduous maxillary canine*	*2 years (+/- 6 months)*	*root hypoplasia*					
	6931.36	*left deciduous maxillary canine*	*2-3 years*						
	6931.37	*right deciduous maxillary first molar*	*12-18 months*	*erupted*					
	6931.38	*right deciduous maxil-lary central incisor*	*1 year (+/- 4 months)*	*erupted*					
	6935.1	clavicula (right)	0-1 year	gnawing marks	I	fill	House 7 (abandoned)	secondary	MDB2
	6935.2	rib (right)	2 4 years						
	6935.3	vetrebral body	2-3 years						
	6935.4	humerus (left), fragment	6 months-1 year						
	6935.5	ilium (left)	perinatal	ocher traces					
	6935.6	rib (right)	2-4 years						
	6935.7	femur (ind.), proximal part	juvenile						
	6935.8	occipital bone, pars lateralis (left)	1-3 years						
	6935.9	vetrebral arch	ca. 2 years (?)						
	6935.10	metacarpal (ind.)	juvenile						
	6935.11	rib (left)	n.a.						
C20	6935.12	maxilla (left)	12-18 months	joins with 6931.33, unspe-cific infection					
	6935.13	skull fragment	n.a.						
	6935.14	rib (left), sternal part	n.a.						
	6935.15	n.a.	n.a.						
	6935.16	metacarpal (ind.)	< 12 years						
	6935.17	spinous process of thoracic vertebra	< 2 years						
	6935.18	spinous process of thoracic vertebra	< 2 years						
	6935.19	vertebral body	< 2 years						
	6935.20	skull fragment	n.a.						
	6935.21	metacarpal I (ind.)	juvenile						
	6935.22	intermediate hand phalanx (ind.)	> 14 years (individual 2.1 (?))						

Table 8.4. (continued).

Loc.	RN	Skeletal parts	Age estimation*	Further information	Stratum	Context	Location	Context reliability	Related burial
	6935.23	*left deciduous maxillary canine*	*12-18 months*	*erupting*	I	fill	House 7 (abandoned)	secondary	MDB2
	6935.24	*left deciduous maxillary first molar*	*12-18 months*	*erupted*					
	6935.25	*left deciduous maxil-lary second molar*	*12-18 months*	*not erupted*					
	6935.26	*left first maxillary molar*	*18 months*	*not erupted*					
C29	6936.1	rib (right)	3-5 years		I	burial	House 7 (abandoned)	primary	MDB2
	6936.2	body of lumbar vertebra	< 2 years						
	6936.3	vertebral arch of lumbar vertebra	< 2 years						
	6936.4	vertebral arch of lumbar vertebra	< 2 years						
	6936.5	vertebral arch of lumbar vertebra	< 2 years						
	6936.6	vertebral arch of lumbar vertebra	< 2 years						
	6936.7	vertebral arch of lumbar vertebra	< 2 years						
	6936.8	humerus (?), shaft	fetal	unspecific infection					
				Scattered teeth					
D163b	*735.2*	*tooth (n.a)*	*adult***		*II/I*	*animal burrow*	*Eastern Midden*	*tertiary*	ø
	735.3	*tooth (n.a)*	*adult***						
	735.4	*tooth (n.a)*	*adult***						
D237	*9223.1*	*left deciduous first molar*	*juvenile, < 6 years*	*heavily eroded root*	*II/I*	*pit*	*Eastern Midden*	*secondary*	*MDB5 (?)*
D256	*9222.1*	*right mandibular second premolar*	*juvenile*	*enamel hypo-plasia + calculus (9222.1 & 9222.2 belong to same individual)*	*II/I*	*fill*	*Eastern Midden*	*secondary/ tertiary*	*MDB5 (?)*
	9222.2	*right mandibular first premolar*	*juvenile*						
	9222.3	*left mandibular lateral incisor*	*juvenile*						
D495	*2093.1*	*left permanent maxillary first molar*	*old adult*	*extremely heavy tooth wear*	*IV*	*ash layer*	*House 14 (abandoned)*	*secondary*	*MDB 14 (?)*
F51	*2105.1*	*left maxillary third molar*	*adult, >18 years*	*large caries at the root*	*0*	*ash layer*	*House 15 (abandoned)*	*secondary*	ø

Table 8.4. (continued).

not always correlate with the number of burials in the vicinity. Skeletal fragments were encountered in all strata and in three of the seven excavation units. Fragments of vertebrae and skull bones occur most frequently. With respect to the relative number of bones in the human body, skull fragments and long bones are overrepresented. However, the sample is too small to assess whether bias is due to the deliberate selection of specific body parts or to differential bone preservation. The ratio of adult to juvenile bones is 1:7. Based on the most frequent sided element (left radius) the minimum number of individuals (MNI) is only three, but taking into account age, size, and morphological incompatibility, it is estimated as seven.

Based on stratigraphic observations and age compatibility, 14% of the bones may stem from contexts where primary burials were recovered in the immediate vicinity, although a definite reassociation must remain tentative as the material could not be compared directly with the skeletal assemblage from the burials. In addition to these, 65% of the bones were recovered from contexts immediately surrounding the disturbed multiple burial MDB2. They include the partial remains of a minimum of two juveniles of 6-18 months and 2-4 years (ind. 2.4 and 2.3), plus one fetus represented by a humerus only and which is considered intrusive. The bones appear to have been intentionally associated with burial MDB2, which thereby has a combined MNI, based on the left radius frequency, of four (one adult and three juveniles). The state of preservation of the juvenile skeletons is poor (Anatomical Preservation Index < 20%), but as not all surrounding contexts have been examined for human remains, the possibility of secondary disposal cannot be evaluated.

21% of the scattered bones cannot be associated with any of the excavated burials, reducing the assemblage to 21 skeletal elements with a density of 0.12 SF/m3. This adjusted assemblage includes fragments of long bones, vertebrae, skulls, jaw bones as well as hand and foot bones. The ratio of adults to juvenile bones is 2:1, and the MNI is estimated as four, based on size and morphological incompatibility only. Remains are present in Units C, D, and E, in all strata, and are distributed among Eastern Midden (38%), abandoned houses (28%), occupied houses (24%), and outdoor areas (10%).

The question of whether these scattered human remains stem from disturbed but unexcavated burials or if they rather point to specific practices independent of burial cannot be answered with certainty. The few primary contexts in which these were found include an outer surface as well as a corner deposit in Building 7. The latter context contained three vertebrae of a neonate as well as a massive but poorly preserved animal horn and two stones. It can be interpreted as an intentional deposit, as all corners of the room were symbolically marked and in three instances contained animal bones (see Table 2.4).

A provenience from disturbed, unexcavated primary burials seems possible for most of the recovered bones given their small sizes, but other sources should also be considered. It is unlikely, for instance, that a complete adult femur (RN 9224.1) would end up in the middle of numerous animal bones in the Eastern Midden due solely to post-depositional disturbance. This might rather attest to a differential handling of the body, possibly the deliberate collection of specific body parts, whether from known or unknown individuals.[119] The high aeolian activity in the area (Berking and Beckers 2018) could have exposed older human remains from the immediate surroundings of the site, some of which may then have been brought to the village on purpose.

An intentional handling of human bones seems particularly evident in the case of a partly preserved human skull (RN 15140.1) found within the fill of Building 14. It was recovered within a large pit, D497, in the fill of the abandoned building, to the west of buttress D571 and next to the house wall (see Figs. 5.9-5.10). The incomplete skull lay ca. 50 cm above the last floor of the building, upside down, with the back of the head to the wall and the orbits facing northeast. Only the frontal, parietal, and part of the occipital bones were preserved, with the remaining parts of the skull likely damaged when it was deposited in the pit, as two fragments of the maxilla were recovered nearby. No other identifiable human bones were found in the vicinity, and the skull cannot be attributed to any known burial. The other contents of the pit included a large quantity of animal bones, with intact scapulae, an animal horn, and a substantial portion of a sheep skull. The skull's presence in this context may be an indication that it was disposed together with other material in a dump in the abandoned building. One can assume that the skull would have been recognized as human by the inhabitants and that its discard as "refuse" was perceived as an appropriate option. The upside-down position and the damage the skull suffered speak against an interpretation as a secondary burial. It seems that the presence of incidentally or intentionally exposed human bones was not an uncommon sight in the settlement and that a casual, as opposed to ritualized, manner of dealing with them was a possible course of action.

Scattered human bones were recovered in nearby Jeitun-period Chagylly Depe and in Chopan Depe, where they were interpreted as disturbed burials (Berdiev 1976, 59). The phenomenon is also attested elsewhere in Western Asia. Halaf sites have yielded numerous isolated fragments of human remains, although they are seldom mentioned explicitly in the scholarly literature and are thus likely underrepresented (Pollock 2011, 50-52; see, in general, Osterholtz et al. 2014; Osterholtz 2016). In Çatalhöyük, loose human bones are often found in secondary or tertiary contexts, since the disruption of earlier graves seems to have been a standard practice (Boz and Hager 2014; Haddow et al. 2016).

Handlungsräume in Monjukli Depe: assessing dispositions in burial practices

How standardized were burial practices in Monjukli Depe? To what extent were the inhabitants guided by specific expectations of how to act? How much leeway for improvisation did they have when burying their dead, and how broad were their *Handlungsäume*, how diverse the possibilities of action?

Deducing social dispositions from similarities is not a simple matter in view of the limited available archaeological data. Following Bocquentin et al. (2010), repeated funerary practices that ostensibly derive from

119 Cut and bite marks were identified on only one bone (RN 6933.2) out of 97, which could not, however, be definitely identified as human. The scattered human bones in Monjukli Depe thus yield no direct evidence for a specific treatment of the body, such as excarnation.

an imperative can be understood as "absolute norms" or strong dispositions, as is also the case for practices that are *not* attested. Practices that relate only to a particular group, for instance those dependent on the deceased's age at death, may be termed conditional. The frequency or infrequency of practices may indicate whether specific dispositions were binding or "soft," and to what extent they could be modified or negotiated. However, not all practices are necessarily socially regulated, and some can arise directly from the choices of the burying individuals.

On a close look, the lack of strict standardization in the Monjukli Depe burials is apparent. Attributes are often similar for the majority of burials but not all, and their combination varies, so that no one burial is identical to any other. One can distinguish between invariably recurring practices (flexed position, primary inhumation) or very frequent ones (deposition on the right side, earthen pit, connection to buildings) and, on the other hand, a spectrum of options regarding location, grave form, body orientation, wrapping, position of the arms, ocher application, and presence/absence and type of grave goods. As the degree of correlation between various elements is limited,[120] the observed variability in most burial practices seems best defined as a free choice within a more or less limited range of possibilities. The age group seems to partly condition the use of ocher, grave goods, location, and grave form, albeit not in a strict manner.

Burial practices at Monjukli Depe hence appear to reflect some binding prescriptions; these are the flexed position of the deceased, but also the general form of disposal as a primary inhumation. Most funerary practices that do not occur at the site can also be understood as strong prescriptions; they would not necessarily have been formulated as interdictions but rather were part of what Bourdieu calls doxa, expressing unreflected impossibilities within the lifeworld of the Monjukli community. Very frequent practices, such as deposition on the right side and placement in earthen pits, can be understood as the outcome of soft dispositions, i.e. dominant but negotiable courses of action. Depositing the deceased on the left side, with the upper body on the back, or below a heap of rubble was rare but possible. Conditional dispositions were age-specific. They include the use of grave goods and ocher for adults, as well as the restriction of adult burials to outer areas and a preference for shaft-graves. In contrast, the use of ocher and grave goods for juveniles is unsystematic.

Other components of the burial such as the use of a shroud or body orientation could seemingly be chosen freely within an internalized frame of possibilities, some perhaps spontaneously in the course of the burial event. The burying group would have had a relatively extensive *Handlungsraum* for shaping many practices related to the interment. This is evident when comparing the reconstructed *chaîne opératoire* of each burial.

As illustrated in Figure 8.4, the burial sequence consists of various steps that could seemingly have been shaped and combined at the performers' discretion. The steps ocher application, grave good deposition, wrapping of the dead, as well as the order in which those were performed,[121] i.e. the practices of adornment of the body in the broadest sense, appear to be particularly subject to personal preference. Although it is evident that many more aspects of the burial performance are lost to us, these minimal sequences show that variability is not only visible in the static structures of the graves but also in the burial process itself. The handling of the dead would have taken place in a liminal phase of the *rites de passage* that arguably presents the highest variability in practice (van Gennep 1909; Turner 1964). Not only would the inhumation proper have belonged to this phase but possibly all activities related to it: the plaiting of a shroud, the preparation of ocher, the selection or crafting of grave goods, the fetching of ash, delegation of tasks, etc.

Keeping these dispositions and *Handlungsräume* in mind, the question arises whether and to what extent the practices described here can be interpreted as representative for the burial practices of Monjukli Depe's inhabitants, as it seems clear that the majority of the deceased were interred outside or at the edge of the settlement, if at all. Following Bocquentin et al. (2010), I suggest that the burials at Monjukli Depe can be referred to as "minority practices," those that applied to only a relatively small group of individuals. Terms such as *Sonderbestattungen* or "deviance" are inappropriate, since they suggest a negatively valued variation from a standard, an abnormality that cannot be documented here (Murphy 2008):[122] indeed, in Jeitun and Anau IA sites in the region there are always a few burials within the villages (see below).

It remains unclear which circumstances led to the burial of an individual within the settlement area. The distinction between a privileged and an underprivileged group is unlikely, not only in view of the lack of evidence for social stratification at the site, but also because the high degree of variability in the burial record regarding

120 In view of the limitations of the archaeological record, the sheer impossibility of recognizing all variables and assessing all potential correlations must be stressed. Many interdependencies are lost to us from the outset (Bocquentin et al. 2010, 161-162).

121 Although a definite order could not be recognized in all instances, the likely sequence of actions has been established on the basis of their practicality in view of the archaeological evidence.

122 One exception may be burial MDB3, as the adolescent was buried without ocher and within a setting of bricks, practices otherwise undocumented for children or adults at the site. His/her body position together with the rest of the burial assemblage suggests other reasons for this particular inhumation, possibly the liminal age between childhood and adulthood.

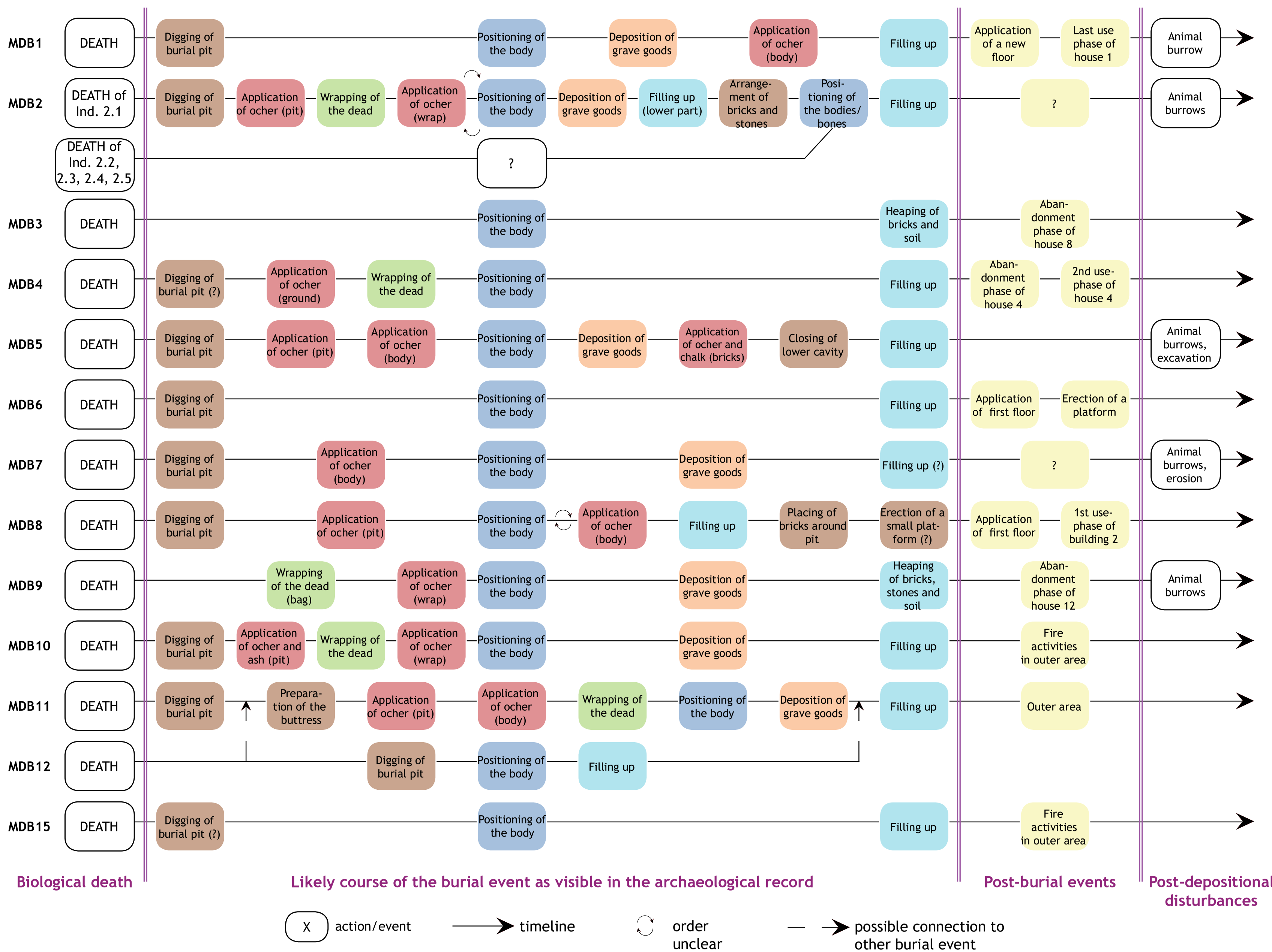


Fig. 8.4. Reconstruction of the burial process based on archaeological evidence (adapted from Weiss-Krejci 2011).

age, grave goods, and degree of effort put into the grave construction suggests a particular story behind each burial and a multiplicity of motivations (cf. Bocquentin et al. 2010, 159).

The burying group could seemingly inhume relatives or community members in a relatively freely chosen manner, while still meeting general social expectations. The lack of strict standardization suggests that the presence of a burial specialist was unnecessary and that expectations of whether and how a burial within the settlement should take place would have been upheld by the community as a whole or at least by a large group, with specific practices negotiated within it.

Potential occasions for village interments might have been burials as foundation deposits, as is likely the case for the fetal/neonate remains in MDB6 and MDB8 that were placed below the first floors of Houses 1 and 2, respectively. They could represent foundation sacrifices in the narrow sense or a "convenient death" or stillbirth, a natural event appropriated for ritual purposes (Moses 2008). Some burials may have played a significant role in house-abandonment processes or closing rituals,[123] as observed in Sabi Abyad (Verhoeven 2000), Qermez Dere (Watkins 1990), but also at the nearby site of Ilgynly Depe.[124] At Monjukli Depe, symbolic closing in which individuals were laid or buried in the fill of an abandoned house usually did not occur immediately but rather after a certain amount of time had passed (MDB4, MDB5, MDB9, possibly MDB3)[125] or even when the houses were no longer visible (MDB11, MDB2). The two latter individuals were placed in particular locations – on a buttress and above a threshold – within previously occupied houses. Both locations could be interpreted as symbolically meaningful places with a liminal character. The careful preparation of the buttress strongly suggests that the location of burial MDB11 was not chosen by chance, but that Building 14 and its architecture were still remembered. To what extent the building and/or its buttresses held a special symbolism, as suggested by the wall painting on the buttress opposite the one used for MDB11, remains to be investigated (Bernbeck et al. 2012, 16; Bernbeck and Pollock 2016: Fig. 7; Chap. 5). Clearly, burial practices were interwoven with other social practices related to the "lives of houses" (Chap. 4) and as such were embedded in the village's biography[126]. The metaphoric birth and death of a house in some cases accompanied or was accompanied by the burial of a (partial) community member,[127] possibly but not necessarily from that house. As all burials are primary inhumations, it seems likely that the construction and/or closing of buildings would have been triggered by specific death events. MDB1, placed below the floor of Building 1, was instead an instance where the deceased was integrated into the life of a building during its occupation. Burials were not associated with all houses, again suggesting particular histories behind each of them. Although not all houses have been excavated to the lowest floor, at least Buildings 9 and 10 were devoid of burials, while others yielded one or, in the case of Building 1, two interments.

Age may also have played a role in decisions to bury individuals in the settlement. Reaching a very advanced age may, for instance, have conferred a particular status on the deceased (MDB2 and MDB11) and made their presence in the neighborhood desirable even in death. As almost all age categories are present at the site, the absence of middle-aged adults among the settlement burials is particularly puzzling, suggesting that age may have also been an exclusion factor.

As inaccessible or unrecognizable as they may be, emotional elements should also be taken into account as an essential part of the experience of death embedded in practice (Tarlow 1997; Hill 2013). Feelings of loss or grief may prompt people to bury their relatives in the immediate vicinity, something that may be relevant for the entire burial sample from Monjukli Depe. Burials within the settlement create a "material locus of emotions" (Kieschnick 2008, 228), linking the dead and the living on a physical and mental level (Hill 2013, 610). Strikingly, none of the burials were disturbed by subsequent building activities. This may suggest that their exact locations were kept in mind over generations; the grave spots could also have been marked, making them more easily identifiable. This might indicate concern for preserving the body's integrity after death, something that agrees well with the preponderance of primary inhumations (see Nilsson Stutz 2010). Lastly, reasons of practicality may have come into play, when, for instance,

123 Whether such closing rituals included an intentional destruction of the house or whether the house was simply left standing and vacant remains open to discussion (see Chaps. 4 and 5).

124 At this site, located approximately 7.5 km southeast of Monjukli Depe, several buildings from the Middle Aeneolithic layer IV seem to have been deliberately set on fire and subsequently filled with rubble as part of an abandonment ritual (Masson et al. 1994, 20-21). In one of those "ceremonial rooms" (Solovyova 2005, 23), disarticulated human remains as well as two infant skeletons were found just above a charcoal layer.

125 At the time of burial, houses were generally already filled with a substantial amount of debris; burials lying directly above the last floor were rarely recovered, save possibly for Berdiev's grave G or MDB 4 in House 4 that was approximately 10 cm above the floor.

126 See also Teufer 2013 for a reflexion on the close conceptual relation between houses and burials in Bronze Age Central Asia.

127 It is unclear whether fetuses and young infants would have been considered full members of the community. The absence of ocher in some cases and their occasional association with adults in multiple burials may suggest that acknowledgment as persons only occurred from a certain age onward. Their presence in adult burials could either point to their status as "grave good" or a means to protect them after death.

hard weather conditions, conflict situations, or lack of resources prevented the community from bringing the deceased elsewhere.

In any case, the dead would not only have played a prominent role in the lives of the living but would also have been embedded in the history of the village as a whole (see Campbell 2000b, 72), linking descendants with the place even after it was abandoned (McAnany 1995). The site of Monjukli Depe may not only have been remembered as a former "home" but might still have been an active part of the lived landscape, as a place where some ancestors were buried. The cluster of burials excavated by Berdiev in the southwestern village area as well as those found in the uppermost levels of the site (MDB2, MDB5, MDB7) suggest that the village continued to be used as a burial ground over time, possibly by groups related to the site's former inhabitants.

Insights into Monjukli's lifeworld

I have already outlined how the investigation of burial practices can grant insight into the organization and experiences of past communities. The analysis of the Monjukli burials allows me to formulate a few reflections about the lifeworld of the village's inhabitants, bearing in mind that the representativeness of the observed practices is by no means certain.

The fact that only a fraction of the population was buried in the settlement, together with the relative profusion of grave goods in an infant burial (MDB9) could be interpreted in a classical manner as a sign of social stratification. However, in view of the absence of evidence for hierarchy at the site or elsewhere in the region at this time,[128] it seems more likely that the burials did not reflect the achieved or inherited status of the deceased but rather the needs and choices of the living. To what extent such decisions were taken on an individual or on a collective basis is difficult to establish. If one assumes that a burial within the village would have occurred once a year at most and taking into account that adult graves were dug in relatively unrestricted spaces such as the Eastern Midden, Central Midden, or other outer areas (MDB2, MDB7, MDB10, MDB11), the burial event would most likely have been a collective matter, involving extensive discussion and negotiation.

The relative infrequency of (settlement) burials may account to some extent for the variability in practices and sequences. As regular but infrequent practices, they lie temporally between the everyday and the extraordinary. Though ritualized, their more or less unaltered perpetuation depends, as do all social practices, on regular performance. In Monjukli Depe, participants and organizers would probably have had only a vague remembrance of the ritual process which was thereby shaped anew while being conducted. Improvisation and creativity on the part of the officiants may thus have played a paramount role in the performance (Barth 1987, discussed in Pollock 2011). In contrast, the non-negotiable dispositions would have been passed on, possibly through their (supra)regional occurrence.

The presence of isolated skeletal parts throughout the settlement – whether they arrived there intentionally or not – as well as the possibility that some inhabitants were not buried but rather exposed or "disposed" outside the village reveal much about the attitude towards death and the human body. It is hard to say whether isolated human bones would have been recognized as such by members of the Monjukli community, but the presence of a human skull and femora seemingly discarded rather than buried in trash layers might point to a mundane interaction with some human remains without a necessarily ritual connotation.

How can the differences in the burial practices of Monjukli Depe be read, with both binding prescriptions on the one hand and a fairly broad *Handlungsraum* on the other? A greater diversity than similarity among burial practices could, according to Pollock (2011, 44-47), suggest a conception of the future as rather open, rather than bound to previous actions. Dealing with the dead is not only closely related to past experiences but also to expectations for the future. If the future was regarded as bearing a wealth of possibilities, this conception may have found its expression in the variability of burial practices.

Claiming that we are in the presence of a community that generated some prescriptive standards while still leaving a relatively large freedom of action in other aspects must remain tentative given the limited range of practices that could be explored. Nevertheless, this interpretation fits well with other characteristics of the site: the homogeneity of building form and orientation that contrasts with variability in configuration of their inner spaces and, among other things, the diversity of fire installations (Bernbeck and Pollock 2016; Chap. 6). This balanced interplay between norms and *Handlungsräume* is arguably not restricted to the sphere of burial practices but extends to other fields of social life as well. Concepts of "tightness" versus "looseness" as developed in Pertti Pelto's (1968) ethnographic study – although mostly used in psychology and modern intercultural studies – may offer food for thought. Pelto argues that in "tight" social environments individuals tend to conform to socially accepted dispositions backed by a high level of sanctions or expectations thereof, whereas in "loose" social environments, expectations are lower and "acting otherwise" is accepted. Monjukli Depe's environment

128 Social stratification in southern Turkmenistan becomes visible from the Namazga II period (Middle Aeneolithic) onwards (Alekshin 1976; Bonora and Vidale 2013).

would in this sense occupy a middle ground: flexibility in practice would have been generally accepted, provided that strong expectations were upheld in specific areas. Further research in this direction may allow the assessment of the degrees to which different social practices can be negotiated within a community and provide insight into how practices were learned and social dispositions acquired in the village of Monjukli Depe (for similar ideas based on another case, see Castro Gessner 2010).

Burials in regional context

As an integral part of the lifeworld of Monjukli Depe's inhabitants, burial practices were both locally anchored and embedded in a broader network of cultural interactions that likely encompassed southern Turkmenistan as well as north-central and northeastern Iran. An overview of documented burial practices from the Neolithic to the Middle Aeneolithic in southern Turkmenistan (late 7th to late 4th millennium BCE) and the Transitional Chalcolithic in northern Iran (late 6th to late 5th millennium BCE) allows us to place Monjukli's burials in a regional setting (Fig. 1.4).[129] The recurrent but unsystematic appearance of particular burial practices throughout this time and space and their diverse combinations suggest that rather than regionally standardized or strictly local burial traditions, settlement-specific responses to death were a matter of local choices based on regionally shared and temporally transmitted notions of what it was appropriate to do with the dead.

Neolithic: Jeitun tradition (late 7th to 6th millennium BCE)

Only 13 burials are known from the Neolithic Jeitun tradition, from Chopan Depe, Chagylly Depe, Pessejik Depe, and Jeitun itself (Alekshin 1986, 16-17). In Jeitun one badly preserved child burial was excavated (Masson 1971, 22-23). Two adolescents, five children, and one adult (?) were recovered in the Middle Jeitun layers of Chopan Depe,[130] and two adult males and one infant in the Late Jeitun layers of Chagylly Depe (Berdiev 1966, 5-7; Berdiev 1971, 73-74; Ginzburg and Trofimova 1972, 40-41). Berdiev also mentions a burial in Pessejik Depe (Berdiev 1969, 414-415); no further information is available. All were single, primary inhumations. They display variable body positions from site to site, seemingly correlated with age of the deceased. Whereas in Chagylly Depe the adults lay on their right side in semi-flexed position, in Chopan Depe juveniles and older persons were generally interred on the back with legs extended or semi-flexed. All of the children's burials excavated at Chopan Depe were in a flexed position on the left side. The child at Jeitun was placed on the right side, legs folded up to the buttocks. Similar to the Aeneolithic Monjukli burials, the position of the arms as well as the orientation of the body of these Neolithic interments do not follow any recognizable pattern.

Burial gifts were rare at all sites. A token and a stone vessel were associated with one adult in Chagylly Depe; in Chopan Depe, an adult had an awl and a child burial contained an unpainted red vessel next to the head. The use of ocher was uncommon: it is mentioned only for one adult and two children at Chopan Depe.

In the absence of clear grave cuts, the identification of burial contexts and reliable stratigraphic assignation often remains problematic. One child was recovered in an outdoor area and an infant within the fill of a building.[131] Adult skeletons were found on a house floor, in a hearth, within house fill, and in an outdoor area.[132] Which burials were dug when the settlements were still inhabited is unclear.[133] The variety of contexts presents a similar picture to Monjukli Depe, especially regarding possible connections to the life cycles of buildings, although burials as foundation deposits are absent in Jeitun times. No burials were found at other Jeitun-period settlements, including Bami, New Nisa, and Togolok Depe (Berdiev 1963; 1964; 1965). However, this may have been due to the limited size of excavations. It seems clear

129 Material culture similarities and migration debates make a comparison with Iranian Transitional Chalcolithic sites relevant. To the north, evidence for cultural contacts with the Kel'teminar culture are, in contrast, scarce (Parzinger 2006, 232). Brunet stressed the existence of relations with the Akchadaria region during the Aeneolithic (Brunet 2011, 195), but those cultural interactions do not seem to be reflected in burial practices as known from the necropolis of Tumek Kičidžik in northern Turkmenistan (see Parzinger 2006, 122 for an overview).

130 Masson (1971, 49-50) lists three adults, one adolescent and four children. Both he and Berdiev relied on the unpublished excavation diaries of Ershov and Marushchenko. Considering the poor state of the skeletons, it is unclear which estimations are more reliable.

131 The child burial in Jeitun was recovered in the "yard" of House 6, the infant from Chagylly (burial 2) in Building 19 (Berdiev 1966, 5; Masson 1971, 22).

132 Chagylly burial 1 lay on a floor in House 18 (2nd building horizon) and burial 3 in the hearth of House 6 (3rd building horizon; Berdiev 1966, 5-7). In Chopan Depe, burial 1 seems to have been located in an outdoor area, possibly a yard, and burial 2 within the fill of House 5 (Berdiev 1971, Fig. 1, 73-74).

133 Masson considers the burials from Chopan Depe, all from the uppermost layers, to be the result of a spatial overlap between settlement and necropolis (Masson 1971, 49). He also suggests that burials 1 and 2 from Chagylly Depe may have been dug from now eroded layers, although burial 3 would clearly attest to the possibility that the dead were buried within the inhabited settlement in the Jeitun period (Masson 1971, 52, 54). Berdiev considers ten children and juvenile burials plus the adult burial 3 from Chagylly Depe to belong to the Jeitun culture (Berdiev 1976, 58-59). Trofimova claims that the Chagylly burials were found below undisturbed floors (Ginzburg and Trofimova 1972, 40). According to Berdiev, Jeitun burials were indeed often found below floors, although he does not explicitly state this for Chagylly Depe (1966; 1976, 58).

that in Neolithic times burying the dead within (inhabited or abandoned) settlements was already one course of action, albeit an exception rather than a regular practice.

Transitional Chalcolithic in Iran (ca. 5200-4300 BCE)

Evidence from sites contemporary to Aeneolithic Monjukli Depe in southern Turkmenistan is up until now very limited. I begin therefore with a consideration of the so-called Transitional Chalcolithic of northern Iran. The settlements of Zagheh (Qazvin Plain), Cheshmeh Ali (Teheran Plain), Shir-i Shian (Damghan Plain), and Sang-e Chakhmaq (Shahroud Plain) provide potential comparisons from south of the Kopet Dag for the periods preceding or contemporary to the occupation of Monjukli Depe.

Some of the earliest burials of the Transitional Chalcolithic period stem from the upper layers of the East Mound of Sang-e-Chakhmaq[134] and point to shifts in local burial practices in the late 6th millennium BCE. While the Neolithic interments on the West Mound were flexed on the right side, the eight presumably Transitional Chalcolithic burials of the East Mound were extended on the side or back (Masuda et al. 2013, 234; Tagaya 2014, 39-40). Two Transitional Chalcolithic multiple burials also attest to changes in practice. One contained a child and three adult females – at least one of them pregnant – buried simultaneously, the other a child with at least two perinatal skeletons (Tagaya 2014, 39-40; Miyauchi 2014, 44-46). The primary inhumations and the standardized body orientation, either N-S or E-W, demonstrate local continuities. Besides burials – mainly of adults – in simple earthen pits, the two mounds yielded bodies of over one hundred fetuses and small infants, most of perinatal age at death (Miyauchi 2014, 44-46), often placed in flexed position in or underneath walls or below Neolithic house floors.[135] This suggests that in contrast to the majority of the adults and children, fetuses and perinatal infants may always have been buried within the settlement, closely associated with houses and possibly as foundation deposits. Grave goods and ocher are seldom attested, and they mostly occur in East Mound burials (Masuda et al. 2013, 234). Similarities to burial practices at Monjukli Depe are limited mainly to the age-related burial contexts and occurrence of multiple burials, while other aspects such as extended body position, standardized orientation, and limited use of ocher clearly diverge.

Further to the west at the early Transitional Chalcolithic site of Tappeh Zagheh (5370-5070 BCE; Fazeli Nashli et al. 2009, 7), over 25 burials were uncovered since the 1970s (Malek Shahmirzadi 1977, 246-271; Talai 1999, 16-17; Negahban 2013). Eight children were interred in flexed position below house floors, although infants were also placed in holes dug in the walls. Seven adults lay in an extended position or flexed on the side; signs of wrapping were identified in one case. In contrast to the children, adults were also buried in outside areas such as courtyards or lanes beyond the domestic areas. Mudbricks were piled on many graves, although only in a few cases can they be interpreted as a grave construction. All buried individuals were covered by ocher. They showed no common grave orientation and were seldom accompanied by grave goods. Besides the secondary burial of three adult skulls, there was also a unique group of eight young women, buried in flexed or extended position in a semicircle of simple earthen pits below the floors of houses adjacent to the so-called “Painted Building.” The faces of the deceased all looked toward this structure, which has been interpreted as a temple (Talai 1999). Ocher was used in large amounts and even found in the deceased’s mouths. Some of the graves also yielded beads of agate or turquoise. Primary inhumation in earthen pits, the ubiquitous use of ocher, a dominantly flexed position, the scarcity of grave goods, and especially the burial contexts (under house floors for children, in outer areas for many adults) show similarities to Monjukli Depe. Variable body positioning, orientation of the grave, and use of wraps/shrouds are also common at both sites. However, interments such as those found around the “Painted Building” have no parallels in southern Turkmenistan.

At Cheshmeh Ali, the type site for the Iranian Transitional Chalcolithic, 32 prehistoric burials were exposed, although their exact dating remains unclear.[136] Preliminary results indicate that 75% of the graves were single burials in simple earthen pits, mostly flexed on the right side, with the arms bent in front of the face (Gustavel 2009, 89). However, the low proportion of immature individuals stands out in comparison to other sites,[137] as does the high frequency of burials containing grave

134 Levels 1 and 2 are attributed to the early Transitional Chalcolithic (Thornton 2013, 244), but the newest radiocarbon dates do not extend later than 5300/5200 BCE, suggesting rather a Late Neolithic occupation (Nakamura 2014, 10-11). However, some of the deceased were buried with vessels of Sialk II type, supporting the attribution of some or all of the burials from the East Mound to the early Transitional Chalcolithic (Masuda et al. 2013, 234).

135 A similar context is documented for some of the adults in the lower layers of the East Mound (Masuda et al. 2013, 234). An infant was buried in an urn in a flexed position on the left side (Tagaya 2014, 40).

136 Timothy Matney (University of Akron), Hassan Fazeli Nashli (University of Tehran), and team are working up the largely unpublished results of Schmidt’s excavation in the 1930s.

137 According to the internet database, almost three-quarters of the buried individuals were adults and almost two-thirds were male (Gustavel 2009, 89). This suggests that most of the immature individuals as well as women were disposed of elsewhere or in another manner.

goods.[138] Ocher is not documented. The deceased were usually buried below the floors of houses, an unusual practice for adults in this time period. Interestingly, in all but one case the deceased faced northerly directions, i.e. the Elburz Mountains (Matney 2012).

To the east, the small site of Shir-i Shian, dating to the middle of the 5th millennium BCE, yielded a single adult skeleton (Dyson and Thornton 2009, 18-19). Although its burial context remains unclear,[139] the flexed position on the right side fits well with the burial pattern observed at Zagheh, Cheshmeh Ali, and later Hissar IA, as well as Monjukli Depe. The placement of a painted pottery bowl near the head (Dyson and Thornton 2009, 9) is also in line with practices known from Sang-e Chakhmaq, Cheshmeh Ali, and at later Anau North IA (Hiebert et al. 2003b, 119) and Hissar IA (Schmidt 1937, 67-71).

Thus, while features such as primary inhumations, the preponderance of single burials, preference for the right side and flexion of the legs, earthen pits, and the occasional use of ocher suggest shared practices on both sides of the Kopet Dag, differences in burial contexts, relative number of burials in settlements, grave goods, and the proportion of children to adults point to local and temporal specificities, including within the Transitional Chalcolithic.

Early Aeneolithic: Anau IA period (ca. 4300-3900 BCE)

The Anau IA period, which follows the Meana Horizon occupation of Monjukli Depe chronologically (Chap. 3), has yielded only few human remains. Two individuals, a male (?) adult (burial 1) and an 18-20-year-old woman (burial 2), were excavated at Anau North in layers 20 and 19 of Kurbansakhatov's sounding, in the fill of Anau IA architecture (Hiebert et al. 2003b, 118-119). Both deceased individuals seem to have been placed on their left side, legs semi-flexed and knees bent, for the woman tightly bent with the feet to the pelvis. The position of the arms is reconstructed as bent with hands in front of the face, in the male burial possibly bound. While the male interment contained neither grave goods nor ocher, the deceased woman had been sprinkled with ocher, observed as a layer below the skeleton. A bowl was recovered at her right foot and a bovine horn in the area of the knees. The orientation of the bodies was inconsistent – one E-W and the other SE-NW. The pit of burial 1 was dug into the fill of an abandoned room, the skeleton resting in the middle of an ash layer. The female was also buried in a rubbish layer and subsequently covered with mudbricks. These levels were interpreted as a midden (Hiebert with Kurbansakhatov 2003, 99). The restricted size of the excavation (3 x 2 m) does not allow any evaluation of the representativeness of those burials for the period. They nonetheless exhibit parallels to those from Monjukli Depe: primary inhumation, flexed position (although on the left side), use of ocher, and the location of adult burials in trash areas within abandoned buildings or outdoor areas. Complete vessels as grave goods are not, however, found at Monjukli Depe and may point to the beginning of a practice that only becomes more widely attested in the Middle Aeneolithic.

A third Anau IA-period burial located at the "73-km" site west of Ashgabat is briefly mentioned by Berdiev. It consists of a child, with head oriented to the east (Berdiev 1976, 16).

Other archaeological sites with Anau IA occupations, including Tilkin Depe, Ovadan Depe, Gavych Depe, Kaushut, and the Serakhs site, have been excavated only in the form of stratigraphic soundings (Berdiev 1974, 6-7; Coolidge 2005, 22). Thus, the scarcity of burials is not surprising.[140] The Anau IA-period site of Chakmakly Depe, Level 2 of which was extensively excavated, did not yield any burials (Berdiev 1968). Although the recovery of scattered human bones and an adult skull suggest the presence of disturbed burials or the handling of human bones at the site (Ginzburg and Trofimova 1972, 42; Berdiev 1976, 59), the majority of the population at Chakmakly was likely buried outside the settlement. In that sense, the burial practices of both the Meana Horizon and the Anau IA period show continuities with an older Jeitun tradition in which interment in the settlement area was generally avoided. However, as the new results from Monjukli Depe demonstrate, it was acceptable, albeit uncommon, to bury both adults and children within a village. Such a practice continued, although likely with different selection criteria, after the site was abandoned but used as a burial ground.

Early and Middle Aeneolithic: Namazga I (ca. 3900-3500 BCE) and Namazga II (ca. 3500-3000 BCE)

Changes in mortuary practices are evident in the burials of the Namazga I and especially in the Namazga II periods in southern Turkmenistan, albeit continuity is also attested. Anau IB levels at Anau North yielded eight children and

138 About two-thirds of the graves contained jewelry or ceramic vessels. Pottery vessels were placed near the head or at the feet. No strong correlation between age or sex and burial goods was noted, but the presence of grave goods in three infant burials has been interpreted as a sign of ascribed status (Gustavel 2009; Matney 2012).

139 Schmidt originally interpreted the site as a camp, but Thornton suggests that the burial might have been located below the floor of a house (Thornton 2010).

140 Two adult skulls from Kaushut and one from Ovadan Depe were studied by Trofimova, but their exact provenience is unclear (Ginzburg and Trofimova 1972, 40).

infants buried in simple earthen pits either under house floors or in abandoned structures within the inhabited site (Hiebert 2002, 34).[141] The bodies were often placed in ash above burnt surfaces and oriented with the head towards southerly directions. In Anau IB2, beads, possibly sewn onto clothing, become ubiquitous. There is a shift in the flexed position from the left to the right side and to a more careful preparation of the graves, which are sometimes surrounded by bricks (Hiebert et al. 2003b, 119-121, 125). These features suggest some "tightening" of burial customs or a narrowing of options. Hiebert regards the Anau IB burials from Anau North as the first consistent burial pattern in Central Asia (Hiebert 2002, 34). Orienting the deceased's head towards southerly directions becomes standard, as does the apparent exclusion of adults from the settlement and the use of grave goods, mostly beads of different shapes and materials, in children's and infants' burials. Adults may have been buried in a separate area of the settlement or at another location,[142] possibly in an off-site cemetery similar to Parkhai II in the Sumbar Valley on the southern side of the Kopet Dag, which yielded both Aeneolithic and Early Bronze Age burials (Hiebert 2002, 34; see Khlopin 1997, 2002). The 24 Early Aeneolithic graves at Parkhai II consist of multiple burials placed in (semi)subterranean earthen vaults. They were used for successive interments of both adults and juveniles, probably over a long period of time, with as many as 36 individuals per chamber. Some had a vertical entry shaft to the side and were seen by the excavator as an early stage of the so-called catacomb graves, a type that flourished throughout Central Asia from the Middle Bronze Age onward (Khlopin 1983, Fig. 14; 1989, 126-127; 1997, 13-38). Whether the small and simple L-shaped graves encountered in Monjukli Depe (Fig. 8.2) are related to such a tradition is hard to say, especially as the Sumbar Valley and the Eastern Piedmont share only a few cultural traits in the Aeneolithic. There are otherwise few comparable sites with burials of the Namazga I period, as it is still one of the most poorly known stages of the Namazga sequence (Kohl 1984, 76).[143]

In contrast, the larger number of Middle Aeneolithic graves recovered in the Kopet Dag foothill region provide a more comprehensive picture. Burials are known predominantly from Kara Depe,[144] Ilgynly Depe,[145] and Anau North.[146] Burials were below the floors of abandoned buildings (Anau)[147] or, at Kara Depe, were dug from unoccupied or outdoor areas of the site into previous architectural layers (Kohl 1984, 89). The prevailing grave form was still the simple earthen pit, containing single burials placed in a flexed position on the right side. While various age groups are represented at Ilgynly Depe (Bonora and Vidale 2013, 157), the deceased population at Anau North comprises almost only children and infants; in Kara Depe adults predominate. A standardized body orientation towards southerly directions was used in Anau and Kara Depe. Coloring the corpse with red pigments is attested in two instances at Kara Depe, as is the wrapping of the deceased in a plaited mat (Kohl 1984, 90; Alekshin 1986, 20-21). The use and distribution of grave goods are similarly site-specific. While at Ilgynly all age groups were buried in the same manner, either without grave goods or with a single pottery cup (Masson et al. 1994, 21-22), in Kara Depe about half of the adults and children were furnished with beads or pottery vessels, with children often turning out to be "wealthier" than adults (Alekshin 1976). In Anau North only one child was buried with grave goods, albeit with 1066 white beads (Hiebert et al. 2003b, 123). This unequal distribution of grave goods has been interpreted as evidence for a status ascribed at birth (Kohl 1984, 90; Bonora and Vidale 2013, 158) and the emergence of a stratified society by the end of Namazga II or beginning of Namazga III (Alekshin 1986, 53-54). There is also an increasing tendency to resort to other forms of disposal, as attested by the many secondary burials at Ilgynly (Masson et al. 1994, 21-22). There, a collective burial containing nine adults in a round pit may date to the Middle Aeneolithic, although except for the already mentioned Parkhai II cemetery, multiple burials become widespread only beginning in the Late Aeneolithic. Due to the larger size of Middle Aeneolithic sites (10-20 ha: Bonora and Vidale 2013, 148-149), the higher number of graves encountered does not point to a significantly higher density of burials within the settlement, and the

141 The body of at least one child had been placed on a woven reed mat under a wall (Hiebert et al. 2003b, 120).

142 A similar hypothesis was formulated by Khlopin in the 1960s regarding the Early and Middle Aeneolithic phases in the Geoksjur Oasis of the Tedjen Delta. Considering the absence of burials despite extensive excavations, he suggested that the dead were buried either in a separate area not far off site, but now likely buried under alluvium, or possibly many kilometers away in the Kopet Dag region, an area from which, he argued, the Geoksjur inhabitants had originally migrated (Khlopin 1964, 166).

143 An early Aeneolithic infant burial was encountered in the lower levels of Kara Depe (Masson 1960b, 381, 412), which shows similarities to Anau North. The adult burial from the early Aeneolithic levels of Namazga Depe probably dates to the early Middle Aeneolithic (Khlopin 1963, 13).

144 Levels 2 and 3 (late Namazga II) yielded the remains of 31 adults and 21 infants and children (Alekshin 1976; 1986, 20-21).

145 In total, 88 burials have been recovered at the site of Ilgynly Depe, with the main occupation phases dating to the Middle and early Late Aeneolithic (Masson et al. 1994, 21-22; Bonora and Vidale 2013, 157). Their stratigraphic assignations are as yet unpublished.

146 Nine burials are attributable to Anau IIA levels, dated to the late Namazga II period (Hiebert et al. 2003b, 121-124).

147 According to Hiebert et al. (2003b, 125-126), this last use-phase of the buildings was also characterized by the presence of hearths in deposits above the floors, possibly linked to funerary rituals.

presence of cemeteries outside the settlements is, as in previous periods, likely. All in all, both intra- and inter-site differences seem more pronounced. They highlight local particularities in funerary practices and point to an increased concern for expressing (social) differences in the mortuary field.

Conclusion

Dealing with the dead at Monjukli Depe was characterized by a palette of practices that provide a glimpse into the dispositions and *Handlungsräume* of this early Aeneolithic community. Primary, flexed inhumations in earthen pits appear to be part of strong and unreflected dispositions, while placement on the right side and the use of ocher can be considered more flexible but still predominant ones. Particular dispositions were related to the age of the deceased, affecting the use of ocher, grave goods, and burial location. Most practices show a variability that points to *Handlungsräume* with a broad range of possible choices. It seems that grave type, body orientation, ocher-bearing objects, position of the upper extremities, as well as burial sequence were often chosen idiosyncratically. While a multiplicity of potential meanings and motivations can thus be envisaged for each burial, the interwoveness of building and mortuary practices suggest a close link between burials and the social life of houses.

Only a fraction of the original population was buried in the settlement itself, so we can speak here only of the practices affecting a minority. How most of the deceased were dealt with remains an open question. Isolated human bones in the settlement may point to a “profane” perception of the dead body.

A review of the regional context stressed the recurrence of particular burial practices on a wider spatial and temporal scale and suggests that although people at each site had unique ways of burying their dead, conceptions of what could or should be done with the deceased were shared and passed on to others. While the outcome of this analysis must be regarded as preliminary due to the small sample size, it provides close-up insights into local practices as well as avenues for further research.

Catalog

human bones	wall
animal bones	bricks
beads	unexcavated / disturbed
metal	
ocher	
pottery	
stones	

MDB1	**Locus:** A33	**Age:** 2-4 years	**Period:** Meana horizon

Burial MDB1 is located in the northern part of Building 1 in the center of room 1a and contains the articulated remains of a 2-4-year-old child.

Position, deposition, taphonomic observations

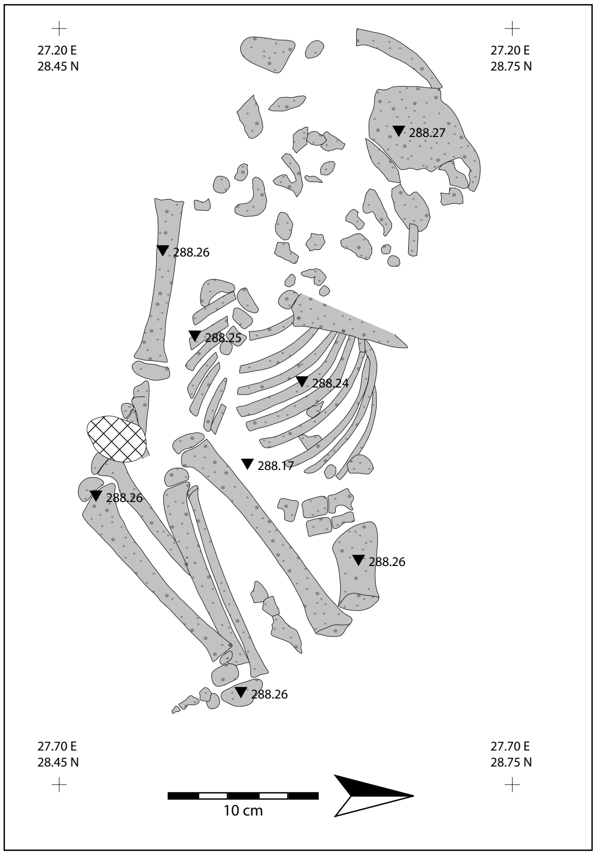
The deceased was placed on the right side with legs tightly folded in front of the chest and crossed at the ankles. The body was oriented NW-SE, the head facing to the SW. The right arm lay extended along the side with the lower arm below the right knee. Excavation damaged the area surrounding the skull and makes the reconstruction of its original position difficult. It seems to have been slightly offset in hyperextension. The left humerus lay in retroversion and seems to have been displaced by the collapse of the left ribs following the decay of the inner organs that also dislocated numerous vertebrae within the resulting thoracic void. The taphonomic analysis points to a primary inhumation in an initially filled space (as opposed to an artificial void created by a coffin or body wrapping). The labile joint connections between the foot bones are still mainly preserved, and the unfused tibial and femoral epiphysis maintained their anatomical position despite being in potential disequilibrium – an *effet de paroi* (Duday 2009, 25-31, 38-40). Very loose soil with an orange patch just above the right arm indicates a secondary void that moved the right humerus slightly to the west, possibly subsequent to the decomposition of organic grave goods.

Ocher and grave goods

Ocher was found in large quantities on the skull, the anterior side of the right humerus and the inner side of the right ribs, sometimes in the form of small particles. It was recorded in lesser quantity on the upper side of the left ribs and lower limbs. Ocher traces are absent in the surrounding fill, so it must have been sprinkled directly on the aforementioned parts after the body had been laid out. An unmodified white stone with ocher on the lower side rested on top of the lower right arm. Two sheep/goat incisors and a Meana Red Wash sherd were found under the skull area.

Stratigraphic observations

The child lay 50 cm below the modern surface in the center of room 1a, Building 1, where it was found buried in the middle of a thick sequence of dense, compact surfaces of red and white plaster alternating with compact fill material (A20/23/26/30/49). This sequence of floors testifies to resurfacing events in the last habitation phase of the building. No burial pit could be identified, and a small animal burrow disturbed the area a few cm above the skeleton, so that the grave's upper edge remains unclear. Nonetheless, the most recent surfaces in the room were intact, pointing to a maximum pit depth of 25-30 cm and a date in Stratum I. The child was interred from one of the surfaces (A26/30), the grave filled with bricky matrix, and then the surfaces replastered above the grave. The building remained in use.



Cat. 8.1.

Cat. 8.2.

MDB2	**Locus:** C5/C29/C116	**Age:** over 50 years (ind. 2.1), 1-2 years (ind. 2.2), 2-4 years (ind. 2.3), 6-18 months (ind. 2.4)	**Period:** Meana horizon (?)

MDB2 is a multiple, composite burial containing an old woman (ind 2.1) and the disarticulated skeletal remains of a minimum of three juveniles (ind. 2.2-4) placed in a funnel-shaped shaft grave. Many of the juvenile bones were not identified in situ and therefore their precise position was not recorded. As the pit's edges were often unclear, some of the juvenile bones were collected from the surrounding loci C6 and C20 and are listed separately in Table 8.4. The burial of all individuals was likely contemporary, as a later reopening of the grave would have substantially disturbed the lower adult skeleton.

Position, deposition, taphonomic observations

Individual 2.1: the adult was laid at the bottom of the grave pit in a tightly-flexed position on her right side. The body was oriented NE-SW, the face looked to the NW. The right arm was bent in front of the chest, with the palm facing the mouth and fingers curved. The left arm was bent in the space between upper body and legs, with the elbow resting on the thighs and the hand originally in supine position. The head was tilted to the back, and the arrangement of the vertebrae seems to indicate a hunched back. The skeleton was still largely articulated, and the preserved connection of the interphalangeal articulations of the feet confirms a primary inhumation. Several bone displacements point to temporary voids around the body: after the loosening of the wrist joints, the left hand moved south towards the right knee and the right hand collapsed to the mouth. Similarly, the still articulated right foot moved in a hypersupinated position as the ankle joint broke. In a filled burial pit, temporary voids could have been created by a shroud wrapped around the body. Indeed, the flattened rib cage and the movement of the right hip bone also suggest a delayed infilling process, which occurs when bones and sediment are not in direct contact (Duday 2009, 32-35).

Individuals 2.2, 2.3, 2.4: Above individual 2.1 lay the disarticulated remains of the incomplete skeleton of a 1-2- year-old infant (ind. 2.2) plus the fragmentary remains of at least two other juveniles of 2-4 years (ind 2.3) and 6-18 months (ind. 2.4), whose bones were found scattered throughout the entire depth and around the burial pit, none in articulation. In view of post-depositional disturbances in the upper part of the pit and its location close to the surface, it is difficult to assess whether these were primary or secondary inhumations. The very low degree of completeness of some of the skeletons could indicate secondary deposition, although the surrounding tertiary contexts have not all been examined for displaced human bones. As no cut or gnawing marks were apparent, a previous burial event and subsequent disinterment is likely.

Ocher and grave goods

The complete skeleton of individual 2.1, but especially the skull, was covered with ocher and lay on an ocher layer that was evenly distributed over the base of the grave. Ocher was also found on the shaft walls where those could be identified. The use of a body wrap coated with pigment seems likely. A large chunk of ocher was also placed in front of the face of the deceased. Behind the skull lay a retouched chalcedony blade and next to the left shoulder a caprine premolar. It seems unlikely that the other objects recovered were included intentionally. The disarticulated juvenile bones could not be associated with any grave goods but several of them showed traces of ocher.

Grave form

The edges of the 90-95-cm-deep burial pit could be only partially followed, and the upper part was very disturbed. Nonetheless, a careful study of the documentation allows the following tentative reconstruction (see Fig. 8.2). The

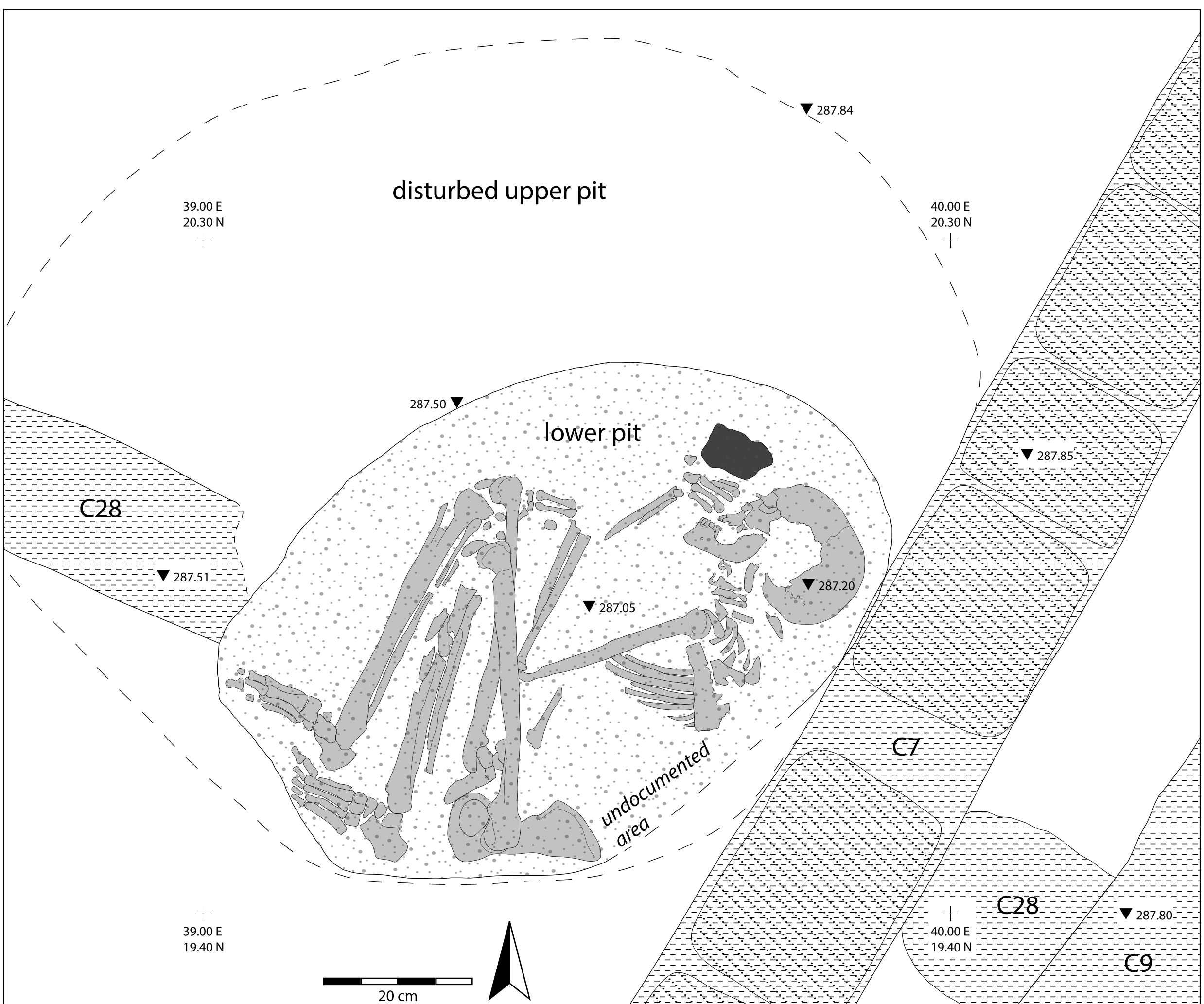
Cat. 8.3. Upper part of burial pit. Scattered bone fragments of ind. 2.2, as wells as possible remains of a stone and brick construction are visible.

Cat. 8.4. Lower part of burial pit with ind. 2.1 in preserved anatomical connection.

vertical grave shaft seems to have been funnel-shaped, with an upper part 120 cm in diameter and filled with a loose bricky matrix. The lower part of the shaft was narrower, 80 x 60 x 50 cm, and exactly tailored for individual 2.1. In the upper part of the pit, a few remnants of a semi-circular structure made of stones and brick fragments was identified and may have had a covering or stabilizing function. The juvenile bones were found both inside and outside the disturbed semi-circular structure.

Stratigraphic observations

MDB2 is located in Unit C at the edge of the Eastern Midden and in the fill of Building 7, its upper edge only a few cm below disturbed modern contexts. It was flanked to the west by wall C7, which may have been built to stabilize walls C24 and C9 of Buildings 7 and 8 that at the time of interment would still have protruded just above the surface. The grave pit of MDB2 may have been dug from a white pebbled surface at 287.98 m asl that was probably contemporary with the Eastern Midden and would have been located in an outdoor area at the edge of the midden. However, a date for the burial after abandonment of the village cannot be excluded. The grave cuts into several destruction layers comprised of wall fall and ash as well as into wall C28, which divided the former Building 7 into two rooms. Part of the shaft lies within a doorway above the former threshold between the two rooms. This might not be coincidental, and the remembered location suggests that a relatively short time elapsed between house abandonment and burial.



Cat. 8.5.

MDB3	Locus: C23/C150	Age: 14-16 years	Period: Meana horizon

This 14-16-year-old individual was found in the fill of Building 8 in the midst of wall fall. The upper body lay outside of the trench. Although not drawn, it was completely excavated so as to keep the body remains together.

Position, deposition, taphonomic observations

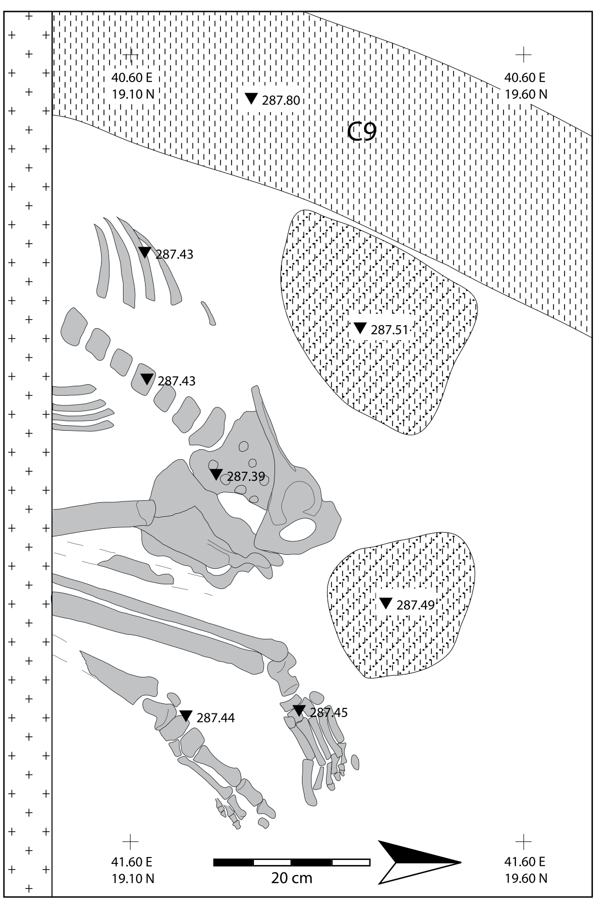
The deceased lay on the back, oriented SW-NE, with legs tightly flexed to the right side of the chest and the feet in extension. Both arms were bent along the right side of the chest, the right one resting crossed on top of it and the left one flexed in semi-abducted position. The hands were both located in front of the mouth, the fingers bent. The skull, crushed by mudbricks and resting against the western wall of Building 8, was rotated to the right and lay in hyperextension facing SW. There is no evidence for a former void around the body. The thoracic cage conserved some of its original volume, and the left coxal bone collapsed only slightly inwards, suggesting a progressive infilling and thus the likely absence of clothing or shroud. The skeleton is largely in anatomical position, and the interphalangeal articulations of the feet are in connection, indicating a primary disposal. The *effet de paroi* on bones lying in potential disequilibrium such as the left coxal bone, which remained in position, also points to the absence of a void around the body.

Ocher and grave goods

None.

Stratigraphic observations and grave form

The skeleton was recovered 55 cm below the modern surface within an 80-cm-thick wall fall layer, C21, in the already abandoned Building 8 and flanked by its western wall, C9. The individual was literally covered by



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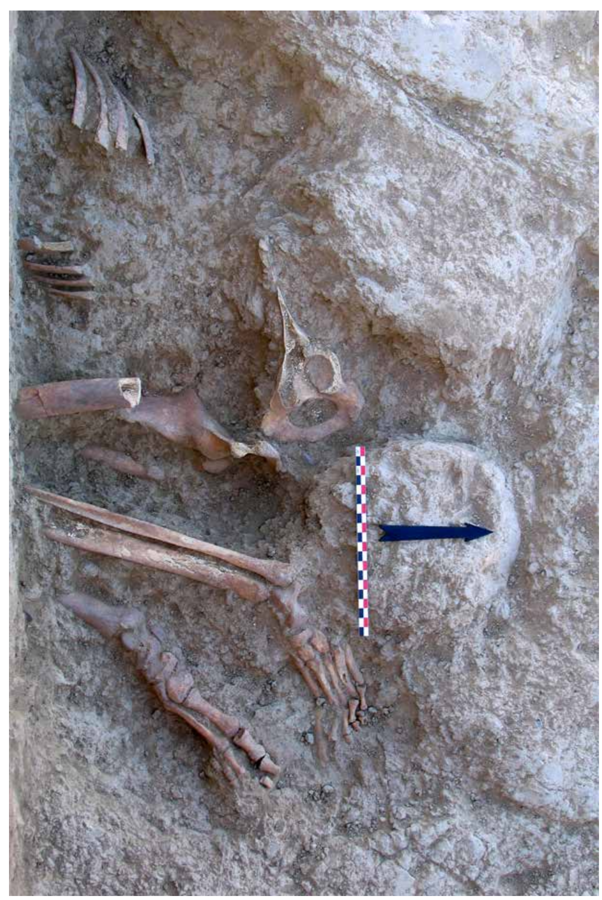


Cat. 8.7.

heavy bricks or brick fragments: several of them were found directly on top of the head, chest, and legs. No grave pit could be identified either during excavation or in the profile, making two scenarios conceivable: 1) This was a flat grave in which the deceased was laid on top of the house fill within a heap of bricks during the abandonment of the building (Stratum III), with walls still standing at least up to 55 cm high; 2) It was an accident, and the individual died following the collapse of a wall, the body was left in place and covered as the abandoned building continued to be filled. The high degree of torsion between the legs and the chest, the mudbricks on top of the body, the "protective" stance of the hands as well as the absence of unequivocal grave goods have indeed led the excavators to hypothesize an accident due to a wall collapse (Pollock et al. 2011, 183). This seems in my opinion unlikely, as this exceedingly tall adolescent (Chap. 9, Table 9.7a) would certainly have towered over the top of the remaining walls. At least 40 cm of fill lay above the last floor, so even if the walls of Building 8 were still standing to their full height at the time, it seems unlikely that their collapse would have caused such a dramatic accident. The position of the body is in line with other burials at the site, and osteological analysis showed no signs of perimortem injury. It thus seems likely that the deceased was placed in a tightly flexed position on the top of the house fill and further bricks heaped over him to cover the body.

MDB4	**Locus:** B87	**Age:** 2-4 years	**Period:** Meana horizon

The complete articulated skeleton of a 2-4-year-old child was found in the northernmost part of Building 4, ca. 1.15 m below the modern surface.

Position, deposition, taphonomic observations

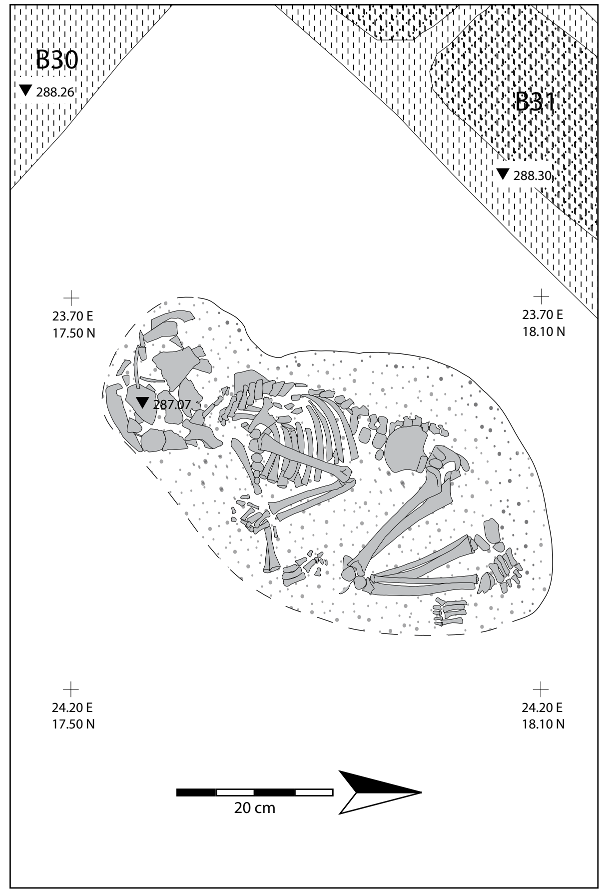
The body was oriented SW-NE and in a flexed position on the right side. The head was straight, facing SE. The right arm lay extended in ca. 45° anteversion in front of the chest, while the left arm was bent, the hand placed above the right elbow. The thoracic cage lost all of its volume as seen by the flattened ribs. Similarly, the left coxal bones fell inwards after decomposition of the inner tissues. Both observations indicate a delayed infilling, likely caused by the presence of a shroud around the body. A shroud would explain the temporary voids that allowed hand and foot bones to move or collapse after the loosening of the wrists and ankle joints. The metacarpophalangeal articulations of both feet and right hand are, however, preserved and confirm that the burial was a primary inhumation. A shroud may also have caused the *effet de paroi* which prevented the displacement of the distal femoral and proximal tibial epiphysis.

Ocher and grave goods

A thick band of ocher was visible behind the deceased, and ocher was further found under the whole body, although not on the surface of the bones. These observations likely confirm the presence of a shroud that would have been wrapped around the body before being laid within the ocher-sprinkled or painted pit. There were no grave goods.

Stratigraphic observations

The individual was found in the northernmost part of Building 4, room 4b, in the area between the parallel walls B30 and B66. He/she lay below a layer of wall fall in the middle of locus B86, which marks a temporary abandonment of the house. No grave pit could be identified or reconstructed, but it is likely that the edges of a shallow pit were missed and the grave dug within the fill layers, although certainly below the surfaces of the following use phase, B37/45/54/60. Whether the burial was a foundation deposit for this new use phase is unclear, but the presumed depth of the pit (80 cm) would certainly be atypical for such a deposit. A flat grave similar to MDB3 or MDB9(?), with the skeleton laid on the fill of the temporarily abandoned house and subsequently covered, is equally unlikely, as no bricks or stones were found in the immediate vicinity of the burial. The skeleton lay only ca. 10 cm above the red floors B78/88/89, and the burial would most probably have occurred not long after the temporary abandonment of Building 4 (Stratum III).



Cat. 8.8.

Cat. 8.9.

MDB5	**Locus:** D62/D67/D70/D84	**Age:** 5.5-7 years	**Period:** Meana horizon (?)

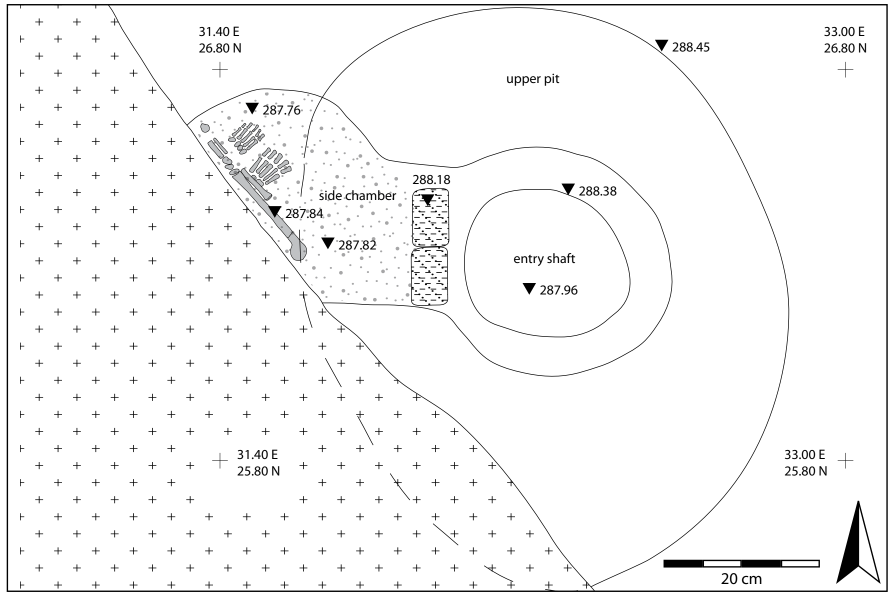
Burial MDB5 contains a child whose upper body was unfortunately cut by excavation work in the 1960s.

Position, deposition, taphonomic observations

Only the lower legs and feet of the body were preserved in situ, as the burial seems to have been heavily disturbed by Marushchenko's sounding. An animal burrow produced further post-depositional disturbances. Nonetheless, the feet were still in anatomical position, the left one in dorsal and the right one in plantar view. The interphalangeal articulations were in connection and confirm that this was a primary burial. Similarly, the left talocrural joint between tibia and talus as well as the subtalar joint were preserved, albeit in very loose connection. The unfused distal tibial epiphysis was thereby not displaced, pointing as well to a primary inhumation despite the otherwise missing or disturbed skeletal parts. Both tibiae and fibulae were still roughly in parallel alignment, but further statements on the body position must remain tentative. We can infer from the location of the feet that the deceased was likely placed on his/her right side, while the narrowness of the burial chamber would only have allowed a flexed position.

Grave form

The L-shaped grave architecture consisted in its upper part of a wide, shallow pit, D62 (140 x 90 x 5 cm) that led through a ca. 40-cm-diameter round hole in its center to an oval, vertical gate chamber or entry shaft, D67/84/258 (45 x 60 x 70 cm). Access to the burial chamber or side chamber proper, D70, was gained through a ca. 40 x 30 cm hole in the western wall of the shaft that was subsequently closed by two obliquely laid mudbricks placed next to each other (see Fig. 8.2). The very narrow side chamber (40 x min. 50 x 15 cm) in which the body was placed was dug to the west of



Cat. 8.10.

Cat. 8.11.

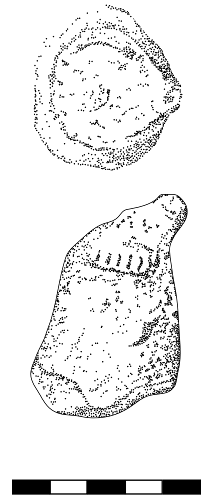
the entry shaft, 10 cm above its base. As the body seems to have fitted tightly into the cavity, it is unlikely that this part of the grave was backfilled. Just below the upper part of the pit and surrounding the entry shaft, several circularly arranged brick fragments were encountered (D152), which might have belonged to the grave architecture and stabilized the entry shaft.

Ocher and grave goods

Ocher covered the ceiling, bottom, and sides of the lower burial chamber, including the interior face of the entrance-closing brick, while the uppermost part of the pit and the gate chamber were free of ocher. Though the chamber access hole is narrow, it seems that the red pigment was applied directly on the irregular surface of the pit's outline along with chalk, as a few patches of it lay above the ocher layer on the pit walls. The thick layer of ocher on almost all faces of the bones of the deceased except for the articular surfaces suggest that it would have been applied in quantity to the individual's body, possibly as a kind of paste, before the deceased was placed in the chamber.

A peg-shaped token with a zoomorphic head was recovered to the northwest of the deceased's feet, while a caprine metatarsus lay directly under the left foot. A remarkable amount of burnt plant material was spread around the body and may indicate the presence of food remains, although this needs to be confirmed by macrobotanical analysis.

Cat. 8.12.



Cat. 8.13. RN 333 - zoomorphic token.

Stratigraphic observations
The preserved upper edge of this L-shaped shaft grave lay only 15 cm below the modern surface, just under the mixed backfill of Berdiev's previous excavations, making integration into the site's stratigraphy difficult. Half of the grave was cut by Marushchenko's sounding.

The pit is located in the northern part of Unit D, within the poorly preserved Building 18, just east of its inner wall, D63. The northern and western walls of the building, D48 and D54, are only preserved to a height of 15 cm, and the grave pit cuts the surface D81 on which they were built. It seems likely that the grave was dug from higher up, probably from the now eroded fill of the abandoned building, as wall fall layers were found surrounding the grave pit's edge. Building 18 belongs to the last settlement phase visible at Monjukli Depe, Stratum 0, and was constructed over former Gate 1. While the date of MDB5 is thus likely to be after the use-phase of Building 18, it remains unclear how much time elapsed between the abandonment of the building and the burial and whether the village was still inhabited at the time. Based on the grave form, a dating in the Bronze Age should also be considered.

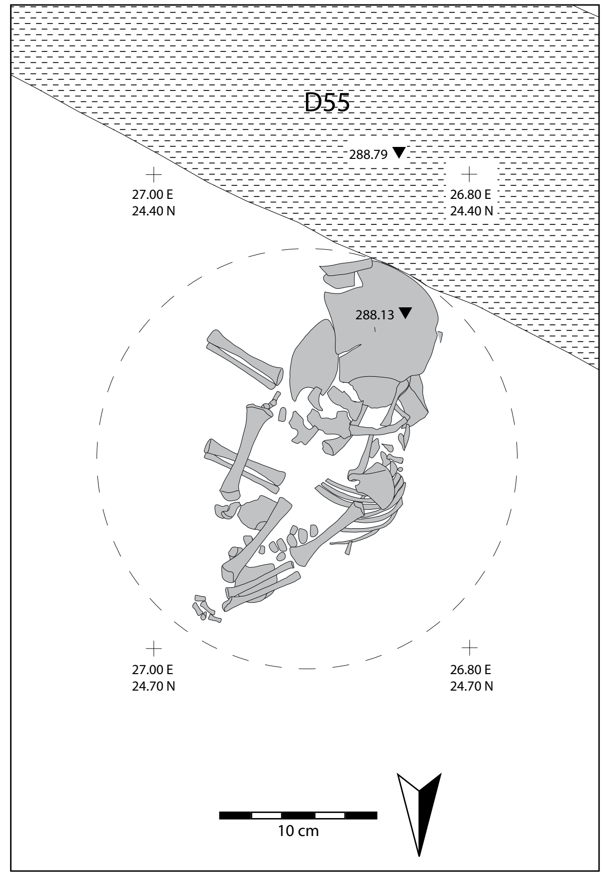
MDB6	**Locus:** D278	**Age:** 36-40 weeks (prenatal)	**Period:** Meana horizon

A well-preserved fetal/perinatal skeleton was found at the southern wall of central room 1b in Building 1.

Position, deposition, taphonomic observations
The body was deposited on the right side in a very tightly flexed position. The knees were bent at right angle, the right one in front of the face, the left one in front of the chest, although the latter's original position was certainly closer to the chin. The left arm rested in extension along the side, while the right arm was raised and lay in semi-extension under the skull. The head and the upper part of the chest were in a somewhat more elevated position than the rest of the body, with the head leaning against – and seemingly pressed into – wall D55. The sutures of the skull were not yet closed, the bones of the calvarium have fallen apart, but the head seems to have faced NE. Following the decomposition of organic tissues, the outward collapse of the left hip bones likely pulled the left extremities with them towards the north, while the difference in height led to the sinking down of many bones of the chest and shoulder girdle. The degree of articulation of the body and the limited range of bone displacements point to a primary inhumation in a filled space.

Ocher and grave goods
None.

Cat. 8.14.



Cat. 8.15.

Stratigraphic observations and grave form

The burial pit was a shallow circular hole below the very first floor of Building 1 (D273/274), flanked by the inner side of its southern wall, D55. The skeleton seems to have been placed directly within the lower ashy layer D287/295 which served as a foundation surface for the walls of Building 1. The small pit was filled with a different, bricky deposit and the burial closed with the application of the floor. The stratigraphic situation makes an interpretation as a foundation deposit very likely. Possibly connected to the burial is also a podium-like structure, ca. 140 x 100 x 30 cm (A43/D231/233/234/268), which was constructed directly above the grave and surrounding area and contains a small hole on its upper side that was used to make or hold fire (FI 18; see Chap. 6). It remains, however, unclear how these events relate to one another. The burial dates without doubt to the earliest phase of Building 1 and is thereby assigned to Stratum II.

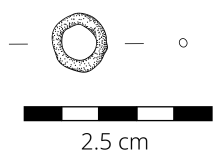
MDB7	**Locus:** D168	**Age:** 17-21 years	**Period:** Meana horizon (?)

The skeleton of a young adult (17-21 years old) was recovered 25 cm below the modern surface in the loose ash of the Eastern Midden.

Position, deposition, taphonomic observations

The individual was buried in a tightly-flexed position on the right side, the body oriented S-N, with the head facing west. The knees were tightly folded in front of the chest, the right arm in anteversion and bent at a sharp angle, with the hand to the shoulder. The right hand was bent with the back lying against the chin. The right elbow and right knee were in contact. The left arm was semi-flexed along the side, with the left hand below both thighs. The head was turned slightly to the right, resting on the shoulder.

The interphalangeal articulations of the feet were well preserved and confirm it as a primary inhumation. The decay of the tissues they rested on displaced the phalanges of both hands. For the same reason, the left coccal bone collapsed fully inwards, and the left humerus rotated medially following the collapse of the rib cage and left shoulder girdle, suggesting a delayed infilling. The bone displacements were otherwise limited. They can all be explained by in situ decomposition processes and do not



Cat. 8.16. RN 839 - limestone (?) bead.

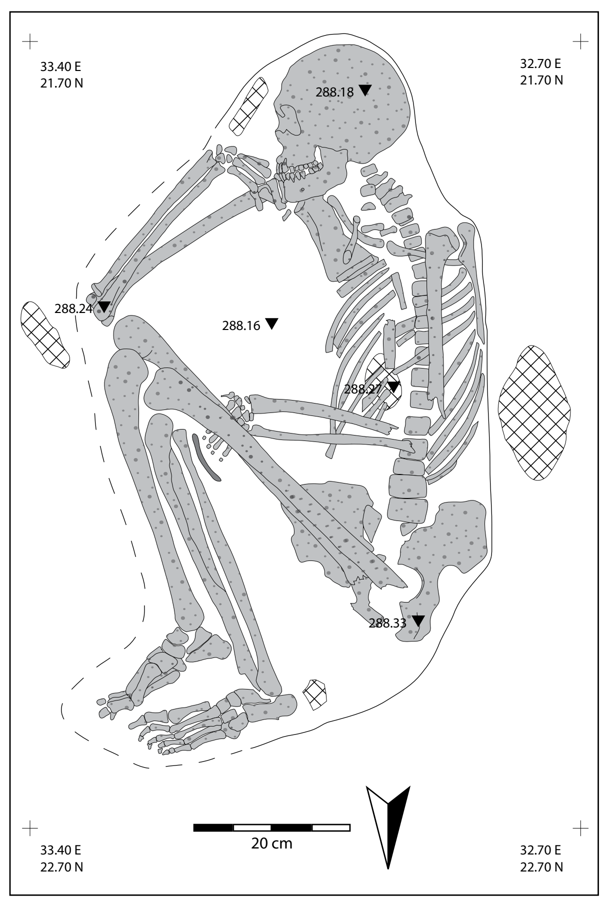
point to an existing void around the body. The high degree of flexion at the hips and knee joints might indicate that the dead body was tied up. One has, however, to bear in mind that tightly-flexed extremities tend to close their angle more acutely during decomposition (Duday 2009, 54). In this case, taphonomic processes do not offer evidence of a shroud.

Ocher and grave goods

A heavy cover of ocher was present on the whole skeleton and on all sides of most bones. Traces of ocher on the ground were only detected on the area below or next to the bones, particularly under the skull and pelvis. It seems that ocher was not applied on the pit's floor but rather heavily to the deceased's body before its deposition, accounting also for many ocher particles in the burial matrix.

The individual was buried with quite a few potential grave goods: several lithics, including a burnt chunk at the left heel; two stones with ocher, one of them in front of the face between wrist and forehead; an unmodified animal rib placed at the left arm; and a white disc-shaped bead.

Cat. 8.17.



Cat. 8.18.

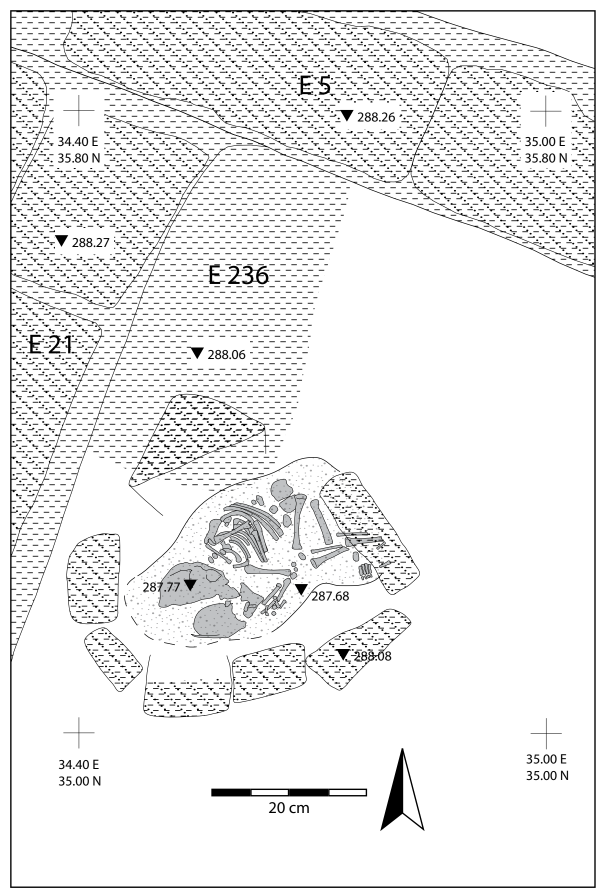
Stratigraphic observations
The skeleton lay immediately below the mound surface, and the grave form can therefore no longer be reconstructed. The border between the compact burial matrix and the surrounding ashy layers of the Eastern Midden was clear and may point to the existence of a now-eroded pit. A surface disposal within the loose midden layers seems unlikely in view of the skeleton's well preserved degree of articulation. In the absence of upper edges for the grave pit, the assignation to a specific stratigraphic level is difficult. Characteristics of the burial, such as the flexed position on the right side, the location of the arms, and the use of ocher, are nonetheless very similar to the other Aeneolithic burials at the site. The burial event could thus have taken place in one of the last settlement phases, possibly Stratum 0.

MDB8	**Locus:** E229	**Age:** 0-6 months	**Period:** Meana horizon

Burial MDB8 was located in the northeastern room 2b of Building 2 and contained a neonate or young infant.

Position, deposition, taphonomic observations
The deceased was deposited on the right side in a flexed position. The body was oriented SW-NE, head straight and facing S or SE. The knees were both flexed at a right angle, the left leg being folded somewhat higher up in front of the abdomen. The right arm was in anteversion and bent acutely with the hand to the face. The left arm lay along the side and seems to have been bent at a right angle with the hand over the right upper arm.

Reconstruction of taphonomic processes from the documentation is difficult. The interphalangeal articulations of the left foot were still in connection,



Cat. 8.19.

Cat. 8.20.

attesting to a primary inhumation. Ribs and hip bones collapsed completely within the secondary thoracic and abdominal voids, bringing about further bone displacement in the shoulder girdle, rotation of the left humerus, and displacement of the left femur. The latter move may point to the existence of an initial void created by a shroud, but the displaced right foot also indicates post-depositional disturbances.

Ocher and grave goods

The whole skeleton was covered with ocher, especially the skull. The pit's surface and walls were also coated with dark red ocher. The grave yielded no grave goods.

Stratigraphic observations and grave form

The grave architecture consists of a ca. 10 cm shallow pit, the upper edge of which was bordered with at least six mudbricks or brick fragments in circular arrangement. The right leg lay below one of the bricks and suggests that the body was laid down before the bricks were set. Immediately above the mudbricks was a compact rectangular block of bricky material, E236 (25 x 45 x 25 cm), which at least partially covered the grave; it may initially have been larger. It seems to be part of a construction related to the burial but is no longer fully comprehensible.

The burial was placed adjacent to the eastern side of the northern buttress E21 in room 2b, in the corner with wall E5. It is located at a similar height to the lower edges of Building 2's earliest walls and the oldest surface, E272, in the south of the same room. I assume that the grave pit was dug before the application of this surface or from the overlying trampled surface E253 on which buttress E21 was constructed. The absence of a floor or surface directly above the burial architecture means that the protruding mudbrick platform was certainly visible for a time in this earliest phase of Building 2 (Stratum II). In the following use phase, a sequence of red floors E187/209/249 was laid throughout room 2b and covered the remnants of the grave.

MDB9	**Locus:** E237	**Age:** 0-6 months	**Period:** Meana horizon

This burial consisted of an infant less than six months old, within an architectural context related to Building 12.

Position, deposition, taphonomic observations

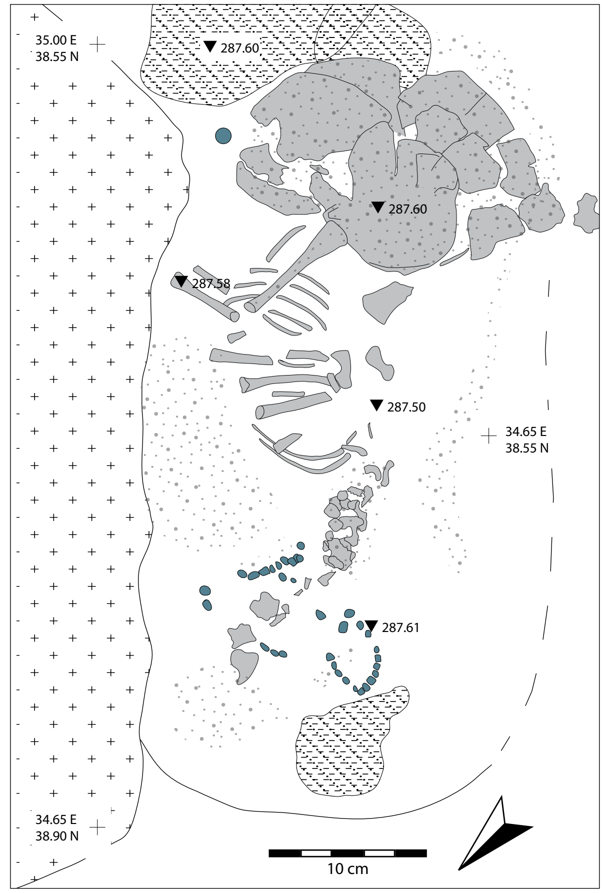
The burial, oriented SE-NW, was disturbed in its eastern and northern parts by several animal burrows, so that the original position of the body remains partially unclear. The infant was deposited on its right side, possibly in a flexed position. Both arms were likely flexed along the sides at a right angle, joining in front of the chest. The head, seemingly straight, faced E. As the sutures were not closed, the bones of the calvarium collapsed over a fairly wide space, pointing to the presence of a temporary void in the area that is not solely explainable by tissue decomposition. The position of the lower body is difficult to reconstruct as most leg and foot bones were missing or scattered, some in the surrounding burrows. A few ribs, the pelvis, and several vertebrae still preserved in articulation were displaced more than 10 cm towards the north, suggesting that the first disturbances occurred fairly quickly after deposition. They also point to a primary inhumation.

Ocher and grave goods

The skull and the area below it were coated with a thick layer of ocher, the other bones with a lesser amount or none. A fine, sinuous line of ocher behind the body as well as patches on other areas next to the skeleton suggest the presence of an ocher-coated shroud. This could also account for the void observed in the skull area.

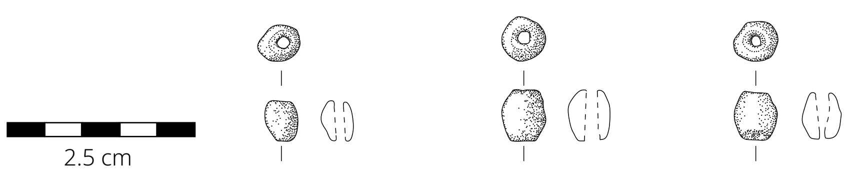
Obvious grave goods include a clay bead and ca. 40 beads of very soft white stone, possibly chalk, that lay in front of the face and in the lower body area, respectively. The white beads are on average 6 mm in diameter, and their form ranges from round to biconical or cylindrical. Most of them were covered with ocher and found still in connection to one another. Fragments of at least three strings of beads were preserved: one shows the beads aligned in a horseshoe pattern, possibly indicating that it had been tied in a bow, while in the two other the beads were arranged linearly. The beads may have been part of a string used to close a now-decayed bag or shroud of organic material, or they might have been sewn onto an ocher-coated piece of clothing or fabric. Although not too far from the potential area of the lower body, it seems unlikely that they represented jewelry worn by the deceased, as the decomposition and displacement of the leg bones would certainly have disturbed the arrangement more substantially. The mandibula of a caprine located 15 cm south of the skull is likely from the surrounding fill.

Cat. 8.21.



Cat. 8.22.

Cat. 8.23. RN 7565 - clay bead RN 7564, 7598, 7599 - limestone (?) beads.



Cat. 8.24. RN 7564 - limestone (?) beads.

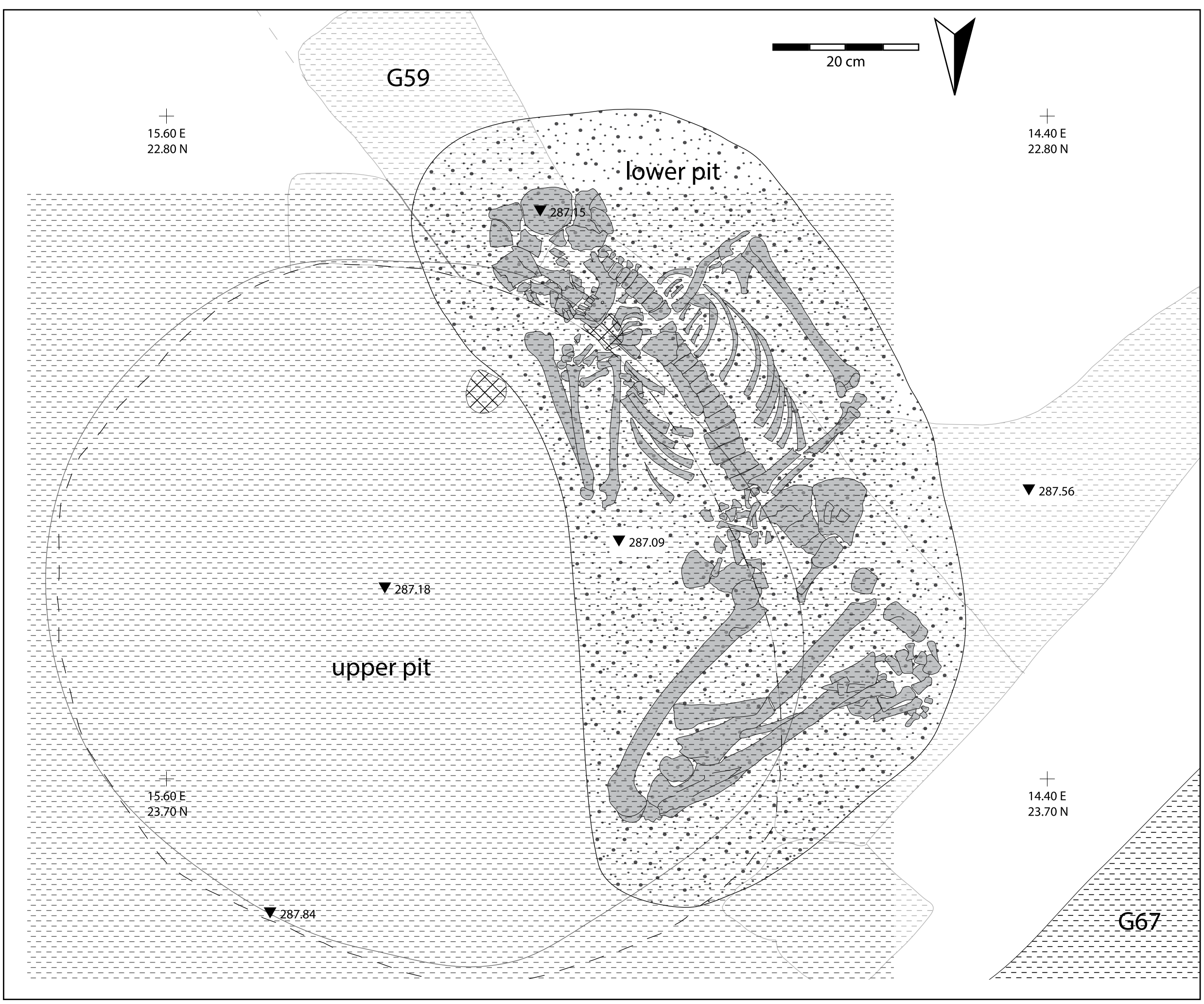
Stratigraphic observations

The burial is located 50 cm below modern surface in the space between walls E47 and E56, which presumably formed a northern annex of Building 12 in its later use phase (Stratum III). Animal burrows have severely disturbed the burial, including burrow E240 that cut into the lower arms of the infant, making the reconstruction of the stratigraphy tentative.

Neither upper nor lower edges of a grave pit could be identified or reconstructed. The skeleton was found within fill E266 and was surrounded by several greenish mudbrick fragments as well as four large used stones, some possibly part of a heap covering or surrounding the body. The infant may have been interred in a bag placed in or on the fill of the abandoned building and covered with stones and bricky material. The presence of a red-orange surface, E266, 10 cm below the grave would suggest that a short time elapsed between house abandonment and burial. This reconstruction of the grave form remains tentative.

MDB10	**Locus:** G66	**Age:** 17-25 years	**Period:** Meana horizon

The skeleton of a young woman (17-25 years old) was exposed in the northwestern part of Unit G.



Cat. 8.25.

Position, deposition, taphonomic observations

The individual was deposited on her back with the legs semi-flexed to the right side and tightly-flexed knees. The body was oriented SE-NW. The left arm was in adduction, bent at right angle with the hand resting in pronation on the pelvis, while the right arm was slightly in abduction and flexed with the hand in front of the face. The head was turned to the right, facing NE, and lying against the elevated right shoulder. The position of the cervical vertebrae and the right clavicular seems to confirm that this was the original position of the head at deposition and not a result of post-depositional collapse. The ribs were flattened within the thoracic void, indicative of delayed infilling. Both elbow articulations are dislocated. The imbalanced right ulna rotated medially and lay against the rib cage, its lateral facing upward. The left ulna and radius rotated laterally following the decomposition of the inner organs. The pelvic girdle was open, with the coccal bones visible in medial view. This led to the lateral rotation of the left femur, the medial side of which was facing up. All those displacements point to a primary void surrounding these parts of the body. Both hands and feet, likely in a position of disequilibrium, decomposed in situ due to the presence of a primary void, though the collapse of the left hand seems mainly due to the decay of the abdominal tissues. The *effet de paroi* on both humeri, which kept their original position, nonetheless indicates a compression from the side. Very likely the individual was wrapped in a relatively inflexible shroud or mat, creating primary voids around the body space and maintaining the upper arms in place. Phytolith analyses revealed a very high quantity of plant remains within the grave, particularly leaves and stems, arguably confirming the use of a mat.

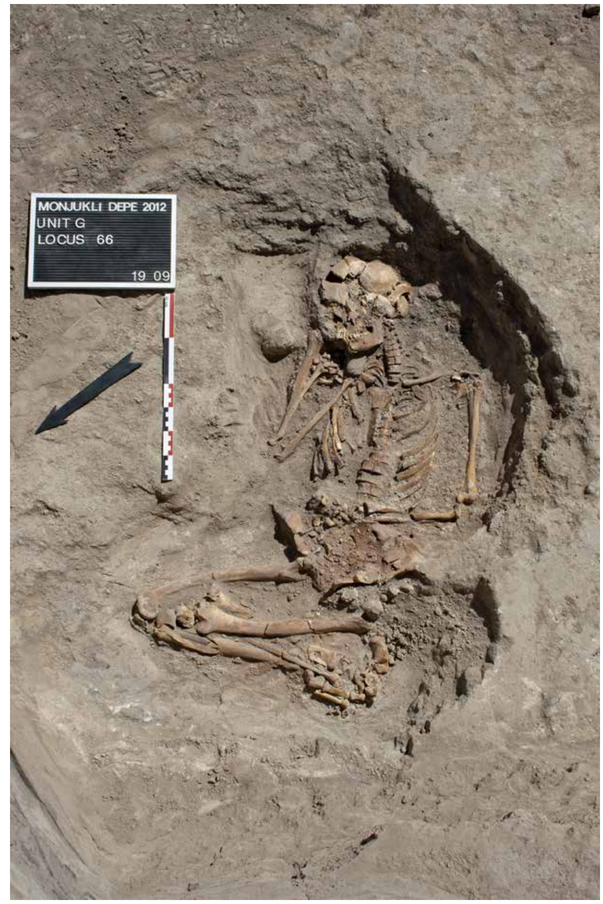
Ocher and grave goods

Ocher was found under the body, in especially high amounts under the pelvis, on the upper side of the skeleton, as well as on the bottom of the grave pit, visible as a bean-shaped colored track.

The adult was buried with a stone next to her right shoulder and one stuck below the chin. Neither one showed processing marks or use wear. In the shaft, a typical fill assemblage with numerous animal bones, ground stones, a few tokens, and shaped clay fragments was recovered and is likely not part of a set of grave goods.

Stratigraphic observations and grave form

The skeleton was located at 287.10 m asl within trash layers in an outside area. An ash pit of 80 x 100 cm diameter and 65 cm deep (G28) was located immediately above the skeleton, although somewhat offset to the northeast. Even though the connection between pit and burial could not be clearly ascertained in the field, it is very likely that this was the upper part of an L-shaped shaft grave, at the bottom of which the skeleton was placed in a recess to the southwest (see Fig. 8.2). The side of the shaft may have been blocked with some kind of brick structure. The burial pit was dug from G22, an outdoor trash layer connected to the use phase of nearby oven FI 38. It cuts into several ash layers, fills, and outer surfaces, as well as into the poorly preserved remains of the curved wall G59, possibly marking the edge of an installation/small building under which the skeleton was placed. Though it is difficult to correlate the burial event to the general site stratigraphy, it seems to be contemporary to the last use phase of the Central Midden (stratum I/II).



Cat. 8.26.

MDB11	**Locus:** D564	**Age:** over 50 years	**Period:** Meana horizon

The skeleton of an elderly individual over 50 years old, possibly male, was recovered lying on the southwestern buttress, D571, of Building 14.

Position, deposition, taphonomic observations

The individual was deposited on the left side, in flexed position with the legs at a right angle. Both knees were tightly flexed, the feet next to the pelvis. The body was oriented SE-NW with the head in extension, facing SW. The right arm lay in adduction along the side, and was bent in front of the abdomen, with the hand placed in pronation next to the left thigh and the fingers curved. The left arm was in anteversion and flexed, with the hand originally placed on the right elbow. Both feet were in supination. The bones of the left hand, in disequilibrium above the right elbow, lost their anatomical position following the latter's displacement due to the flattening of the rib cage. The interphalangeal articulations of the feet and the right hand are well preserved and establish that the inhumation is primary.

The fully flattened rib cage and the medial collapse of the right coccal bone point to a delayed infilling, likely due to the presence of a shroud or piece of clothing. Other bone displacements are minimal and indicate a largely filled space, with an *effet de paroi* on the right scapula, meaning that the shroud would have been wrapped tightly around the body.

Macroscopically visible silica of finely interwoven plant remains, possibly reed, were recovered especially on the anterior, lateral, and posterior face of the right humerus, the exterior side of the ribs, the lateral and posterior faces of the coxal bones (Fig. 8.3), as well as in

Cat. 8.27. Lower part of burial pit with ind. 11.1 lying on buttress D571, House 14.

Cat. 8.28. Top of buttress D571 coated with white plaster and ocher.

the fill between the iliac wings. The silica's depositional pattern on the skeleton as well as the aforementioned taphonomic processes strongly indicate the presence of a shroud made of woven plant material that was wrapped tightly around the body.

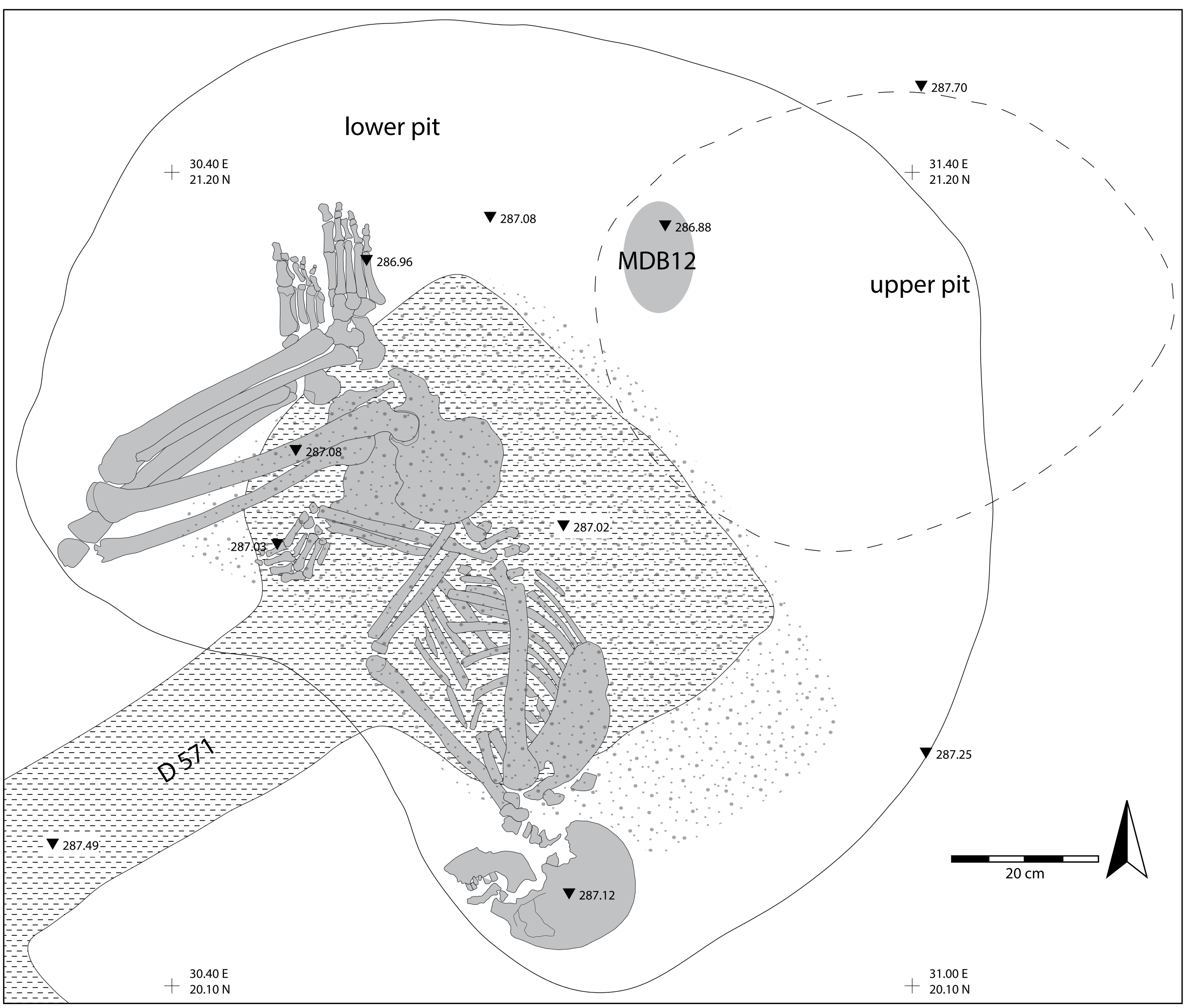
Ocher and grave goods

Approximately half of the pit base was lined with ocher in an almost rectangular shape which covered the surface of the former buttress and the lower area surrounding it, reaching below the skeleton's upper body and head and extending up to 50 cm beyond its back. In contrast, only the bones placed directly above the buttress, i.e. from the neck to the middle of the right femur, were pigmented, with ocher mostly on their lateral faces (facing either up or down, given deposition on the side). Some of the thick ocher traces were located directly on the bones and below the traces of plant silica, so it is clear that ocher was applied directly on the skin of the deceased.

A few unworked stones, animal bones, lithics, and a broken spindle whorl were found in the grave fill but not in the vicinity of the body and thus are secondary inclusions. A complete cattle horn core, a hammerstone, and a broken tanged blade may have been deposited intentionally.

Stratigraphic observations and grave form

The shape of the burial pit could only be reconstructed in retrospect and remains tentative. The grave seems to have been dug from immediately below the outdoor surface D441, in use in Stratum III, in the area between Buildings 3 and 10. The upper edges of pit D464 – the presumed upper part of the burial shaft – were sealed by this intact surface, which provides here a terminus ante quem. The burial pit was deepened into the lower-lying



Cat. 8.29.

ash and wall fall layers of the abandoned Building 14, thereby cutting down buttress D571 by 25 cm.

The pit likely took the form of a 75-cm-deep, L-shaped shaft, the lower part of which broadened to the SW where the corpse was deposited (see Fig. 8.2). At its upper edge, the pit was oval, ca. 70 cm in maximum diameter, whereas at the level of the skeleton a wider, bean-shaped outline of ca. 1.30 x 1 m was recognizable. The buttress, which had probably been cut from the side as the shaft was broadened, protruded a few cm higher than the bottom of the shaft and was carefully prepared with its upper side coated first with white plaster and then ocher. On top of it, just below the skeleton, traces of organic material were found.

Though the stratigraphic connection is insecure, burial MDB11 may have been associated with the fetal/young infant burial MDB12, which lay only a few centimeters below the lowest level of the adult skeleton and to the NE of the feet and pelvis area within the circumference of MDB11's grave pit. A shallow pit might have been dug for the infant next to the adult body, which could account for the absence of ocher in this area of the grave. As this remains a hypothesis, we have assigned two different burial numbers to the individuals.

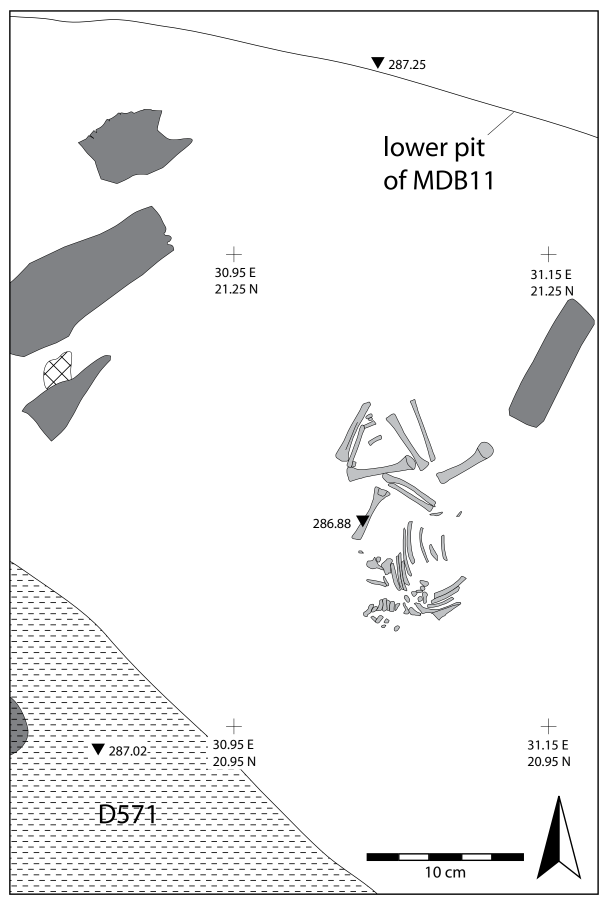
MDB12	**Locus:** D583	**Age:** fetus / young infant (not analyzed)	**Period:** Meana Horizon

Burial MDB12 was located within the scope of burial MDB11, about 30 cm to the northeast of the adult's pelvis. Osteological analyses have not been conducted, but a perinatal death seems likely.

Position, deposition, taphonomic observations

The burial was heavily disturbed during excavation, making an accurate description of the body position difficult. Only ribs and some thoracic vertebrae maintained their approximate anatomical position. The extremities and the skull were displaced, and their original position

Cat. 8.30.



Cat. 8.31.

can only be partly reconstructed. The preservation of joint connections between cervical vertebrae attests nonetheless to a primary inhumation. The upper body was in a supine position, probably semi-seated; the head and cervical vertebrae collapsed to the left following the decay of the soft tissues. The left arm was bent at a right angle, with the hand placed on the pelvis. The legs seem to have been flexed to the right side.

Ocher and grave goods

It remains unclear whether the numerous animal bones recovered around the body can be interpreted as grave goods, as they also occur in the layers into which the body was placed. No traces of ocher were present.

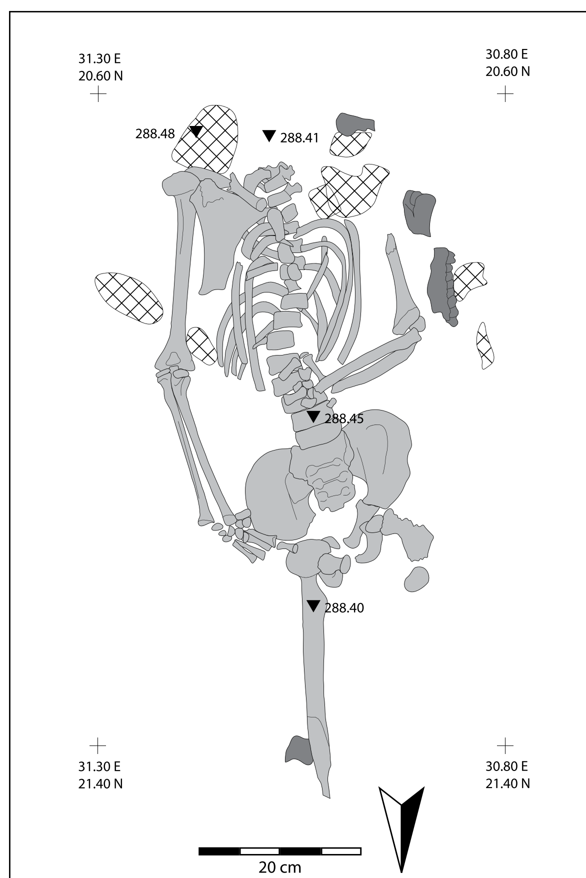
Stratigraphic observations and grave form

The burial was found in the upper fill of abandoned Building 14 at 286.88 m asl. No grave pit was identified, but the ashy matrix around the body was distinct from the surrounding bricky layers. Two stratigraphic attributions seem plausible. The burial could be related to burial MDB11 and the body placed contemporaneous (Stratum III) at the bottom of the latter's L-shaped burial shaft. Alternatively, if we consider the vicinity of MDB11 to be happenstance, the body would have been laid down in a shallow pit dug into the surrounding fill. The burial would then have occurred within House 14, but quite some time after its abandonment in view of the height of the rubble below it. It could then be assigned to early Stratum III.

MDB13	**Locus:** A2	**Age:** 8-12 years	**Period:** ?

The articulated remains of an 8 to 12-year-old child were found immediately below the modern surface in Unit D.

Cat. 8.32.



Cat. 8.33.

Position, deposition, taphonomic observations

The body was placed on the back in extended position and oriented S-N. Many of the bones, including skull, left leg, and right lower leg were not in situ or were cut due to heavy post-depositional disturbances, possibly following Marushchenko's and Berdiev's excavations. The right arm was in slight abduction extended along the side, with the hand initially perhaps resting in vertical position against the right hip. The left arm was bent to a right angle, with the hand in pronation lying on the abdomen.

The decay of the inner organs induced the full flattening of the ribs and the collapse of the bones of the left hand. The pelvic girdle was semi-open to the left and open to the right, the femora did not rotate. Although the most labile articulations are not preserved due to post-depositional disturbances, the articulated thoracic vertebrae indicate a primary inhumation. The surface disturbances do not allow an assessment of whether the burial occurred in a filled or partially empty space.

Ocher and grave goods

No ocher was used in the fill or on the body. The numerous stones and fragments of animal bones surrounding the body, including a maxilla next to the left upper arm, could be grave goods or simply belong to the surrounding fill.

Stratigraphic observations

The burial was located within the uppermost layers of the Eastern Midden just below the backdirt of Marushchenko's and Berdiev's excavations. The massive disturbances and location close to the modern surface make the reconstruction of a grave pit impossible and leave open the question of whether the burial can be assigned to the Aeneolithic or, much likelier, to later periods, as the absence of ocher and the extended position suggest.

MDB14	**Locus:** L8	**Age:** adult (?) (not analyzed)	**Period:** Middle Bronze Age

Sounding L in the southern part of the site yielded the burial of a probable adult individual; osteological analysis has not yet been conducted.

Position, deposition, taphonomic observations

The individual was deposited on the right side in a flexed position and the body oriented W-E. The upper body was slightly twisted to the right in comparison to the pelvis position. The head rotated laterally following post-depositional decay of the cervical ligaments and would likely have originally faced down. The right arm was bent at a right angle under the body, with the right hand palm up and fingers bent. The fingers lay just below a bronze pin but do not seem to have been closed around it. A few of the interphalangeal articulations were still in connection and can be seen as evidence of a primary inhumation. The left arm was bent acutely in front of the chest, the left hand to the right shoulder. The legs did not lie at the same angle: the right one was flexed to ca. 60° in front of the chest and the upper left one flexed at a right angle. Both knees were flexed to ca. 35°. The preservation of the bones was very poor, limiting the reconstruction of other taphonomic processes.

Ocher and grave goods

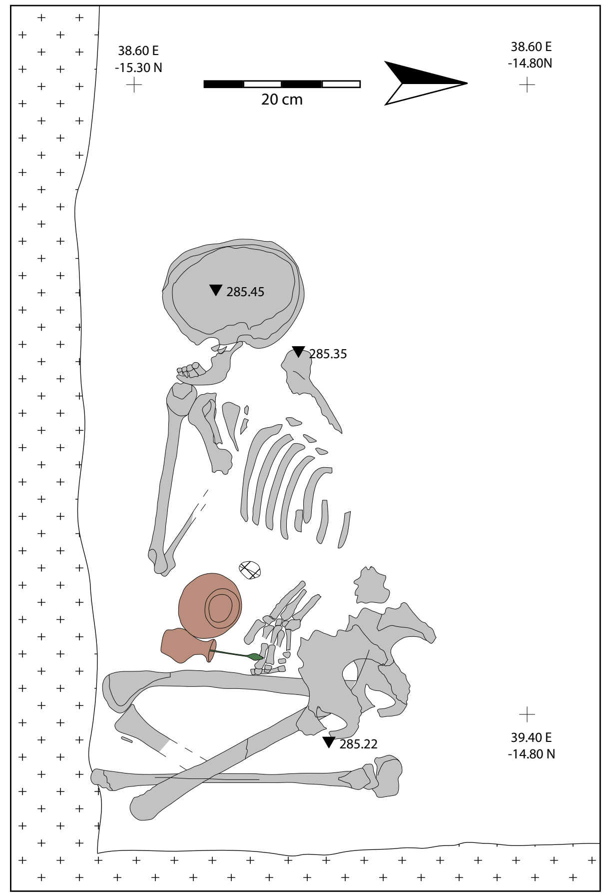
No ocher traces were present. Between the chest and right femur were two complete wheelmade ceramic vessels. The small pot RN 13026 has an everted open rim, a short neck, and a rounded body. It stood in a slightly oblique position at the left elbow, next to a small, horizontally-laid perfume or cosmetic jar, RN 13028. This second miniature vessel, with everted rim, long neck, and globular body, contained a thin metal applicator that rested below the right hand of the deceased. A steatite (?) bead or possibly spindle whorl was located between the small pot and the chest of the deceased.

Dating

Both vessels show clear parallels to late Middle Bronze Age ceramics recovered in burials at Gonur and Altyn Depe. RN 13026 bears similarities in shape to the frequently encountered "type 97" pot in the Gonur Necropolis (after Udeumuradov 2002; see also Sarianidi 2007, 65-67, fig. 31-40) and to type 28A and 28Б "small pots" recovered in late Namazga V burials at Altyn Depe (Masson and Berezhkin 2005, 372-373).

Several clay cosmetic jars were found in Altyn Depe burials from both the middle and late Namazga V period (Masson and Berezhkin 2005, 379). A flacon from burial n°721, late Namazga V, was also recovered with a metal applicator inside (Masson and Berezhkin 2005, plate 110). At Gonur, only few burial inventories have been published in detail. Of them burial n°194/1998 yielded a clay flacon and a type 97 small pot (Rossi-Osmida 2002, 88). It is dated by Teufer (2015, 669) to the Middle to Late Bronze Age transition. Bronze flacons of similar shape are also encountered at the site both in the Middle Bronze and the

Cat. 8.34.



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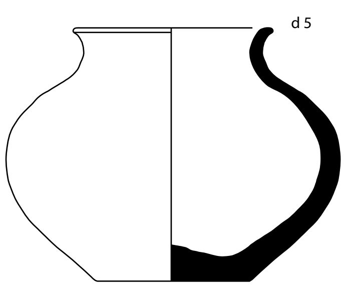
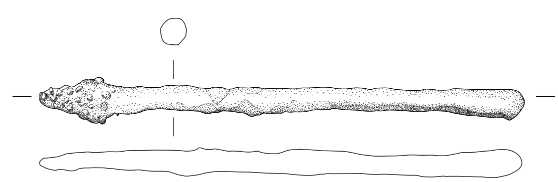
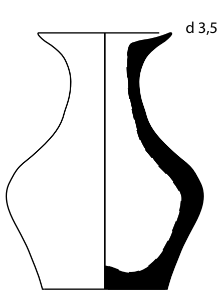


Cat. 8.36. RN 13026 - small pot.

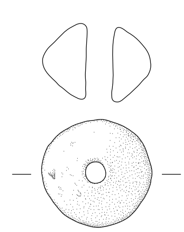


Cat. 8.38. RN 13027 - applicator.

5 cm



Cat. 8.37. RN 13028 - perfume jar.



Cat. 8.39. RN 13025 - spindle whorl / bead.

Middle to Late Bronze Age transition (Teufer 2015, 120-121), while the practice of burying the dead with a vessel placed in the hand is also documented in burial n°549 (Sarianidi 2007, 94, fig. 120). The available typological data thus allow a dating of the Monjukli grave to the Middle Bronze Age, arguably towards the end of the period.

Stratigraphic observations

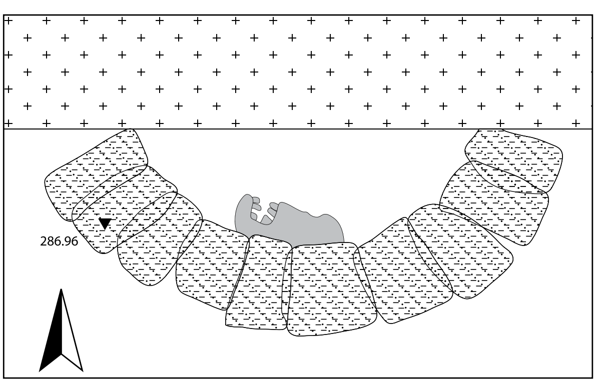
The skeleton was located in Unit L ca. 1.50 m below the modern surface within a hard bricky matrix. No grave pit could be identified. The upper part of the burial pit was likely eroded in a subsequent deflation phase as attested by the aeolian deposits identified just above the skeleton (Bernbeck 2018). Further up in the stratigraphy, a 2-m-wide and as yet undated irrigation canal, L6, was encountered. Aeneolithic occupation layers start ca. 20 cm below the burial. Since there are no Middle Bronze Age settlement layers in Monjukli Depe, a connection to the nearby Bronze Age site of Altyn Depe is likely. Altyn Depe may have had an off-site burial ground, or this grave may have been a singular event. Alternatively, ephemeral Bronze Age settlement layers may have existed in the area surrounding Monjukli Depe that are now covered or destroyed by aeolian activity (Bernbeck 2018).

MDB15	**Locus:** G17	**Age:** 20-28 weeks (prenatal)	**Period:** Meana Horizon

The complete remains of a 20-28-week-old fetus (Irvine, pers. comm.) were recovered in the uppermost layers of Unit G, ca. 20 cm below disturbed modern contexts. The grave was only retrospectively identified as such, so no information on the body position, grave pit, or possible grave goods is available. The burial seems to have been in an outdoor area, arguably contemporaneous to the use phase of oven FI 38 (see Chap. 6) and the Central Midden (Stratum II/III). The deceased would have been laid or interred in a flat grave placed in the burnt ashy layer, G17, that abuts the oven's western side.

Unexcavated	**Locus:** G75 and G77	**Age:** -	**Period:** Meana Horizon

Two other burials were recognized in Unit G, loci G75 and G77. They seem to have been dug from outer surface G72 (Stratum II/III). In G75, a burial pit of 90 cm diameter running into the northern profile of the unit was surrounded by a neat circular arrangement of mudbricks and filled in its upper part with brick fragments. Below them a skull was visible. The burial was left unexcavated. Burial pit G77 runs into the eastern profile. Only the pelvis and one long bone were exposed; they were left in situ. They seem to be located below the pit's western edge, possibly indicating the remains of another L-shaped burial.



Cat. 8.40. Sketch of locus G75. The burial was left unexcavated.

Chapter 9

Demography and Pathology at Monjukli Depe

Dawnie Wolfe Steadman

Keywords: *bioarchaeology; paleopathology; tuberculosis; metabolic disease; osteoarthritis*

Introduction

The field of bioarchaeology engages archaeology, skeletal biology, and other subfields of anthropology to reconstruct the diet, population structure, migration patterns, and health status of past populations. Much of this research has focused on health changes of populations transitioning to agriculture in Asia, Europe, and the Americas (Cohen and Armelagos 1984; Steckel and Rose 2002; Steckel 2003; Cohen and Crane-Kramer 2007). These studies not only examine the direct nutritional effects of agricultural products on human biology but also the impact of accompanying technological advances and sociopolitical changes on settlement patterns and food choices. Monjukli Depe offers a unique opportunity to gain insight into the health and demography of an ancient village in the Meana-Chaacha region that has yielded skeletons from earlier excavations but few skeletal analyses. This chapter provides the baseline bioarchaeological analysis of the skeletal and dental remains of sixteen individuals recovered from Monjukli Depe between 2010 and 2012. These results can ultimately be combined with other site data as well as comparative skeletal analyses to address more nuanced bioarchaeological questions.

The excavated areas of Monjukli Depe span the late Neolithic and early Aeneolithic periods and post-date the advent of agriculture in the region (Pollock et al. 2011). Generally speaking, changes in population density, sedentism, and potential narrowing of dietary choices often associated with reliance on agriculture may result in an increase in nutritional and infectious diseases (Barrett et al. 1998; Harper and Armelagos 2010). Herding practices at Monjukli Depe placed animals in close proximity to humans, thereby increasing the risk of zoonotic transmission of pathogens (Ortner and Aufderheide 1991; Upex and Dobney 2012; Scott 2017).

In addition to disease experience, bioarchaeology has the potential to shed light on the population structure within regions over time. For instance, Soviet diffusionist models predicted an influx of migrants into the Kopet Dag foothills, yet this is based only on the distribution of new technologies and exchange items (Kohl 1984, 54-55, 65-71). However, significant immigration and population replacement cannot be simply assumed despite rapid changes in technology and social structure (Steadman 1998; Bellwood

2001). Population genetic models can be used to directly test hypotheses concerning population movement and other microevolutionary forces (Relethford and Blangero 1990; Steadman 2001; Relethford 2007). Intra-cemetery and regional studies further seek to understand local population dynamics (e.g., Nystrom 2006; Stojanowski and Schillaci 2006). Assuming skeletal samples are sufficiently large, such population-based approaches can provide crucial understandings of population dynamics independent of the route of material culture exchange into or within a region.

Technological advances, most notably in biogeochemistry and molecular anthropology, have created new tools to directly address questions related to diet composition, geographic history, climate, residence patterns, intra-cemetery biological relationships, migration, and population structure (Ambrose and Katzenberg 2006; Knudson and Price 2007). One of the questions that can be approached at Monjukli Depe in the future is the genetic relationships among individuals buried at the site, particularly where burial patterns differ (Chap. 8). While mitochondrial DNA and Y-chromosome analysis can assess familial patterns (if any) among the individuals buried in Monjukli Depe, isotopic analyses can further detect which individuals were non-local (Ambrose et al. 2003) and determine the amount of agricultural products consumed, reflecting dietary change over time.

The current skeletal sample size at Monjukli Depe is too small to address some of these overarching questions, yet the basic demography and pathology of the skeletons provide the foundation upon which additional research can be based. This chapter provides a contextual analysis of the age, sex, stature, and pathological status of each individual or assemblage excavated at Monjukli Depe between 2010 and 2012 and available for analysis by the author in September 2012.

Paleodemographic and paleopathological approaches

This analysis begins by enumerating the burial remains recovered at the site followed by the construction of demographic and pathological profiles for each individual. While some of the skeletons were incomplete, bone and tooth preservation were overall excellent. The analyses indicate that 11 juveniles (children) and five adults over 17 years of age were recovered from a variety of burial contexts (see Chap. 8 for a discussion of the burial contexts as well as differences in the assemblages examined).

Skeletal samples and representation

It is impossible to determine precisely the number of individuals who were originally buried at Monjukli Depe or at any burial site. A number of cultural decisions, postdepositional processes, and scientific biases directly impact the size and composition of a skeletal assemblage. Cultural factors may dictate who is buried at a site, who may be buried elsewhere, or who may not be buried at all. Once interred, taphonomic processes may differentially destroy some skeletons and preserve others. In general, smaller, less dense bones such as small bones of the hands and feet or infant skeletons are less likely to preserve than larger, denser bones (Galloway et al. 1997). Archaeological bias can also play a role in that only a portion of a site or cemetery may be chosen for excavation, as was the case at Monjukli Depe. Finally, some skeletons or skeletal elements may not be recognized during excavation or may be discarded prior to analysis, something that is often referred to as curation bias. Thus, the demography of a skeletal sample is unlikely to directly represent the living population, especially when the recovered sample is small (Waldron 1994; Milner et al. 2008). Rather, the sample provides a minimum estimate of who was buried at a site.

There are several techniques used to approximate the number of individuals recovered from a site. The minimum number of individuals (MNI) represents the smallest number of individuals necessary to account for all of the identified bones in the assemblage. Used largely in faunal studies, MNI is typically determined by counting the most abundant sided bone or tooth (Max [L,R]), where L is left and R is right for each element. The MNI typically underestimates the true number of individuals, especially in samples smaller than 30-50 individuals or when the assemblage consists of extremely fragmentary skeletons (Grayson 1978).

In the case of Monjukli Depe, commingling was limited as most of the skeletons were recovered from discrete burials that contained a single individual. In addition, archaeological field notes and photographs were consulted to help reassociate any commingled individuals. Thus, in this study the MNI was calculated, but the utilization of more complex statistical analyses of the number of individuals represented in the collection was deemed unnecessary (see Adams and Konigsberg 2004; Byrd 2008; Herrmann and Devlin 2008).

Demographic profile

Paleodemography, the study of human demography among past populations, lies at the heart of contemporary bioarchaeology. Typically involving estimation of the sex and age of skeletons, the demographic profile provides essential information concerning who was buried at a site. The demographic profile serves as the foundation for understanding the microevolutionary processes that shaped the population structure (Relethford and Blangero 1990; Steadman 1998; 2001; Relethford 2012) and for addressing questions about health within the context of subsistence, settlement patterns, and social organization (Wilson 2014). In this study, the paleodemographic profile will include age and sex as well as stature for individuals for whom preservation permits long bone measurements.

Age, sex, and stature estimates may be most accurate when population-specific reference samples and methods can be applied. However, such reference samples are unavailable for the time period and geographic area of Monjukli Depe. Instead, we turn to large reference samples of contemporary populations in order to try to capture the greatest variation. In this study, age, sex, and stature are estimated based on standard methods that were developed from large reference samples on white and black American males and females.

Age estimation

Age estimation methods vary based on whether individuals are juvenile or adult. Juvenile age is estimated from dental development and eruption, epiphyseal fusion, bone fusion, and measurements of bone diaphyseal lengths. Adult age estimation techniques, on the other hand, rely on the systematic degradation of specific joints in the skeleton. The different methods utilized to estimate the age of juveniles and adults are described in this section.

Juvenile age estimation

Deciduous tooth formation starts in utero, while the permanent dentition begins to form in infancy and continues through adolescence. Tooth development commences at the cusp and proceeds rootward, terminating with the closure of the root apex. Each tooth type develops at a different age such that a fairly narrow age range can be estimated when multiple teeth are available. In this analysis, the Moorrees et al. (1963) system was applied (as modified by Smith 1991), which divides each tooth into fourteen stages, from the appearance of the first cusp until the final stage when the root apex closes, providing a tooth-dependent age for each stage. Dental eruption is the process of tooth emergence from the crypt until it is in occlusion (final position) in the tooth row. The age of tooth eruption was assessed using the dental eruption chart provided by Ubelaker (1989). Dental development is more tightly genetically controlled than eruption, but the entire pattern of development and eruption provides a reliable estimate of juvenile age (Ubelaker 1989).

Juvenile age can also be estimated based on rates and patterns of skeletal development. Long bones consist of a single diaphysis (shaft) and at least one epiphysis at each end that is separated from the diaphysis by a cartilaginous growth plate. Through the process of endochondral ossification, cartilage at the growth plate proliferates and is ossified, adding length to the shaft, and the child becomes taller until growth ceases and the growth plate fuses. Each epiphysis in the skeleton fuses at a different time, allowing for a fairly accurate age estimate if the skeleton is complete (Scheuer and Black 2000).

Multiple parts of certain bones of the skull, sternum, vertebral column, and sacrum fuse together to make a whole bone. For instance, the neonate mandible consists of left and right halves that fuse together at approximately 12 months of age. Similarly, each vertebra undergoes multiple fusion events (fusion of the posterior neural arch, fusion of the neural arch to the centrum, and fusion of epiphyseal rings), the timing of which varies by spinal region. Bone fusion times provided by Scheuer and Black (2000) are used to estimate age.

Diaphyseal measurements of juvenile long bones can also be used to estimate age, especially in fetal and infant skeletons. Scheuer and Black (2000) provide reference measurements from fetal to approximately 18 years of age that are used in these analyses. When dental and skeletal ages differ, dental ages are given preference since dental development is less plastic than skeletal development.

Adult age estimation

In contrast to skeletal and dental development in growing children, age estimates of adults focus on standardized degenerative changes of specific areas of the skeleton. Depending upon the preservation and availability of these indicators, the pubic symphysis (Brooks and Suchey 1990), auricular surface (Lovejoy et al. 1985), and cranial sutures (Meindl and Lovejoy 1985) methods were applied. The pubic symphysis and auricular surface techniques use certain age-related morphological changes among multiple features on each indicator. For instance, the pubic symphyseal face of a young individual has considerable topography, called ridges and furrows, that are less distinct in middle adult age and nearly non-existent among old adults, while a rim around the face forms in middle age and then breaks down in older age. The amount of closure of the major ectocranial sutures is examined, whereby the sutures become largely obliterated in old age (after approximately 50 years). This method provides rough estimates of early (20-35 years), middle (35-50 years), and old (50+ years) age.

Sex estimation

Sex cannot be reliably estimated from the skeleton until a juvenile reaches puberty, after which morphological differences between males and females become distinct. Thus, sex is only estimated for Monjukli Depe individuals for whom epiphyseal fusion is complete or nearly complete.

Sex estimation is based on the morphology of the pelvis and the cranium as well as measurements of the humeral and femoral heads, when available. Table 9.1 provides a list of the morphological features of the sexes for the pelvis and cranium. The Phenice characteristics of the pelvis are considered the most reliable; they include the ventral arc, ischiopubic ramus, and pubic concavity (Phenice 1969; Klales et al. 2012). The greater sciatic notch

Female	Male
ventral arc present	absence of ventral arc or straight ridge
ischiopubic ridge present and narrow ramus	wide inferior pubic ramus lacking ischiopubic ridge
subpubic concavity present	absence of subpubic concavity
wide sciatic notch	narrow sciatic notch
thin, short and narrow mastoid process	wide, thick mastoid process
smooth glabellar region	protruding glabella and supraorbital torus
thin, sharp supraorbital border	thick supraorbital border
gracile nuchal crest	robust, well-developed nuchal crest
small mental eminences	robust mental eminences

Table 9.1. Morphological features used to assess sex (based on Phenice 1969; Buikstra and Ubelaker 1994; Walker 2008; Klales et al. 2012).

Measurement	Female mean (mm)	Male mean (mm)	Sectioning point* (mm)	Classification Rate
maximum diameter femur head	42.05	48.4	45	0.88
humeral head diameter	42.47	48.81	46	0.83

Table 9.2. Univariate sectioning points for postcranial measurements from Spradley and Jantz (2011) for white males and females. *Values between the mean and sectioning point are considered ambiguous, and sex is not estimated.

and preauricular sulcus may also be useful (Buikstra and Ubelaker 1994). Sex features of the cranium include the relative robusticity of the nuchal crest, mastoid process, glabella, supraorbital border, and mental eminence (Walker 2008).

While cranial measurements are commonly used to estimate sex using discriminant function analysis, the adult crania recovered from Monjukli Depe were too fragmentary to measure. However, Spradley and Jantz (2011) have shown that certain measurements of the postcranial skeleton are superior to those of the cranium in estimating sex for black and white Americans. Measurements of the humeral and femoral heads, for example, have long been used for sex estimation, whereby the sexes are divided by a metric sectioning point (Stewart 1979). Table 9.2 provides the data for white males and females from Spradley and Jantz (2011) used in this study. While regression formulae utilizing measurements from multiple bones may be more accurate, few skeletons were sufficiently complete for measurement.

Stature

Adult stature can be estimated by measuring complete and fully fused long bones and applying a regression formula. The software program, Fordisc 3.1, provides regression equations for stature based on a reference sample of 20th century white and black males and females in the Forensic Data Bank (Jantz and Ousley 2005). This reference sample is employed as it has the largest size and encompasses the greatest variation. Estimates are reported with a 90% prediction interval. Since sex and ancestry are unknown for Monjukli Depe individuals, the "any" sex and ancestry reference sample in Fordisc was selected, as it incorporates the largest prediction intervals. All of the available skeletal measurements from the sample are provided here in Appendices A (juvenile measurements) and B (adult measurements).

Paleopathology

The skeleton contributes directly to the functions of hemopoiesis (blood cell production) and mineral metabolism and is thus susceptible to nutritional imbalances. In addition, bones provide the levers for movement, they support the body, and they protect internal organs, making them vulnerable to trauma. Because bone remodels relatively slowly, the skeleton may provide an historical record of disease and traumatic insults, including those that do not primarily affect bone. For instance, many types of non-skeletal cancers may metastasize to bone and a number of metabolic diseases can cause changes in bone through its mineral regulation or hemopoietic functions. Infections of other organs may also spread to bone. Thus, diseases as far ranging as anemia, multiple myeloma, Paget's disease, syphilis, and rheumatoid arthritis can leave detectable markers on the skeleton (Ortner 2003).

There are only two types of bone cells that directly affect bone morphology in response to disease or injury; osteoblasts deposit bone tissue and osteoclasts resorb bone. Thus, a bony response to insult is limited to only three possible responses – bone deposition, bone loss, or a combination of both. Despite these limitations, diseases and injuries can result in a myriad of morphological shape, size, and density changes. Certain diseases leave patterned responses on the skeleton that permit a specific diagnosis.

1. sex	5. bone formation, loss, or combination
2. age	6. bone shape or size
3. number of lesions	7. active, healing, or healed lesion
4. symmetry of lesions	8. skeletal distribution of lesions

Table 9.3. Parameters used to conduct a differential diagnosis.

The process of identifying specific diseases is called differential diagnosis, a step-wise exclusionary model in which abnormal conditions are systematically eliminated from a list of possibilities until only one or a few conditions remain. Some diseases can be eliminated based on sex or age incidence, morphology, or the distribution of lesions in the skeleton (Table 9.3).

Dental pathology

The dentition provides an important window into the diet and health of populations. Dental health is impacted not only by the nutritional content of the diet but also by the texture and chemistry of the food. The tooth is comprised of hard enamel overlying a softer material, dentin, which further surrounds the pulp cavity containing the blood and nervous supply for each tooth. One of the most common pathological conditions of the teeth is caries (cavities) that form due to bacterial erosion of the enamel. Carious lesions can penetrate into the dentin and pulp cavity and ultimately lead to abscesses (infection) and antemortem tooth loss. Calculus formation (plaque) is due to the accumulation of bacteria and their by-products on the tooth surface around the gum line. Calculus and caries formation are typically seen in high carbohydrate diets and/or when grittier foods or dental care are absent. In contrast, a diet consisting of a harder or grittier texture may result in significant occlusal wear such that the enamel is sheared away over time and the underlying dentin is exposed. While some occlusal wear is expected with advancing age, significant wear can be interpreted as a sign of diet composition (Hillson 2005; Larsen 2015).

Another commonly observed dental pathology occurs before the tooth erupts. Linear enamel hypoplasias, or LEH, refer to grooves in the enamel that form due to a temporary cessation of enamel deposition during tooth development. Ameloblasts are cells that lay down enamel, but their activity is susceptible to stress such that enamel formation may temporarily cease. An LEH typically appears as a horizontal depression across the tooth surface, although pitting can occur as well. The labial surfaces of the crowns of the mandibular canines and maxillary incisors are most susceptible to LEH (Goodman and Rose 1990). There are a number of regression formulae that have been developed to estimate the age of LEH formation (e.g., Massler and Schour 1941; Goodman and Song 1999; Reid and Dean 2000; 2006). These ages are typically between 1 and 5 years and are often interpreted as coinciding with weaning (Goodman and Rose 1990; Goodman 1993), although different methods provide different estimates of formation age making a primary interpretation as weaning stress tenuous (Łukasik and Krenz-Niedbała 2014). However, these methods depend minimally upon complete crowns lacking occlusal tooth wear and/or microscopic methods to view the microstructure of the teeth. In the case of Monjukli Depe, many of the crowns exhibiting LEH were incomplete, or crucial landmarks for measurements were obscured by calculus or stained by ocher. Thus, the frequencies of LEH are quantified, but the ages of formation are not calculated.

Skeletal pathology

There are a number of categories of pathological conditions that can affect the skeleton, although the first four are most common for ancient populations and are highlighted here (Table 9.4). Some individuals may exhibit multiple pathologies related to a single underlying condition. For instance, fractures can occur due to direct trauma to a bone, such as in a blow or a fall, or can occur as a pathological condition when bone is weakened by osteoporosis, a metabolic disease, or cancer.

Bone fractures are traumatic disruptions of bone tissue that result in complete or incomplete fragmentation of the bone. Fracture healing involves the formation of a callus, first comprised of fibrous tissue and/or cartilage, then replaced by bone to produce a "hard" callus. The callus will remodel over time but is often still visible as a raised area of bone many years after the fracture event. Complications of fracture may include infection, deformation of healed bone if the fracture ends were not realigned properly, and pseudoarthrosis (Ortner 2003; Wedel and Galloway 2013).

Infectious diseases are those that are spread from one host to another. Bacteria may enter a bone directly, such as when a bone fractures, or disseminate from another entry site in the body, as in tuberculosis. Osteomyelitis is an infection of the bone marrow that often results in significant bone modifications. The presence of a cloaca, or defect in the bone where pus and other infectious byproducts drain from the marrow cavity, is pathogenic for pyogenic (pus forming) osteomyelitis. However, osteomyelitis can also cause significant expansion of the bone without cloaca formation (Ortner 2003).

1. fractures	5. cancers
2. infectious disease	6. endocrine
3. metabolic disease	7. circulatory
4. rheumatic disease	8. congenital

Table 9.4. Categories of skeletal pathology.

Periostitis is a common skeletal finding associated with infection and trauma. It refers to an inflammation of the periosteum, a connective tissue sheath that surrounds the external surface of a bone that stimulates underlying osteoblasts to lay down new bone on top of the existing cortex. This new, or "active," bone formed is very thin, discolored, disorganized, and porous due to new blood vessels. An active periosteal lesion has a loose connection to the bone and flakes off easily. As a periosteal lesion heals, the new bone matures, pores are filled in, and the margins of the lesion become incorporated into the underlying bone. A healed lesion is fully integrated into the cortex and may be difficult to detect except as an abnormal elevation on the bone surface. Except when periostitis is directly associated with a healing fracture callus or an osteomyelitic lesion, it is typically difficult to assess its cause, and it is therefore considered a "non-specific" indicator of stress or infection.

Some infectious diseases predilect certain bones, thereby creating a pattern of skeletal changes that permit a specific diagnosis. For instance, *Mycobacterium tuberculosis* typically infects the lungs or digestive system but can later spread to the bones. The mycobacteria require a high oxygen load and therefore settle in bones and bony elements that have a good blood supply, including the vertebral bodies, hip and knee joints, ribs, and the skull vault. Tuberculosis is also primarily a lytic disease whereby the bacteria cause resorption of the affected bones. Extensive resorption of the vertebral bodies may lead to vertebral collapse and kyphosis ("Potts Disease"). Tuberculosis can also result in the destruction of major joints. Tuberculosis expression in the ribs comprises periosteal deposition and/or lytic lesions on the pleural (internal) aspects of the ribs (Kelley and Micozzi 1984; Matos and Santos 2006; Nicklisch et al. 2012).

Metabolic diseases are those that alter the normal biochemical pathways related to the conversion of food to energy. Metabolic bone diseases are caused by abnormalities in mineral homeostasis and include osteoporosis, vitamin deficiencies, and hyper- and hypoparathyroidism. Some metabolic diseases leave skeletal markers, although these are largely non-specific to a particular condition. For instance, porotic lesions of the skull vault (often referred to as porotic hyperostosis) and orbits (cribra orbitalia) exhibit a spongy, hypervascular appearance and can have multiple etiologies. Iron-deficiency anemia, for instance, increases blood cell production in the diploe of the skull to attempt to create more hemoglobin to carry oxygen to the tissues. This may manifest itself as diploic expansion through the outer table of the vault and orbits, causing the spongy appearance. Hemolytic anemias, as well as scurvy and trauma, can also create porous lesions through different mechanisms (Walker et al. 2009). Scurvy results in periosteal deposition on the bone surface around hemorrhaged blood vessels weakened by vitamin C deficiency. Scurvy can be diagnosed based on the pattern of lesions that typically occur around the greater wing of the sphenoid, zygomatic, mandible, and maxilla as well as the vault, orbits, and long bones (Ortner et al. 1999; 2001).

Rheumatic diseases include over 100 specific conditions that affect bones, joints and connective tissue that have a variety of etiologies and expressions. For instance, autoimmune diseases cause lupus and rheumatoid arthritis, while gout is caused by diet, and osteoarthritis is due to long-term wear-and-tear or trauma. Osteoarthritis is the most common rheumatic disease in prehistory and among contemporary populations. The loss of articular cartilage that caps each bone surface within a joint will lead to bone-on-bone contact, which in turn causes subchondral pitting, erosion, and eburnation (polish) on the joint surfaces (Rogers and Waldron 1995). Compensatory bony osteophytes around the periphery of the joint ("lipping") is also a sign of osteoarthritis. Lipping of the vertebral column as well as the porosity of the articular surfaces indicate osteoarthritis of the spine. Any synovial joint of the body can be affected by osteoarthritis, but high-use joints are especially susceptible, such as the knee, shoulder, and elbow. Some bioarchaeological studies examine the distribution of arthritis in the skeleton to infer certain habitual or occupational activities (Jurmain 2013; Larsen 2015).

Burial descriptions

I turn now to the specific case of the human remains from Monjukli Depe. The skeletal remains of each individual recovered from the site between 2010 and 2012 were cleaned with a tooth brush and water and laid in anatomical position on a table for inventory and analysis. Care was taken to preserve ocher and organic material that might be adherent to the bone. Commingled individuals within a single burial were segregated and enumerated. The nomenclature MDB refers to Monjukli Depe Burial, followed by the burial number; these numbers are the same as those used in Chapter 8. The locus refers to the context within an excavation unit in which the burial was recovered. Differential diagnosis of specific conditions is provided in the discussion below.

MDB1, locus A33

MDB1 is a relatively well preserved and complete skeleton of a juvenile recovered from the center of room 1 in Building 1. The skull is fragmentary and incomplete, although the postcranial bones are better preserved, and the long bones can be measured (see Appendix A). The left maxilla and most of the mandible are missing, although the teeth are present. Red ocher adheres to many of the bones, especially the skull, ribs, and right arm bones, such that observation of the bone surfaces is difficult.

Demography
All of the deciduous dentition is in occlusion, indicating an age above 2 years. The developing crowns of the first permanent mandibular molars are in their crypts, as is the right mandibular second molar. The nearly complete left mandibular canine crown can also be observed in its crypt. Overall the dental age is consistent with an assignment of 2-4 years.

The petrous bone is fused to the temporal and the mandibular symphysis is fused, both indicating an age greater than one year. The lumbar neural arches are fused to each other but not to the bodies, indicating that the age is above 1 year and less than 4 years. Age based on measurements of the limb bones is 1.5-2 years, while the clavicle length indicates an age of 2-4 years. Emphasizing the dental development, the final age estimate of the individual is 2-4 years.

Dental pathology
The permanent maxillary left first incisor crown, which was still developing in the tooth crypt, exhibits a linear enamel hypoplasia.

Skeletal pathology
The right femur exhibits an active periosteal reaction on the lateral midshaft. The lesion is about 6 cm long (proximo-distal) and about 1 cm wide across the lateral shaft. The boundaries are fairly well defined, and the lesion is gray in color. Slight healing is evident at the margins.

The left femur exhibits sclerotic periostitis on the posterior proximal shaft. This also measures about 6 cm by 1 cm, but healing is more advanced than the lesion on the right femur. The mixed healing status indicates a chronic reaction, perhaps to a trauma, although the etiology cannot be determined.

MDB2, locus C5
MDB2, locus C5 (individual 2.2 – see Chap. 8) is a fragmentary and incomplete juvenile found scattered within a grave shaft above locus C29, an adult (individual 2.1). The remains consist of a partial vault, teeth, a few ribs and vertebrae, lower arm bones, lower left leg bones, right leg, and the left ilium. Many animal bones are commingled with the human bone, as is a right lateral occipital portion of an older infant. The MNI of the assemblage attributed to locus C5 is therefore two individuals.

Demography
The incisors have erupted, but root development is incomplete, suggesting an age of 12-18 months. The canines and first molars are still erupting, indicating an age of 12-24 months. The lumbar neural arches have fused to each other but not to the centra, and the lateral part of the occipital is still separate, indicating an age of 12-24 months. The mandible is fused in the midline, which also occurs around the age of 12 months. The metopic suture is fused, which usually occurs before the age of two years. The ulna and radius measurements indicate a slightly younger individual, 6-12 months. However, the majority of the skeletal and dental development indicate an age of 1-2 years.

Dental pathology
No dental pathological conditions were observed.

Skeletal pathology
Both orbits exhibit thick sclerotic porosity consistent with cribra orbitalia (Fig. 9.1a). The left orbit is fractured near the midline and demonstrates that new bone has also been deposited on the external table of the orbit and the diploe has not expanded (Fig. 9.1b). While there may be some new activity, the lesions appear to have been healing at the time of death. No porosity of the vault is observed except near the glabella. As mentioned previously, these lesions are likely caused by a metabolic disease, although a specific etiology cannot be determined.

The tibia (possibly from the right side) exhibits fusiform expansion and cortical thinning of the entire diaphysis (Fig. 9.2). The deposition appears mainly to be on the anterior surface and is mostly well healed, though some sclerotic porosity is still visible on the anterior and distal shafts. The overall effect has created an anteriorly bowed appearance of the tibia. A fibula, likely from the right side, also exhibits some diaphyseal expansion compared to the other fibula. This is mainly confined to the midshaft and is well healed. Such a pathology in an individual of this age could be related to a metabolic disease indicated in the orbit, but there is not enough information to make a specific diagnosis.

MDB2, locus C29
The remains represent a single adult female (individual 2.1) buried at the base of a grave shaft that included MDB2 locus C5 and one bone of another infant in the upper layers. The skeleton is mostly complete, including most of the foot and hand bones, but fragmented. The ribs and vertebrae are poorly preserved as are the lower leg bones. Salt crystals have formed on the inside of the vault bones, which has resulted in some erosion. Some of the long bones can be measured for stature.

Demography
Sex and age estimation are hampered by the lack of pubic bones. However, sex is estimated as female based on deep and broad preauricular sulci and very wide greater sciatic notches. However, the supraorbital margins are very thick and the right supraorbital torus is well developed, indicative of male sex, although the mastoid processes are

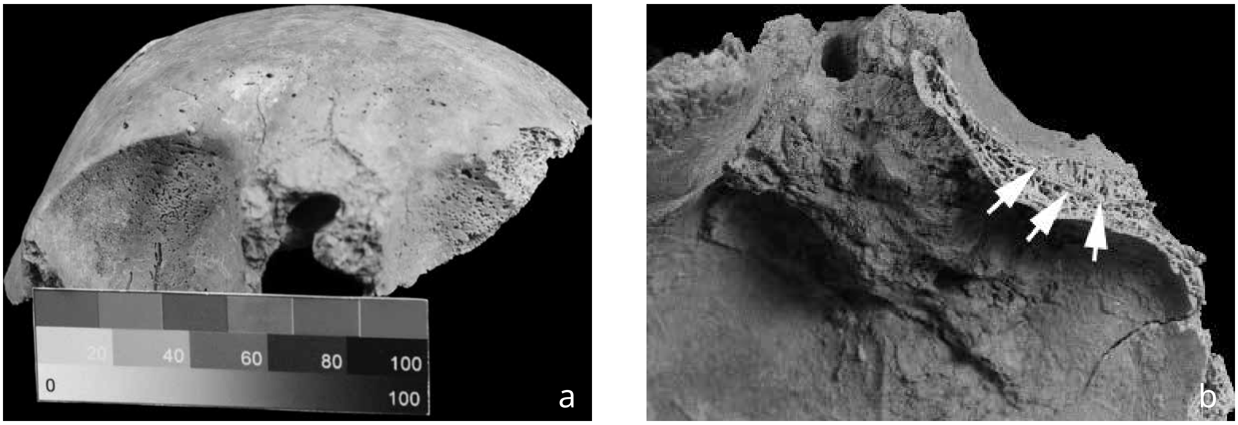


Fig. 9.1. a) Anterior view of the frontal bone exhibiting healing cribra orbitalia in both orbits of MDB2 locus C5; b) Interior view of the left orbit. Note that the external table is still present (arrows), indicating new bone was laid down on top of the cortex rather than diploic expansion.

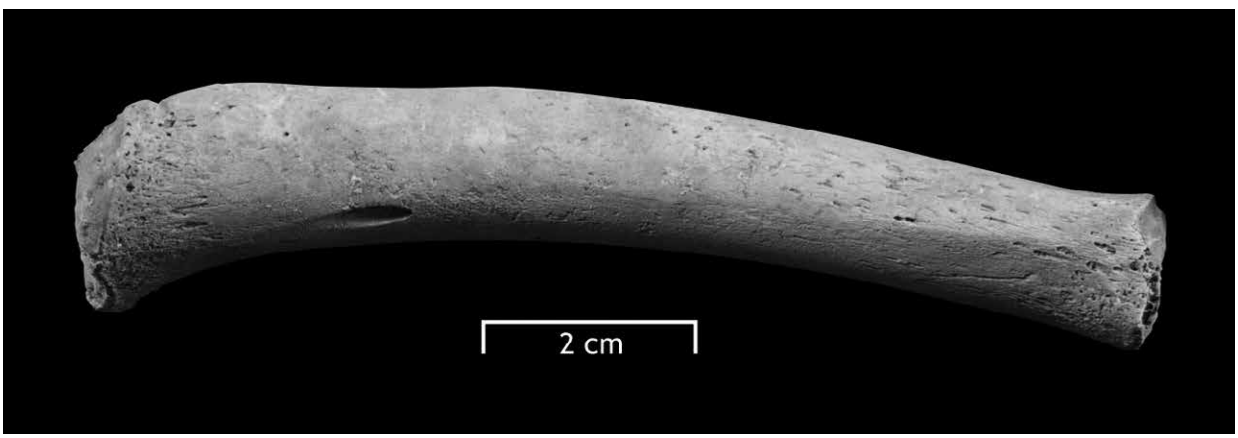


Fig. 9.2. Bone formation and bowing of a tibia of MDB2 individual 2.2. Proximal end is to the left.

very small and the nuchal crest is gracile. Robusticity of the orbit area is common in older females (Walker 2008). The humeral head measurement, 41.8 mm, is within the female range described by Spradley and Jantz (2011). Thus, the individual is estimated to be female.

The pubic bones are missing and the auricular surfaces are possibly pathological, leaving only the skull for age estimation. The lateral-anterior sutures of the vault are missing and the vault sutures are completely open, suggesting a young individual. However, given that the bones are light and porotic and tooth wear is heavy, it is unlikely that this individual was a young adult. Moreover, there is much osteoarthritis of the lower spine and hands. Based on these indicators, the age is estimated to be over 50 years.

Long bone measurements of the humerus, ulna, radius, and femur facilitated stature estimation. Using the Fordisc 3.1 20th century reference sample for "any" sex and ancestry affiliation, the 90% prediction interval is 157-172cm.

Dental pathology

All of the teeth exhibit severe occlusal wear, especially the anterior teeth, although there are no caries. A ring of enamel is present around the perimeter of each tooth, but dentin exposure is significant on all teeth (Fig. 9.3). Two linear enamel hypoplasias are observed in the right mandibular canine, but most teeth are too worn to score for LEH. There is antemortem loss of the mandibular right first premolar and left third molar as well as the maxillary right first molar and left first premolar. An active abscess is present at the root of the right mandibular second premolar. Healed abscesses are present below the right first and second molars as well as the left first and second molars. There is a great deal of alveolar recession of the mandible such that the alveolar sockets of the anterior teeth are very shallow.

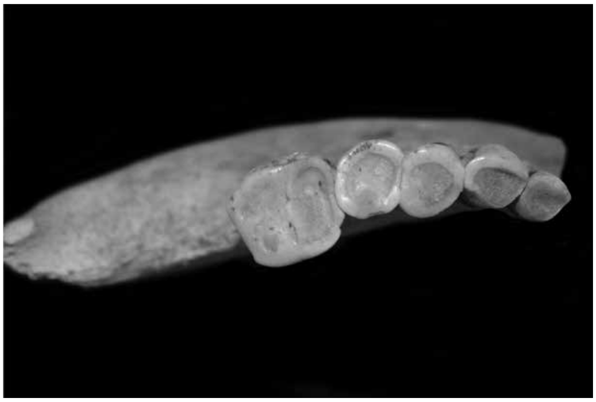


Fig. 9.3. Heavy occlusal tooth wear on the left mandibular dentition of MDB2 individual 2.1. Note only a small ring of enamel around each occlusal surface.

The maxillary dentition lacks abscesses but does exhibit heavy wear on all available crowns. The enamel has been completely removed by wear on the occlusal surface of the left maxillary canine and lateral incisor. There is rotation of the central maxillary incisors away from each other, and the right canine is rotated 90 degrees such that the lingual surface is facing the right lateral incisor.

Skeletal pathology

The bones of this individual exhibit generalized osteoporosis, especially of the vertebrae, as well as multifocal osteoarthritis. Arthritic changes observed are subchondral pitting and some marginal lipping but little eburnation (Fig. 9.4). Joints affected include the shoulders, cervical and lower lumbar vertebrae, right sacroiliac joint, the right knee, both ankles, both wrists, and the phalanges of both hands. Osteoarthritis typically results in joint stiffness and pain, but a definitive statement about mobility restriction is speculative.

MDB3, loci C23 and C150

This burial represents the complete skeleton of a juvenile recovered from Building 8. The burial was partially excavated in 2010 (as locus C23) and then recovered completely in 2011 (designated locus C150). An osteological review confirms that the bones excavated during the two field seasons are of a single juvenile individual. The bones are robust and well preserved. The skull and long bones exhibit postmortem fractures, likely due to the presence of mud bricks that were observed on top of the body.

Demography

The epiphyseal fusion pattern of the skeleton is consistent with an age of 14-16 years. The major long bone epiphyses are still fusing. In particular, the distal radius epiphysis is fusing on the right but open on the left, and the proximal humeral and distal ulnar epiphyses are open. The tibiae exhibit epiphyseal lines both proximally and distally. The iliac crest is fusing on the right but the epiphysis is still separate on the left. The medial and lateral clavicular epiphyses are open. The rib head epiphyses are fully fused, as are those of the hands and feet. The only epiphyseal ring beginning to fuse is on the inferior centrum of the fourth cervical vertebra. The third molars have fully erupted.

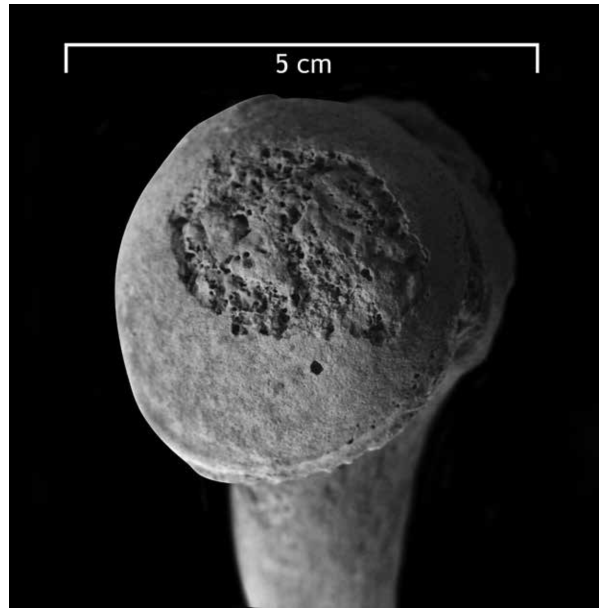


Fig. 9.4. The right humeral head of MDB2 individual 2.1 exhibiting subchondral bone loss typical of severe osteoarthritis.

The features of the skull and pelvis are consistent with male sex, but the young age of this individual makes sex estimation unreliable. The left greater sciatic notch is narrow, the ischiopubic ramus is wide and flat, and there is no subpubic concavity or ventral arc. There is a trace of a preauricular sulcus on the right os coxa. While the pelvic indicators could be male, it is possible that the secondary sex characteristics have not yet developed in a female of this age. The mastoid processes are relatively small. There is no supraorbital area to observe. The superior nuchal crest is not well developed. This cranial morphology is relatively gracile, but a young male cannot be excluded. Thus, the sex of this individual cannot be reliably estimated.

The limb bones are quite long, indicating that the individual was fairly tall. While most of the long bones were too fragmentary to measure accurately with an osteometric board, a tape measure was used to obtain a left tibial length of 420 mm (the epiphyses of which were fused). The 90% prediction interval is 172-190.8 cm.

Dental pathology
Linear enamel hypoplasias are observed on the buccal surfaces of the left maxillary first molar as well as both mandibular first molars. All four canines exhibit three LEH per tooth, and the mandibular left lateral incisor exhibits two LEH. Light occlusal wear is observed on the molars. Slight to moderate calculus formation is observed on the mandibular incisors and canines and maxillary right first molar, first premolar, canine, and lateral incisor as well as the left canine, second premolar, and first molar. A healed abscess is present on the left mandibular second molar. Caries are observed on the buccal surfaces of the right mandibular first and second molars.

Skeletal pathology
No skeletal pathology was observed.

MDB4, locus B87
This is a nearly complete juvenile skeleton that was found in room 4b of Building 4. The skull is highly fragmentary but relatively complete. The pelvis, vertebral column, hands, and feet are complete. The long bones are intact and measurable.

Demography
All of the deciduous teeth are in occlusion. The first permanent maxillary molar crowns are nearly complete, as are the left and right mandibular canines and left mandibular second incisors, although none have erupted. This indicates an age of 2-4 years. The age based on postcranial measurements also indicates an age of 2-4 years.

Pathology
No pathological conditions are observed on the teeth or bones.

MDB5, locus D70
This juvenile skeleton was recovered from a complex grave shaft that was heavily disturbed by previous excavations. The skeleton consists only of the lower legs and feet and one cranial fragment. However, it is likely that bones recovered from an unlabeled assemblage also belong to this individual (see below). Red ocher covers most of the bones, especially the foot bones.

Demography
A reliable estimate of age is difficult because only the lower leg and foot bones are present. The length of the left tibia (224 mm) indicates an age of 5.5-7 years (Scheuer and Black 2000).

Skeletal pathology
A small patch of active periostitis is present on the medial aspect of the distal left tibial shaft. It measures 3 x 1 cm. The periosteal bone is porous and is not incorporated into the underlying bone. There may be other lesions but most bone surfaces are occluded by ocher.

Unlabeled assemblage (reassociated with MDB5 locus D70)
This is an unlabeled assemblage of juvenile human bones, nonhuman bones, stone, and one adult phalange that was stored with other skeletal material from Monjukli Depe. The juvenile remains consist of a portion of the mandible, the right os coxa, left ischium, right radius and ulna, and left and right femora. None of these bones are redundant with those from locus D70. As indicated below, the age is also consistent with locus D70 as is the general size, pathology status, and taphonomy (the bottoms of these bones are also covered in ocher). The bones have therefore been reassociated with MDB5 locus D70.

Demography
The dentition is represented only by the anterior mandible. The two permanent central incisors are missing postmortem, but the permanent lateral incisors are erupting and can be seen in the crypts. The roots are half formed, indicating an age of 5.6-6.6 years. Measurements of the right ulna, right radius, and left femur indicate an age of 5.5-7 years, which is the same as that estimated for the tibia from locus D70.

Pathology
A lesion of active periostitis is observed along the lateral aspect of the right femoral midshaft, measuring approximately 6 x 1 cm (Fig. 9.5). The bone is disorganized in the middle but the margins were becoming incorporated with the underlying bone. A periosteal lesion of similar size is observed on the proximal shaft of the posterior left femur. This also measures 6 x 1 cm but is more advanced in healing. Note that the left tibia of locus D70 also exhibits active periostitis.

MDB6, locus D278
Burial MDB6 comprises a well-preserved and nearly complete fetal/perinatal skeleton recovered at the base of wall D55.

Demography
Only the crowns of the deciduous central maxillary and central mandibular incisors are present, and none have erupted. No permanent teeth have formed. The basilar bone measurement indicates a fetal age of 35-36 weeks, while the clavicle and ilium lengths indicate an age of 36-40 lunar weeks. The long bones of the arms and legs are consistent with an age of 36-38 lunar weeks. The occipital components or other bones have not begun to fuse. Thus, the age estimate is 36-40 lunar (prenatal) weeks.

Fig. 9.5. Active periosteal lesion on the right femoral midshaft of MDB5.

Pathology
No pathological conditions are observed.

MDB7, locus D168
This is a nearly complete but fragmentary skeleton of a young adult recovered from the Eastern Midden. Red ocher adheres to the skull, mandible, long bones, vertebrae, and some ribs.

Demography
The skeleton is not yet fully mature. The long bone epiphyses have fused, but the medial clavicles are unfused and the iliac crest and vertebral epiphyseal rings are still fusing. The third molars have fully erupted, and the apices are closed. An overall age estimate based on these developments is 17-21 years.

Sex cannot be estimated reliably, as the os coxae are too damaged for analysis and the nuchal crest and mastoid process are of intermediate robusticity. Moreover, the diameters of the femoral and humeral heads (45.16 mm and 44.7 mm, respectively) are near the sectioning points for males and females.

A stature estimate of 163.8-182.9 cm is based on the left humerus length.

Dental pathology
The maxillary dentition is nearly complete, with the exception of the left first molar that is only represented by a root. The right second premolar is rotated mesially within the tooth row. Calculus is observed on the buccal surfaces of the left first and second maxillary premolars and circumferentially on the right maxillary first molar. Linear enamel hypoplasias are observed on the maxillary central incisors (two LEH on the left central incisor) and each of the mandibular central and lateral incisors, the right central incisor exhibiting two LEH. Superficial pitting of the crowns is noted, particularly on the molars, likely due to grit in the diet.

The mandibular dentition is also complete, although the left molar crowns are separated from the roots. A small carious lesion is observed on the occlusal surface of the left mandibular third molar crown. Heavy wear is present on the first incisors and first molars, especially on the left. Calculus formation is observed on the buccal surface of the left second molar and the lingual surfaces of the left premolars, canine, and incisors as well as the right second incisor.

Skeletal pathology
Skeletal pathological conditions are found in the lower vertebral column as well as on three lower ribs (Fig. 9.6).

The eleventh and twelfth thoracic vertebrae (T11 and T12) as well as the first two lumbar vertebrae (L1 and L2) exhibit multifocal bone loss within the centrum. These four vertebrae are contiguous within the vertebral column but there is no vertebral collapse or kyphosis. T10 is missing and therefore cannot be observed.

The entire inferior half of the centrum of T11 has been resorbed. Two additional lytic areas are visible within the centrum but do not penetrate the superior centrum surface. The lesion surfaces are smoothed (sclerotic) and there is no evidence of new bone formation (Fig. 9.6a).

T12 exhibits bone resorption on the superior centrum via multiple lytic foci, although the destruction is not as extensive as that of T11. There is again a slightly sclerotic reaction in the trabeculae but no large-scale healing response (Fig. 9.6b).

L1 exhibits multiple lytic foci in the superior centrum with sclerosis. There is also a deep cavernous lesion that exits the centrum posteriorly below the central canal (Fig. 9.6c).

Multiple lytic foci are observed on the right half of the superior centrum of L2 (the left half of the centrum is missing). There is also perforation of the posterior wall of the centrum superior to the central foramen. No sclerotic bone or any other signs of healing are observed.

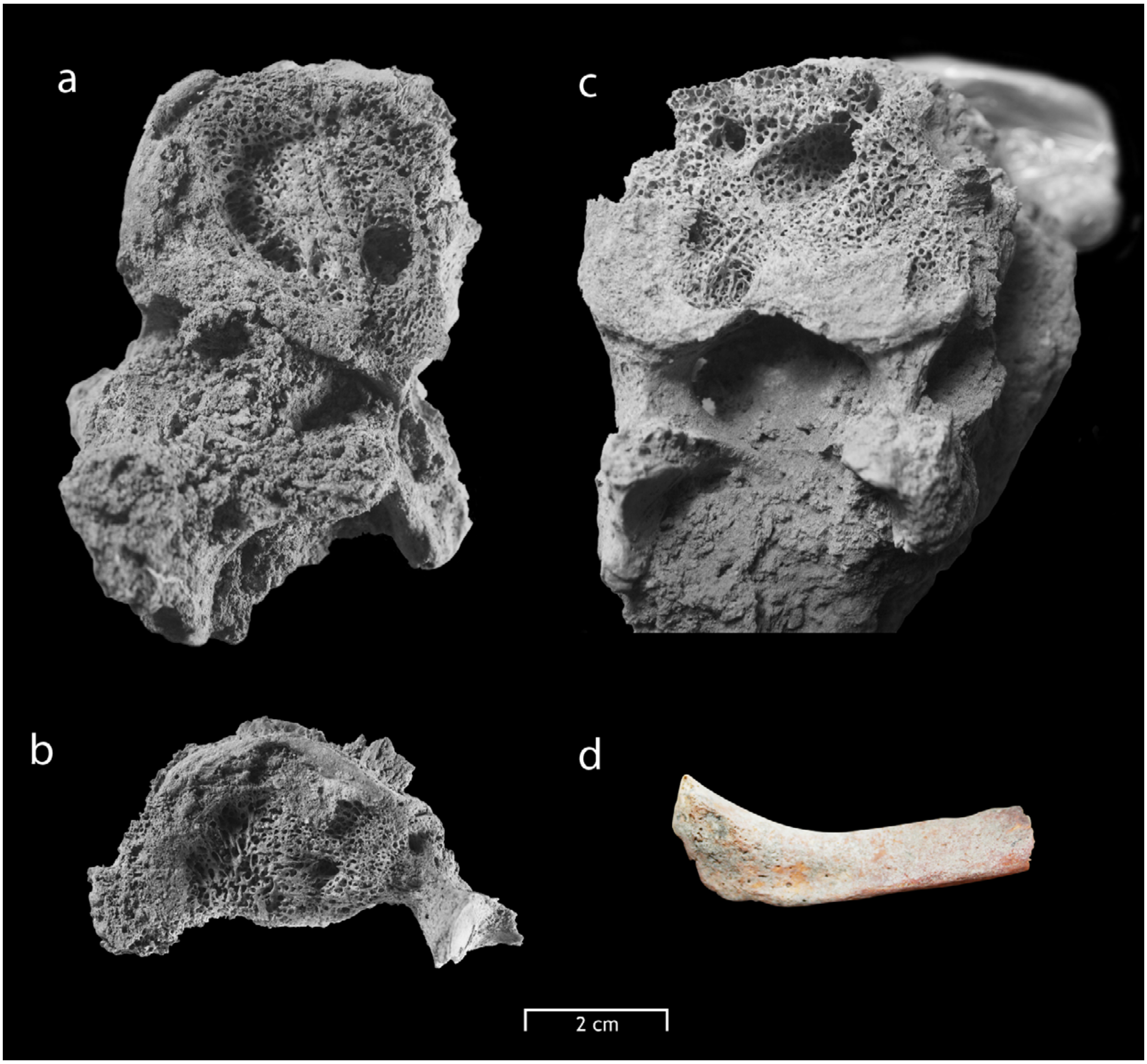


Fig. 9.6. Lytic lesions of a) T11, b) T12, c) L1, and d) a rib of MDB7.

Left rib 11 and another rib, which may be left rib 12 or right rib 11, exhibit healing periosteal bone deposition on the inferior surfaces of the rib necks, immediately behind the rib head. The inferior surface of an unsequenced lower right rib has a large lytic lesion with sclerosis on the ventral aspect of the inferior neck (Fig. 9.6d). This lesion measures 2.5 cm long. These lesions on the ribs and vertebrae are consistent with extrapulmonary tuberculosis (Buikstra 1976).

MDB8, locus E229

Locus E229 is an incomplete but well preserved neonate skeleton recovered from room 2b of Building 2. There is no ocher or other adhering material, although ocher was noted on the bones at the time of excavation.

Demography

The deciduous dentition is still forming, with the crowns partially complete, indicating an age of birth to 6 months postnatal. The measurements of the long bones are consistent with a prenatal age of 38-40 weeks or neonate. The petrous bone is not fully fused to the temporal and the vertebral neural arches are unfused, indicating an age below one year. This individual appears to be a neonate, slightly older than MDB6. The estimated age is 0-6 months.

Pathology
There are no observable pathologies on this individual.

MDB9, locus E237
This is a well-preserved partial infant skeleton associated with Building 12. The burial was disturbed by an animal burrow. The skull and torso are present, although many elements of the inferior half of the skeleton are missing. Red ocher is present on the surfaces of the vault, long bones, and ribs, which obscures the bone surfaces.

Demography
All of the deciduous crowns are still developing, indicating an age of 0-6 months. The ulna and humerus measurements indicate an age of 3-6 months. The petrous bone is fusing to the temporal on the right side but not the left. The lateral parts of the occipital are unfused to the squamous. The metopic suture is still open. None of the neural arches have fused. These indicators suggest an age less than one year old. An age range of 0-6 months is estimated.

Pathology
There is no observable pathology.

MDB10, locus G66
A semi-flexed skeleton of a young adult was recovered from the northwestern part of Unit G. The body was placed on a bed of red ocher and ash. While the skeleton is largely complete, the skull, vertebral column, pelvis, and ribs are highly fragmentary. Ash and ocher adhere to the dependent surfaces of the bones.

Demography
Most of the long bone epiphyses have fused, although the rib heads, medial clavicle, and epiphyseal rings of the lower thoracic and upper lumbar vertebrae are still fusing. Sacral vertebrae 1-2 and 2-3 are still open. The iliac crests are still fusing, although the ischial tuberosities appear to be complete. All of the limb bone epiphyses are fully fused. This pattern suggests an age of 17-25 years. The right pubic symphysis exhibits all ridges and furrows indicating a young individual who has not progressed beyond Suchey-Brooks phase 1 for females (19.4 ± 2.6 years, 95% range of 15-24 years).

Sex is estimated as female by Fordisc 3.1 based on the long bone measurements of the right clavicle and right arm bones. In addition, the humeral head diameter of 39.7 mm is well within the female range. Furthermore, the nuchal crest is gracile, the mastoid processes are relatively thin, and there is no supraorbital torus. The supraorbital margin is thick and blunt, as was also observed in MDB2. The left os coxa shows a wide and deep preauricular sulcus. The greater sciatic notch is not preserved on either side.

Fig. 9.7. Occlusal tooth wear of the right mandibular dentition of MDB10 as well as a small caries on the left third molar (indicated by the arrow).

Stature is estimated as 146.5-165.1 cm based on measurements of the arm bones.

Dental pathology
The left and right mandibular canines each exhibit two linear enamel hypoplasias. There is antemortem loss of the mandibular left central incisor. The left mandibular second premolar has a large interproximal caries as well as an active abscess on the buccal surface. The third right mandibular molar exhibits one carious lesion on the buccal surface as well as pinpoint caries on the occlusal surface (Fig. 9.7). The maxillary third molars are not present and may not yet have erupted. Slight calculus is observed on most teeth. Moderate wear is observed on all of the teeth, particularly the molars.

Skeletal pathology
There are porotic lesions of both orbits and the right side of the vault. The left orbit exhibits active porosity on the superior and medial aspects. The orbit was recently broken into two parts allowing a cross-section to be seen. No external table or table remnant can be observed, suggesting that it might have been destroyed by diploic expansion. The right orbit exhibits a more sclerotic reaction.

Vault porosity is observed on the anterior right parietal and both inferior temporals. The right parietal has sclerotic pinpoint porosity in a fairly circumscribed region anterior to the parietal boss and another near the sagittal suture. The right temporal exhibits pinpoint porosity that may be more active just superior and anterior to the zygomatic root (Fig. 9.8). The left temporal area shows a denser area of porosity in the same region that also appears to be active. Together, these lesions are indicative of a metabolic disease such as scurvy or anemia.

MDB11, locus D564
The skeleton of an adult was recovered from the buttress of Building 14. The skeleton lay on top of ocher and ash.

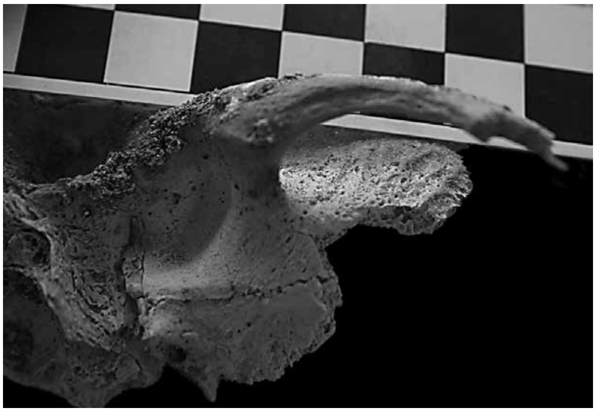


Fig. 9.8. Dense porosity on the anterior left temporal bone of MDB10. This individual also exhibits porotic hyperostosis and cribra orbitalia and represents a probable case of scurvy.

The skeleton is nearly complete and the bones are quite robust, although fragmentary. Measurement of the long bones for stature is not possible.

Demography

The pubic symphyses are missing and cannot be utilized for age or sex estimation. The individual is skeletally an adult given that all dental and skeletal development is complete. The Meindl and Lovejoy (1985) ectocranial suture closure method was applied to estimate the age of the individual as the vault is largely intact. Most of the vault sutures were obliterated, and the cumulative vault score of 17 indicates a mean age of 48.8 ± 10.5 years. The left auricular surface shows macroporosity, an irregular face, marginal lipping, and no transverse organization. The retroauricular area is missing. These characteristics are typical of Phase 7-8 in the Lovejoy et al. (1985) auricular surface method, giving an age estimate of 50+ years.

Sex is based on skull morphology and postcranial measurements. The left os coxa exhibits a well-developed pre-auricular sulcus and a moderately broad greater sciatic notch, but these features are not nearly as developed as in MDB2 individual 2.1 and MDB10, who were estimated as female. The nuchal crest is moderately well defined and the mastoid processes are relatively thick, but the supraorbital torus is gracile. The supraorbital rim is blunt and thick, however, further suggesting male sex.

Only a few bone measurements could be taken due to the fragmentary nature of the skeleton. The femoral and humeral head diameters measured 44.37 mm and 43.97 mm, respectively. These measurements are in between the sectioning points for males and females, so they are not informative of sex. These measurements, as well as the maximum left calcaneus length were entered into Fordisc 3.1 and compared to the reference samples of white and black males and females. While the measurements are more consistent with females in the reference samples, the posterior probabilities are very low, and Fordisc was unable to discriminate between the sexes. While these indicators are not strongly suggestive of either sex, the individual was likely quite tall and the bones are very robust, suggesting probable male sex.

Stature is based only on the left calcaneus (86 mm) and is estimated as 162.6-185.4 cm using a 90% prediction interval.

Dental pathology

The maxillary dentition exhibits a large amount of antemortem tooth loss and heavy occlusal wear on the remaining teeth. There is antemortem loss of the left maxillary premolars and first molar, while the maxillary right first premolar has an active buccal abscess and that tooth has been lost antemortem. There is also an active abscess of the right maxillary central incisor (Fig. 9.9). Occlusal attrition has completely eliminated all of the cusps of the remaining teeth, precluding an analysis of linear enamel hypoplasias.

The mandibular dentition also exhibits heavy wear, especially on the anterior teeth, but to a slightly lesser degree than the maxillary teeth. Active abscesses are observed on both roots of the right first molar, and that tooth also exhibits an interproximal caries. The left central incisor was lost antemortem. Moderate to heavy calculus formation is observed on most teeth.

Skeletal pathology

Osteoarthritis is present in many joints of the skeleton, particularly the right elbow, both knees, and both ankles. There is severe eburnation and surface pitting among most of the available thoracic articular facets, particularly the inferior facets. This appears to be most severe in the middle thoracics. Likewise, the rib heads and tubercle facets are enlarged and porotic with marginal lipping. The right knee and ankle exhibit more extensive arthritic changes than the left, and the calcaneus/talar joint is especially severe.

Enthesopathy, or ossification of the ligamentous attachments to the bones, is observed on the right tibia, fibula, and patella. These can occur due to local trauma, age, or certain diseases. The etiology in this case is unclear.

There is generalized osteoporosis/osteopenia, especially notable in the vertebrae and ribs. Some of this may be due to preservation, but these bones are especially friable and light.

MDB13, locus A2

MDB13 is an incomplete skeleton of a juvenile recovered from the Eastern Midden in Unit D. It was likely disturbed during previous excavations. The right pectoral girdle and lower right leg are missing, as are the upper cervical

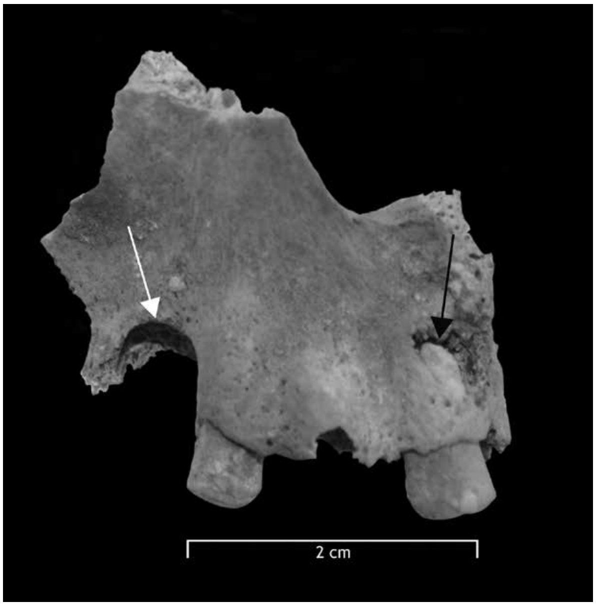


Fig. 9.9. Abscesses at the roots of the right maxillary incisor (black arrow) and right first premolar (white arrow) with loss of that tooth, MDB11.

vertebrae, head, and most of the left leg. Some cranial fragments and most of the teeth are present, however. Animal bone is commingled with the human remains. No ocher or ash is present.

Demography

All of the deciduous teeth have been replaced by the permanent dentition. Age based on tooth development of the premolars and anterior teeth ranges from 8-12 years. Length measurements of the radius and humerus indicate an age of 8.5-9.5 years. All of the vertebral neural arches have fused but the sternum has not begun to fuse, suggesting an age below 10 years. The ischiopubic rami have not fused, indicating that the individual may have been less than 8 years old. Measurements of the right humerus and ulna indicate an age of 8.5-9 or 9.5 years. Together, the dental and skeletal evidence indicate that the individual was between 8 and 12 years at death.

Dental pathology

Two linear enamel hypoplasias are observed on the left lateral maxillary incisor. Heavy calculus is present on the mandibular incisors. No abscesses or caries are observed.

Skeletal pathology

There are no observable skeletal pathological conditions.

Loci D163a and D163b

These loci represent an assemblage of human and nonhuman bone rather than a discrete burial. The remains were found in the southeastern quadrant of Unit D near MDB7. The assemblage includes a human juvenile left mandible, three adult teeth (two mandibular canines and a right second mandibular incisor that may belong to the same individual), and approximately 20 nonhuman bone fragments. The burial drawing and notes indicate that this is a flexed burial with legs drawn up, but no leg bones are present in the assemblage. The juvenile mandible is designated Locus D163a and the adult teeth are Locus D163b.

The juvenile mandible consists of empty sockets of the left second and first deciduous molars and the left deciduous canine, but no teeth are present for aging. Assuming that these deciduous teeth were fully erupted, the individual was likely less than 10 years of age. Mandibular measurements are not possible due to the fragmentary nature of the bone. A more specific age of the adult teeth (locus D163b) cannot be estimated.

Based on provenience, it is possible that the remains of locus D163 could belong to MDB7 or MDB13. However, both burials can be eliminated as the source of these teeth. Locus D163a has only deciduous teeth but both of the other burials have all permanent dentition, as they are older individuals. The mandible fragment is also either redundant or of inappropriate age to belong to any of the other juveniles. The permanent teeth of locus D163b are redundant with those of MDB7 and MDB13 and likewise cannot be reassociated with the other adults with certainty.

Dental pathology

The mandibular dentition of locus D163a exhibits multiple LEH, including three each on the left and right canines and two on the right lateral incisor.

Paleodemography and paleopathology at Monjukli Depe

This section provides differential diagnoses for particular conditions described above, a synthesis of the results from the individual burials, and a discussion of possible future avenues of study. Table 9.5 provides a summary of the preservation, demography, and pathological status of each individual.

Preservation and MNI

Preservation of the recovered bones and teeth, including those of infants, ranged from good to excellent. The burial numbers provided match those described in Chapter 8, but it is noteworthy that some burials contained more than one individual and, in two cases, two locus numbers represent a single individual. MDB2 includes three individuals found within a grave shaft, an infant (locus C5, individual 2.2) mixed with animal bones and a fragment of another infant, and an adult female (locus C29, individual 2.1) buried at the base of the shaft. Thus, the MNI of this grave

Burial number	Burial locus	Sex	Age	Stature	Pathology	Comments
MDB1	A33	NA	2-4 years	NA	periosteal lesions of both femora and LEH of the developing permanent maxillary left first incisor	nearly complete skeleton of a juvenile
MDB2	C5	NA	1-2 years	NA	porotic lesions of the skull indicative of a metabolic disease; periostitis of the right tibia and fibula suggestive of metabolic disease or infection	nearly complete skeleton of an infant found above C29 in a shaft. Mixed with animal bone and one occipital fragment of an older infant
MDB2	C29	female	50+ years	157-172 cm	antemortem loss of several teeth, LEH, several abscesses, extremely heavy tooth wear; arthritis of shoulders, hands, spine, knee, and ankles	found at bottom of same burial shaft as locus C5
MDB3	C23/150	NA	14-16 years	172-191 cm	slight molar wear and slight to moderate calculus formation on many teeth; multiple LEH observed; no skeletal pathology	excavated over two field seasons, reassociated in the laboratory as a single individual
MDB4	B87	NA	2-4 years	NA	none observed	complete skeleton of a juvenile
MDB5	D70 and unlabeled assemblage	NA	5.5-7 years	NA	active periostitis on the left tibia of D70 and right femur of unlabeled assemblage; left femur of unlabeled assemblage exhibits sclerotic (healing) periostitis	D70 consists of feet and lower legs only; an unlabeled assemblage of bones likely belongs with this individual. Feet covered with ocher on the bottom. Bones in the assemblage match well in size, development, pathology, and taphonomy with those of D70. Covered with ocher on the dependent bone surfaces
MDB6	D278	NA	36-40 lunar weeks	NA	none observed	nearly complete skeleton
MDB7	D168	NA	17-21 years	164-183 cm	multiple dental pathologies. Lytic lesions of lower spine and periosteal lesions on the ribs. Possible tuberculosis	most bones covered with a layer of ocher on the posterior aspect. Charcoal and ash also present
MDB8	E229	NA	0-6 months	NA	none observed	well preserved skeleton
MDB9	E237	NA	0-6 months	NA	none observed	well preserved but incomplete skeleton
MDB10	G66	female	17-25 years	147-165 cm	antemortem tooth loss, abscesses, LEH and moderate tooth wear. Porotic lesions of the skull and vault indicate metabolic disease	nearly complete but fragmentary skeleton; covered with ocher and ash on dependent bone surfaces
MDB11	D564	probable male	50+ years	163-185 cm	multiple dental pathologies. Osteoarthritis of the spine, knees and ankles, particularly on the right side; generalized osteopenia	semiflexed on a bed of ocher, a mat, and ash
MDB13	A2	NA	8-12 years	NA	LEH of the left maxillary lateral incisor, heavy calculus on the mandibular incisors	skeleton disturbed by previous excavations
	D163a	NA	juvenile less than 10 years old	NA	multiple LEH on multiple teeth	juvenile mandible commingled with 3 adult teeth (D163b); associations unclear
	D163b	NA	adult	NA	none observed	three adult teeth commingled with D163a

Table 9.5. Summary of burial data from Monjukli Depe by individual.

is three. On the other hand, MDB3 is comprised of remains recovered from two field seasons, which could be reliably reassociated in the lab to a single juvenile individual. Similarly, the remains of MDB5 included locus D70 and an assemblage of bones found in unlabeled bags. However, locus D163a and D163b could not be reassociated with any of the burials examined.

A strict mathematical MNI based on the most frequent sided element, the left mandible, is 14. However, based on burial context and reassociation, the representative number of individuals in the sample analyzed is 16. Given the small assemblage in which individuals can easily be segregated or reassociated based on the burial context and individual ages, the contextual estimate of 16 will be used in this study.

Demographic results

Given the limited sample size, paleodemographic tools such as hazard models could not be applied, and only a descriptive approach is provided. All 16 individuals were given at least relative ages (adult or juvenile), and sex was estimated for three skeletons. As Table 9.6 reveals, most of the individuals recovered from Monjukli Depe are juveniles under the age of 16 years. Two are young

Age range	N	Sex estimation
fetal-12 months	3	
1-5 years	4	
6-16 years	4	
17-25 years	2	1 female
25-50 years	0	
50+ years	2	1 probable male, 1 female
adult	1	
Total	**16**	

Table 9.6. Demographic categories at Monjukli Depe.

Burial number	Locus	Sex	Stature (cm)
MDB2	C29	female	157-172
MDB3	C23/C150	NA	172-191
MDB7	D168	NA	164-183
MDB10	G66	female	147-165
MDB11	D564	probable male	163-185
Average stature			169.2

Table 9.7a. Stature estimates of Monjukli Depe adult individuals, calculated using 20th century white males or females in Fordisc 3.1.

Region	Site	Mean female stature (cm)	Mean male stature (cm)	Combined mean stature (cm)
Iran	Ganj Dareh	158	171	164.5
N. Levant	Abu Hureyra	155	162	158.5
S. Levant	various sites	155-168	160-171	163
Turkmenistan	Monjukli Depe			169.2

Table 9.7b. Neolithic statures derived from various Neolithic sites (modified from Merrett 2004: 231).

adults between the ages of 17 and 25, and two are above 50 years of age. One adult represented only by teeth (D163b) cannot be aged further. Locus D163a was placed into the 6-16 years category. Conspicuously absent from the assemblage are adults between the ages of 25 and 50 years. While it is possible that there is a bias against this age group at the site (e.g., preference for the young and old to be buried within the village), we must await further excavations to better understand if such cultural decisions are responsible for the current demographic profile.

Sex could not be estimated for most of the individuals, given that the ages were below puberty. MDB10 is a young adult and exhibits female morphology of the pelvis. MDB2 individual 2.1, one of the two older adults, could also be estimated as female. Only the cranium was available for sex estimation for MDB11, which exhibited a mixed morphology. Thus, a qualified category of "probable male" was assigned. Although the numbers are small, it does not appear that either sex was purposefully excluded from burial in the village.

Stature could be estimated for five individuals for whom the major long bones are available and the epiphyses have fused (Table 9.7a). The average stature for the five individuals is 169.2 cm. This is taller than the average stature at Ganj Dareh, a Neolithic site in Iran, and data from Levantine sites (Merrett 2004; Table 9.7b). However, these statures were derived from different equations and reference samples. They may therefore not be directly comparable.

The average stature of contemporary males from Turkmenistan is 172 cm and that of females is 161.7 cm (Bentham et al. 2016). These statures, measured in 2014, are 8-10 cm higher than those of Turkmen males and females in the year 1914 (which were 161.7 cm and 152.9 cm, respectively). This clearly shows the effects of a secular increase in stature within the last 100 years (Meadows and Jantz 1995). The estimated stature ranges of the Monjukli Depe females are near or higher than the 1914 female mean of 152.9 cm. Similarly, the stature estimate of MDB11, a probable male, is also above the 1914 mean stature for males. These comparisons only indicate that growth trajectories in the Aeneolithic were similar to those of the 19th century Turkmen population and do not imply biological continuity of the Monjukli Depe population and modern Turkmen.

Paleopathology results

Fourteen of the sixteen buried individuals from Monjukli Depe consisted of complete or nearly complete skeletons, although many were fragmented and/or bone surfaces were partially occluded by ocher staining or adhering to the bone. The Monjukli Depe skeletons exhibited evidence of metabolic disease, osteoarthritis, infectious diseases, dental disease, and growth disruption of the dentition.

Dental pathologies

Unlike bone tissue that can remodel, teeth provide a permanent record of stresses and insults over a lifetime. Moreover, caries and abscesses can provide a portal of entry for bacteria into the body that can subsequently cause systemic infections (Larsen 2015). Table 9.8 provides a summary of the dental pathologies among the Monjukli Depe individuals, while Table 9.9 provides frequency data for the sample.

Evidence of growth disruption very early in life is observed by the presence of LEH in permanent teeth that are still developing in their crypts. In particular, a child aged 2-4 years (MDB1) has an LEH on the permanent maxillary left first incisor. Although a precise time of formation cannot be calculated in this case, it is clear that it occurred under the age of four years. MDB1 also exhibited periosteal lesions of both femora (described below). One or more linear enamel hypoplasias were also observed among six additional older juveniles and adults. A total of 42 LEH were observed, mostly on the mandibular teeth (Table 9.9).

Individual	Age	LEH tooth*	LEH #	Occlusal wear (absent/ slight/ moderate/severe)	AMTL #
MDB1	2-4y	LI^1	1	NA	NA
MDB2 ind. 2.1	50+y	RC_1	2	severe	4
MDB3	14-16y	LM^1	1	absent	0
		LM_1	1		
		RM_1	1		
		LC^1	3		
		RC^1	3		
		LC_1	3		
		RC_1	3		
		LI_1	2		
MDB7	17-21y	LI^1	2	severe	0
		RI^1	1		
		LI_2	1		
		LI_1	1		
		RI_2	1		
		RI_1	2		
MDB10	17-25y	LC_1	2	moderate	1
		RC_1	2		
MDB11	50+y		0	severe	6
MDB13	8-12y	LI^2	2	severe	0
Locus D163a	juvenile	LC_1	3	absent	0
		RC_1	3		
		RI_2	2		

Table 9.8. Dental LEH, occlusal wear and antemortem tooth loss (AMTL) among Monjukli Depe skeletons. *Nomenclature: side (R=right, L=left), tooth type (I = Incisor, C=Canine, P=Premolar, M=Molar), tooth sequence (1 = first or central, 2 = second or lateral), maxillary = superscript, mandibular = subscript.

Only four individuals, MDB3, MDB7, MDB10, and MDB11, exhibited one or more caries. Three of these (MDB3, MDB10, and MDB11) also had at least one abscess, as did MDB2 individual 2.1. Both of the elderly individuals, MDB2 individual 2.1 and MDB11, presented abscesses and antemortem tooth loss. Occlusal tooth wear is extensive among the older individuals but also some of the juveniles. In the cases of the older adults, the cusps were worn away and only a ring of enamel was present around the dentin. Nearly all of the individuals over the age of 8 years exhibited some amount of calculus formation, including MDB13, who was 8-12 years of age.

Skeletal pathologies

Metabolic diseases

Two individuals, MDB2 individual 2.2 and MDB10, exhibited porotic lesions of the vault and/or orbits. MDB2 is a 1-2-year-old infant with cribra orbitalia on the superior aspect of both orbits. The lesions were healing at the time of death. There is no evidence of porotic hyperostosis on the vault. Retention of the outer table of the orbit excludes iron deficiency and the hemolytic anemias as a potential diagnosis (Walker et al. 2009). This infant also exhibits periosteal lesions of the legs (see below).

MDB10 is an adult female who exhibits active and healing porotic hyperostosis on multiple vault bones and bilateral cribra orbitalia. Differential diagnosis includes scurvy, rickets, anemia, and other metabolic diseases. The distribution of the vault porosity is on the superior and lateral vault primarily, including the anterior temporals. Given that the middle meningeal vessels pass over the greater wing of the sphenoid and anterior temporal, porosity in this area is often seen when these vessels hemorrhage as a result of vitamin C deficiency (Ortner et al. 1999; 2001). Metabolic diseases are typically due to nutrient deficiencies such as insufficient fruits and vegetables or a limited variety of foodstuffs in the diet. In

	Total # teeth	# teeth observed for caries	# teeth with caries	% caries	# abscess spaces observable	# abscesses	% abscesses	# teeth observed for calculus	# teeth with calculus	% calculus	# LEH
Maxilla	77	72	0	0 %	61	2	3.28 %	68	19	27.9 %	13
Mandible	96	88	6	6.8 %	83	8	9.6 %	82	34	41.4 %	29
Total	173	160	6	3.75 %	144	10	6.94 %	150	53	35.3 %	42

Table 9.9. Frequency of caries, abscesses, calculus, and LEH among all teeth observable.

the future, radiographs could help confirm whether the porosity in the orbits and on the vault is due to diploic expansion, which would further exclude the anemias as diagnoses.

Periostitis

Three individuals exhibit periosteal reactions on one or more long bones. MDB1, a 2-4-year-old child, exhibits bilateral periosteal lesions on the femoral shafts. The lesions are approximately the same size but the distributions on the shafts vary, and the lesion on the left exhibits some healing, while that on the right is active. The lesions cannot be reliably assigned to a particular etiology, as trauma, infection, or other disease processes could be responsible.

MDB2 individual 2.2 had cribra orbitalia but also has fusiform expansion of the right tibia and extensive periosteal deposition of a fibula, possibly also from the right side. The etiology is unclear and can include trauma, infection, and metabolic disease. The tibia and fibula are intact so the medullary cavity cannot be observed without radiographs, which were unavailable. While osteomyelitis cannot be excluded, it is unlikely that it would affect both bones. The anterior bowing of the bones can be due to treponematosis, but this would also likely include the medullary cavity. Metabolic diseases may also be considered, if the leg bones and porotic hyperostosis are linked. Rickets and scurvy can cause postcranial periostitis, and rickets can result in anterior bowing of the tibia and fibula, although this typically occurs at the distal metaphysis rather than proximally in infants (Ortner 2003). Infectious or metabolic disease, or both, are the likely causes of these lesions.

MDB5 locus D70 and bones from an unlabeled assemblage both exhibit active periosteal lesions of the leg bones, which assisted in reassociating the remains to a single skeleton of a 5.5-7-year-old child. Active periostitis is observed on the diaphyses of the left tibia and right femur and healing periostitis on the left femur shaft. Similar to MDB1, there is no specific skeletal pattern of lesions, and a precise etiology cannot be determined.

Infectious disease

MDB7 exhibits periostitis on the ribs but importantly also has lytic lesions of T11-L2 that have resulted in significant bone loss, although not vertebral collapse and kyphosis. The periosteal lesions are on the pleural aspect of the ribs and are typically caused by inflammation of the pleura that can stimulate an osteogenic reaction on the internal rib surfaces. While not pathognomic for a specific disease in isolation, the presence of rib periostitis with the vertebral pathology is suggestive of systemic infectious disease.

Following Buikstra (1976), a differential diagnosis of lytic lesions of the spine includes tuberculosis, brucellosis, blastomycosis, and malignant tumors. Diseases that can cause both lytic lesions in the spine and inflammatory rib lesions include tuberculosis and brucellosis. Multiple species of mycobacteria (termed the *Mycobacterium tuberculosis* complex) can cause tuberculosis in humans, including *M. tuberculosis, M. bovis, M. canetti, M. microti*, and *M. africanus*. Infection typically occurs through respiratory or digestive routes, the latter primarily from drinking infected milk products. In the lungs, the bacilli may remain dormant for years in a Ghon focus (lung lesion), only to be released into the bloodstream upon activation or reinfection. There is no sex or age predilection for infection, although the manifestation in the skeleton can differ by age. In particular, fusiform expansion of the limb bones can occur in children (which was observed in MDB2 individual 2.2), while the lytic lesions of the spine, hip, and knees are most commonly seen in tuberculosis of adults because of the high oxygen content in these areas.

Brucellosis is caused by *Brucella* spp., a bacterium transmitted to humans from cattle, and it can leave similar vertebral and rib lesions to those of tuberculosis (Mutolo et al. 2012). According to Ortner (2003), adult males are more commonly affected than females, although this may depend upon gender roles associated with cattle care. While brucellosis can cause lytic lesions in the spine, they are less dramatic and do not result in Potts disease as seen in tuberculosis. Given the amount of destruction observed in the vertebrae of MDB7, tuberculosis seems a more likely cause than brucellosis.

Mycotic diseases cannot be ruled out given that the agricultural practices at Monjukli Depe would place individuals in direct contact with soil spores. In North America, coccidiomycosis is prevalent in the American Southwest (causing “valley fever” in extant populations), and blastomycosis is predominant in the American Midwest (Buikstra 1977). However, the author is currently unaware of specific pathogenic fungi in the soils of this region of Turkmenistan that would cause such lesions.

The morphological evidence of tuberculosis at Monjukli Depe may be convincing but should be verified by molecular techniques. Ancient DNA (aDNA) analysis of human skeletal material can yield molecular information about the pathogens that may be present, including those that cause tuberculosis, brucellosis, syphilis, plague, and leprosy (Mays et al. 2001; Raoult 2008; Taylor et al. 2009; Hershkovitz et al. 2015; Lee et al. 2015). Specific insertion elements, such as IS6110 and IS1081, help determine if any of the *M. tuberculosis* complex is present (Masson et al. 2015). Other molecular signatures, such as oxyR pseudogene and mtp40 pseudogene, can distinguish between *M. tuberculosis* and *M. bovis*. Other techniques include lipid biomarkers, such as mycolate and mycocerosate fatty acids, that can also detect *Mycobacteria* spp. (Hershkovitz et al. 2008). *Brucella* spp. can also be detected molecularly, including by the IS6501 insertion element and the Bcsp31 gene (Mutolo et al. 2012). These techniques allow detection of ancient pathogens in the bones of skeletons that lack "classic" diagnostic criteria (e.g., Potts disease) that only occur in the later phases of the disease. They also allow disease detection in individuals who died before any skeletal manifestation occurred.

Some of the oldest Neolithic cases of tuberculosis are known from Atlit-Yam in Israel, dating to 7300-6210 BCE (Hershkovitz et al. 2008) and Hungary, dating to 4932 – 4602 BCE (Masson et al. 2015), although other putative cases have been found in Neolithic farming villages of Sweden (Nuorala et al. 2004), Italy (Canci et al. 1996), and pre-Dynastic Egypt (Zink et al. 2004). While previous models suggested that tuberculosis began in the Neolithic due to proximity to cattle carrying *Mycobacterium bovis*, molecular discoveries have shown that (1) *Mycobacterium bovis* strains arose after the Neolithic (Rothschild et al. 2001; Brosch et al. 2002; Mostowy et al. 2002) and (2) pathogenic strains of mycobacterium are carried in other animals that are domesticated and/or consumed by humans (Rothschild et al. 2001; Comas et al. 2013; Bos et al. 2014; Hershkovitz et al. 2015). These findings indicate that bovine proximity is not required for tuberculosis transmission and that there is a long history of human experience with tuberculosis that potentially predates the Neolithic. It may not have been until nucleation in villages that rapid transfer of the disease and long-term care of the sick enabled visible skeletal involvement, something that shapes our view of the Neolithic appearance of tuberculosis (Weiss and McMichael 2004).

Osteoarthritis

The two older individuals, MDB2 individual 2.1 and MDB11, have osteoarthritis in multiple joints of the skeleton. MDB2 individual 2.1 is a 50+ year old female with arthritis throughout the spine, shoulders, hands, knees and ankles. Similarly, MDB11, an elderly male, has osteoarthritic changes in the spine, knees, and ankles (Table 9.10). Polyarticular osteoarthritis is common among older individuals. There is no specific pattern in either individual suggestive of habitual activity that would induce arthritic changes.

Other considerations of pathology

While the potential presence of tuberculosis within the Monjukli Depe population may be unexpected, the pathological conditions that were not observed in the skeletons are also somewhat surprising. The overall frequency of caries is low (3%) compared to that observed at Neolithic villages (e.g., Goodman et al. 1984; Lukacs 1992). However, Merrett's (2004) study of pathological conditions at Ganj Dareh in the Zagros mountains of Iran (~8,150 cal BCE; Meiklejohn et al. 2017) found that only 1% (n=6) of the 594 teeth exhibited caries. Studies of later Bronze Age skeletal samples at Harappa found relatively high rates of caries (Lukacs 1992). Agricultural products of western Central Asia consisted primarily of cereals such as barley and wheat. Starchy products produced from these grains can be cariogenic and also lead to calculus formation. The relative percentage of animal and grain products consumed at Monjukli Depe has yet to be determined by isotopic studies, yet the presence of porotic lesions of the skull and LEH likely indicates some nutritional insufficiency and growth disruptions. However, the low frequency of caries, even in this small sample, suggests that a more careful examination of the dietary components is necessary, rather than relying on the assumption of high consumption of grain products.

In addition to archaeological recovery of processed grain products at the site, a direct means of determining dietary consumption of agricultural products is through isotope analysis. In particular, the analysis of strontium, iron, oxygen, carbon, nitrogen, lead, and calcium isotopes can provide insight into dietary composition as well as other cultural processes such as mobility (Katzenberg 2000). For instance, carbon can distinguish animal and plant products among different trophic levels, and nitrogen can help calculate total protein intake (Schwarcz and Schoeinger 1991; Knudson and Price 2007). Oxygen provides information on drinking water sources and, together with nitrogen, can elucidate the age of weaning (Clayton et al. 2006; Dupras and Tocheri 2007). Moreover, oxygen, strontium, and lead isotopes can be used to reconstruct mobility, minimally determining who is local and non-local to a site (Price et al. 2002). Combined with DNA determination of sex, differential dietary practices based on age, sex, and status can also be examined.

One pathological condition that is notably lacking is trauma. Bones can be broken as a result of intentional aggression and conflict or via accidents, such as falls, especially in rugged landscapes (Neves et al. 1999; Jurmain 2001). Fractures are age-accumulative, whereby more fractures are expected in older individuals. While the sample size, particularly of adults, is small, the lack of healed fractures could indicate easily traversable landscapes and/or a lack of high risk activities. Merrett (2004) also found little evidence of trauma and none that indicated conflict in a much larger skeletal sample at Ganj Dareh.

Although trauma was not recorded among the skeletons at Monjukli Depe, the two oldest individuals, a male and female each above 50 years of age, exhibit osteoarthritis that may have hampered their mobility. MDB2 individual 2.1 exhibits arthritic changes in the shoulder, spine, wrists, hands, knees, and ankles, and MDB11 exhibits severe changes in the spine, knees, and ankles. While it is not possible to equate the skeletal distribution of arthritis with pain levels, bioarchaeologists

MDB2 individual 2.1		
Bone (side)	*Specific location*	*Description*
Clavicle (R)	medial end	Large, deep porosities on the inferior portion of the medial epiphysis; these have coalesced.
Scapula (R)	glenoid	Extensive subchondral pitting.
Scapula (L)	glenoid	Area of coalesced pits on the posterior surface of the glenoid fossa.
Humerus (R)	head	Slight marginal lipping around the head.
Humerus (L)	head	Thick marginal lipping as well as a large (2 x 4 cm) area of the mid-humeral head that has extensive subchondral erosion of the cortex.
Cervical centra	centra	Cervical bodies are very porous and light but two also exhibit large, coalesced pores on the superior surfaces. One of these also has porosity on the left superior facet.
Lumbar centra	centra	Three lumbar bodies demonstrate thick, extensive marginal lipping of the superior and inferior centrum. There also appears to be some shortening of the height but no collapse is evident.
Sacrum (R)	ala	The right ala has large, coalesced porosity in the superior aspect of the wing; the right ilium does not demonstrate this.
Os Coxa (R)	acetabulum	Thickened marginal lipping around the acetabulum of the ilium. The left side is not preserved. The femoral heads appear normal.
Femur (R)	distal epiphysis	Both condyles of the distal femur exhibit large pores and some surface osteophytes on the posterior condyles. The areas are well circumscribed. There is some marginal lipping on the medial condyle. The left femur cannot be observed.
Patellae (L,R)	facets	Both patellae show extensive loss of the medial and central portions of the facets. There may be some postmortem erosion, but they also look as though there may have been cysts there (like the left trapezium). Subchondral pitting is well defined around the borders of bone loss. Only slight marginal lipping.
Tarsals (R)	calcaneus, talus	The calcaneal facet of the talus has two small circumscribed areas of coalesced pitting, one laterally and one more centrally located. Not nearly as extensive as the subchondral damage on the left side. The talar facet of the calcaneus has one very small area of pitting on the lateral surface that matches that on the talus.
Tarsals (L)	calcaneus, talus	Both have thick marginal lipping as well subchondral pitting. There may have been some eburnation on the posterior aspect of the calcaneal facet.
Carpals (R)	capitulum, lunate	Porosity of the articular surfaces.
Carpals (L)	trapezium, lunate, trapezoid	All have large pores in and around the articular surfaces. The trapezium has a large lytic lesion on the radial articular surface that may be a subchondral cyst.
Hand phalanges (L,R)	distal	Hand phalanges of both sides exhibit some marginal lipping, particularly of the distal bases. This is mild in severity.

MDB11		
Bone (side)	*Specific location*	*Description*
Humerus (R)	distal end	Vertical ridge of bone has developed between the capitulum and trochlea. Proximal radius and ulna not available to compare.
Ribs (R,L)	articular facets	Most rib heads available exhibit enlarged articular facets with surface porosity and marginal lipping. This corresponds to the same changes in the thoracic vertebrae available.
C1	fovea	The fovea of C1 is greatly enlarged, with thickened marginal lipping and porosity inside. The dens is not available for comparison.
Thoracic vertebrae	articular facets	Most of the thoracic vertebrae available exhibit at least one articular facet with surface porosity and/or eburnation and marginal lipping. This appears to be especially prevalent on the inferior facets and on the right side, though some have both sides affected. This is severe.
Femur (R)	distal end	The distal femur has thickened lipping around the margin, surface osteophytic ridges on the patellar surface, and subchondral erosion.
Patella (R)		The right patella has moderate marginal lipping and porosity. Large surface osteophyte in the distal end towards the apex.
Tibia (R)	proximal end	The lateral condyle of the proximal tibia shows thickened marginal lipping that is more extensive than that on the medial condyle. There is also eburnation of the posterior lateral condyle with some slight grooving.
Tibia (R)	distal end	The distal epiphysis exhibits slight to moderate lipping around the available joint surface. No surface features observable.
Femur (L)	distal end	There is slight lipping of the distal epiphysis with more thickened, heavier lipping around the lateral one. There is only surface porosity (pinpoint) on the medial condyle but subchondral erosion is visible on the lateral condyle.
Calcaneus (R)		Superior expansion of the talar facet with eburnation superiorly and laterally on its surface. Very thick marginal lipping along this superior border. The other facets do not appear to be affected.
Talus (R)		The calcaneal facet is greatly expanded laterally with eburnation visible on the new bony area and very thick marginal lipping. The bone seems to have doubled its surface area.
Calcaneus (L)		This calcaneus has a similar manifestation as the right with great superior expansion of the talar joint surface but also has a circumscribed area of surface pitting and osteophytes in the lateral face at the margin of this new expansion.
Talus (L)		The talus has lateral expansion of the calcaneal facet but is not as dramatic as the right side.

Table 9.10. Description of arthritic changes in MDB2 individual 2.1 and MDB11.

have begun to consider the impact of potential disability on the human experience and community structure (e.g., Martin and Harrod 2016; Vlok et al. 2017). For instance, Martin and Harrod (2016) suggest that advanced arthritis and infections, as well as abscess, tooth loss, and caries are likely to cause pain, suffering, and disability. Long-lived individuals with advanced non-infectious diseases may be an indication of a level of community care for individuals despite their decreasing lack of ability to contribute to daily tasks (Tilley and Oxenham 2011; Tilley and Cameron 2014). Thus, as more skeletons are analyzed from Monjukli Depe and surrounding contemporary sites, further attention can be given to the concepts of disability and survival in the face of potentially debilitating infectious and degenerative diseases.

Conclusions

This chapter began with an overview of bioarchaeological approaches and techniques that can shed light on particular questions concerning the lives and lifeways of past populations. Given the small sample size recovered thus far from Monjukli Depe, broad questions concerning population structure and subsistence cannot be adequately addressed. However, the results of this study and the mortuary analysis in Chapter 8 do invoke some interesting questions that can be addressed with future studies, particular those involving isotopes and ancient DNA:

1. Tuberculosis may have been present at Monjukli Depe. Appropriate molecular techniques are required to confirm the presence of tuberculosis or other diseases, including brucellosis, in MDB7 and other individuals at the site. While MDB7 may have lived long enough to develop skeletal manifestations of the disease, other individuals buried at Monjukli Depe may also have been infected but died prior to developing lesions (cf. Wood et al. 1992). Thus, it would be ideal to conduct molecular analysis of a vertebra from each individual, but especially MDB2 individual 2.2, given clear evidence of infection in the right tibia.
2. Intrasite familial relationships: While most individuals were buried in single graves in separate structures, there may be some genetic relationships that can be elucidated by DNA analysis. The most obvious relationship may be between the two individuals designated as MDB2 (individuals 2.1 and 2.2), an infant and an adult female.
3. Direct dietary assessment through isotopic analysis of the teeth and bones is crucial given that the skeletons lack carious lesions typical of high carbohydrate diets, yet the skeletons provide clear evidence of dietary insufficiencies in the form of metabolic diseases. Thus, it appears that the diet was not nutritionally robust but lacked cariogenic properties. The analysis of carbon, strontium, iron, nitrogen, and oxygen isotopes, in particular, can help delineate the nature of the diet and shed light on the dietary components of the food.
4. Isotope analysis can also shed light on immigration and determine which individuals, if any, are non-local. Of particular interest may be the geographic residence history of MDB7, the individual with presumptive tuberculosis.

The rich contextual information derived from the mortuary and skeletal analyses at Monjukli Depe sets the stage for a more extensive understanding of the biological and cultural impacts of rapid technological advancements, population movement, interregional trade, and changes in settlement patterns. The inclusion of systematic skeletal studies from other Aneolithic sites in the region as well as interregionally will be especially insightful for interpreting biocultural change in the Meana-Chaacha region and beyond.

Burial	MDB1 locus A33	MDB2 locus C5	MDB4 locus B87	MDB5 locus D70	MDB5	MDB6 locus D278	MDB8 locus E229	MDB9 locus E237	MDB13 locus A2
Basilar length						11.08			
Basilar width						13.15			
L clavicle length	69.96					40.22	42.69		
R clavicle length	72.35		73.56			40.62		54.76	
R clavicle diameter			8.11						
L ilium length						26.73			
R ilium length	63.46		61.05			27.9			99.06
L ilium width			66.65			30.95			
R ilium width	64.51					31.38			111.29
L pubis length	32.61								
L humerus length	121.5		123.43			57.04	61.57	82.75	
R humerus length			124.14			56.79	61.73		228
L ulna length	107.75		106.5			53.26	58.39	74.57	
R ulna length	108.26	83.85	108.15		160	53.3	58.14		194
L radius length			95.92			47.26			
L radius diameter									170
R radius length	94.15	73.95	96.25		144	46.94	52.26		
L femur length	167				258	65.17	68.95		
R femur length			165			64.85	69.28		
L tibia length	138		134	224		56.23	62.62		
R tibia length	140	99.03	133			56.44			
L fibula length	134.14					53.03	60.26		
R fibula length	133.75		133			52.89			

Appendix A. Measurements (in mm) of juvenile bones from Monjukli Depe.

Burial	MDB2 locus C29	MDB3 locus C23/150	MDB7 locus D168	MDB10 locus G66	MDB11 locus D564
clavicle: max L		165		128	
humerus: max L	282		330	285	
humerus: epicondylar br	56.09		57.63		
humerus: vert diam head	41.8	48.1	44.71	39.76	43.97
humerus: max diam midshaft	18.58		21.33		
humerus: min diam midshaft	14.37		14.12		
radius: max L	223			207	
radius: a-p diam midshaft	9.98				
radius: m-l diam midshaft	13.06				
ulna: max L				231	
femur: max L	410				
femur: max diam head	39.13		45.16		44.37
tibia: length		420			375*
fibula: max L				229	
calcaneus: max L					86

Appendix B. Measurements (in mm) of adult bones from Monjukli Depe. *Measured without the malleolus.

Chapter 10

The Pottery from Monjukli Depe and its Visual Affordance

Julia Schönicke

Keywords: *pottery; vessel shape; painting practice; unfired clay vessel; visual affordance*

Introduction

This chapter presents the Neolithic and Aeneolithic ceramics from Monjukli Depe. I begin with a discussion of the Neolithic pottery which has only been recovered from a few areas at the site. I focus thereafter on the Aeneolithic pottery. Probably the most prominent feature of the latter is the small quantity in which it is present. The Aeneolithic contexts at Monjukli Depe might – with only minimal exaggeration – be described as aceramic, although at the time the technology of ceramic production was well known and widespread. In this respect, Aeneolithic Monjukli Depe marks a strong contrast to the omnipresence of pottery at other 5th millennium sites in Western Asia. There was a marked decline in the density of pottery at the site from the Neolithic to the Aeneolithic period.

I present the ceramics from the 2010-2014 fieldwork in descriptive and visual form. This includes a comparison of the Neolithic and Aeneolithic pottery in terms of production, painted motifs, and forms. Since the low density of Aeneolithic ceramics points to the likelihood that other materials were used for containers, I also discuss the occurrence of unfired clay vessels and non-ceramic containers from Monjukli Depe.

The basis for any ceramic analysis is the study of production. Increasingly, attempts are also being made to examine ceramic vessels in a sociocultural framework in terms of their contexts of use. Definitions and categorizations of artifacts often place substantial limits on the range of possible interpretations, since they suggest that each object can only be assigned one specific purpose. However, recent discussions on the affordance of things (see, among others, Hodder 2012; for an example from Monjukli Depe, Keßeler 2016) show that objects cannot only be used in narrowly restricted ways, but often contain far-reaching "action possibilities" or affordances (Gibson 2015 [1979]). Thus, they offer possibilities of being used in a variety of ways, with some use options preferred and others neglected. There is also a visual component to affordance, in that things offer multiple perspectives to be seen that in turn affect their handling. This is what I call "visual affordance." It contributes to broadening the spectrum of (archaeological) interpretations and the reconstruction of everyday practices. I will explain this concept by way of specific types of pottery from Monjukli Depe that afford different ways of seeing them so that certain options for their handling and use become apparent. Finally, I consider parallels to the Monjukli Depe ceramics from other sites, with two specific objectives in mind. Doing so permits chronological attributions as well as the reconstruction of potential interregional relations.

Methods: documentation of the Monjukli Depe pottery

In the framework of the Monjukli Depe project, all collections of artifacts were distinguished by locus and assigned a registration number (RN) on a daily basis. Each sherd received an individual number within an RN; the resulting number combination exists only once in the project documentation. It is thereby possible to determine the context from which a specific sherd originated. Each sherd passed through a documentation process consisting of several steps. After the sherds arrived at the excavation house, each collection was washed separately using a soft toothbrush. After drying, the sherds were sent to primary sorting, which involved the division of the collection into wares that were recorded by count and weight per category. Non-diagnostic pieces were sent for refitting where possible.

Diagnostic pieces, including rim and base sherds as well as those with a reconstructible motif, were passed on to secondary processing. There, each sherd was described in more detail. The structure of the recording was based on the principle of a *chaîne opératoire* introduced by Leroi-Gourhan (1964; see also van der Leeuw 1993, 239-240), which in turn rests on the technical choices made during the production process, ranging from the processing of the raw material through firing to possible use traces.

For each diagnostic sherd, the texture of the fabric (fine, medium, coarse) and the inclusions (temper) were documented. Depending on the part of the vessel (rim, base, etc.), the manufacturing technique (e.g., hand-formed) and the diameter were recorded. Surface treatment was described for both interior and exterior surfaces; decoration was noted and a sketch made of the design. Information was recorded on firing technique and degree of oxidation. Additional comments were added as needed. Finally, it was noted whether the sherd was to be drawn and/or photographed prior to being returned to the other pieces for potential refitting. If significant joins were found, the piece might be sent back to be photographed and drawn in its new state. For the most part sherd breaks were only lightly eroded, making the identification of joins relatively easy. On the whole, however, refitting was not very successful, due in part to the high fragmentation of the material but also to the small quantity of pottery.

It remains unclear where the ceramics from Monjukli Depe were produced, since neither pottery kilns nor ceramic slag[148] or other evidence for local production has been found. The archaeometric analyses suggest, however, that the clay for both Neolithic and Aeneolithic pottery came from a local source (Daszkiewicz 2011; 2013).

Archaeometric analyses

In the first year of excavation, we received permission to export seven small sherds to Germany for archaeometric study. The aim was, first, to find out whether the clay from which they were made was locally available and thereby to determine the place where the pottery was produced. A second goal was to ascertain the original firing temperatures by refiring the sherds. For this purpose, Neolithic[149] and Aeneolithic sherds were selected for MGR analysis.[150] From wave-dispersive X-ray fluorescence analyses, it was determined that the Aeneolithic vessels were produced without the use of mineral temper.[151] Overall, Małgorzata Daszkiewicz's analyses show that all sherds investigated have very similar compositions and probably similar provienences. Thus, the difference between Neolithic and Aeneolithic pottery lies in their technology, not in their raw material (Daszkiewicz 2011, 193). After the 2011 excavation season, additional Neolithic and Aeneolithic sherds as well as a piece of Aneolithic burnt clay were analyzed archaeometrically (Daszkiewicz 2013, 81). The original firing temperature of five Neolithic sherds was determined to have been 800-900° C; two were fired at 900-1000° C. The Neolithic ceramics of this second sample contain chaff inclusions but no intentionally added mineral constituents. The Neolithic sherds show a significantly higher porosity (44-52%) than the Aeneolithic ones (26-37%). Two Aeneolithic sherds were originally fired at 800-900° C, three specimens between 900 and 1000° C. Only four of the 22 analyzed pieces were briefly exposed to the highest firing temperature, indicating fluctuating firing conditions. Daszkiewicz confirms macroscopic

148 A single piece of ceramic slag was collected on the mound surface in the first year of the project, but it is unclear whether it dates to the Aeneolithic. There is also some Bronze Age pottery on the modern surface of Monjukli Depe, probably due to the proximity of the large Bronze Age settlement of Altyn Depe, and it is possible that the slag originates from there and from a later time (Pollock et al. 2011, 185).

149 Daszkiewicz 2011, 188. It should be noted, however, that the Neolithic fragments of “group B” in her report are not typical of the Neolithic pottery from Monjukli Depe, but rather were pieces found in tertiary Aeneolithic contexts such as mud bricks.

150 MGR analysis (matrix grouping by refiring) is a cost-effective method in which the ceramic fabric is refired. This takes place above the original firing temperature of the pottery, so the plastic components can be characterized macroscopically. The original firing temperature can be estimated by the sintering or melting behavior of the sherds (Daszkiewicz and Schneider 2001).

151 Daszkiewicz 2011, 189-193. The very fine mineral inclusions in the clay most probably occur naturally in the raw material rather than being added to it.

observations that indicate that the clay of the Aeneolithic pottery was better prepared than that of Neolithic wares. A piece of lightly burnt clay from the excavations that was analyzed was subjected to a maximal temperature of 800° C and correlates in its chemical properties as well as porosity (43%) with the Neolithic pottery.

Overall, Daszkiewicz distinguished seven chemical composition groups among the 35 Neolithic and Aeneolithic sherds. Although differences were definable on a geochemical level they are so small that the clay could have been derived from a common source, albeit from various locations within it. Only one Aeneolithic piece could be from an imported vessel, based on its composition (Daszkiewicz 2013, 91).

Although the firing temperatures of the Neolithic and Aeneolithic ceramics do not differ greatly from each other, the Neolithic samples were subjected to higher temperatures in the same range but for a shorter time. Therefore, Daszkiewicz suggests that there was a technological change in the firing technology in the transition to the Aeneolithic period.[152]

Statistical methods

Percentages of ceramic types were calculated on the basis of all sherds excavated during the 2010-2013 seasons and included in the primary sorting. The color designations are based on samples that were recorded using the Munsell Soil Color Chart under daylight conditions (Tables 10.1 and 10.2).

In order to be able to compare quantitative occurrences of ceramics at the site, I first sorted the Neolithic and Aeneolithic loci by excavation units and strata. I then calculated the total excavated volumes of the loci in each group. In a third step, I used the primary sorting ceramic database to determine the number and weight of sherds from those contexts, in the case of the Neolithic by excavation unit, in the case of the Aeneolithic period according to contexts. The weight-based sherd density per unit of investigation could then be calculated. For the Neolithic, this allows a direct comparison of the excavation units categorized by stratum, for the Aeneolithic by house and outdoor area (see Tables 10.3 and 10.11).

Another important factor is the degree of fragmentation calculated as average sherd weight per context (Rice 1987, 290-293). The comparative degree of fragmentation allows observations about the state of preservation of the ceramic material. Highly fragmented wares will show a lower weight per sherd, whereas a higher average sherd weight indicates lower fragmentation. However, wall thickness of different wares must also be taken into account. This is especially true for the diachronic comparison between Neolithic and Aeneolithic pottery at Monjukli Depe, as Aeneolithic sherds are much thinner than the thick-walled, coarse and heavier Neolithic vessels, and the former are therefore more likely to break into smaller pieces.

A high degree of fragmentation suggests intensive reuse in secondary contexts. It can be assumed that highly fragmented material is found mainly in garbage contexts, since a vessel that is broken into very many small pieces is difficult to repair. A low degree of fragmentation (i.e. a high average weight per sherd) may therefore indicate a primary use context. As a working hypothesis, I assume that the intensity of an activity is defined by its frequency. That should in turn correspond to a combination of high (weight) density values and a low average sherd weight, assuming that sherd fragmentation is not solely attributable to taphonomic processes.

In the following sections, I first present the individual wares and their characteristics as they have been defined in the Monjukli Depe project. The categories are based on macroscopic observations of surface color and inclusion size among other attributes. Due to irregular firing, it is possible for a vessel to show different surface colors despite a uniform surface treatment. Therefore the assignment of a sherd to a category on the basis of color is always subject to some uncertainty.

The Neolithic ceramics from Monjukli Depe

Neolithic occupational layers were reached in Units C, D, H, I, and K. However, nowhere has a large area been exposed, and Neolithic pottery has only been recovered in small quantities.

Neolithic wares

A total of 2245 Neolithic sherds from the 2010-2014 seasons were recorded. Of these, only 107, or 4.8%, are diagnostic sherds. Only 1209 sherds were recovered from well stratified contexts. The most characteristic feature of the Neolithic pottery from Monjukli Depe are the vegetal inclusions, as is typical for a wide Neolithic horizon extending across the Iranian highlands and into northern Mesopotamia. A secondary classification feature is surface treatment. Almost all Neolithic sherds are very well smoothed on both interior and exterior surfaces, sometimes to the point of being polished. Smoothing of surfaces can significantly reduce porosity. The colors of Neolithic wares generally show a strong intensity and luminosity.

As demonstrated by the archaeometric analyses, the Neolithic pottery was fired between 800-1000° C, with inconsistent firing conditions that only rarely and briefly reached the maximum temperatures. This is reflected in macroscopic observations. Fresh breaks display a gray color, indicating incomplete oxidation. The surfaces of

152 Daszkiewicz 2013, 96. Investigations of the fire installations at Monjukli Depe support this hypothesis by confirming a growing variability and an overall increase in handling fire from the Neolithic to the Aeneolithic (Chap. 6).

Ware	Percentage and count	Munsell color
Neolithic Brown Wash on Slip	49.8% 1064	10R 4/6 red 10R 4/4 weak red 5YR 4/6 yellowish red 5YR 4/4 reddish brown
Neolithic Dark Wash on Slip	35.0% 748	5YR 3/2 dark reddish brown 5YR 4/2 dark reddish gray
Neolithic Polytone	2.1% 44	10R 5/1 reddish gray 2.5Y 8/4 pale yellow 2.5YR 5/4 reddish brown
Neolithic Plain	9.6% 206	7.5YR 7/4 pink 7.5YR 6/4 light brown
Neolithic Black on Red	1.5% 33	10R 4/6 red 10R 3/6 dark red 5YR 4/1 dark gray (paint) 5YR 2.5/1 black (paint)
Neolithic Painted	0.7% 14	5YR 4/4 reddish brown 5YR 3/2 dark reddish brown 5YR 4/1 dark gray (paint) 5YR 2.5/1 black (paint)
Neolithic Coarse Chaff	1.4% 29	7.5YR 6/4 light brown

Table 10.1. Neolithic pottery from Monjukli Depe. Counts and percentages of each ware out of the total Neolithic pottery assemblage and Munsell colors.

Ware	Percentage and count	Munsell color
Meana Black on Red	55.6% 1811	*wash:* 5YR 6/6 reddish yellow 10R 5/6 & 7.5YR 6/4 light brown *paint:* 10YR 3/1 very dark gray 10YR 4/1 dark gray
Meana Red Wash	13.2% 430	10R 4/4 weak red 7.5YR 5/6 strong brown
Meana Black on Buff	7.6% 247	*wash:* 5Y 8/3 pale yellow 10YR 6/2 light brownish gray 2.5Y 7/2 light gray *paint:* 5YR 3/1 very dark gray 10YR 4/1 dark gray
Meana Buff Wash	2.1% 69	5Y 8/3 pale yellow 10YR 6/2 light brownish gray 2.5Y 7/2 light gray
Meana Painted	5.0% 164	5YR 6/6 reddish yellow *paint:* 10YR 3/1, 5YR 3/1 very dark gray 10YR 4/1 dark gray
Meana Plain	8.4% 275	5YR 6/6, 5YR 7/6 reddish yellow 5YR 6/4 light brown
Meana Bitone Red Inside	0.6% 21	see Meana Black on Red/Buff
Meana Bitone Buff Inside	0.2% 7	see Meana Black on Red/Buff
Meana Polytone	0.5% 17	10R 6/2 pale red 2.5Y 7/4 pale yellow 10R 7/8 light red
Meana Coarse Ware	0.1% 2	5YR 6/6, 5YR 7/6 reddish yellow 5YR 6/4 light brown
Aeneolithic unfired	1.6% 51	5YR 6/1, 5YR 5/1 gray
Other	5.1% 166	-

Table 10.2. Aeneolithic pottery (Meana Horizon). Counts and percentages of each ware out of the total Aeneolithic assemblage and Munsell colors.

several sherds also had traces of irregular firing. This may indicate use of an open fire or, less likely, inconsistent firing conditions in kilns.

The Neolithic ceramics have been subdivided into five wares on the basis of their macroscopic properties and features connected to the manufacturing process:[153] Neolithic Brown/Dark/Polytone Wash on Slip,[154] Neolithic Painted, Neolithic Black on Red, Neolithic Plain, and Neolithic Coarse Chaff. These consist of a total of seven variants that I describe in the following section. Counts and percentages as well as Munsell color values are summarized in Table 10.1.

Neolithic Brown Wash on Slip

Neolithic Brown Wash on Slip (49.8%) constitutes almost half of the total Neolithic ceramic assemblage. It is a medium- to coarse-grained, chaff-tempered ware with a slip[155] that was subsequently provided with a reddish-brown to medium-brown wash[156] (Fig. 10.1). Wall thickness is medium (0.5-1.5 cm) to thick (> 1.5 cm).

Neolithic Dark Wash on Slip

Neolithic Dark Wash on Slip (35.0%) is a medium- to coarse-grained, chaff-tempered ware, covered with a slip and then a dark brown wash (Fig. 10.2). The wall thickness is medium (0.5-1.5 cm) to thick (> 1.5 cm).

Neolithic Polytone

Neolithic Polytone (2.1%) refers to a medium- to coarse-grained, chaff-tempered ware with a slip and a multi-colored surface that varies from ocher-yellow to reddish to dark brown (Fig. 10.3). It is unclear whether it constitutes an intentionally produced polytone coloring or if the variations are due to unintended, irregular firing conditions. The wall thickness is medium (0.5-1.5 cm) to thick (> 1.5 cm).

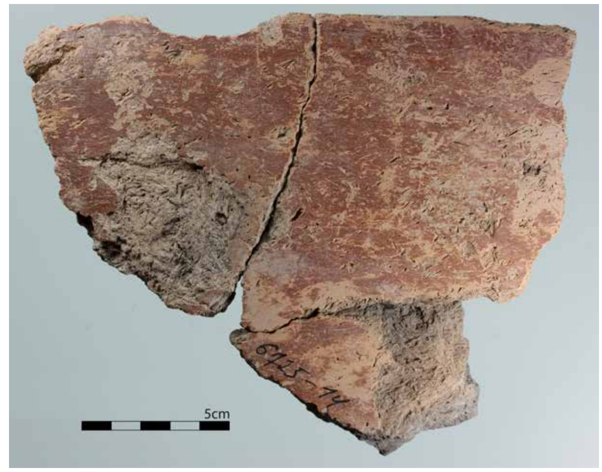


Fig. 10.1. Neolithic Brown Wash on Slip, exterior, RN 6725.1, 7, 14.

Fig. 10.2. Neolithic Dark Wash on Slip, exterior, RN 3440.6.

Neolithic Painted

Neolithic Painted (0.7%) is a medium- to coarse-grained, chaff-tempered painted ware, sometimes slipped, provided with a brown or dark wash and decorated with dark paint (Fig. 10.4 and Cat. 10.26-27, 10.29-30, 10.32, 10.34). Depending on the firing and the pigments used, the color of the paint varies from medium brown, dark brown, violet to ocher. The wall thickness is medium (0.5-1.5 cm) to thick (> 1.5 cm).

153 These include the fineness of the clay and the inclusions, the average wall thickness, and the steps involved in the surface treatment (none/slip/wash/paint). Painted ceramics are distinguished from unpainted ones, since the painted vessels require additional steps on the part of the producer, including obtaining the pigments, selecting and preparing the paint, making a painting tool, etc.

154 The decision to assign sherds with brown, dark brown, or polytone wash to one ware group is based on the characteristic of ocher-based pigments that change color when fired. It is quite possible that a red-brown and a dark-brown wash originate from the same pre-firing color.

155 Slip refers to a liquid slurry of fine clay and water applied to or poured over vessels before firing. It makes the surface of the vessel smoother and more impermeable to liquids (Rice 1987, 482).

156 Wash is a thin color coating, with pigments applied with water to a large area of the vessel surface. Wash is generally applied before firing, and I assume this to be the case at Monjukli Depe (see, however, Rice 1987, 151, according to whom a wash is used after firing).

Fig. 10.3. Neolithic Polytone, exterior, RN 6775.2.

Fig. 10.4. Neolithic Painted, interior, RN 6395.12.

Neolithic Black on Red

Neolithic Black on Red (1.4%) is a fine, thin-walled (< 0.5 cm), chaff-tempered ware, with a slip, a bright red wash, and black painted designs (Fig. 10.5 and Cat. 10.28, 10.31, and 10.33). This ware is found in small quantities, sometimes intrusive in Aeneolithic building material (Pollock et al. 2011, 186).

Neolithic Plain

Neolithic Plain (9.6%) refers to a medium- to coarse-grained, chaff-tempered ware without visible surface treatment in the form of slip, wash, or color. This may be an intentionally undecorated ware or unpainted parts

Fig. 10.5. Neolithic Black on Red, interior, RN 25073.1.

of painted vessels. It could also derive from vessels with surfaces that were abraded by taphonomic processes. The wall thickness is medium (0.5-1.5 cm) to thick (> 1.5 cm).

Neolithic Coarse Chaff

Neolithic Coarse Chaff (1.4%) is a coarse-grained, chaff-tempered ware that cannot be assigned to any of the other categories. A surface treatment is not identifiable, since the surfaces erode easily due to the porosity of the fabric.

Neolithic vessel forms

The fact that no complete profiles have been preserved or could be reconstructed makes ascertaining vessel shapes difficult. So far two different shapes can be distinguished, but they cannot be defined statistically due to their small quantities.

Wide Open Bowl

This vessel designation refers to open bowls (Cat. 10.1-7). The vessel wall at the rim is often thinned and tapering. Twelve diagnostic sherds could be assigned to this shape.

Steep Open Bowl

This vessel shape is defined by its straight rim, which slants neither to the inside nor to the outside of the vessel (Cat. 10.9-17). The lip is rounded. Nine diagnostic sherds are attributable to this form.

The bases of Neolithic vessels are slightly rounded and concave (Cat. 10.18-25). The edges of the base are often heavily abraded, indicating intensive use. The base diameters vary between 8 cm and more than 50 cm, the latter perhaps a product of oval vessels.

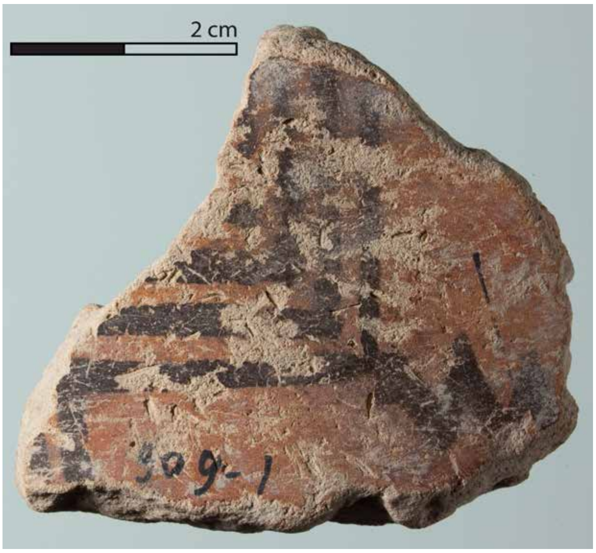


Fig. 10.6. Neolithic Painted sherd with parallel zig-zag lines and another one leading to the right edge, exterior, RN 909.1 (Cat. 10.32).

Painted decoration on Neolithic pottery

Two Neolithic wares bear painted decoration, Neolithic Painted and Neolithic Black on Red. The Neolithic Painted pottery often exhibits thin parallel lines that extend vertically or diagonally downwards from the vessel's rim. Zig-zag lines occur frequently (Fig. 10.6). Sherds of Neolithic Black on Red ware also have thin black lines arranged parallel and/or at right angles to each other. A reconstruction of whole motifs is not possible due to the high degree of fragmentation.

Densities and degree of fragmentation of the Neolithic pottery

Since no coherent building plans have yet been identified in the Neolithic levels at Monjukli Depe and only small areas have been exposed, I have calculated ceramic densities and degrees of fragmentation per excavation unit in order to compare relative distributions within the settlement by stratum. Not all deposits could be assigned to a single stratum, so strata were in some cases combined (Table 10.3). Only sherds from well stratified contexts are included in this calculation.[157]

In Unit C average sherd weight (9.1-9.5 g) and densities (1.08-1.33 g/l) do not change appreciably from Stratum VIII to Strata VII-VI. They also differ little from Stratum VII in Unit D which shows an average density of Neolithic ceramics of 1.27 g/l. In Unit D Stratum V, a low ceramic density (0.7 g/l) is combined with a high average sherd weight of 14.9 g. However, this is based on only seven sherds.

157 The total number of stratified sherds included in this calculation is 1209.

Strata	Volume in liters	Pottery weight (g) and count	Weight density (g/l)	Average sherd weight (g)
		Unit C		
VII-V	5597	7391.0 778	1.33	9.5
VIII	1593	1710.8 188	1.08	9.1
total	7190	9101.8 966	1.27	9.4
		Unit D		
V	144	104.3 7	0.7	14.9
VII	265.5	336.7 37	1.27	9.1
total	409.5	441.0 46	1.07	9.6
		Unit H		
VI-V	784	35.7 9	0.05	4.0
IX- VII	1176	0.0 0	0.0	0.0
total	1960	35.7 9	0.02	4.0
		Unit I		
VII- VI	2512	1521.7 169	0.61	9.0
		Unit K		
VII-V	1452	501.1 19	0.35	26.4

Table 10.3. Counts, average sherd weights, and densities of Neolithic pottery by unit and stratum.

Unit H Strata VI-V show a very low ceramic density together with a low average sherd weight. Despite the relatively high volume excavated in Strata IX-VII, no Neolithic ceramics were found. This results in an average ceramic density of 0.02 g/l for the Neolithic layers of Unit H and an average sherd weight of 4.0 g.

Unit I Strata VII-VI have an average sherd weight similar to the contemporary strata in Units C and D, but the ceramic density is only half as high. In Unit K, the degree of fragmentation is lower than in all other investigated Neolithic units, but the average sherd density is also low.

The high ceramic density in the eastern central part of the settlement (Units C and D) is striking. The degree of fragmentation is relatively low, with an average sherd weight of more than 9 g. In Unit C there is a slight increase in both measures in the more recent strata. Unit I, located to the southeast of the central mound area, shows a significantly lower ceramic density and a slightly lower average sherd weight. This tendency is observed more strongly in Unit H, at the northwestern periphery of the settlement. There, the ceramic density is sharply lower and the degree of fragmentation much higher than in the centrally located units. The combination of measures indicates that this area lay at the extreme edge or even outside the Neolithic settlement, where taphonomic processes (erosion) may have deposited a few small sherds. Also noteworthy is the complete absence of ceramics in the lower strata.

In contrast, Unit K to the north of the mound shows a very high average sherd size, although the ceramic density is low, which could point to primary contexts of ceramic use in this location. According to a single radiocarbon determination, the Neolithic occupation in Unit K dates later than the other excavated Neolithic contexts at the site (Chap. 3). The distribution can be explained by the displacement of the Neolithic settlement; its center in the later Neolithic period may have lain to the north of the earlier Neolithic village (Bernbeck 2018).

Fig. 10.7. Smoothing traces on the interior of an Aeneolithic Meana Red Wash vessel, RN 6483.1.

The Aeneolithic pottery from Monjukli Depe – the Meana Horizon

Aeneolithic ceramics have been found in all excavation units. On the basis of the absolute chronology, which shows that the Aeneolithic layers at Monjukli Depe are older than those from Anau IA (Chap. 3), as well as stylistic differences, we refer to the Aeneolithic ceramics from Monjukli Depe as "Meana horizon" pottery.[158] Differences to the Anau IA ceramics, named for the type site Anau North, may also be due to regional variation. I consider the Meana horizon pottery to be a single ware, the variants of which differ only in the color of their clay. In contrast to the Neolithic ceramics, there are no other macroscopic distinguishing features that would justify their division into different wares. The unfired clay vessels are an exception. Due to their state of preservation, they cannot be assigned definitively to any specific ware, but they clearly belong to the Meana Horizon and were recorded separately.

Aeneolithic Meana ware

In the years 2010 to 2013, 3260 Aeneolithic sherds were documented. Of these, 11.8% (385 sherds) are diagnostics. The Aeneolithic pottery from the Meana horizon is basically untempered, in contrast to the Neolithic ceramics.[159]

The Aeneolithic ware was used to make mostly hemispherical to straight- and thin-walled (< 0.5 cm) vessels with a simple rounded rim and a slightly concave base. The vessels were fired at temperatures between 800° and 1000° C. This probably did not take place in special pottery kilns but rather in open fire installations. This is suggested by the fact that no kilns were found as well as by the evidence for variable firing temperatures (Małgorzata Daszkiewicz, 2011, pers. communication).

The surfaces of vessels are generally well smoothed, on the outside better than on the inside. In many cases, traces of a smoothing tool could be recognized, possibly a wooden or stone spatula, that left 2-3 mm wide lines in the leather-hard clay. The smoothing tool was often guided horizontally along the vessel rim, as well as in a zigzag-like fashion on the vessel body (Fig. 10.7). More rarely, fingerprints from smearing the clay or fingernail imprints are visible. The wall thicknesses differ only slightly among the vessels. The clay is invariably very fine and well kneaded, and air bubbles are neither present in the breaks nor on the surfaces. Rare lime spalls indicate that the clay was cleaned well but was not completely free from impurities.

A striking feature of many rim and base sherds is the heavy abrasion of paint and wash on the points of contact. This indicates intensive movements of the vessels on hard surfaces. It should be noted that rims (Fig. 10.8) and bases (Fig. 10.22) are equally abraded, pointing to different positioning of the vessels during their use. In contrast, the wash and painting on the exterior of body sherds were only slightly abraded, if at all.

Macroscopic classification of the Aeneolithic ceramics according to surface color is a purely descriptive tool. In many cases it is not possible to establish whether the different surface colors are caused by different colored clays, different washes, or by irregularities in firing, whether intentional or not. The macroscopically distinguishable variants of the Meana pottery are summarized in Table 10.2.

158 The pottery exposed in Unit M, a trench excavated for geomorphological purposes in 2014, does not belong to the Meana horizon but appears to date to the Anau IB horizon.

159 Berdiev (1968) and Masson and Sarianidi (1972, 50) consider Aeneolithic pottery to be sand tempered. The investigations of Daszkiewicz (2011, 193) suggest that the wares were untempered and the inclusions unintentional. Thus, what the aforementioned authors interpreted as a tempering ingredient might rather be part of the natural inclusions in the raw material. Petrographic analysis of thin sections could provide further information.

Fig. 10.8. Meana Black on Red sherd, with traces from a burnishing tool and a heavily abraded rim with chipping at the right corner. Wash and paint are heavily worn, RN 1156.5, 1190.1-2.

Fig. 10.9. Meana Black on Red rim, Incurved Rim Bowl, RN 8118.1.

Meana Black on Red

Meana Black on Red (55.6% of all Aeneolithic pottery) is the most frequently found variant at Monjukli Depe. It has a red, reddish brown, or brownish wash. In most cases, the sherds are painted on the interior and exterior in a gray to black color (Fig. 10.9).

Meana Red Wash

Meana Red Wash (13.2%) corresponds in the color of the wash to the Meana Black on Red category, but it lacks paint. Due to the high degree of fragmentation, it remains unclear whether the vessels to which they belonged were actually unpainted or whether they are the unpainted parts of a painted vessel. However, since no rim sherds without a black band around the rim have been found at Monjukli Depe, it can be assumed that all vessels were painted. The same assumption can be made for the Meana Buff Wash sherds.

Meana Black on Buff

Meana Black on Buff (7.6%) has a pale yellow to beige wash and is painted on the interior, exterior, or both surfaces with a grayish to black paint (Fig. 10.10). The colors of the paint correspond to those of the Meana Black on Red category, but in most cases they appear more transparent due to the lighter background.

Meana Buff Wash

Meana Buff Wash (2.1%) consists of sherds with a wash of similar color to that of the Meana Black on Buff pottery, on which, however, no painting has been found (Fig. 10.11).

Fig. 10.10. Meana Black on Buff base, RN 960.11, 833.7.

Meana Bitone, Red Inside

Meana Bitone, Red Inside (0.6%) has a reddish wash on the interior and a yellowish one on the exterior. The sherds are either painted on the inside, outside, or both in a grayish to black color.

Meana Bitone, Buff Inside

This is a rare variant (0.2%) with a yellowish wash on the interior and a reddish one on the exterior. The paint color is similar to Meana Bitone, Red Inside.

Meana Polytone

Meana Polytone (0.5%) includes sherds with a colored wash that varies from yellow to red to violet. Although it

Fig. 10.11. Meana Buff Wash rim, Incurved Rim Bowl, RN 1302.1-2.

Fig. 10.12. Meana Polytone Painted base, RN 3525.1, 3494.4,7.

Fig. 10.13. Meana Plain base, RN 1639.1-8, Cat. 10.85.

is possible that it comes from differently colored pigments applied during the production process, it is more likely that the varying colors result from irregularities in the firing process (Fig. 10.12). Polytone sherds are often painted on both surfaces, occasionally only on one, with dark gray to black paint.

Meana Painted

Meana Painted (5.0%) consists of sherds with black or gray paint but no wash on the interior, exterior, or both surfaces. It is possible that an original wash is no longer preserved.

Meana Plain

Meana Plain (8.4%) sherds have neither wash nor paint (Fig. 10.13). This may be due to production choices or to taphonomic processes. The surface color corresponds to that of the fabric.

Meana Coarse Ware

In the entire ceramic assemblage, only two fragments (0.1%) of a highly fired, thick-walled type were identified. The clay of this ware was insufficiently kneaded, and the fabric contains air bubbles. No surface treatment could be identified, and the surface color corresponds to that of the fabric.

Unfired clay vessels

In addition, some pieces of unfired clay vessels were found in ashy contexts. They comprise 1.6% of the entire Aeneolithic assemblage.

Aeneolithic vessel forms

Two basic vessel forms were defined for the Aeneolithic ceramics of the Meana horizon. These two types are based on our present-day archaeological categorization, but their formal differences are small. The relation between rim and base diameters, wall thickness, rim shape, and ware are similar, and people at Monjukli Depe may not have distinguished these types.

Stratum	Form	
	Incurved Rim Bowl	Open Bowl
I	81.1% 30	18.9% 7
II	65.5% 19	34.5% 10
III	58.3% 7	41.7% 5
IV	40.0% 2	60.0% 3
Total	58	25

Table 10.4. Percentage and count of Aeneolithic vessel forms by stratum.

Exterior	Interior			Total
	Vertical bands & lines	Dots	Monochrome	
Band & Rays	45.2% 38	2.4% 2	32.1% 27	67
Rectangle & Lines	0% 0	17.9% 15	3.6% 3	18
Total	38	17	30	85

Table 10.5. Combinations of interior and exterior painted motifs on Meana Horizon rim, body, and base sherds.

Vessel shape could be determined for 169 rim and 72 base sherds.[160] The average rim diameter of the vessels is 18 cm. The base diameter is usually between 3 and 5 cm. A large proportion of the vessels (65.7%) consists of more or less hemispherical bowls with a simple, usually slightly incurving rim. We refer to these as Incurved Rim Bowls. The second most common group (29.0%) are Open Bowls with a simple, straight rim. In addition, there are three miniature vessels (Meana Pinched, Cat. 10.69-71). These are small beakers that were probably modeled with the thumb by pinching. A cylindrical vessel has a simple rounded rim and straight wall (Cat. 10.62-63). This form along with a few undefinable shapes and a holemouth jar (Cat. 10.48) have been placed in the category Other (5.3%).

The hemispherical and the open bowls taper strongly toward the base. Vessel bases are almost always slightly concave or dimpled: Cat. 10.76-88). Only two bases are flat (Cat. 10.63), belonging to the aforementioned straight-walled cylindrical vessels.

A trend in the temporal development of Incurved Rim Bowls and Open Bowls is clear, although it is rendered unreliable by the small sample size and the frequent lack of clear stratigraphic assignment (Table 10.4). It is striking that in the lowest stratum Open Bowls predominate, whereas hemispherical vessels are dominant in the upper strata. However, in Strata IV and III very few sherds are clearly assignable to a vessel form. In Strata II and I two-thirds or more of the rims assignable to vessel shapes belong to Incurved Rim Bowls.

This changing proportion of vessel shapes may reflect a change in practices associated with the vessels. It is also possible that minor deviations are attributable to the production gestures of the potters rather than to different vessel preferences. Since the ceramics were made by hand, it can be assumed that vessels will always differ slightly from one another in terms of crafting. Overall, however, the relative proportion of open vessels decreases significantly, implying a change in the activities conducted using the vessels.

Since vessel form and use cannot be directly correlated, it is only possible to reconstruct practices for which specific shapes were more or less suitable (Rice 1987, 224-225). For example, liquids are more easily spilled when contained in open vessels, which is why storage in vessels with an incurved rim or a neck is preferable. Solid or semi-solid foods may be more easily eaten from open vessels. Due to their unusually small bases and thus their limited stability, Meana Horizon vessels do not appear to be well suited for daily use. Stands or supports would be necessary, but no traces of them have been found. The Incurved Rim Bowls are usable for transporting food and/or liquids. It seems, however, that the vessels are most suitable for use as ornamental objects, for long-term storage, or perhaps as lids.

Painted designs on Meana Horizon pottery

With few exceptions, the painting of the Aeneolithic ceramics from Monjukli Depe seems to follow a standard structure, independent of vessel shapes. It consists of a band at the exterior of the rim that may contain various motifs plus straight lines that extend from this band to the vessel base. For the motifs described below, two main combinations could be documented through a quantitative analysis of 85 rim, body, and base sherds (Table 10.5). The specific type of vertical lines below the rim band forms the distinguishing feature and also correlates with particular interior decorations.

Horizontal Band with Rays (exterior)

On 67 sherds, it was possible to make a connection between the horizontal band along the rim with rays rising from the base and a diagnostic interior design. The vertical lines are wide at the bottom and narrow toward the top. In most cases the tips of the rays touch the horizontal band under the rim and can therefore be combined into one pattern (Fig. 10.14, Cat. 10.53-60). This

160 There is only one vessel with a complete profile. Rim and base forms can therefore be connected only indirectly.

Fig. 10.14. Horizontal band with vertical rays, Meana Black on Red/ Polytone Painted, from left to right, upper row,: RN 4150.1 (Cat. 10.45); RN 1269.1, 3 (Cat. 10.46); RN 10074.1; lower row: RN 2440.4; RN 1029.1.

Fig. 10.15. Vertical band with curved lines, Meana Black on Red/Buff. Interiors of pieces shown in Fig. 10.14.

"rays" design is found on both Incurved Rim and Open Bowls. For the larger sherds, corresponding interior painting could also be reconstructed. Over half of these vessels are painted on the inside with broad vertical bands between which parallel lines extend to the vessel rim. In part, these lines originate from the broad vertical bands and extend up to the rim, producing the impression of a tree or an abstract insect (Fig. 10.15, Cat. 10.50, 58). Most of the remaining pieces are painted solidly black on the interior (Cat. 10.45). In some cases where sherds are small, the apparently solidly painted interior might be instead part of a broad band. Rarely, the inside was decorated with a dot pattern.

Crosshatched Rectangles with Lines (exterior)

A horizontal band with crosshatched rectangles almost always occurs together with vertical lines of the same width on the vessel exterior. The line running from the base to the rim simultaneously forms the outer boundary of the crosshatched rectangles (Cat. 10.42-45). Vessels with this design occur almost exclusively on Incurved Rim Bowls. 18 sherds with this motif have diagnostic interior painting. 15 of them show characteristic, seemingly randomly distributed dots on the interior surface (Fig. 10.24, Cat. 10.42-44; see below, "Jackson Pollock" motif). Only three sherds were painted solidly

Exterior	Interior										Total exterior
	cross-hatching	*cross-hatched band*	*band and lines*	*vertical band*	*vertical lines*	*horizontal band*	*horizontal lines*	*dots*	*ladder*	*solidly painted*	
crosshatched triangle/rim	2		8		16			1		16	**43**
crosshatched band/rim	1	1	17		5	1		3		23	**51**
crosshatched rectangle/rim								10		11	**21**
crosshatched/ body	1		8		18			3		42	**72**
rays/base			18							53	**71**
rays			5		5			4		24	**38**
vertical lines			1					19		3	**23**
horizontal band					1			1		5	**7**
diamonds					3				2	5	**10**
trellis	2										**2**
tree in the wind			1		8		3	5		1	**18**
ladder								6		11	**17**
small triangles				1	1	1				2	**5**
stripes/base								2			**2**
solid triangles			5		3			1		11	**20**
triangles/base										1	**1**
tree/base										1	**1**
Total Interior	**6**	**1**	**63**	**1**	**60**	**2**	**3**	**55**	**2**	**209**	

Table 10.6. Counts of exterior and interior motif combinations on Meana Horizon pottery from Monjukli Depe.

Crosshatch type	**Percentage and count**
diagonal	61.3% 49
orthogonal	15.0% 12
vertical-diagonal	12.5% 10
horizontal-diagonal	8.8% 7
threefold	2.5% 2
total	80

Table 10.7. Counts and percentages of crosshatch variants on exteriors of Meana Horizon rim sherds.

Fig. 10.16. Crosshatched triangles, Meana Black on Red/ Black on Buff, from left to right, upper row: RN 10545.1-3; RN 938.1-3; middle: RN 8313.1 (Cat. 10.39); lower row: RN 6281.1; RN 8014.9-12.

Fig. 10.17. Diamonds, Meana Black on Red, from left to right, upper row: RN 9517.9, 11-12, 33; MT Backfill.22, 24; RN 6402.4, 16, 24; lower row: RN 9569.12; RN 3645.2 (Cat. 10.61); RN 9569.3 & 9517.19; RN 6402.6, 13, 20.

Fig. 10.19. "Tree in the wind," Meana Black on Red/ Polytone, from left to right, upper row: RN 7011.6, 9, 12 (Cat. 10.65); RN 1589.1, 1600.1, 2, 4; lower row: RN 6402.10, 22; RN 16128.1; RN 883.3.

Fig. 10.18. Ladder, Meana Black on Red, from left to right, upper row: RN 555.1-3; RN 4202.3 & 4253.2, 4-6 (Cat. 10.62); RN 4316.1-2; middle: RN 10074.4; lower row: RN 8396.5; RN 1794.1.

Fig. 10.20. Small filled triangles, Meana Black on Red, from left to right, upper row: RN 229; RN 8519.2; RN 4087.1; lower row: RN 872.2, 3, RN 921.6 (Cat. 10.66).

black on the inside. This may have been part of a very wide black band.

Due to the high degree of fragmentation, the entire painting on a vessel could only be documented in a few cases. In the following section, I describe the motifs that have been found on rim or base sherds, without trying to specify their position in overall painted structures. Unless stated otherwise, the descriptions refer to the exterior of the vessel (Table 10.6).

Rim sherds

Crosshatch

A large portion of the rim sherds exhibits exterior painting in the form of a fine, narrow-mesh crosshatch that fills a broad horizontal band running along the rim. This band is bounded on the top by a fine line, approximately 0.5 cm wide. The lower boundary line is approximately 1 cm wide. This combination was observed on all analyzed sherds.

Crosshatching occurs in numerous variations (Table 10.7). Oblique (two intersecting diagonal lines), perpendicular (a horizontal line intersects a vertical line), horizontal-oblique (horizontal lines cross diagonal ones), vertical-oblique (vertical lines cross horizontal ones), and threefold variants (three intersecting lines with horizontal, vertical, and diagonal orientation) can be distinguished. Of 80 rim sherds examined, almost two-thirds (61.3%) were doubly obliquely crosshatched, whereas smaller numbers of sherds have a horizontal-vertical pattern, vertical-oblique, and horizontal-oblique crosshatching. Only two pieces were decorated with triple cross-hatching.

On some sherds the horizontal band along the rim was painted with geometric motifs that in turn were filled with crosshatching. These occur predominantly in Strata II and I and include alternating triangles (43 sherds, 16.5%;

Fig. 10.16, Cat. 10.35-41)[161] and rectangles (21 pieces, 8.0%; Cat. 10.42-45). The orientation of the crosshatching of the triangles varies among the aforementioned possibilities, apart from triple hatching, which does not occur as a filler in geometric forms. The interiors of these sherds are painted with vertical lines and bands. Miscellaneous crosshatch not inserted into other geometric forms is also present (Cat. 10.46-52).

Solid Triangles at the Rim

A few pieces were decorated with the aforementioned band along the rim and triangles solidly filled with black paint (Cat. 10.53-56). The interiors of these sherds are usually monochrome painted, with vertical lines and bands or in one case with dots. Unfortunately, only two pieces with this motif are from well stratified contexts; both come from Stratum I. A total of 20 sherds (7.7% of the Aeneolithic pottery assemblage) bears this motif.

Diamonds

Ten sherds (3.8%) have a doubly diagonal crosshatching that gives the impression of a row of diamonds on a brown background or a chessboard (Fig. 10.17, Cat. 10.61). This motif is represented in Strata I and II. It may be understood as a further variation of crosshatching. The interior is painted with monochrome lines and in one case a ladder motif.

Ladders

Two parallel lines connected by short perpendicular ones yield a ladder motif (Fig. 10.18), identified on 17 sherds (6.5%) from Strata I-III. The interiors were either solidly painted or dotted. The ladder motif was documented on two sherds that are parts of cylindrical vessels (Cat. 10.62-63). Perhaps vessels with this special decoration were imported products, since this combination of form and motif differs significantly from the other vessel types.

"Tree in the Wind"

18 sherds (6.9%) are decorated with oblique lines, from which small parallel strokes extend. This motif is reminiscent of a tree with waving branches (Fig. 10.19, Cat. 10.64-65). The interiors are decorated with vertical or horizontal lines or dots. Sherds of this type were excavated in Strata I and II as well as in Berdiev´s backfill. In one case, the motif was found on a vessel base from Stratum II in combination with the usual ray motif described above.

"Jackson Pollock"

A motif consisting of small painted dots or blobs occurs only on the interiors of vessels (Fig. 10.24; Cat. 10.43-44,

Fig. 10.21. Trellis, Meana Black on Red, left: RN 3794.2 (Cat. 10.67); right: RN 15088.1.

Fig. 10.22. Rays at base, Meana Black on Red/Polytone Painted, from left to right, upper row: RN 3794.1, 4, 7 (Cat. 10.79); RN 7931.1, 7, 8, 10; RN 5414.3 (Cat. 10.80); RN 9694.1-2; lower row: RN 368.1 (Cat. 10.76); RN 5642.1 (Cat. 10.81).

10.59). The dots were more or less carefully applied in rows or produced by shaking paint from a brush.

Small, Solid Triangles

Monochrome painted triangles alternating along a vertical line (Fig. 10.20, Cat. 10.66) were found on six sherds (2.3%), including one base. The interiors are painted with lines, bands, or are solid colored. Examples were found only in Strata I and II.

Trellis

The trellis motif occurs on two small sherds. They are painted with elongated, crosshatched diamonds on a red-brown background along the rim of the vessel (Fig. 10.21, Cat. 10.67). On the interior the sherds are decorated with widely separated, intersecting horizontal and vertical lines, which may represent a further variant of crosshatching. One sherd comes from Stratum I-II, another from Stratum III.

161 For these frequency calculations, I grouped the ceramics according to their exterior painted patterns. This allows only a general overview without a further stratigraphic breakdown.

Exterior motif	Stratum				Sherd count
	I	II	III	IV	
orthogonal crosshatch	X	X	X	X	10
diagonal crosshatch	X	X	X	X	29
horizontal-diagonal cross-hatch	X	X	X	-	4
vertical-diagonal crosshatch	X	X	X	-	8
crosshatched triangles	X	X	X	-	12
solid triangles	X	-	-	-	2
crosshatched rectangles	X	X	-	-	4
monochrome	X	X	X	-	23
rays/base	X	X	X	X	17
rays with tree/base	-	X	-	-	1
tree in the wind	X	X	-	-	13
diamonds	X	X	-	-	6
small triangles	X	X	-	-	2
ladder	X	X	X	-	16
trellis	-	-	X	-	1
undecorated	X	X	X	-	5
undecorated/ base	X	X	X	X	37
total					**190**

Table 10.8. Presence/absence of motifs on Meana Horizon pottery by stratum.

Stratum	Motifs present in only one of the two strata	Motifs present in both strata	Total number of motifs	Jaccard coefficient
II-I	2	12	14	0.86
III-II	6	8	14	0.57
IV-III	6	4	10	0.40

Table 10.9. Innovation in motif painting as expressed by the Jaccard coefficient of similarity. Values are calculated on the basis of Table 10.8, excluding the two undecorated categories.

Base sherds

Rays

A characteristic feature of almost all vessels (66 out of 84; 78.6%) is an exterior design consisting of bands that run up from the base and taper towards the tops and are pointed; I refer to them as "rays" (Fig. 10.22, Cat. 10.76-84). Parts of this motif were documented on body sherds (89 pieces) painted with solid colors or with dots on the interior. A few larger sherds show that the rays generally co-occur with the horizontal bands at the exterior rim described above. Bases with this design are found in all strata.

Lines

Similar to the rays, lines of approximately 1 cm width run upwards from the base (Cat. 10.43-44, 59, and 86). These lines are not, however, tapered but remain the same width. So far, only two bases with this decoration have been found, whereas it is attested on many body sherds (42 pieces) from Strata III-I. Larger pieces testify to a co-occurrence of the vertical lines with crosshatched rectangles (see above).

Other base motifs include ladders (Cat. 10.63) and small alternating triangles (Cat. 10.66). In these cases, there is no division into an upper band at the rim and rays below.

Stratigraphic analysis of motifs is based on presence/absence data. In the matrix only those pieces were counted that could be assigned to a single stratum (Table 10.8). The smallest area was excavated in Stratum IV. Due to previous excavations and taphonomic processes, remains of Stratum 0 were often no longer preserved. The matrix thus reveals tendencies only.

Crosshatching is represented in all Aeneolithic strata. The occurrence of crosshatched rectangles is restricted to Strata I and II, whereas crosshatched triangles, double-diagonal and horizontal-vertical motifs are present in Strata I-III. The variance in crosshatching thus increased over the course of the Aeneolithic period at Monjukli Depe.

The presence/absence data for all motifs by stratum reveal that the richness of motifs increases with time, from three in Stratum IV to nine in Stratum III, and 13 each in Strata II and I (undecorated categories not included). This may be due in part to increasing sample size. In contrast, the rate of new motifs, or innovation in pottery design, shows a reverse trend. I use the Jaccard coefficient as an expression of the similarity of motif assemblages between pairs of successive strata (Table 10.9). The higher the coefficient, the more similar the two strata are in terms of their motif repertoires and thereby the less innovation. The change between Strata IV and III is marked, with a low similarity coefficient of 0.40, increasing significantly with the next pair (Strata III and II) to 0.57 and to 0.86 for Strata II and I (keeping in mind that it is difficult to differentiate Strata II and I). This means that while there was an increase in the number of painted motifs, inventiveness in the creation of new motifs slowed over time, and by Stratum II a relatively stable set of painted motifs had been established. Table 10.8 also indicates that the use-life of most motifs did not end during the stratigraphic sequence. Instead, they continued to be used until the end, marking a kind of stylistic conservatism despite the contemporaneous invention of new motifs.

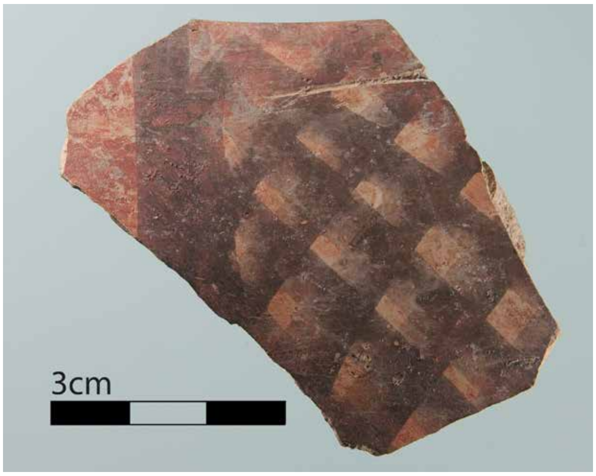


Fig. 10.23. Crosshatching made with thinned paint, Meana Black on Buff with post-depositional ocher, RN 9503.1.

Fig. 10.24. Rows of dripped dots, Meana Black on Red, interior, RN 3078.5.

Fig. 10.25. Fine lines at the base show that rays were painted from rim to base and continued beyond the edge of the base, Meana Black on Buff, RN 960.11+883.7.

Fig. 10.26. Wavy lines along the rim, probably originating from slanting spread of the paintbrush, Meana Black on Red, RN 9569.12.

The practice of painting

I turn now to the painting gestures that can be reconstructed from the brushstrokes on vessels. Other studies concerned with this topic examine the thickness of the paint, the width of brushstrokes, and, in some cases, the order in which lines were painted in complex designs as a way to reconstruct gestures and identify individual painters or groups of painters (cf. Castro Gessner 2008).

The Monjukli Depe sherds were painted with a thinned pigment that appears dark gray to black after firing.[162] The paint was applied after the vessel surfaces had been smoothed and covered with a wash. A thin hair brush or similar tool was probably used to apply the paint, as evident from the fine, clean lines of the design. Occasionally, impressions of individual hairs could be discerned in the paint. In some cases, the liquid paint ran into grooves left by the smoothing tool and was well protected against abrasion by the slight scoring of the surface. Due to the strong

162 Due to the lack of chemical analyses, it is not yet clear which pigments were involved. The use of manganese or iron oxide seems possible. However, it is unclear where these raw materials were procured, and an occurrence in the nearby Kopet Dag seems unlikely (Jonas Berking, 2016, pers. communication).

Fig. 10.27. Very tightly meshed crosshatching that appears as a nearly solid surface, Meana Black on Red, RN 6035.1.

dilution of the pigment with liquids, most likely water, the applied lines appear slightly transparent, resulting in a watercolor effect where individual lines cross (Fig. 10.23). Clearly distinguishable brushes of different thicknesses for a single vessel are not attested.

Various techniques were used to paint patterns with the available tools. For example, potters not only applied the paint with simple brushstrokes, they also sprayed the liquid paint over the vessel wall with the brush or let it drip onto the vessel (Fig. 10.24).[163] On all diagnostic painted rim sherds, a fine line (now more or less abraded) was added along the rim after the application of the motif, probably as a last step before firing.

Fine, irregular as well as tapering lines were often observed directly on the bases of the vessels. They were created during the painting of the rays on the lower vessel walls. The painting process was probably started at the tip of the ray and the brush guided to the base of the vessel, but it did not immediately stop when the edge of the base was reached. Instead, the line was continued onto the base and the brush only then removed from the vessel (Fig. 10.25; Cat. 10.76, 78, 80-82). One can also observe that the rays were composed of several thinner lines, rather than having been made using one large brush. This painting practice suggests that the lower part of the vessel was decorated with the vessel set on its rim. Since a fine black line was observed along the rim on almost all sherds, the vessel must have been placed or held in various positions during painting, or it was rotated, since the rim and the base could not be painted simultaneously. Alternatively, the paint must have dried in one area in order to be able to continue painting in another. Perhaps the vessel was held on the lap during painting, so that the painter was close to it. Brush gestures can also be reconstructed at the rim. Fine curving lines indicate that the paint was applied from the rim in the direction of the body (Fig. 10.26).

There are significant differences in the precision of the painting. Many sherds were painted with fine, regular lines that are clearly distinct from each other. Crosshatching rarely crossed boundary lines. However, some sherds have overlapping lines of different thicknesses. The lines of the crosshatching are often so close to one another that they give the impression of a uniformly black surface except when viewed from very close (Fig. 10.27). It is unclear why potters did not use a different technique, such as a thicker brush or a cloth to produce this overall black effect. Perhaps it was not only the final result – the visual impression of the finished vessel – that mattered, but the production process itself could have been significant. The variability of painting gestures and the combination of individual motifs to produce designs suggest an intense concern with the appearance of the vessels. The diversity in the painting process indicates that they were probably painted by different people. Untrained painters may be the reason for a sometimes imprecise execution.

The visual qualities of Aeneolithic pottery from Monjukli Depe

I turn now to the position of the Aeneolithic ceramics from Monjukli Depe in their social and cultural context. This includes in particular the circumstances of use (or non-use) of vessels. I focus, among other things, on the design qualities of the vessels. I first present the theoretical background of my practical-aesthetic analysis and then turn to the concrete visual qualities of Meana Horizon vessels.

Traditional ceramic analysis is focused on vessel production. This says little, however, about vessels' later use or embeddedness in people's everyday lives. Production analyses develop linear models purported to have been followed by potters, in which the form of a vessel depends on its function (Gosselain 1998, 79-80). An abstractly defined style is often equated with "identity," whereas intra-society relations are neglected (for a critique, see Kramer 1977, 91).

As Olivier Gosselain has shown, differing technological decisions during vessel production can lead to similar

163 Similar painting techniques were used by modern artists such as Jackson Pollock, hence our designation as the "Jackson Pollock" motif.

results (Gosselain 1998, 86, Fig. 4.2). Factors such as everyday practice and social relations ultimately lead to the choice of individual production steps. However, this notion is based on the assumption that things (in this case, vessels) are made for a single purpose that is already established prior to production. Accordingly, the process of making vessels is purposeful and targeted. This assumption is founded, however, on a world view drawn from the legacy of the industrial revolution and cannot be simply transferred to pre- or non-industrial societies (Bernbeck 2017).

The concept of affordance postulates, in contrast, that there are always immanent potentials for use of an object that exist independently of the user (e.g., Keßeler 2016, 346). A thing offers possibilities for use, but these possibilities were not necessarily exhausted. I assume, however, that there were various emphases for the use of things that are consistent with a range of original intentions that guided production. The use that emerges contingently and more or less spontaneously from the coincidence of parameters of practice is ultimately created by the user. These fundamental insights and the neologism "affordance" come from the work of American psychologist James Gibson, who engaged with living beings' visual perception of their environment as well as the interaction between them and environmental "offers" (Gibson 2015). He assumed that there are always reciprocal relations between actors and their worlds and that subjects are constituted by their perception of an environment that also works back to shape the material world. According to Gibson, the basic prerequisite for perceiving the environment's offers is the processing of optical information – seeing – which in turn is based on the presence of light: "The central question for the theory of affordances is not whether they exist and are real but whether information is available in ambient light for perceiving them" (Gibson 2015, 132). And further:

> The environment constrains what the animal can do, and the concept of a niche in ecology reflects this fact. Within limits, the human animal can alter the affordances of the environment but is still the creature of his or her situation. (Gibson 2015, 135)[164]

It follows that a person not only influences the physical world, but the affordance character of things also affects people and the creation of new subjectivities. Human and thing are inseparably interwoven (Hodder 2012, 48-50). From an archaeological point of view, this means that inferences regarding the embedding of things in a sociocultural context can be drawn from analyses of artifact use. It is irrelevant whether in the context of their production these things were supposed to fulfill a certain purpose or function. More relevant is the question of their *Sitz im Leben* ("seat in life"; Bernbeck 2017, 99), that is, the intersection between thing and subject within a use context. This concept extends the interpretation of artifacts beyond an instrumentalizing function. Following Bernbeck, the *Sitz im Leben* of objects is constituted through culturally dominant doxic relations between people and things and gives an indication of the social contextualization of a specific object.

The term doxa was employed by the French sociologist Pierre Bourdieu to mean the "ordinary acceptance of the usual order which goes without saying and therefore usually goes unsaid" (Bourdieu 1984, 424). As a rule, this order cannot be perceived by the subject, but rather is unquestioningly assumed to be natural or self-evident.[165] Accordingly, the doxic is constitutive of habitus,[166] which in turn significantly influences the actions of a subject (Bourdieu 1980, 88-89).

Which possibilities for practice a subject ultimately exploits (following Bourdieu) or which perceptual potentials are used (following Gibson) are thus set by habitus and doxa, but they always also depend on the affordance of things. The background of affordances does not consist of rational decisions that take into account the uses of an object in a foreseeable fashion or in a logical or instrumental way. Rather, things are involved in situation-dependent practices that can be referred to as improvisations.

A decisive factor for the situation-specific exploitation of perceptual potentials is taste, including visual taste. I follow Bourdieu's definition of "taste" as "the propensity and capacity to appropriate (materially or symbolically) a given class of classified, classifying objects or practices, … the generative formula of life-style" (Bourdieu 1984, 173). What a collective subject – a class or group – favors or rejects in terms of taste is constituted, to a significant extent, by social circumstances and their associated habitus as well as by dispositions.[167]

164 In my opinion, this view turns living beings into passive recipients of environmental influences and ignores subjects' *Eigensinn*.

165 Social conventions or behavior patterns are, among other things, part of doxa. They are commonly followed without questioning the meaning of doing so. These form the horizon of a subject, which can under certain circumstances be expanded but in general constitutes the framework for everyday practices that are possible.

166 Bourdieu's habitus theory mediates on a sociological basis between objectivism and subjectivism and represents a system of dispositions of social actors. According to Bourdieu, habitus is limited socially (and hence historically) and is reflected in schemes of perception, thought, and practice (see Schwingel 1995, 59-62; Chap. 8).

167 Ultimately, however, there are potentials of *Eigensinn* that enable subjects to move outside their social fields independently of habitus and taste dispositions. *Eigensinn* thus expands the (doxic) framework established by habitus. See Bernbeck 2017; Sturm in preparation.

	Close view = producers = details	Distant view = users = gestalt
interior view	- surface treatment - fine wavy lines ("tree")	- cross
exterior view	- surface treatment - fine lines at base - crosshatch / triangles	- black band with vertical lines - star

Table 10.10. Comparison of visual affordance and the connection to producers and users, drawing on the example of a Meana Horizon vessel with star/cross motif.

For archaeology, this means that not only things themselves, but also the associated social concepts, values, and modes of action of subjects are reflected in material culture. If aesthetic value is based on visual perception, taste itself is the prerequisite for the situational exploitation of a range of perceptual options, which are based on the affordance character of things. An object therefore offers the subject not only ways to be used, but also how it "wants to be seen." There is not only one "right" way of seeing a thing. Rather, there is a visual diversity, which is adopted in a specific way by the subject according to the framework of action.[168] This is what I call visual affordance.

The visual affordance of things (including archaeological artifacts) exists independently of the historically changing location of an object. When applied to archaeological materials, the concept can help to open up potential perspectives and subjects' resulting spaces of action. The criteria I use to analyze the visual affordance of Aeneolithic vessels from Monjukli Depe are distance, angle of view, light conditions, color contrasts, and the eyesight of the spectators. For my investigation, I assume a static relationship between the eye (standing in a simplified way for the viewing subject) and a thing. The angle of vision between eye and vessel is indicated in degrees, whereby the eye functions as a central point of orientation and the vessel moves (virtually) in space.

The visual affordance of Aeneolithic vessels

The more closely we examine a sherd, the more brushstrokes, smoothing traces, and usewear can be recognized. According to my hypothesis, this analytical approach from close proximity promotes the understanding of production and thus of producers. In the analysis of the aesthetic qualities and the visual perception of vessels, however, a different relationship between object and subject is presupposed, with reference to the people *using* the vessels (Table 10.10). I assume that the gestalt of the vessel is revealed when viewed as an overall conception at some distance. By "gestalt perception" I understand the perception-conditioned completion of individual elements to form a whole. The gestalt theory developed in the 1920s, especially by Max Wertheimer, states that partial events are subject to the inner laws of the whole in a structure:

> There are contexts in which what is happening in the whole cannot be deduced from the characteristics of the separate pieces, but conversely; what happens to a part of the whole is, in clear-cut cases, determined by the laws of the inner structure of its whole. (Wertheimer and Riezler 1984, 311)

I use the theory of gestalt perception in order to analyze the potentials of the visual affordance of vessels. I take as an example the vessels that have a horizontal band along the exterior rim, with widening rays arranged underneath and an interior design with vertical bands. Since there is only a single complete profile of a vessel in the entire Aeneolithic assemblage, my analysis is based on sherds that fit into this scheme (n=38). These represent 1.2% of the total Aeneolithic pottery and 9.9% of the diagnostic sherds.

If the vessel is placed on the rim with the base at the top and seen from above, the rays are seen as surrounded by the band. The actual structure remains invisible due to the viewing angle. Seen from a distance, the motif resembles a star in a circle (Fig. 10.28). For the sake of simplicity, I refer to this pattern combination as a star. Vessels with this exterior painting have vertical, partially tapering bands on the interior, between which parallel curving lines are arranged. A few base sherds show that these bands cross in the center of the vessel. If such a vessel is viewed directly from above, the impression of a cross is created; the motif will be referred to hereafter as such (Fig. 10.29). The curving lines in connection with the bands recall a tree or the silhouette of an insect. For vessels with this painting, the pattern combination is thus star (exterior) plus cross (interior).

168 In art, visual perceptual options are referred to as polyperspective, implying multiple viewpoints of viewers that are narrowed by the way an artwork is fashioned. Two examples from the field of painting illustrate this point. In Salvador Dalí's "Swans Reflect Elephants" (1937), swans are visible on a lake with trees in the background: their mirror images are elephants. If the painting is rotated 180 degrees, the one-time elephants appear to be swans, and the original reflection becomes a "real" image. The painting "The Messengers" (1533) by Hans Holbein the Younger shows two standing diplomats together with a variety of instruments and utensils. The highly distorted skull in the foreground is only visible when the painting is viewed from a particular angle. Jacques Lacan interprets the painting as the embodiment of the psychoanalytic concept of the object that looks back ("gaze"), because the skull looks (back) at the viewer through its distorted representation without itself being seen: "This picture is simply what any picture is, a trap for the gaze" (Lacan 1978, 89).

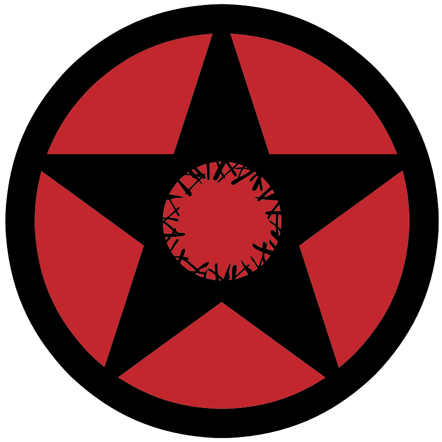


Fig. 10.28. Horizontal band along the rim and vertical rays produce a star-like impression when viewed from above (idealized). The fine lines on the base are visible.

Fig. 10.29. The intersecting bands on the interior of a vessel produce a cross when viewed from above (idealized). The curving lines in between are reminiscent of a tree or an insect.

This pattern combination is decisive for the conception of the vessel form, but only one side can be perceived at a time. There are therefore two visual options contained in the vessel painting, the rim side up and the upside-down view. The fact that these motifs are perceived as a star and consequently interpreted as such is only one of many possibilities of the vessels' visual affordance. These and other possibilities existed independently of any original intention of the producers. The "right" way of seeing is therefore not the one that the producers may have had as a mental image, especially since we have few possibilities to infer this. In any case, the intention of the producers is – according to post-structuralist viewpoints – irrelevant for tracking visual affordances. The object has left the production circuit and is mainly of interest in its potentials within a use horizon. From the possibilities of gestalt perception, I reconstruct potential spaces of practical engagements with the vessels.

In addition to visual affordance, I also build on the concept of proxemics. The term comes from the work of the anthropologist Edward T. Hall, who uses it to describe different stages of social intimacy (Hall et al. 1968, 91; see also Hall 1966). Proxemics refers to the behavior of people through nonverbal communication. Hall divides the areas of social distance into intimate, personal, social, and public spheres in which signals are transmitted as part of communication. These can be designed differently depending on the culture. Individuals transmit signals based on their social distance, and these are interpreted by others on the basis of common socialization. Misunderstandings can arise in cases of different socialization: While it is normal in one society to touch other persons during a conversation, it may be unthinkable in another one. Things are also integrated within the framework of their action potentials. Barbara Mills was able to demonstrate through analysis of ceramic painting that the visuality of the painted patterns correlates with their use, so that conclusions can be drawn concerning commensal and ritual practices. Mills examined painted vessels in the Pueblo III and IV periods (c. 12th to 14th century AD) in the southwestern U.S. She argues that the visibility of the exterior painting of the vessels stands in proportion to the size of a potential audience. Thus, large, contrasting exterior motifs that are visible from afar were associated with a vessel used in the framework of a large audience. In the case she discusses, paintings became finer over time and could in some cases only be seen from certain angles. From this, Mills concludes that the visual performance of the vessels was correlated with the framework of festivities, and changes in vessel painting were accompanied by changing (ritual) practices (Mills 2007, 232).

In order to examine the Meana Horizon vessels with the star-cross motif combination in terms of their visual affordance (Fig. 10.30), I assume a static relationship between the viewing subject (schematically represented as an eye) and the vessel. I distinguish between close (0-1 m between eye and vessel) and distant (1-5 m) as well as upright and upside down views. The viewing angles between eye and vessel are 0°, 90°, and 180°. An angle of 0° describes a position in which the vessel is located below the viewing eye and standing on its base. Here, a top-down overview is possible. The 90° angle allows viewing from the side at eye level. At an angle of 180°, the vessel is located vertically above the eye, so that a view from below is possible.[169]

169 Alternatively, the vessel can be viewed from above but upside down. For this investigation, however, I assume a uniform positioning of the vessel.

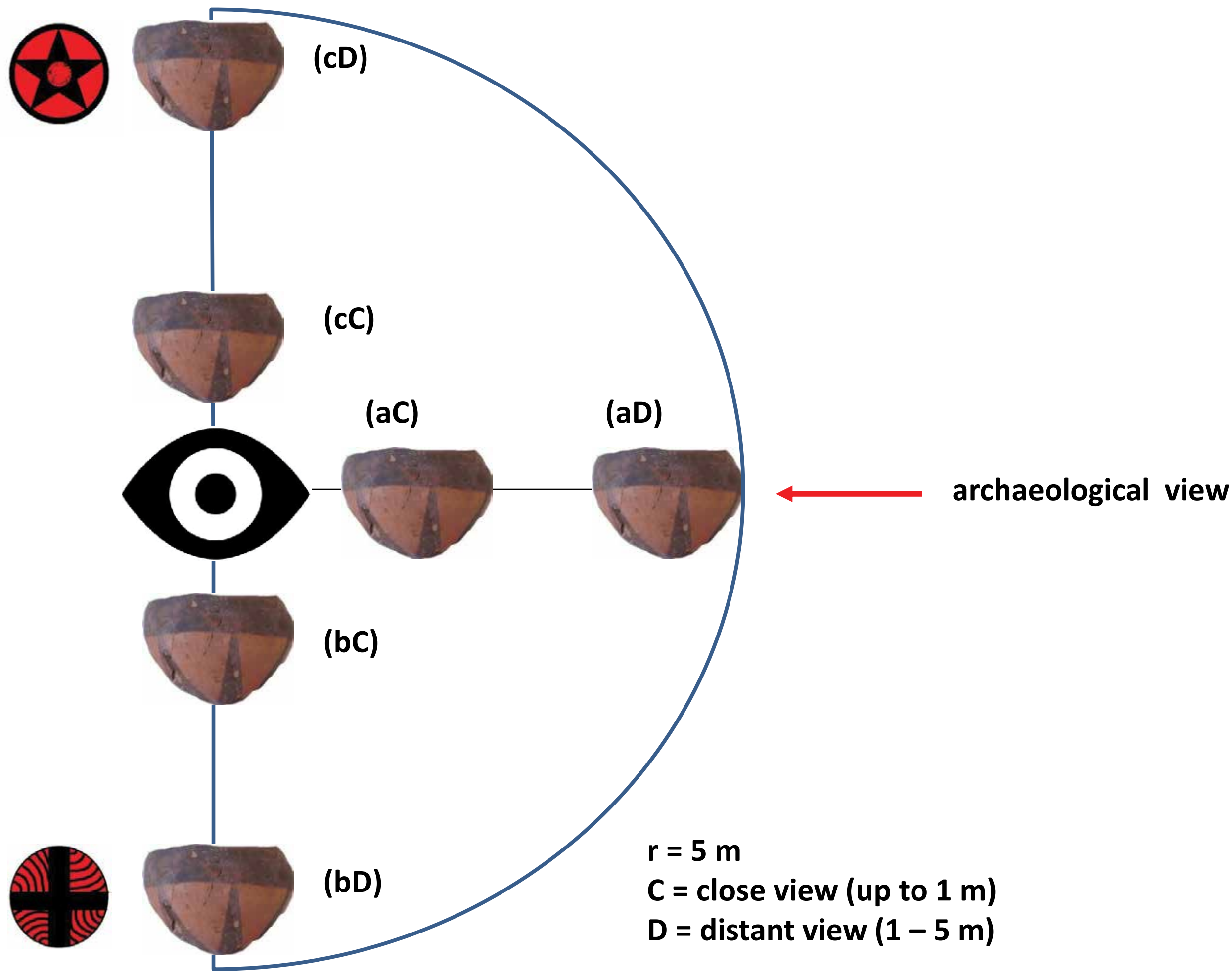


Fig. 10.30. Visual affordance of a Meana Black on Red vessel. The letters a, b and c show different angles from which to look at the vessel (a = 90°, b = 0°, c = 180°). Capital letters indicate close (C) and distant (D) view.

Standing on the base and seen from the side: When the vessel is viewed from close up and at eye level (aC), all details of the production become apparent: the precision of execution and the different orientations of crosshatching, whether the horizontal band is formed of alternating triangles or rectangles, the fine lines on the base, the degree of smoothing, etc. It is less the shape than the individual elements out of which the form is composed that are perceived. The vessel thus demands an analytical glance. The star and cross as synthetic forms are not perceived from this view.

If the vessel is viewed from afar and at eye level (aD), the details of the painting and the production traces are reduced to a background. Any triangle motifs and dense crosshatches are blurred into a uniform black band. The view no longer captures details of production. Instead, the vessel offers the possibility of being perceived as a gestalt. The star and cross are barely visible, so that the motif consists only of a band with vertical lines that widen toward the base.

I refer to these two views as an archaeological perspective because they are closest to the conventional positioning we use to analyze ceramics. It is also remarkable that distance leads to distinct differences in perceptions of the exterior design, something that is less evident for the interior: the interior is not composed of elements that cannot be perceived from a distance, nor does a certain proportion of the motifs fall outside the visual field due to specific placement of the vessel. When viewed from a short distance (bC), the curving lines between the intersecting bands in the vessel interior are clearly recognizable and can be seen as tree- or insect-like motifs. The production traces on the inside of the vessel are also perceptible from this perspective. The painting of the vessel on the interior base can also be seen from a distance (bD). The cross is visible, but not the primary gestalt-shaping element, since the curving lines capture and redirect the view toward the rim of the vessel.

Seen from below, thus enabling inspection of the outside: From close (cC) the fine lines on the exterior base of the vessel are visible, as already described. Because of the brush strokes, these lines become thinner towards the center and act like mirrored miniatures of the rays on the vessel body. Viewed at the same angle but from a distance (cF), the production traces disappear, and instead the aforementioned star is recognizable, while the bands on the rim are seen only as a thick black line, at the edge of which the rays end.

The various options of visual perception consist of the potentials inherent in an object, in this case a vessel. However, other factors have to be taken into account, such as the light conditions and the viewer's eyesight. If the vessels were used inside buildings at Monjukli Depe, or in the evening or night, crosshatching would likely not have been visible at all because of the low light (with little or no daylight, only weak or diffuse light from fire installations or tallow lamps). Due to the strong wind and frequently occurring dust storms, it seems unlikely that the houses had many windows.[170] As already mentioned, the vessels show use traces on the rim and base from moving them on hard surfaces. The abrasion occurs both on vessel walls and bases, but they show no other usewear (e.g. chipping), indicating that people took care in using them. Platforms or benches of varying heights were present in some buildings (e.g., Buildings 1 and 9), on which the vessels may have been placed.

Color intensity and the contrast of the vessel painting are further central factors in visuality. In her investigation, Mills pointed out that surface design is a decisive feature of the visual performance of vessels (Mills 2007, 215). This aspect is reflected in the striking Meana Black on Red pottery. The sometimes intensely red background color and dark gray to black paint create a stark contrast that makes visible the general structures of the motifs over a distance of several meters in conditions of good visibility. This varies, however, from sherd to sherd – some have a low contrast, the black often appears gray to light gray, while the red is dark. As a result of the assumed poor light conditions within the houses, views from a distance are unlikely. It may be that the ceramics were mainly intended for use in outdoor areas in public contexts. Since pottery played a limited role in the everyday life of the inhabitants of Monjukli Depe (see below), the vessels may have been especially appreciated and their use perhaps linked to public festivals. The high density of pottery in the Eastern Midden supports this hypothesis (Chap. 7). This does not imply that they were prestige goods: this concept implies a vertical hierarchization of society that does not seem to be present at Monjukli Depe. Because of the low number of vessels overall, it appears unlikely that on such occasions each participant would have had her/his own vessel. Rather, pottery may have been used in common or handed around, allowing multiple perception possibilities. However, this can apply for the interior painting only if the vessel was empty or slightly filled or if it contained a transparent mass or liquid. Since the paint on the vessels was mostly not heavily worn, it can be assumed that they were rarely filled, unless they were used for liquids. An interesting contrast is offered by the alternation of close and distant vision, since the exterior design details (triangles, etc.) are only visible from close up. Knowledge of these details is therefore directly related to accessibility to the vessels and the possibility to handle them individually.

These vessels may also have been used as covers or lids, which would explain the severe abrasion on the rims. Due to the strong wind and omnipresence of sand and dust, there may have been a need to protect food from dirt, small mammals, or insects inside the house. The production of protective lids led in turn to the inclusion of visual elements associated with the use of a vessel placed upside-down over the food. It is also conceivable that the pottery was not or only occasionally used as a container and had instead only a decorative character. This seems, on the one hand, unlikely due to the abrasion found on some rims and bases, but on the other hand there may have been variation in use from vessel to vessel. The diverse perceptual options of the vessels acted upon the users, who may have used them not only or even primarily as a container but also as a lid, as revealed by the visual affordance that fits such a positioning. Together, the multiple perceptual options immanent to the vessels and the use traces point to practices that contextual investigations alone cannot elucidate.

In my discussion, I have emphasized the ambiguity and ambivalence of the Monjukli Depe pottery. The potentials of visibility – the visual affordances – are inherent in a vessel and allow different visual perspectives. As such, this approach broadens the spectrum of interpretive possibilities of everyday practices in past societies.

Use, repair, and reuse of ceramics

In the course of the use of a vessel, traces accumulate on its surface. From these many of the actions conducted with the vessel can be reconstructed. They include, for example, scratching and grinding traces produced by tools, abrasion of the paint from handling the vessel, and soot marks from cooking (Rice 1987, 234-235). In

170 But see the opposite possibility discussed in Chaps. 2 and 14.

Fig. 10.31. Meana Horizon sherds with repair holes, drilled from the exterior.

general, the paint and wash on Meana Horizon vessels from Monjukli Depe are well preserved, except for the aforementioned abrasion on the rim and base as well as on a few body sherds. The vessel surfaces rarely show scratches. In some cases, the base-wall joins were also abraded, pointing to their use on a hard, sandy-textured surface.

If a ceramic vessel breaks, it is not necessarily discarded as waste. Rather, there are numerous ways to repair broken vessels or to recycle the sherds to make new products with different uses (David and Kramer 2001, 93). In the case of repair, a common means is to perforate sherds near the broken edge so that they could be "sewn" together by means of a thread, tendon, or thin leather strap and then used again to store dry goods such as cereals (South 1968, 7). In order to hold liquids, the fracture points could be sealed with resin, bitumen, or something similar; however, no such macroscopic residues were identified on the perforated sherds from Monjukli Depe.

Holes drilled from the outer surface of vessels were documented on some Aeneolithic sherds from Monjukli Depe (Fig. 10.31, Cat. 10.73-74). Due to the form and the rotary motion of the drill, the diameter of the hole is larger on the outside than on the inside. The minimum diameter of the hole corresponds to the maximum size of the drill. The bores measure 0.32-0.68 cm on the outside and 0.21– 0.28 cm on the inside.[171]

Body sherds are present in Neolithic and Aeneolithic contexts that were recycled by being transformed into tools (Fig. 10.32, Cat. 10.75, 102-103). The tools appear to have been used to scratch, scrape, and smooth. We designated sherds with chipped and rounded edges similar to lithics as scrapers. Pieces with very smooth surfaces were categorized as polishing tools. Many of the pieces cannot be attributed unambiguously to a single category but rather seem to have been used for various tasks.

Since reused sherds make up a very small portion of the total ceramics (0.6%), recycling may not have been an essential part of everyday practice. Instead, people handled vessels with care so that they did not break quickly. However, the small number of vessels indicates that new pots were not made immediately after breaking old ones. If a vessel broke, it was disposed of. Ceramic

171 These data are the minimum and maximum dimensions of the drill holes, based on a sample size of 26.

Fig. 10.32. Tools made out of Neolithic and Aeneolithic sherds, left to right, upper row: RN 16089.4; RN 26083.1; RN 25068.2, middle: RN 25035.3; RN 15276.1; lower row: RN 25214.1; RN 25328.1; RN 26113.1.

containers were apparently not essential for everyday life in Monjukli Depe.

Contextual evaluation of the Meana Horizon pottery

I turn now to an investigation of ceramic densities and their spatial and temporal distribution. In this way, I elaborate on differences and similarities within the village in order to better understand the use of ceramics at Monjukli Depe. Such insights contribute to the reconstruction of social relations.[172]

Densities and fragmentation

A total of 21 Aeneolithic buildings have been identified and at least partially excavated in four strata. In my analysis, I also include the outdoor areas of the Eastern Midden and Berdiev Street for comparative purposes. The location of the buildings can be found in Chapter 2, the ceramic densities and average sherd weights in Figs. 10.33-36 and in Table 10.11. All densities figures used here are weight densities. I use these instead of count densities for two reasons. First, count densities of sherds do not take into account whether a sherd is large or small. Second, the Meana Horizon ware generally has a very homogenous clay matrix, so I assume that sherds of the same size have a similar weight. Calculating the weight density in g/l therefore yields comparable and reliable data for each analyzed context.

The Eastern Midden was used in Strata II and I and was apparently connected to communal or regional feasts (Chap. 7). As shown in Table 10.11, whereas sherd density decreases from Stratum II to Stratum I in the midden, average sherd weight increases.

Within Strata II and I different surfaces of Berdiev Street could be defined. The two strata are combined here, but a horizontal distinction is made since the street was excavated both in Unit D and Unit F. Neither the sherd densities nor the average sherd weight in the two sections of the street differ significantly from each other, but both parameters are slightly higher in Unit D. One could suggest that due to the lower fragmentation in Unit D, this area was less frequently used, an argument that is supported by the narrower width of the street close to the gate that suggests limited access. However, this does not explain why the density is higher in Unit D.

I turn now to a comparison of sherd density and average sherd weight by context and stratum. This makes it possible to compare changing ceramic distributions on a horizontal as well as a diachronic level. In some cases (Buildings 3, 4, 7, and 8), it was impossible to associate the phases of the building's use with specific strata, so I calculated average values and, in the case of Buildings 3 and 4, separate values for unit levels. This allows the computation of an internal

172 The results should not be viewed in isolation but in relation to other parameters, in particular other contexts and categories of finds.

	Volume (liters)	Pottery weight (g) and count	Density (g/l)	Average sherd weight (g)
		Eastern Midden		
Stratum I	2601.5	291.7 26	0.11	11.2
Stratum II	3062.5	702.4 129	0.23	5.4
Strata II/I	5868.0	1370.9 158	0.23	8.7
total	11532.0	2365.0 313	0.21	7.6
		Berdiev Street		
Strata II-I (Unit D)	1084.0	58.7 15	0.05	3.9
Strata II-I (Unit F)	3060.0	67.9 22	0.02	3.1
total	4144.0	126.6 37	0.03	3.4
		Building 1		
Stratum I	7640.0	584.0 81	0.08	7.2
Stratum II	3064.0	67.3 19	0.02	3.5
total	10704.0	542.3 100	0.06	5.4
		Building 2		
Stratum I	7149.5	212.3 47	0.03	4.5
Stratum II	7177.5	8.4 6	0.01	1.4
total	8648.5	220.7 53	0.03	4.2
		Building 3		
Strata IV-I	13908.0	675.0 87	0.05	7.8
B2a	8648.0	606.1 70	0.07	8.7
B2b	5064.0	42.9 16	0.01	2.7
B2c	196.0	24.0 1	0.12	24
		Building 4		
Strata IV-I	8368.0	96.6 16	0.01	6.0
B1	4540.0	67.7 5	0.01	13.5
B2	3828.0	28.9 11	0.01	2.6

	Volume (liters)	Pottery weight (g) and count	Density (g/l)	Average sherd weight (g)
		Building 5		
Stratum III	2156.0	26.2 5	0.01	5.2
		Building 7		
Strata IV-III	2012	1.0 2	0.0005	0.5
		Building 8		
Strata IV-III	2515.0	21.5 6	0.01	3.5
		Building 9		
Stratum III	4146.0	110.1 20	0.03	5.5
		Building 10		
Stratum III	7492.5	293.8 20	0.04	7.5
		Building 11		
Stratum I	2214.0	320.8 39	0.14	8.2
		Building 12		
Strata III	2298	91.0 26	0.04	3.5
		Building 13		
Stratum I	3293.5	130.0 14	0.04	9.3
		Building 14		
Stratum IV	18083.75	749.0 76	0.04	9.9
		Building 15		
Stratum I	2151.0	231.9 37	0.14	6.2
		Building 16		
Stratum I	1003.5	11.6 4	0.01	2.9
		Building 17		
Stratum IV	1859.0	63.0 10	0.03	6.3

Table 10.11. Pottery count, weight, density, and average sherd weight in the Aeneolithic buildings, Eastern Midden, and Berdiev Street.

stratigraphic development in sherd density and average sherd weight. To avoid repetition, these buildings are discussed with their oldest represented stratum.

In the plans of each stratum (Figs. 10.33-36), the average sherd weight is depicted as low (≤ 4.9 g /sherd; green circle), medium (5.0-9.9 g /sherd; yellow circle), and high (≥ 10.0 g/ sherd; red circle). The size of the circle is related to the ceramic density; the single values indicate the ceramic densities per context in g/l and average sherd weights in grams.

Stratum IV: Buildings 3, 4, 7, 8, 14, 17[173]

In the earliest Stratum IV, the adjacent Buildings 14 and 17 (Fig. 10.33) have low ceramic densities and moderate degrees of fragmentation.

173 Buildings 19 and 20 are not included in my calculations because they were only excavated or exposed after I completed my analysis.

Fig. 10.33. Pottery densities and average sherd weights in Stratum IV. The size of the circles is related to ceramic density, the color to average sherd weight.

Fig. 10.34. Pottery densities and average sherd weights in Stratum III. The size of the circles is related to ceramic density, the color to average sherd weight.

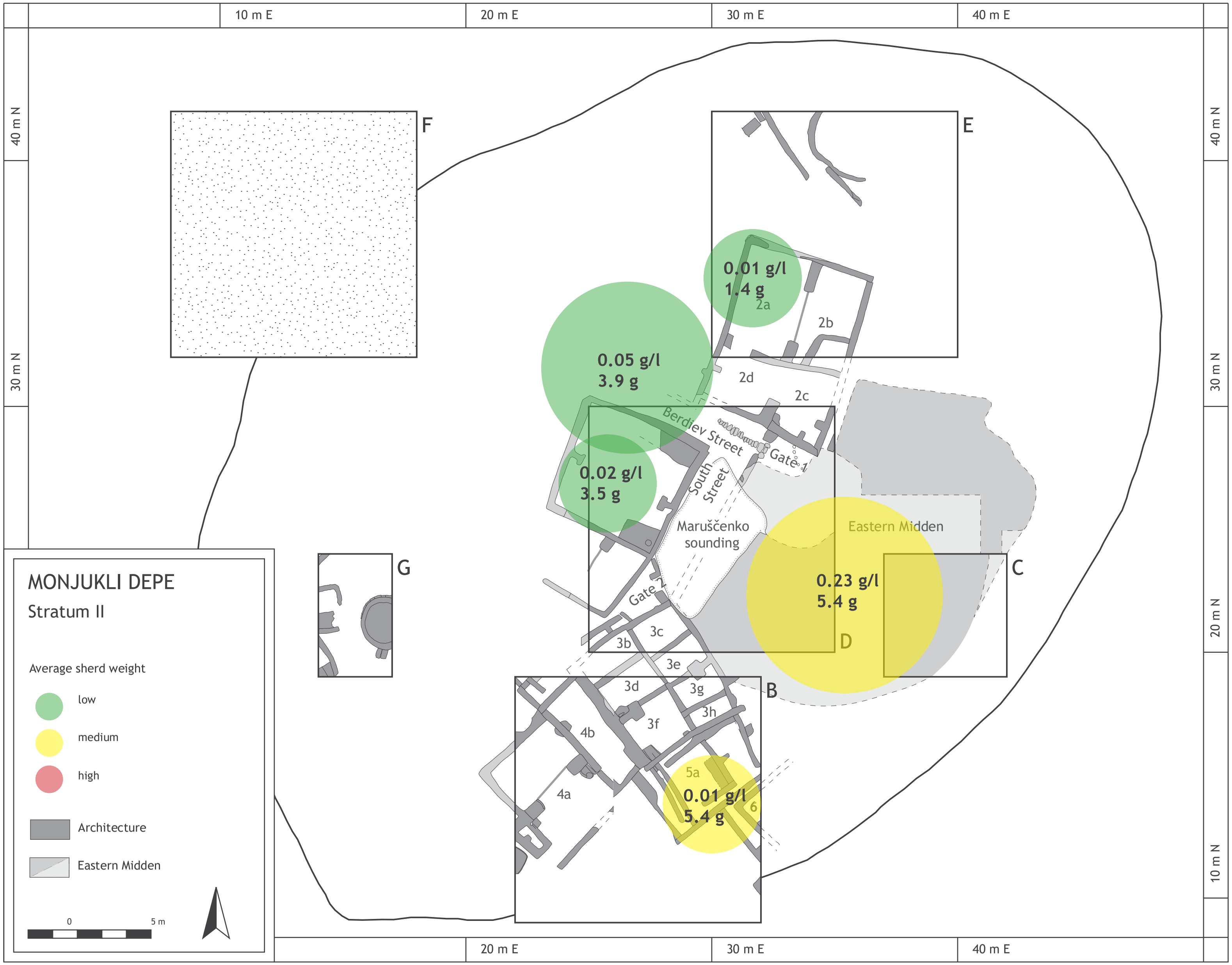


Fig. 10.35. Pottery densities and average sherd weights in Stratum II. The size of the circles is related to ceramic density, the color to the average sherd weight.

Ceramic density in Building 3 is very low in the lowest unit level B2b, together with a high degree of sherd fragmentation/low weight per sherd. The ceramic density is seven times higher in the uppermost unit level B2a, whereas fragmentation is only one third as great. On average, the ceramic density and the fragmentation are moderate in Building 3.

In the lowermost level B2 of Building 4, the ceramic density is, similar to Building 3, very low with a high degree of fragmentation. Whereas the low ceramic density remains stable in level B1, the degree of fragmentation is much lower.

Average values for Strata IV-III were also calculated for the two adjacent buildings 7 and 8. The ceramic density in Building 7 was extremely low. Ceramic density is also very low in Building 8 but 20 times higher than in the neighboring Building 7, with a high degree of fragmentation.

Contexts with low fragmentation may have been use contexts despite their low densities. Ceramic densities in Stratum IV are overall very low, indicating that pottery was barely in use. Perhaps this is related to the founding of the Aeneolithic village in which ceramic vessels played only a limited role. Pottery densities increase within the levels of Buildings 3 and 4.

Stratum III: Buildings 3, 4, 7-10, 12

Calculations for Stratum III include Buildings 9, 10, and 12 (Fig. 10.34). They show a low density with a medium (Buildings 9 and 10) to low (Building 12) degree of fragmentation. This can be interpreted as a sign that the buildings were left in a clean state, as the majority of the sherds come from deposits above floors and may have been deposited during the time the buildings were open after abandonment. A few were found directly below floors.

Stratum II: Buildings 1-6

Only Buildings 1, 2, and 5 and parts of the Eastern Midden could be definitely attributed to Stratum II (Fig. 10.35). The other buildings shown are discussed below. The buildings contain low ceramic densities with high (Buildings 1 and 2) to medium (Building 5) degrees of fragmentation. This is particularly evident when compared to the Eastern Midden, which has the highest ceramic density of all analyzed contexts: ten times higher than Building 1 and more than twenty times higher than Building 2. These figures indicate a thorough cleaning of the buildings at the time of abandonment or may point to little or no activity involving ceramics.[174] The moderate degree of ceramic fragmentation in the Eastern Midden in Stratum II is more than twice as high as in Stratum I. Presumably a higher frequency or intensity of use of the midden area during the time of Stratum II also led to a greater density in comparison to Stratum I. One might postulate that the higher degree of fragmentation in Stratum II was due to trampling resulting from frequent use of the area. The assumption of higher trampling is, however, contradicted by the accumulations of articulated animal bones in Stratum II of the Eastern Midden (Chap. 7). It is possible that the residents of buildings bordering the Eastern Midden disposed of broken vessels directly in the midden before the feasts that led to the accumulations of bones. Overall, use and disposal of pottery were more intense in Stratum II than in Stratum I.

Average calculations for Strata II-I are possible for the Eastern Midden, Berdiev Street, and Buildings 1 and 2. Berdiev Street displays a low ceramic density and high degree of fragmentation. As one would expect, the sherds that were deposited in the street were heavily fragmented due to trampling. The values for the Eastern Midden are many times higher than in the neighboring Buildings 1, 2, and 3 and in the street, indicating that the events forming the Eastern Midden involved significantly different pottery use than in the surrounding areas.

Stratum I: Buildings 1-6. 11, 13, 15, 16

Stratum I (Fig. 10.36) includes the Eastern Midden, Berdiev Street, and numerous buildings. It is striking that the highest ceramic densities occur in the adjacent Buildings 11 and 15 and in the Eastern Midden. The degree of vessel fragmentation is lowest in the Eastern Midden. In waste contexts, usually the larger and thereby annoying pieces of trash are discarded, which is reflected here in the low degree of fragmentation. In connection with the results of the faunal analysis (see Chap. 7), we could suppose that the ceramics found in the Eastern Midden may have been used in connection with feasts. The low fragmentation suggests that the pottery vessels were used and broken on the spot.

Buildings 11 and 15 have the highest pottery density in structures of Stratum I and a medium degree of fragmentation. Similar daily practices may have taken place in these two buildings, as reflected in an intensive use of ceramics and/or disposal of the broken vessels in the buildings, as about half of the sherds originate from fill contexts. The sherd density is somewhat lower in Building 1, whereas average sherd weight in Building 1 falls between that of Buildings 11 and 15. The neighboring Building 16 shows a contrasting picture. Here the lowest ceramic density is in Stratum I, co-occurring with the highest degree of fragmentation. Pottery may not have played a significant role in this structure, or this may be a result of the limited area of exposure of this building. It was cleaned very thoroughly after abandonment, and only waste, possibly from elsewhere, was recovered from it. Buildings 2 and 13 also have comparatively low ceramic densities. The degree

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174 It will be important to compare this to the results of ongoing microarchaeological studies to support or contradict this conclusion (see Sturm 2011).

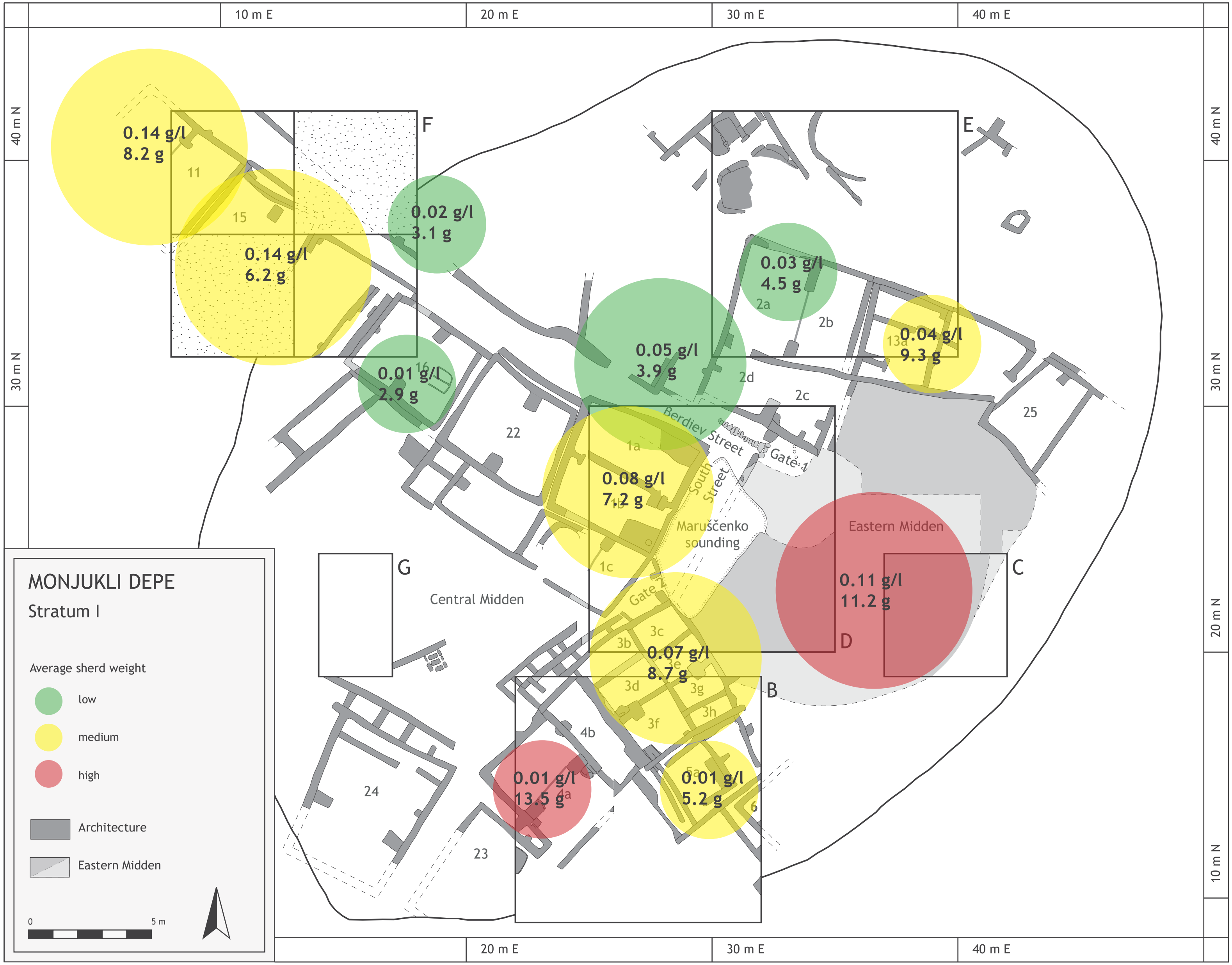


Fig. 10.36. Pottery densities and average sherd weights in Stratum I. The size of the circles is related to ceramic density, the color to the average sherd weight.

Stratum	Number of buildings	Number of bases	Vol. (m^3)	Density vessels/m^3	Vessels/ building
I	10	26	59.67	0.44	2.6
II	6	6	25.34	0.24	1.0
III	7	9	47.27	0.19	1.3
IV	6	2	29.81	0.07	0.3
total	51	43	162.09	0.27	1.5

Table 10.12. Stratigraphic distribution and densities of Aeneolithic vessels, as indicated by counts of bases. Buildings 19 and 20 are not included in the calculation.

of fragmentation of the ceramics in Building 13 is low, while that of Building 2 is in the middle range.

The results show clearly that the overall amount of pottery in Aeneolithic Monjukli Depe was very low. It increased over the course of the Aeneolithic occupation, but no uniform development is evident in terms of degrees of fragmentation. This may be due to the fact that buildings were abandoned in different ways. It is striking that neighboring contexts exhibit similarities (Buildings 1 and 2, 11 and 15, 14 and 17). Perhaps this can be linked to groups of persons or individuals who shared similar practices in handling pottery. Evidently the practice of building abandonment was also variable (Chaps. 4 and 5). We do not know what role, if any, ceramics played in abandonment rituals.

Reconstruction of numbers of vessels per stratum

The quantity of Aeneolithic ceramic vessels in Monjukli Depe was apparently quite low, and a rough estimate of the number per household is therefore of interest. As a working hypothesis, I assume that the count of pottery bases can be equated with the number of vessels. This is possible because the bases are generally very small (3-5 cm in diameter), and no matching fragments were discovered in the refitting. Therefore, I assume that every base sherd represents – more or less – one vessel.

In total, 101 Aeneolithic base sherds were recovered. For this reconstruction, only pieces that could be clearly assigned stratigraphically to one stratum and that do not derive from tertiary contexts were included in the calculation. In order to achieve comparability, I have divided the number of bases by the total excavated volume per stratum. The result is the number of vessel bases per cubic meter of sediment excavated (Table 10.12). Stratum IV includes only two clearly assignable Aeneolithic vessel bases; one of them was found in Building 14. In Stratum III, nine bases come from clearly stratified contexts, one each from Building 8, 10 and Building 12. In Stratum II two from six bases were from Building 1. In Stratum I, 26 bases were excavated. Two of these come from Building 2 and one from Building 11.

The calculations of vessel densities confirm the overall very small quantity of Meana Horizon ceramic vessels. However, the densities increase continuously during the Aeneolithic period from Stratum IV to I.

If the number of vessels is divided by stratigraphically assignable building numbers per stratum, the average number of vessels per building can be estimated (Table 10.12). For Stratum IV (six buildings), on average not even one building out of three contained a vessel. For Stratum III every building contained at least one vessel, in Stratum II every building had on average one vessel, and for Stratum I there was an average of 2.6 vessels per building. The temporal extent of Aeneolithic occupation at Monjukli Depe is estimated as a maximum of 300 years (Chap. 3), so this means that not all buildings contained vessels at the same time. Supposing that each stratum has a duration of 75 years, it becomes clear that even the highest number of vessels – 2.6 per building in 75 years – is still very low. By dividing the approximate duration of the Aeneolithic occupation by the total number of bases (43), it can be calculated that for the excavated part of the village a vessel was made (or imported) every seven years. Ceramics were therefore not everyday objects, but rather exceptional goods. It should be borne in mind that a majority of the sherds are from fill contexts or outdoor areas and only very few from primary contexts and/or buildings. This suggests that the vessels may have been used primarily in outdoor areas, are more likely to have been associated with community activities, or testify to careful cleaning of the houses. Even so, with 101 bases as an estimate for the total number of vessels in the excavated part of the site for a span of 170-300 years, the average rate of production would be less than one per year.

The rarity of vessels leads to another important question. Generally speaking, pottery is produced only in certain seasons and not by all residents in a village, but rather by members of a smaller "community of practice" (Lave and Wenger 1991, 98). The fineness of the Meana Horizon vessels points, however, to skilled crafting, which is generally connected to a long process of learning and practice (Gosselain 1998, 94). How can a craft that is based upon maintaining one's skills be transmitted if vessels are made only every few years? Routines anchored in frequently conducted bodily practices cannot develop or be maintained in such cases. Perhaps traveling craftspeople were responsible for pottery production. In that case, one would expect that the typical Monjukli Depe pottery would be found elsewhere, but this is not the case. The shapes display supraregional similarities, but the painted designs do not (see below). Perhaps only the painting was done by the inhabitants of Monjukli Depe, but this seems rather unlikely, as it would involve

Fig. 10.37. Unfired Meana Horizon clay vessel with flat base and impressed and incised decoration on the exterior, RN 6461.

Fig. 10.38. Unfired Meana Horizon clay vessel with rounded base and interior incisions, RN 15375.1.

the dissociation of the production process from one group or person, with migrant craftspeople responsible for shaping and local people for decoration. Maybe one person (or a small group) in the village with a lot of talent was responsible for making the vessels, but why, then, did she or he make only one or a few vessels every several years? I assume that the relatively high density of pottery in the Eastern Midden is connected to feasting activities and has therefore a different significance than in everyday life – perhaps it was even a taboo to produce, own, and use ceramics in non-ritual contexts.

Not only pottery production leaves questions open. Since the statistics show that there was very little pottery in Aeneolithic Monjukli Depe, it is also unlikely that the inhabitants used ceramic vessels for everyday activities such as cooking or preserving. There must therefore have been other alternatives for containers in daily life.

Unfired clay vessels and non-ceramic containers

The omnipresence and large quantities of pottery in many western Asian archaeological sites from at least the Chalcolithic onwards lead us to forget that in addition to ceramic vessels there may also have been a large variety of containers made of other materials that have not been preserved over the millennia (Knappett et al. 2010, 582).

Unfired clay vessels

Unfired clay vessels are often problematic to recognize in archaeological contexts. In most cases, the fragile pieces are no longer preserved (Rice 1999, 39). At Monjukli Depe, however, the properties of ash have contributed to the preservation of unfired or low-fired clay objects such as spindle whorls (Chap. 11), tokens (Chap. 13), figurines (Chap. 12), and also a few unfired containers (Pollock, Bernbeck, and Schönicke 2013, 61).

Small quantities of unfired clay vessels were recovered from ashy contexts in most strata. The unfired ware is characterized by a fine to medium, untempered fabric (based on macroscopic observation) and a medium to dark gray color. The pieces are very fragile and would dissolve on contact with water (Harry et al. 2009, 34). The sherds are somewhat coarser than the typical Meana ceramics for which fine, well-kneaded clay was used. Irregularities are often recognizable on the vessel surfaces; in some cases there are incisions and embellishments. The wall thickness varies between 0.5 and 2.0 cm. Coarse pieces with vegetal tempering resembling Neolithic ceramics are attested, albeit rarely.

The unfired clay vessel fragments were found in the Eastern Midden and in ashy deposits in buildings. In Stratum I sherds were recovered from a few contexts. One of them can be attributed to Building 15 and another to a round, partially excavated structure in the north of Unit E that contained large amounts of ash. From an ashy fill in Unit F came a small vessel decorated with incisions and impressions (Fig. 10.37). In Stratum II, no unfired clay sherds were found, although a context from Building 3 might belong to Stratum I or II. In Stratum III, pieces were recovered from the fill layers below the Eastern Midden and in Building 9. Strikingly well-preserved examples come from Stratum IV, Building 14, including a simple rounded base that may have been made in a mould or formed in the hand. Fine parallel scratches are visible on the interior (Fig. 10.38).

The presence of unfired clay vessels offers a possible explanation for the small quantities of ceramics in Monjukli Depe. The inhabitants of the village may not have considered it necessary to fire ceramics on a regular basis. High-temperature firing requires large quantities of wood or other fuel. Since the natural environment of Monjukli Depe was not characterized by rich tree growth, this might at first sight be a decisive factor in favor of unfired vessels. However, the large amounts of ash present in Monjukli Depe are clear indications of intensive use of pyrotechnology, so a considerable amount of fuel –

wood (predominantly tamarisk), straw, dung, etc. – must have been available. As an alternative to such rational considerations, social preferences (tastes) could also be responsible for the use of unfired pottery.

Unfired clay vessels may seem impractical. They can break easily under continued tension (less so from a shock impact) or dissolve in contact with liquids. The sherds we have found do not suggest a particular size or storage function for these objects. However, rare archaeological discoveries[175] as well as ethnographic observations show that it is possible to store food and liquids in unbaked, sun-dried, or very low-fired vessels and even to cook in them under certain conditions (Harry et al. 2009). Unfired vessels can acquire impermeable properties through application of oil and/or animal blood (Rice 1999, 4; Harry et al. 2009, 40). In addition, the use of unfired clay vessels may have a positive, health-related effect when used for food intake. Small quantities of clay can mix with the food and be ingested. The properties of argillaceous earth are detoxifying and help to make tannin-rich diets (for example, from nuts or barks) more easily digestible (Rice 1999, 9).[176] However, it is important to emphasize that there is no evidence for large quantities of unfired clay vessels at Monjukli Depe, and therefore we cannot assume that their use was an essential part of daily life.

Other non-ceramic containers

Other alternatives to ceramics are containers made of materials other than clay. They existed long before the advent of pottery but are rarely preserved archaeologically. Containers of this type may consist of animal skins or stomachs, wood, stone, large shells, plant fibers (for manufacture of baskets, nets, etc.), and in later times of metal (Knappett et al. 2010, 599).

In the ashy contexts of Building 14, a clay impression of a basket only a few millimeters thick was preserved (Chap. 5, Fig. 5.11). Whereas the plant material had decayed, the negative impression was preserved. The clay lining presumably made the basket more stable and prevented the stored contents from trickling out. Phytolith analyses, imprints of matting on the floors of Buildings 2 and 10, and macrobotanical investigations all point to the presence of reed and reed grasses around the site (Miller and Ryan 2011, 227). Their flexible stems are suitable for plaiting.

The numerous stones available in the nearby wadis could be processed into vessels, and indeed fragments of

	Neolithic	Aeneolithic
vessel forms	Steep Open Bowl Wide Open Bowl	Incurved Rim Bowl Open Bowl
inclusions	heavy chaff, coarse	rare sand, fine very little vegetal material – unintentional?
average diameters (rim / base)	27 cm/17 cm	18 cm/3-5 cm
surface treatment	thick slip thin wash very smooth/ polished, glossy	thin slip (occasional) thin wash variably smoothed, not glossy
decoration	mostly solid color, rare painted (lines)	painted interior and exterior, thin paint (geometric motifs)
firing	800-1000°C	800-1000°C
pottery density & min.-max. sherd weight	0.02-1.33 g/l 2.7-18.1 g/sherd	0.01-0.23 g/l 0.5-11.2 g/sherd

Table 10.13. Comparison of the macroscopic properties, firing temperatures, densities, and average sherd weights of Neolithic and Meana Horizon pottery from Monjukli Depe.

stone vessels were recovered in the excavations (Rogasch and Teuwsen 2013, 73; see also Berdiev 1972, Fig. 2). These are mostly large, flat vessels or small bowls, making a use for food storage improbable; they may, however, have been used for food processing (Öğüt in preparation). Approximately 45 stone vessel fragments, amounting to a minimum of 20 vessels were found in Monjukli Depe. These may therefore have offered an alternative to pottery.

Wooden vessels are rarely preserved archaeologically. No wooden vessels have been recovered at Monjukli Depe, and an intensive use of wooden containers seems unlikely due to ecological conditions – 70% of the charcoal analyzed from Monjukli Depe is tamarisk.[177] Tamarisks are small in size and grow slowly. They might have met firewood requirements but are not suitable for making containers. However, some of the containers used at Monjukli Depe might have been made of wood or bark from willow or poplar that also grew in the area (Miller 2011, 214-216, Tab. 15).

Indirect evidence for cooking with non-ceramic containers is present in the form of numerous burnt and partially shattered stones (Öğüt in preparation). It is conceivable that these were used to warm liquids in animal skins or similar materials (Chap. 6; Dittmann 1990, 24, 27; Odgaard 2007, 11).

Comparative archaeological as well as ethnographic studies show that it is not necessary to use ceramics to carry out everyday activities such as cooking or the storage of foodstuffs. Instead, a variety of practical alternatives can also protect existing resources. Since pottery was

175 Unfired or low-fired pottery is known from Neolithic Ganj Dareh, for example (Smith 1990, 333).

176 Geophagy can be observed among humans and other animals in a variety of recent contexts (see, among others, Hunter 1973; Geissler 2000). In modern natural healing *Heilerde* (natural loess) is recommended as a gastrointestinal therapeutic (Mayer 2008, 22-28).

177 Based on the identification of macrobotanical samples for radiocarbon dating by Dr. Reinder Neef (DAI).

already a widespread item in the Neolithic of southern Turkmenistan, one can speak of a conscious avoidance of ceramic production and use in Aeneolithic times. The reasons for this remain, however, unclear.

Comparison of Neolithic and Aeneolithic pottery at Monjukli Depe

The description of the Neolithic and Aeneolithic pottery has shown that wares and quantities differ clearly from one another in these two periods (Table 10.13). The basic distinguishing feature is the vegetal tempering of the Neolithic pottery and the absence of tempering in the Meana Horizon ware. Although both types of ceramics may have been fired at similar temperatures, the Neolithic pottery is significantly more porous and often incompletely oxidized. Vessel shapes and sizes also differ significantly. The most common Neolithic vessel forms are open bowls (Steep Open or Wide Open Bowls) with an average rim diameter of 27 cm and base diameter of 17 cm, a stable and functionally multipurpose shape. The Aeneolithic vessels also consist in part of Open Bowls, but the differences in proportions allow no comparison to the Neolithic ones, and Incurved Rim Bowls dominate. The average rim diameter of the vessels is 18 cm, base diameters range from 3 to 5 cm.

The surfaces of both wares are well-smoothed, but the Neolithic pottery has a thick burnished slip with a shiny surface, whereas the Aeneolithic ware is only coated with a thin wash and appears matte. A radical difference exists in the use of decoration. More than two-thirds of the Aeneolithic vessels were painted, but less than 3% of the Neolithic pottery (see Tables 10.1 and 10.2).

Calculations of ceramic densities have demonstrated the small quantity of pottery in total and for the Aeneolithic period in particular. Minimum and maximum ceramic densities in Neolithic levels range from 0.01 g/l to 1.33 g/l. The low values come from Unit H, which most likely represents the edge of the Neolithic settlement. High values are found in Units C and D, near the center of the Neolithic village. In Aeneolithic contexts ceramic densities fall between 0.01 g/l and 0.23 g/l.

If the Neolithic Strata V-VII in Unit C are compared with the oldest Aeneolithic building (Building 8) in that area of the village, a decline in ceramic density from 1.33 g/l to 0.01 g/l can be observed. This is a reduction by more than 130 times. Average sherd weights are reduced by almost two thirds: 9.5 g in Strata V-VII and 3.5 g in Building 8.[178] The drastic reduction is also observable in other contexts: Neolithic layers in Units C and D (density 1.26 g/l, average sherd weight 9.4 g) can be compared with Building 14, Stratum IV in Unit D (density 0.03 g/l, average sherd weight 0.8 g). This amounts to a reduction of ceramic density to less than 1/40 and of average sherd weight to less than 1/10. These radical differences in densities and sherd weights suggest that the cultural relevance of pottery was very different in the two periods.

Fig. 10.39. Neolithic pottery with interior painting from Chagylly Depe. From the reconnaissance of the Monjukli Depe team and the 2012 Chaacha-Meana Survey directed by Castro Gessner.

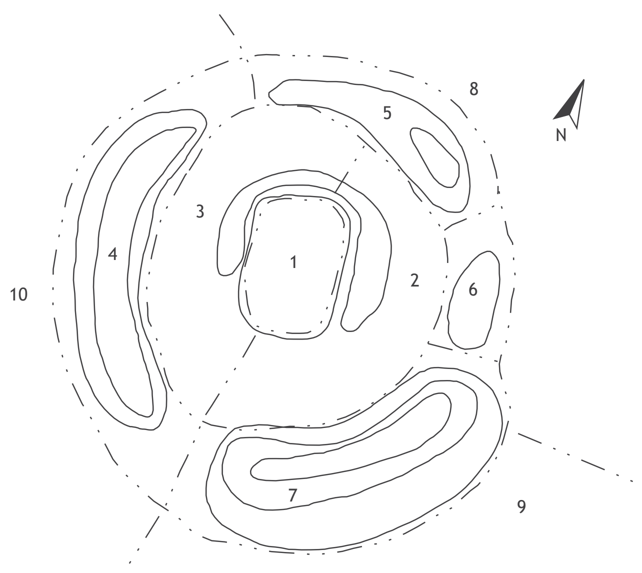


Fig. 10.40. Sketch of Chagylly Depe showing the collection fields of the Monjukli Depe Team in 2012. They were defined following the topography of the ring-shaped mound, which is a product of the old excavations. Not to scale.

178 The Neolithic and Aeneolithic wares have different physical properties and breakage patterns. This makes a comparison of degrees of fragmentation problematic; the results shown here represent tendencies only.

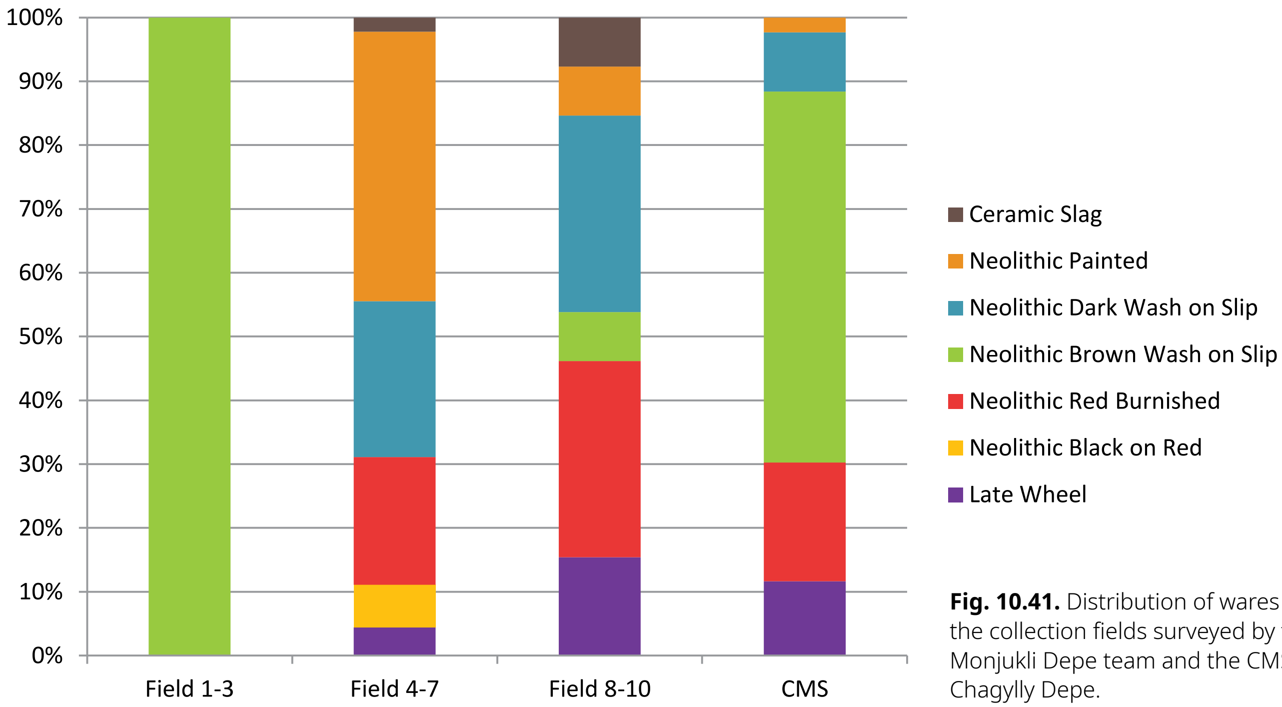


Fig. 10.41. Distribution of wares in the collection fields surveyed by the Monjukli Depe team and the CMS at Chagylly Depe.

In summary, not only production and style underwent a marked change from the Neolithic to the Aeneolithic, but ceramic density also decreased radically. This indicates a significant break in cultural techniques involving the use of pottery. It is surprising that in spite of continuities, such as similarities in building plans (Bernbeck and Pollock 2016), Aeneolithic ceramics looked not only completely different than their Neolithic counterparts but also appear to have been little used. This seems not to be the case at contemporary sites in northern Iran, for example. I turn now to a regional and supra-regional comparison of the Monjukli Depe pottery.

Regional and interregional comparisons

In this section I draw on sites from southern Turkmenistan and northeast and north-central Iran with Neolithic and Aeneolithic ceramic assemblages that can be compared with the pottery from Monjukli Depe. Geographically, I proceed from the area of Monjukli Depe to more distant sites in Iran.

The Neolithic in southern Turkmenistan

The Neolithic in the Kopet Dag region of southern Turkmenistan, or Jeitun period, dates between the end of the 7th and the late 6th millennium BCE (see Fig. 3.15; Kohl 1984, 55; Hiebert 2002).

Chagylly Depe

The site of Chagylly Depe is located along the southeastern spurs of the Kopet Dag foothills between the Meana and Chaacha rivers (Castro Gessner 2018, Fig. 15). The site was excavated by Berdiev in the mid-1960s and dates to the Late Neolithic. In 2012 a site reconnaissance was carried out by the Monjukli Depe team (Fig. 10.40); the Chaacha-Meana Survey directed by Castro Gessner also visited the site (Castro Gessner 2018, 26, Fig. 15). The surveys collected 123 sherds. A ware typology was constructed for the Chagylly Depe ceramics (Fig. 10.41). The survey sherds were drawn, photographed, and statistically evaluated. Special attention was paid to the characteristic Neolithic Black on Red ware (Pollock et al. 2011, 186).

The ceramics consist mainly of open bowls and carinated vessels (see also Berdiev 1966, 9, Figs. 6-7). The vegetal-tempered wares have a red-brown wash on a thick slip (Fig. 10.39; Cat. 10.89-103), and the pottery is painted with fine parallel lines, grid patterns, wavy lines, zig-zags, and triangles. Quantitative data are not available.

There are clear similarities to the Neolithic pottery from Monjukli Depe. Vessel forms include Steep Open Bowls (Cat. 10.89-91), a Wide Open Bowl (Cat. 10.92), and an Everted Rim Bowl (Cat. 10.93). Bases are flat (Cat. 10.95-96), ring-shaped (Cat. 10.94), or rounded (Cat. 10.97-98). The majority of the assemblage consists of Neolithic Brown Wash on Slip (39.8%), while Neolithic Painted (17.1%, Cat. 10.99) and Neolithic Red Burnished (17.1%; compare Table 10.1 and Fig. 10.41) are well represented. The characteristic Neolithic Black on Red ware (2.4%, Cat. 10.100-101), which we already know from Monjukli Depe, and Neolithic Plain (9.8%) and Polytone sherds (4.9%) appear at Chagylly Depe as well. 1.6% of the sherds were undefinable (designated as Other), whereas 7.3% are post-Neolithic (mostly wheel made). Two Neolithic sherds are worked into pottery disks (Cat. 10.102-103), in a technique similar to one known from Monjukli Depe. Two pieces of pottery slag were also found, but it is unclear whether they belong to the Neolithic assemblage of the site. At least in fields 4-7, the dating of Chagylly Depe to the Late Neolithic can be supported by the comparative abundance of Neolithic Black on Red Ware, which is very rare in the Neolithic layers of Monjukli Depe but found in stratigraphically younger, tertiary material.

The pottery distribution shows that at the center of the mound only Neolithic Brown Wash on Slip ware is present, whereas in the surroundings the assemblage is more heterogeneous. The variability might indicate different practices carried out within the village using different pottery wares. Another explanation could be that the vessels belonged to different households. The Bronze Age wheelmade pottery was probably brought there by people from nearby Altyn Depe. Of course, taphonomic processes also influence the occurrence of surface pottery finds and must be taken into consideration when interpreting the results.

Jeitun

The ca. 0.7 ha site of Jeitun is located in the Akhal region, about 25 km northeast of the capital Ashgabat. It was excavated first in the 1950s and 1960s and again in the 1980s and 1990s (Masson 1971; Masson and Sarianidi 1972, 33-46; Harris 2010; Chap. 1). A series of radiocarbon determinations date Jeitun to 6300-5600 cal BCE. It is unclear whether it was inhabited year-round or only seasonally (Harris 2010, 86; Harris with Gosden 2010a, 121; Harris with Gosden 2010b, 194). Among the ceramic forms are large open vessels and bowls. The pottery is vegetal tempered with a thick, reddish-brown slip. It is painted with fine parallel lines forming geometric patterns. There are clear similarities to Neolithic pottery from Monjukli and Chagylly Depe, but there are many more painted sherds from Jeitun. The Jeitun pottery is also comparable to Late Neolithic ceramics from the northeastern Iranian site of Sang-e Chakhmaq East (Tsuneki 2014b, 17-18, Abb. 10) and exhibits some parallels to Sialk I ceramics (see below; Coolidge 2005, 66).

The Neolithic in north-central and northeastern Iran

Masson and Sarianidi claim that parallels to Early Jeitun assemblages can be found at Jarmo and Tepe Guran and for the Middle and Late Jeitun period at Sialk I, 1-5 (Masson and Sarianidi 1972, 36; Coolidge 2005, 64). However, due to the great geographical distances involved, these sites cannot be considered direct parallels. Rather, temporal and material similarities can better be drawn to sites closer by in north-central and northeastern Iran.

Sang-e Chakhmaq

Sang-e Chakhmaq is located near Shahrud and is comprised of two mounds (Tsuneki 2014a). The western one can be dated to the Middle Neolithic (7200-6600 cal BCE) and the eastern one to the Late Neolithic to Transitional Chalcolithic periods (6300-5200 cal BCE, although most radiocarbon dates fall between 6200 and 5700 cal BCE; Nakamura 2014, 10). The East Mound thus dates similarly to the Neolithic levels at Monjukli Depe (Chap. 3). The chaff-tempered ceramics from Sang-e Chakhmaq West have very well smoothed surfaces covered with a reddish wash. The pottery from the East Mound is comprised of hemispherical bowls, carinated vessels, and open bowls. Many vessels are painted with fine, parallel lines and/or geometric motifs, including straight and wavy lines, dots, checkerboards, crosshatch, and opposing triangles (Tsuneki 2014b, 13-16).

Cheshmeh Ali

Cheshmeh Ali lies southeast of Tehran at the edge of the medieval city of Rey. The 7-m-high mound contains Neolithic, Chalcolithic, Parthian, and Islamic levels, with a direct continuity from the Late Neolithic to the Early Chalcolithic. The Neolithic settlement of Cheshmeh Ali ends around 5300 cal BCE. Radiocarbon dating has not given an exact beginning, but the time span for the Late Neolithic at Cheshmeh Ali is placed at the end of the 7th to the middle of the 6th millennium cal BCE (Fazeli et al. 2004, 13, 22, Table 3). The Neolithic pottery is chaff tempered and decorated with fine parallel and zigzag lines (Fazeli et al. 2004, 19, Fig. 3), showing clear parallels to Neolithic Monjukli Depe wares.

Tepe Sialk

Tepe Sialk is located approximately 200 km south of Tehran and not far from the modern city of Kashan in the province of Isfahan. The site consists of a northern and a southern mound situated approximately 600 meters apart. The Neolithic-Chalcolithic periods Sialk I 1-5 and II, 1-3 are attested on the northern mound (Malek Shahmirzadi 2004, 9-11). The Neolithic levels have been further divided into Sialk I 1-3 (Early Neolithic) and Sialk I 4-5 (Late Neolithic) (Fazeli Nashli et al. 2009, 18, Tab. 7). On the basis of recent radiocarbon dates, Sialk I 1-5 is assigned to 5715-5376 cal BCE (Fazeli Nashli et al. 2013, 108, Table 7.1). Sialk I 1-5 pottery exhibits uneven firing and was produced in simple kilns (Malek Shahmirzadi 2004, 10). It resulted in black-painted, geometric motifs, mostly fine parallel lines or crosshatching, on a beige or red background. Masson compared the motifs with those of the Middle and Late Jeitun period (Masson 1971, 69, Fig. 16). Among them are dots, wavy lines, crosshatching, ladder motifs, and zigzag lines (Coolidge 2005, 64) of which some are also present on the Neolithic Monjukli Depe sherds.

The ceramic assemblages of these three sites show clear parallels to the pottery excavated in Monjukli Depe. Generally, thick, chaff-tempered steep or wide open bowls were decorated with fine lines, forming various geometric motifs such as zig-zag lines, crosshatch, and wavy lines, even though the majority of the Monjukli Depe Neolithic pottery is unpainted. Hence, groups of people from the regions of what is now northern and northeastern Iran and southern Turkmenistan shared similar cultural techniques concerning pottery production and decoration style. Network-like contacts are therefore probable. Contrary to previous assumptions, the Neolithic levels at Monjukli Depe date to the early rather than the middle or late Jeitun period (Chap. 3). This requires new explanations for the transfer of cultural techniques during the Neolithic in the region.

Aeneolithic in southern Turkmenistan

The very early Aeneolithic of southern Turkmenistan is referred to as the Anau IA period and dates, according to radiocarbon determinations from Anau North, to the late 5th millennium BCE (Hiebert 2002, 28, Tab. 2; Hiebert with Kurbansakhatov 2003, 55, Tab. 5.1; Chap. 3).

Chakmakly Depe

Chakmakly Depe is the closest early Aeneolithic site to Monjukli Depe and is located in the Meana-Chaacha district. According to soundings conducted by Berdiev (1968, 30), the oval, ca. 60 x 80 m and 1-m-high mound contains approximately 3 m of cultural deposits dating to the early Aeneolithic. The most recent of five levels marks a transitional time between Anau IA and Anau IB. The existence of a transitional period is assumed based on the presence of thin-walled, sand-tempered Anau IA ceramics and thick-walled, vegetal-tempered Anau IB pottery (Berdiev 1968, 27). The latter ware was found in Unit M at Monjukli Depe as well (Chap. 2). According to the excavators, the older levels of Chakmakly Depe contain Anau IA material (Masson and Sarianidi 1972, 49). Hemispherical bowls were covered with a red or yellowish slip and painted black motifs. Frequently, a horizontal band along the rim was filled with zigzag lines or crosshatched triangles, a well attested pattern from Aeneolithic Monjukli Depe.

Fig. 10.42. Aeneolithic pottery from Chakmakly Depe, from the 2012 reconnaissance of the Monjukli Depe and Chaacha-Meana Survey teams. Black on Buff pottery with crosshatch: upper row, 3rd-6th from left; Black on Buff pottery with grid motif: middle row, 2nd from left; chaff-tempered Anau IB pottery: upper row right, middle row right and 2nd from right, lower row right; others: high and partly overfired Aeneolithic plain pottery.

A stone hoe, very similar to that from Sialk I, 1-5 (Ghirshman 1938, Pl. VIII) was recovered in the younger levels at Chakmakly Depe and was interpreted by Berdiev, in combination with other factors, as an indication of the immigration of groups belonging to the Sialk I complex. He proposed a scenario in which immigrant groups bringing Anau IA ceramics were assimilated by local Jeitun residents and gradually adapted themselves to the local technologies of the Jeitun people (Berdiev 1968, 32). He supported this thesis by noting changes in the ceramics from coarse, vegetal-tempered (Jeitun, local) to fine, sand-tempered wares (Anau IA/Sialk II [1-3]) and then to medium-coarse, chaff-tempered ones (Anau IB). Masson and Sarianidi suspected that the early Aeneolithic ceramic technology at Chakmakly Depe was temporally prior to Anau IA:

> It is quite clear that the early Chalcolithic complex of the Chakmakli type preceded the Anau complex, and held a transitional position in the development of the local mixed farming culture. Until recently, all this pre-Anau material, irrespective of its geographical position, was classed as the Anau I-A complex; such a rough division is no longer satisfactory and the material requires a more detailed classification (Masson and Sarianidi 1972, 50; the reference to pre-Anau is to Chakmakly pottery).

Mellaart distinguished a Chakmakly and an Anau IA complex without specifying their chronological relationships. He classified Chakmakly and Monjukli in the same complex (Mellaart 1975, 216-219). However, current research by the Monjukli project has disproven this assumption.

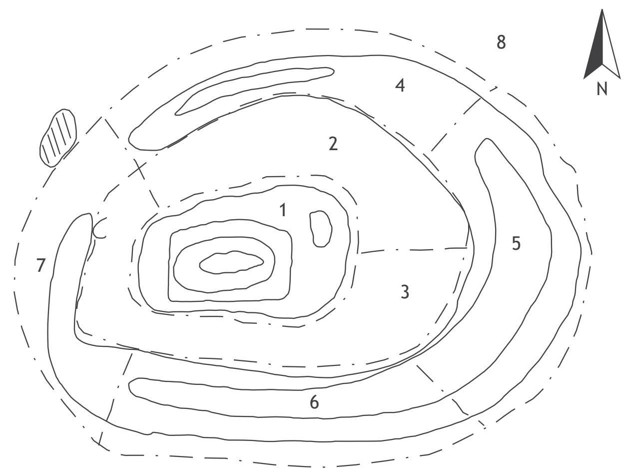


Fig. 10.43. Sketch (not to scale) of Chakmakly Depe, showing the 2012 collection fields of the Monjukli Depe Team. They were defined following the topography of the ring-shaped mound, which is a result of old excavations.

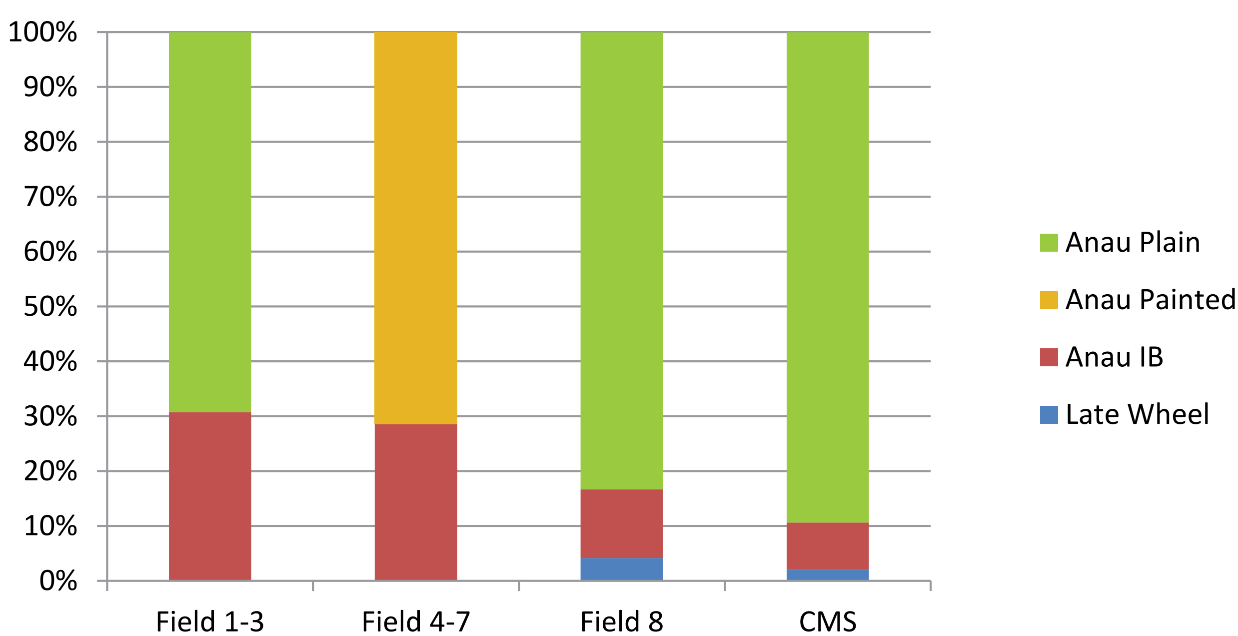


Fig. 10.44. Distribution of wares in the collection fields of the Monjukli Depe team and the CMS at Chakmakly Depe.

The Monjukli as well as the Chaacha-Meana Survey team visited Chakmakly Depe in 2012 (Castro Gessner 2018, 26, Fig. 15). The surface of the mound was systematically sampled, the pottery recorded, drawn, and photographed (Fig. 10.42-44).

A comparison of sherds from the surface collection (122 sherds) at Chakmakly Depe (Fig. 10.43, Cat. 10.104-116) and the pottery from the excavations at Monjukli Depe suggests that the uppermost level at Chakmakly Depe dates later than Monjukli Depe. The abundance of thick, vegetal-tempered Anau IB pottery (14.8%) at Chakmakly Depe is clear evidence for this (Cat. 10.108, 115; for comparison see "B.3 ware" in Hiebert with Kurbansakhatov 2003, 64). Due to this apparent later dating, we refer to the Aeneolithic ware from Chakmakly Depe as "Anau" rather than "Meana." Anau Plain (74.6%) and Anau Painted sherds with crosshatch decoration (8.2%, Cat. 10.105-106) are present; Late Wheel pottery (2.5%) comes from a later occupation and/or post-occupational contexts. The small concave bases (Cat. 10.109-113) are very similar to those from Monjukli Depe, but the polytone surfaces indicate higher (and unstable) firing temperatures.

The distribution of wares shows an overall occurrence of Anau IB pottery in similar amounts across the mound. It is striking that no painted pottery was found at the center. This might either be connected to an uneven distribution of these wares within the village or to the small amount of painted pottery within the collections.

Anau North

It was in Anau North that very early Aeneolithic pottery was found for the first time, later becoming the defining criterion of the Anau IA horizion (Pumpelly 1908; Hiebert with Kurbansakhatov 2003). A Bayesian analysis of recent radiocarbon dates place Anau IA at ca. 4400-3800 cal BCE (Chap. 3). The pottery was classified by Schmidt as "group c" (Schmidt 1908, 130-132). Characteristic are hemispherical bowls with concave bases made of fine, high-fired, sand-tempered fabric (Hiebert with Kurbansakhatov 2003, 57). The fabric is clearly distinct from the rest of the vegetal-tempered, Anau-period pottery, as Schmidt emphasizes: "The fragments of group c were so characteristic and deviated so widely in their technique from those of group a, that upon their first appearance they were regarded as something special" (Schmidt 1908, 131). Schmidt´s ceramic chronology describes pottery of "Culture I" from Anau North (IA and IB) and "Culture II" from Anau South.

Later, Hiebert and Kurbansakhatov refined the Anau chronology (Pre-Anau IA, IA, IB1, IB2, IIA) and defined eight pottery wares, A-G. Group C refers to a high-fired ware with a brown slip and sand temper. The sub-group "C1 ware" or "Anau IA" type, and not to be confused with Schmidt's group c, is a high-fired, medium-fine ware with smoothed surface, reddish to brownish slip, and exterior dark gray to black paint (Hiebert with Kurbansakhatov 2003, 68). The C1 pottery was found in small quantities (15% of the total Anau IA assemblage) in a 3 x 3 m trench (Hiebert with Kurbansakhatov 2003, 58, 60, Tab. 6.2).

The motifs of the C1 ware were applied in a dark paint on a weak brown to reddish-brown slip. They consist of geometric patterns, including a crosshatched diamond pattern, also known from Shir-i Shian. This ware was also identified at other sites in the Kopet Dag foothills, including Ovadan, Gavych, the "73 Kilometer" site, Kaushut, and Chakmakly Depe (Berdiev 1974). Berdiev presumed that this pottery was produced in the eastern Kopet Dag near Monjukli and Chakmakly Depe, because it is more common there than in the west (Berdiev 1972). I examine this hypothesis below in light of our recent work at Monjukli Depe.

From the regional and interregional comparisons, it is clear that despite numerous commonalities with other sites, Monjukli Depe occupies a special position in the Aeneolithic of southern Turkmenistan. For instance, neither the star motif nor the "Jackson Pollock" pattern appears at any of the other sites discussed here.

The Chalcolithic in north-central and northeastern Iran

The pottery of the central Iranian Chalcolithic that is relevant for this work comes from Aq Tepe (Gorgan Plain), Chenaran on the southern side of the Kopet Dag, Shir-i Shian (Damghan Plain), Cheshmeh Ali and Ismailabad (Tehran Plain), Sialk, and Zagheh (Qazvin Plain).

Northeastern Iran

The site of Aq Tepe is located in the Gorgan Plain, about 16 km northeast of Gonbad-e Kavous. It dates to the 6th millennium cal BCE (Malek Shahmirzadi and Nokandeh 2001). The ceramics of Aq Tepe are attributed to the Late Neolithic, Transitional Chalcolithic, early Chalcolithic, and Iron Age; the Transitional Chalcolithic material is relevant for my comparisons here (Masson and Sarianidi 1972, 50; Dyson and Thornton 2009, 12). The open and hemispherical vessels have in some cases concave bases. They are decorated with black paint on a red background. A broad horizontal band along the rim painted with geometric motifs is common. Notable is the close-mesh crosshatching on large surfaces or within geometric motifs such as triangles and diamonds (Shamirzadi and Nokandeh 2001, Figs. 13.2, 9, 18.7), which corresponds to the ways of painting crosshatch at Monjukli Depe.

The site of Chenaran is located in the province of Khorasan (Basafa and Razaei 2014). Situated south of the main range of the Kopet Dag, it is close to the Iranian-Turkmenistan border. Chenaran's "Context 6" has been singled out by the excavators as belonging to the Anau IA and Cheshmeh Ali horizon (Basafa and Rezaei 2014, 11, 13, Table 1). The Chenaran sand-tempered pottery has black painting on a dark red background including geometric motifs filled with lines or crosshatching. Due to clear parallels in production and style, I would suggest assigning the Chenaran pottery to the pre-Anau IA, corresponding to the Meana Horizon in Monjukli Depe.

Damghan Plain

The Damghan Plain is located on the Iranian plateau about 340 km east of Tehran. The Chalcolithic chronology in northeastern Iran is based to a large extent on comparisons with the ceramic sequences of north-central Iran and southern Turkmenistan. Regional ceramics have been described as Jeitun or Cheshmeh Ali (Dyson and Thornton 2009, 4).

Shir-i Shian is located approximately 15 km southwest of the city of Damghan (Dyson and Thornton 2009). The sherd density on the surface of the mound is high. Ceramics from Schmidt's survey were initially assigned to the Hissar IA horizon (Schmidt 1933, cited in Dyson and Thornton 2009, 5). A more recent relative chronology dates the site to 4700/4600-4300 cal BCE, so Shir-i Shian was settled earlier than Hissar IA and Anau IA (Dyson and Thornton 2009, 14). Thornton notes, "An Iranian origin for the new high-firing technology witnessed in the 'Anau IA' ware of southern Turkmenistan remains to be demonstrated empirically, but can no longer be ruled out" (Thornton 2004, cited in Dyson and Thornton 2009, 14).

The ceramic assemblage from the 1930s excavation is neither accessible nor is quantitative information available. A large part of the documentation is based on Schmidt's brief notes and drawings from his 1937 publication (Dyson and Thornton 2009, 9). It is clear, however, that many of the hemispherical bowls were decorated with horizontal rows of crosshatched diamonds. This pattern is also found on Chalcolithic pottery from Ismailabad and Kara Tepe in the Tehran plain (Burton-Brown 1979; Talai 2000), Aq Tepe (Shamirzadi and Nokandeh 2001), as well as Anau IA (Hiebert with Kurbansakhatov 2003, 68) and Gavych Depe (Masson and Sarianidi 1972, 50; Dyson and Thornton 2009, 12). Parallels to Monjukli Depe are recognizable in the manufacturing technique (high-fired), shape (hemispherical bowls), visual conception (horizontal band along the rim), and painted decoration (crosshatched patterns).

Tehran Plain and Sialk

The high plateau around Tehran lies south of the Elburz mountains at an elevation of ca. 1100 m asl. The region is rich in Neolithic and Aeneolithic sites (Coningham et al. 2004, 2).

In addition to a late Neolithic occupation, the aforementioned site of Cheshmeh Ali contains Transitional and early Chalcolithic levels. Recent radiocarbon dates place the Transitional Chalcolithic at ca. 5300-4300 cal BCE. The distinctive black-on-red painted ceramics form a central marker for the relative chronology of the central Iranian plateau (Fazeli et al. 2004, 13, 20). For a chronology, however, this characteristic is too general to be of much value. The characteristic hemispherical vessels have slightly concave bases with a relatively small diameter, similar to the Aeneolithic repertoire from Monjukli Depe.

The pottery of Sialk II 1-3 (ca. 5250-5150 cal BCE) is considered transitional from the late Neolithic to the early Chalcolithic and is therefore also part of the Transitional Chalcolithic (Dyson and Thornton 2009, 1; Fazeli Nashli et al. 2013, 108, Tab. 7.1). The pottery was fired under more controlled conditions than the previous Sialk I period and decorated with stylized animals and plants in addition to geometric motifs (Malek Shahmirzadi 2004, 10). The frequently occurring open bowls have a base, often dimpled, with a small diameter relative to the rim. Along the rim is a band filled with geometric motifs. In some cases, vertical lines run below the rim band to the bottom of the vessel (Ghirshman 1938, Pl. XLV, s. 1394 (Sialk I 1) and s. 1641 (Sialk II 2)), similar to the decorative scheme at Monjukli Depe. The interior of some vessels is decorated with triangles, the tips of which meet at the base. Crosshatched diamonds are also prominent and are similar to those from Shir-i Shian and Aq Tepe. A list of direct comparisons reveals only parallels with Sialk II 1 and 2, so that Monjukli Depe probably parallels the earlier Cheshmeh Ali period (Ghirshman 1938, Pl. XLVII, A13=Sialk II 1, Pl. XLIX, A25=Sialk II 2, Pl. XLVIII, D14=Sialk II 2). The latter are a "Jackson Pollock" and a dense vertical crosshatch pattern, less characteristic than the vertical lines that seem to be mostly from the Sialk II 1 period. In short, there are many sherds published, of which only a few show parallels to Monjukli Depe.

The Chalcolithic site of Tappeh Pardis (Fazeli et al. 2007) is situated ca. 35 km southeast of Tehran. It was occupied in the Transitional Chalcolithic, early and late Chalcolithic (Fazeli Nashli et al. 2013, 108, Tab. 7.1). A Late Neolithic occupation is also mentioned. The Transitional Chalcolithic is dated to 4900-4680 cal BCE (Coningham et al. 2006, 46). The ceramic assemblage is compared by the excavators to the pottery from Cheshmeh Ali and Sialk II. This pottery is characterized by its black-on-red decoration and clearly differs morphologically from the late Neolithic wares from the site. The open or hemispherical vessels have concave bases. They are painted with geometric, floral, and zoomorphic motifs along the rim. Occasionally, vertical lines on the vessel based were documented (Coningham et al. 2006, 39-41, Fig. 9, no. 27).

Qazvin Plain

During a large-scale survey in 2003, 23 Neolithic, Chalcolithic, and Bronze Age sites were identified in the Qazvin Plain, indicating an intensive settlement there after the Neolithic period (Fazeli Nashli et al. 2009, 2).

Approximately 60 km south of the city of Qazvin is the site of Tepe Zagheh. It is approximately 4 ha, with 6 m of cultural layers (Malek Shahmirzadi 1977, 49). Originally, the site was assigned to the Neolithic period, but more recent radiocarbon dates place it in the Transitional Chalcolithic (5370/5070-4460/4240 cal BCE; Fazeli Nashli et al. 2009, 1). The pottery wares show a local style ("Zagheh type") with transregional influences ("Cheshmeh Ali type"). Dominant vessel forms are open bowls and vessels with incurved rims. The geometric motifs painted black or dark brown on a red or beige background consist, among others, of fine patterns of parallel lines, crosshatching, and triangles that sometimes fill a horizontal band along the rim. The slightly concave bases occasionally reveal vertical lines that may be connected to the horizontal band at the rim (Malek Shahmirzadi 1977, 273, 304, Pl. V).

Assessment of the migration hypotheses

In the transition from the 6th to the 5th millennium, a break in ceramic technology can be observed in southern Turkmenistan and on the northeastern Iranian plateau. However, hypotheses that are based on wide-ranging geographic areas and uniform styles spread by homogenous cultural groups leave little room for the investigation of local phenomena. The chronological, morphological, and typological characteristics of the Meana ceramics from Monjukli Depe make it clear that this ware cannot simply be classified as part of the Anau IA horizon. Since the immigration hypotheses are heavily based on similarities in ceramic assemblages, mainly painted designs, the reassessment of the Monjukli Depe pottery as both earlier and formally different from Anau IA ceramics places this thesis in doubt, at least for southeastern Turkmenistan.[179]

Despite the considerable distances involved, linear models of migrations of whole cultures have been constructed. To some extent, these reflect the state of research in the region. In western discourse Turkmenistan is often regarded as a periphery in comparison to the region stretching from the Levant through Iran and has not been studied with the same intensity as the Mesopotamian and Levantine "heartlands." The density of known archaeological sites in northeastern Iran is considerably lower, and future research in this area would be highly desirable (such as recent excavations at Qaleh Khan, Khorassan: Garazhian et al. 2014). It can be assumed that there were active contacts between individual settlements within the geographical area of northern Iran, southern Turkmenistan, and elsewhere.[180] However, in my view, the existence of networks over smaller distances seems more likely than the migration of homogenous groups over long distances. The spread of a technological complex can, of course, also occur in the absence of migration.

At many 5th millennium sites from northern Iran and southern Turkmenistan, including Ghabrestan, Sialk II 1-3, Zagheh, Ismailabad, Cheshmeh Ali, Tappeh Pardis, Shir-i Shian, Aq Tepe, a vessel type with a wide rim and a very narrow base predominates. Its decoration consists mostly of a horizontal band filled with motifs. In some cases, this band was connected to the base by vertical lines (Zagheh, Sialk II 1-2, Cheshmeh Ali, Monjukli Depe, Pardis). However, the horizontal band with vertical rays tapering towards the top is not attested anywhere except Monjukli Depe. While the same vessel shapes (especially the Incurved Rim Bowl and Open Bowl) are present at all sites named above, the visual conception of the vessels from Monjukli Depe differs significantly from these other sites. At Monjukli Depe zoomorphic and anthropomorphic motifs are completely lacking, whereas they are frequent at Sialk II and other sites on the Iranian plateau. We can therefore speak of a local style embedded in a far-reaching cultural technique of shaping and painting pottery, a supraregional taste.

Comparative densities and degrees of fragmentation offer other important clues concerning the handling of ceramics. As I have demonstrated for Monjukli Depe, stratigraphic developments can thereby be clarified. The break between the Late Neolithic and the largely aceramic early Aeneolithic is remarkable and throws new light on migration debates. If the Aeneolithic inhabitants of Monjukli Depe came from northern Iran and brought with them a new ceramic technology that ended in the Anau IB period, why does so little of it appear in the excavated remains? For an interregional comparison of the handling of ceramics in early Aeneolithic southern Turkmenistan and the Transitional Chalcolithic of northern Iran, calculating comparative densities of pottery would be indispensable. In this way, commonalities and differences in daily practice can be approached, providing a much more reliable basis for the analysis of cultural contacts, access to raw materials, and social (in)equalities.

179 See McCown 1942; Khlopin 1963; Berdiev 1972; 1976; Masson and Sarianidi 1972; Lamberg-Karlovsky and Tosi 1973; Kohl 1984; Hiebert with Kurbansakhatov 2003; Dyson and Thornton 2009.

180 In Monjukli Depe, for example, carnelian and lapis lazuli beads as well as lithics made of chalcedony were found (Pope 2011, Table 7, referred to as "Translucent White"). The presence of finished end products made from these materials without evidence for production indicates that these objects were likely imported.

Even today in the archaeology of this region the question rarely arises as to whether the emergence of new or changed cultural techniques should be associated with the migration of whole groups. Such changes can also be initiated by internal social shifts in, for example, needs or in a *Zeitgeist*. In the case of Monjukli Depe, however, the hiatus between the Neolithic and Aeneolithic must be taken into consideration. The Neolithic site was abandoned and only resettled many centuries later. What happened in the meantime? A more detailed investigation of sites in the immediate vicinity (Chagylly and Chakmakly Depe) as well as absolute chronological dating are indispensable. On closer examination many current hypotheses are not tenable at the small scale, as the example of Monjukli Depe illustrates.

In this chapter, the importance of ceramics in the everyday life of the inhabitants of Monjukli Depe was examined. The densities and degrees of fragmentation are a first indication of the distribution and availability of pottery. However, they do not tell us much about ceramic use. The concept of visual affordance can help expand the perception of ceramics in archaeological investigations. The rarity of pottery at Monjukli Depe and thus of its production and use raise important questions about the position of these vessels in the daily lives of the village's inhabitants. The same is true for the possibilities of seeing and using these objects, leading to archaeological investigation of the visual varieties of vessels and their embeddedness in sociocultural contexts. These are all questions in need of further research.

Catalog pottery

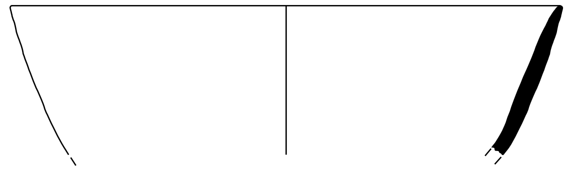
Abbreviations

NBW	Neolithic Brown Wash on Slip
NDW	Neolithic Dark Wash on Slip
NBR	Neolithic Black on Red
NPt	Neolithic Painted
NPl	Neolithic Plain
NPyt	Neolithic Polytone
NRB	Neolithic Red Burnished
MBR	Meana Black on Red
MRW	Meana Red Wash
MBB	Meana Black on Buff
MBW	Meana Buff Wash
MPt	Meana Painted
MPl	Meana Plain
MPyt	Meana Polytone
MBtR	Meana Bitone Painted Red Inside
MBtB	Meana Bitone Painted Buff Inside
MPin	Meana Pinched
AnIB	Anau IB
AnRR	Anau Red on Red

Pottery from Monjukli Depe (Cat. 10.1 - 10.88)

Neolithic Wide Open Bowls (Cat. 10.1-7), Everted Rim Jar (Cat. 10.8) and Steep Open Bowl (Cat. 10.9)

10 cm



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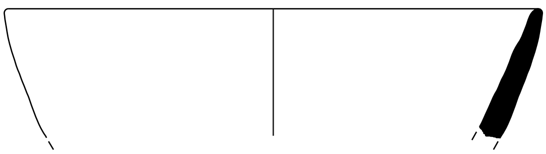

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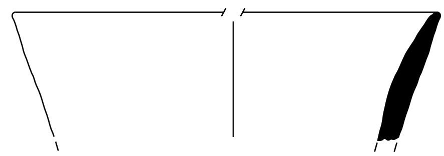

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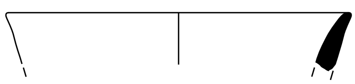

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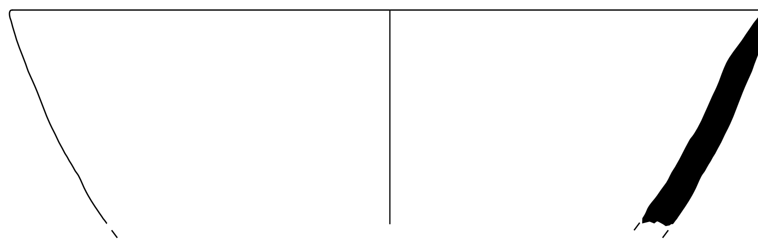

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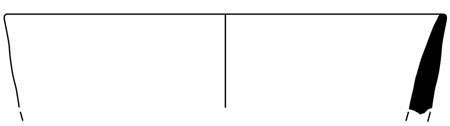

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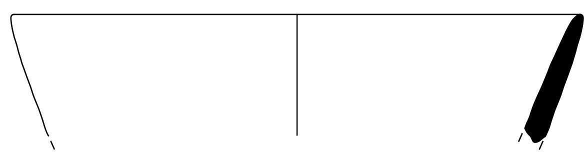

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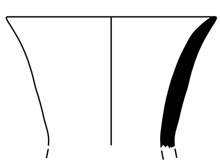

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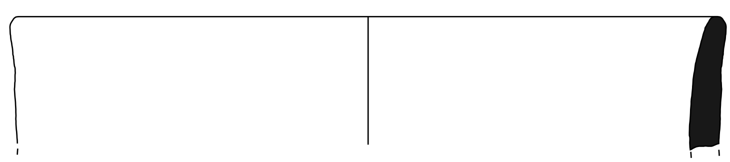
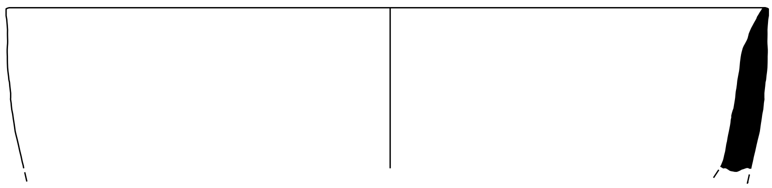


Cat. 10.9.

Cat. 10.1 - RN 229.1, NBW. Ext.: reddish brown wash on brown slip. Int.: brown wash on reddish-brown slip, core buff - Ø 29 cm
Cat. 10.2 - RN 3327.1, NDW. Ext. + Int.: dark brown wash on brown slip, core gray to orange - Ø 28 cm
Cat. 10.3 - RN 3440.6, NDW. Ext. + Int.: dark brown to dark red wash or slip, core buff - Ø ?
Cat. 10.4 - RN5816.6, NBW. Ext. + Int.: brown wash on light brown slip, core light gray - Ø 18 cm
Cat. 10.5 - RN6693.36, NBW. Ext. + Int.: reddish brown wash on light brown slip, core gray - Ø 23 cm
Cat. 10.6 - RN6725.1, 7, 14, NBW. Ext. + Int.: brown slip and wash, core dark gray - Ø 40 cm
Cat. 10.7 - RN6775.1, NBW. Ext. + Int.: reddish brown wash on reddish brown slip, core gray - Ø 30 cm
Cat. 10.8 - RN 6897.1, NBW. Ext.: reddish brown wash on brown slip. Int.: brown wash on brown slip, core light gray, everted rim jar - Ø 11 cm
Cat. 10.9 - RN 5010.3, NBW. Ext. + Int.: dark red to violet wash on brownish buff slip - Ø 37 cm

Neolithic Steep Open Bowls (Cat. 10.10-17)



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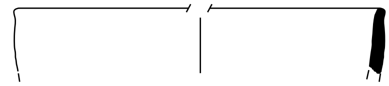

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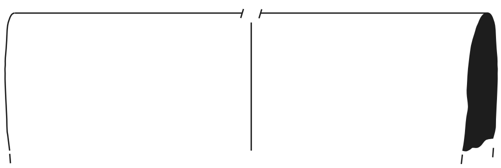

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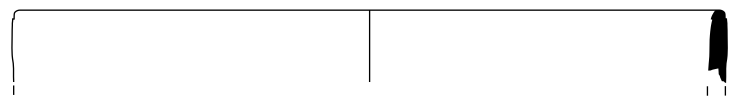

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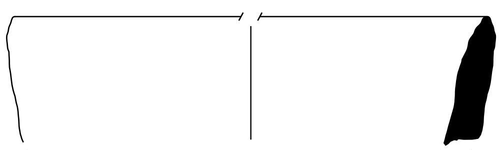

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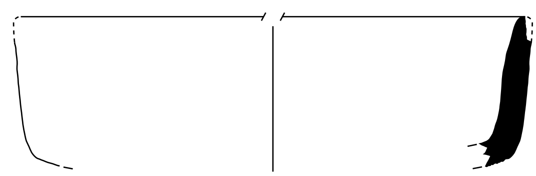

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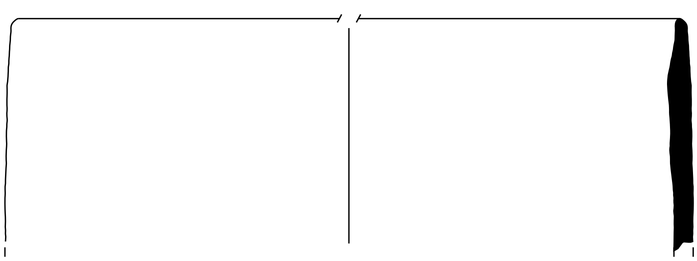
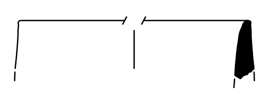
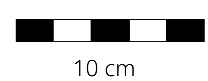


Cat. 10.16.

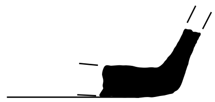


Cat. 10.17.

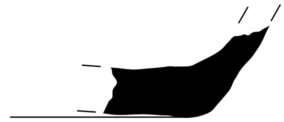


Cat. 10.10 - RN 5312.1, NBW. Ext. + Int.: brown wash on brown slip, core grayish buff - Ø 40 cm
Cat. 10.11 - RN 5752.2, NDW. Ext.: brown wash on grayish brown slip. Int.: buff wash on grayish brown slip, core gray - Ø ?
Cat. 10.12 - RN 5780.11, NBW. Ext. + Int.: light brown wash on brown slip, core light gray to reddish - Ø 22-30 cm
Cat. 10.13 - RN 6681.1, NBW. Ext. + Int.: reddish brown wash on light brown slip, core buff - Ø 37 cm
Cat. 10.14 - RN 6693.4, 6, 25, 26, 41, NDW. Ext. + Int.: dark red wash on light brown slip, core light brown - Ø ?
Cat. 10.15 - RN 6762.1, NBW. Remains of brown slip, core brown to gray - Ø ?
Cat. 10.16 - RN 12015.1, NBW. Vegetal temper. Ext. + Int.: reddish brown wash on brown slip, core light gray to orange - Ø >20 cm
Cat. 10.17 - RN 16403.17, NBW. Vegetal temper. Maybe rectangular vessel. Ext. + Int.: brown wash on orange slip, core gray to orange - Ø ?

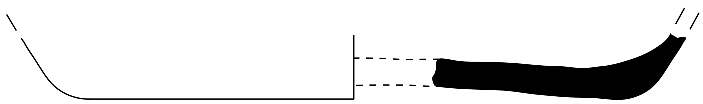
Neolithic Bases (Cat. 10.18-25)



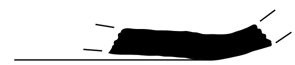
Cat. 10.18.



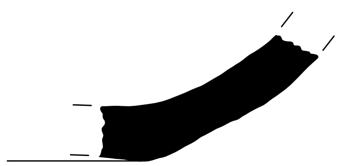
Cat. 10.19.



Cat. 10.20.



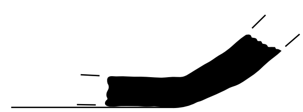
Cat. 10.21.



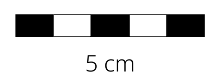
Cat. 10.22.

Cat. 10.23.

Cat. 10.24.



Cat. 10.25.



Cat. 10.18 - RN 2701, NBW (?) - Ø ?

Cat. 10.19 - RN 5950.11, NDW. Ext. + Int.: dark brown wash on dark brown slip, core dark gray - Ø ?

Cat. 10.20 - RN 6716.15, NBW (?) - Ø 14 cm

Cat. 10.21 - RN 16403.7, NBW (?) - Ø ?

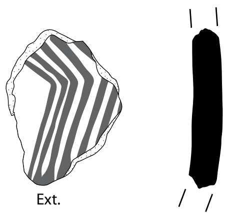
Cat. 10.22 - RN 16403.51, NPyt. Ext.: reddish to brown wash on brown slip. Int.: eroded, core light gray to orange - Ø 18 cm

Cat. 10.23 - RN 16403.56, NBW. Vegetal and sparse mineral temper. Ext. + Int.: reddish brown wash on orange slip, core gray - Ø >16 cm

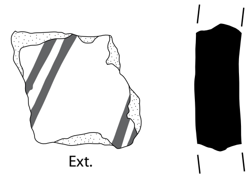
Cat. 10.24 - RN 16403.58, NBW/ NRB (?). Ext.: brown to dark brown wash on light brown slip. Int.: brown wash on light brown slip, core gray to orange buff - Ø 10 cm

Cat. 10.25 - RN 16403.59, NPyt. Ext.: yellow, brown, and dark brown wash on orange slip. Int.: black paint (?) on reddish brown wash and orange slip, core light gray - Ø 12 cm

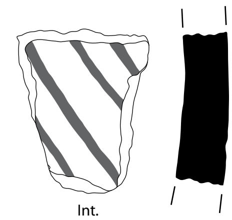
Neolithic Painted (Cat. 10.26-34)



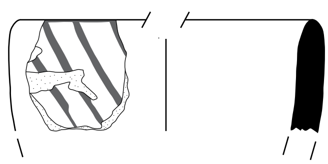
Cat. 10.26.



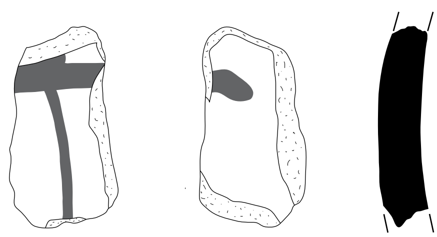
Cat. 10.27.



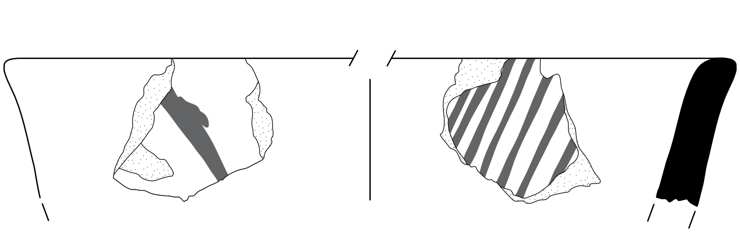
Cat. 10.28.



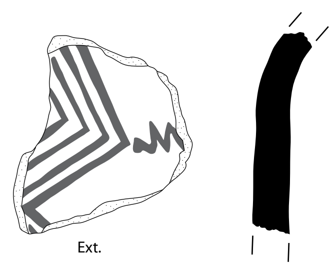
Cat. 10.29.



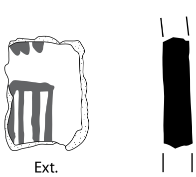
Cat. 10.30.



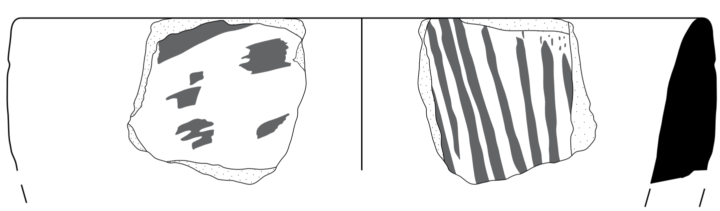
Cat. 10.31.



Cat. 10.32.



Cat. 10.33.



Cat. 10.34.

5 cm

Cat. 10.26 - RN 3620.2, NPt. Ext. + Int.: black paint, brown wash on reddish brown slip, core light gray

Cat. 10.27 - RN 5811.1, NPt. Ext.: black paint, reddish brown wash on brown slip. Int.: black paint, medium brown wash on brown slip, core light reddish

Cat. 10.28 - RN 6331.4, NBR. Ext.: red wash on brown slip. Int.: black paint, red wash on brown slip, core light gray

Cat. 10.29 - RN 6395.12, NPt. Ext.: black paint, brown slip. Int.: brown slip, core medium brown - Ø ?

Cat. 10.30 - RN 8206.1, NPt. Ext. + Int.: black paint, red wash, core brown

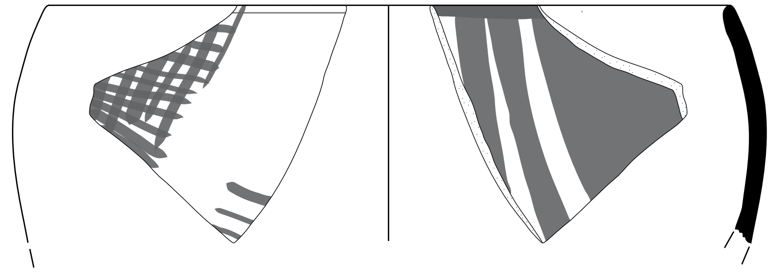
Cat. 10.31 - RN 8396.1, NBR. Ext.: black paint on red slip. Int.: black paint, dark red slip, core light buff - Ø ?

Cat. 10.32 - RN 909.1, NPt. Ext.: black paint on brown slip. Int.: brown slip, core brownish-buff

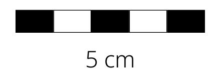
Cat. 10.33 - RN25073.1, NBR. Ext.: black paint, red wash on brownish red slip. Int.: red wash on brownish red slip, core reddish buff to light gray

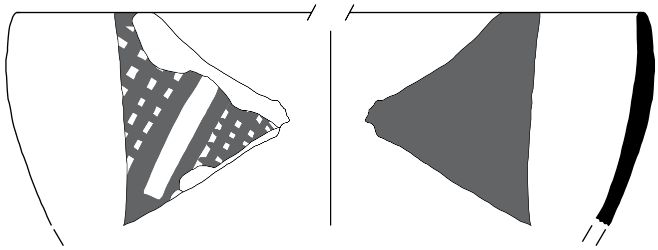
Cat. 10.34 - RN 25493.1, NPt, steep open bowl. Ext.: black paint on brownish red wash and brown slip. Int.: black paint on red wash and brown slip, core light gray to orange - Ø 18 cm

Meana Horizon Pottery, Cross-hatched Triangles: Incurved Rim Bowls (Cat. 10.35-39), Open Bowls (Cat. 10.40-41)

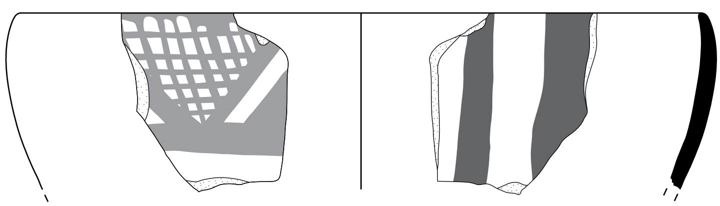


Cat. 10.35.

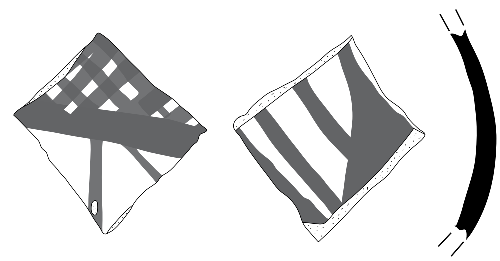




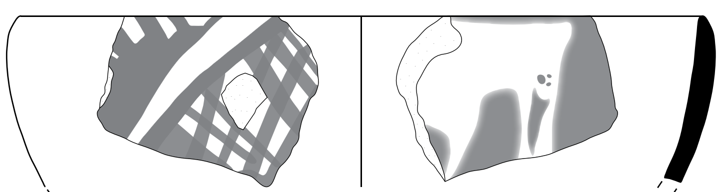
Cat. 10.36.



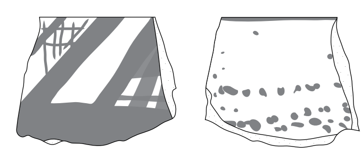
Cat. 10.37.



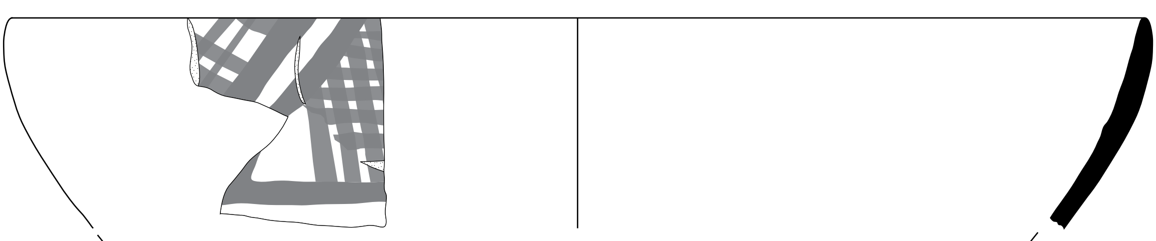
Cat. 10.38.



Cat. 10.39.



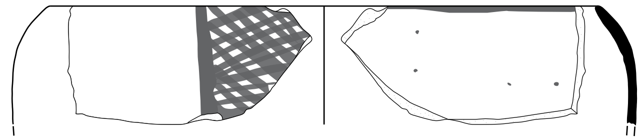
Cat. 10.41.



Cat. 10.40.

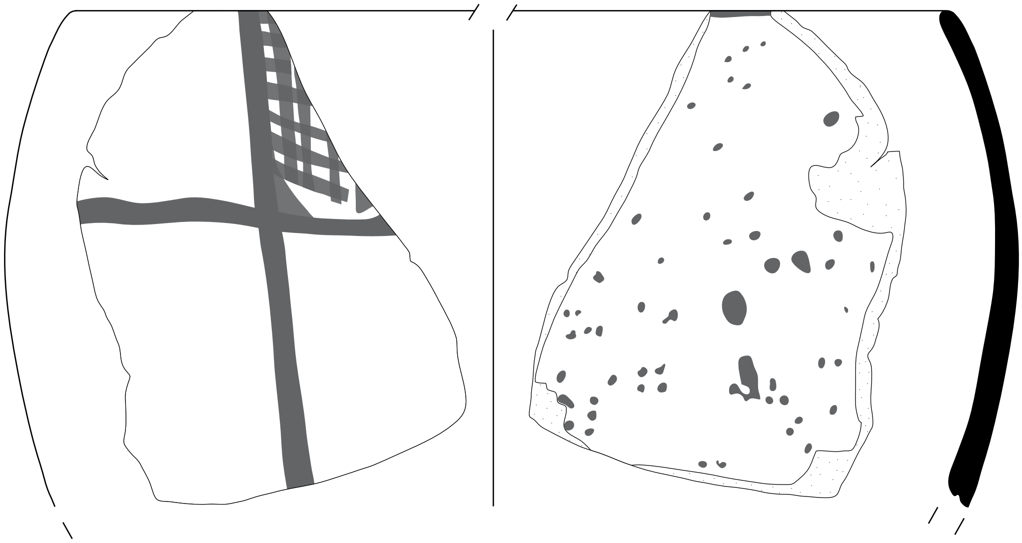
Cat. 10.35 - RN 318.1, MBR. Ext. + Int.: black paint on red slip, core gray - Ø 18 cm
Cat. 10.36 - RN 1010.2, MBB. Ext.: black paint on buff wash. Int.: black paint, core reddish buff - Ø ?
Cat. 10.37 - RN 1791.8, MBR. Ext.: gray paint on red wash. Int.: black paint on red wash - Ø 18 cm
Cat. 10.38 - RN 2440.4, MBR. Ext. + Int.: black paint on red wash.
Cat. 10.39 - RN 8313.1, MBB. Ext.: dark brown paint on buff wash. Int.: brown paint on buff wash, core brownish buff - Ø 18 cm
Cat. 10.40 - RN 5404.9-14, MBtR. Ext.: light brown paint on buff wash. Int.: red wash, core reddish buff - Ø 30 cm
Cat. 10.41 - RN 6957.7, MBtR. Mineral and vegetal temper. Ext.: brown paint on buff wash. Int.: brown paint on red wash, core reddish buff - Ø 13 cm

Meana Horizon Pottery, Crosshatched Rectangles: Incurved Rim Bowls (Cat. 10.42-44)

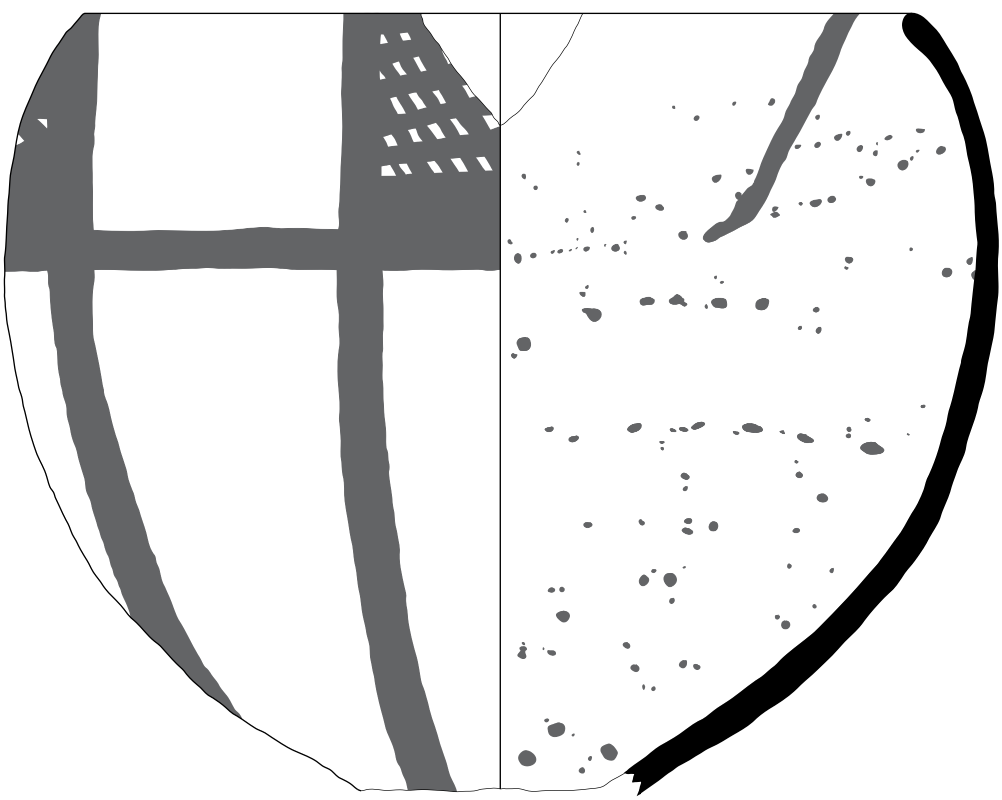


Cat. 10.42.

10 cm



Cat. 10.43.



Cat. 10.44.

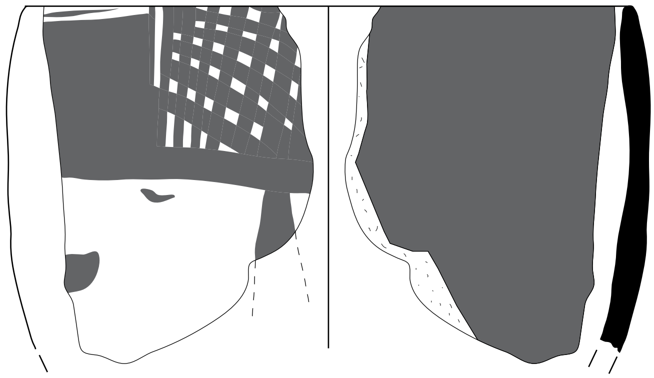
5 cm

Cat. 10.42 - RN 3376.1, MBR. Mineral and vegetal temper. Ext. + Int.: black paint on red wash, core light gray - Ø 29 cm

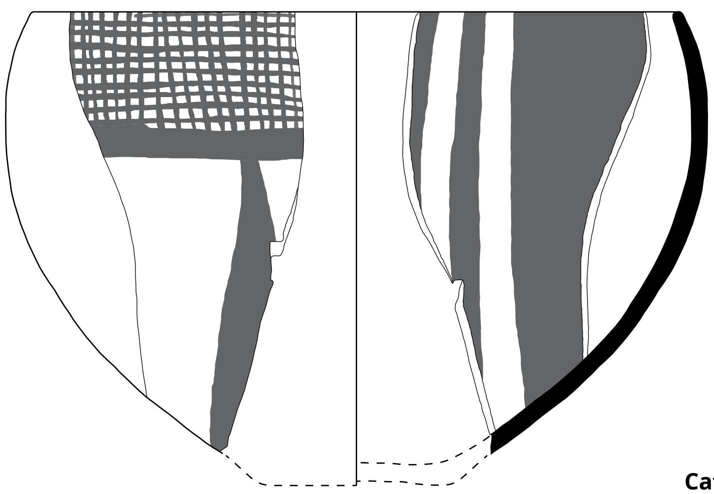
Cat. 10.43 - RN 6971.1-2 + 6958, MBR. Ext. + Int.: black paint on red wash, core gray to reddish - Ø ?

Cat. 10.44 - RN 13524.1-11, MPt. Mineral temper. Ext. + Int.: black paint on red wash (upper two thirds) and brown wash (lower third), core red - Ø 22 cm

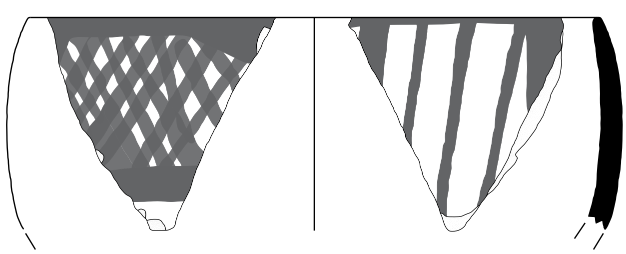
Meana Horizon Pottery, Crosshatched Rectangles: Open Bowl (Cat. 10.45); Miscellaneous Crosshatch: Incurved Rim Bowls (Cat. 10.46-47) and Holemouth Jar (Cat. 10.48)



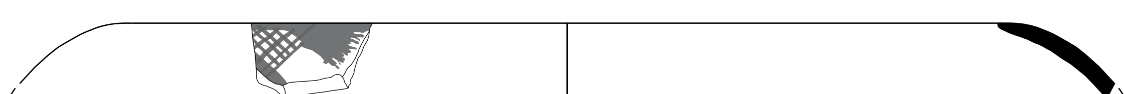
Cat. 10.45.



Cat. 10.46.



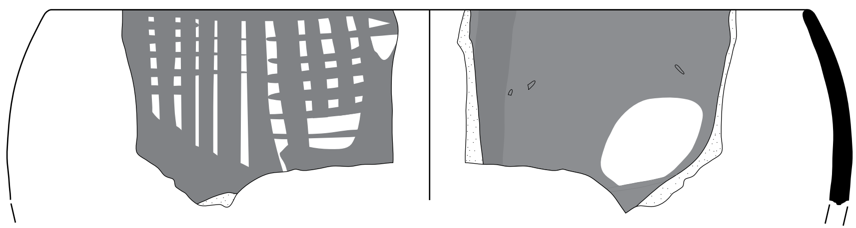
Cat. 10.47.



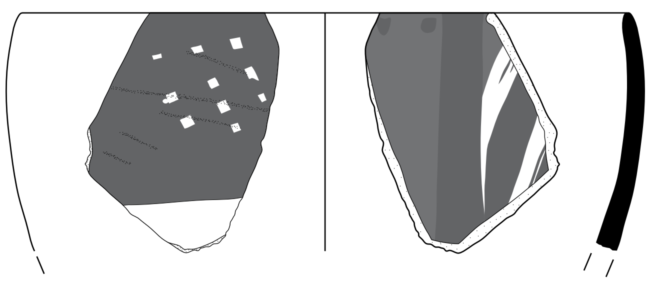
Cat. 10.48.

Cat. 10.45 - RN 4150.1, MBR. Sparse vegetal temper. Ext. + Int.: black paint on red wash, core light brown - Ø 16 cm
Cat. 10.46 - RN 1269.1 + 3, MBR. Ext.: black paint on red wash. Int.: black paint on reddish buff wash, core buff - Ø 17 cm
Cat. 10.47 - RN 2819.4, MBR. Mineral temper. Ext.: black paint on red wash. Int.: black paint on red wash, core light red - Ø 15 cm
Cat. 10.48 - RN 3190.1, MBR. Mineral and vegetal temper. Ext.: black paint on red wash. Int.: red wash, core buffish gray - Ø 23 cm

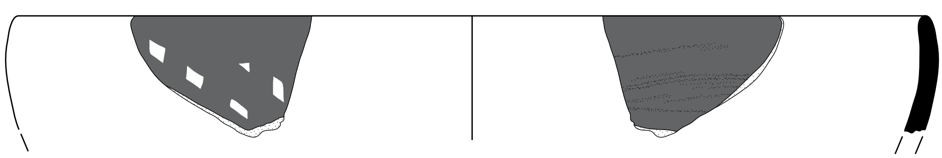
Meana Horizon Pottery, Miscellaneous Crosshatch: Incurved Rim Bowls (Cat. 10.49-51) and Open Bowl (Cat. 10.52)



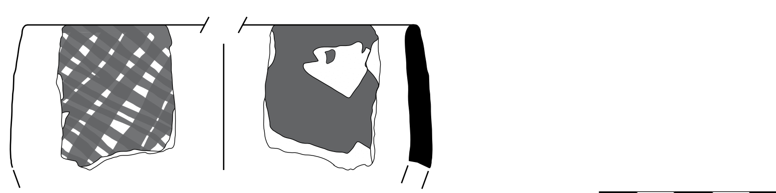
Cat. 10.49.



Cat. 10.50.



Cat. 10.51.

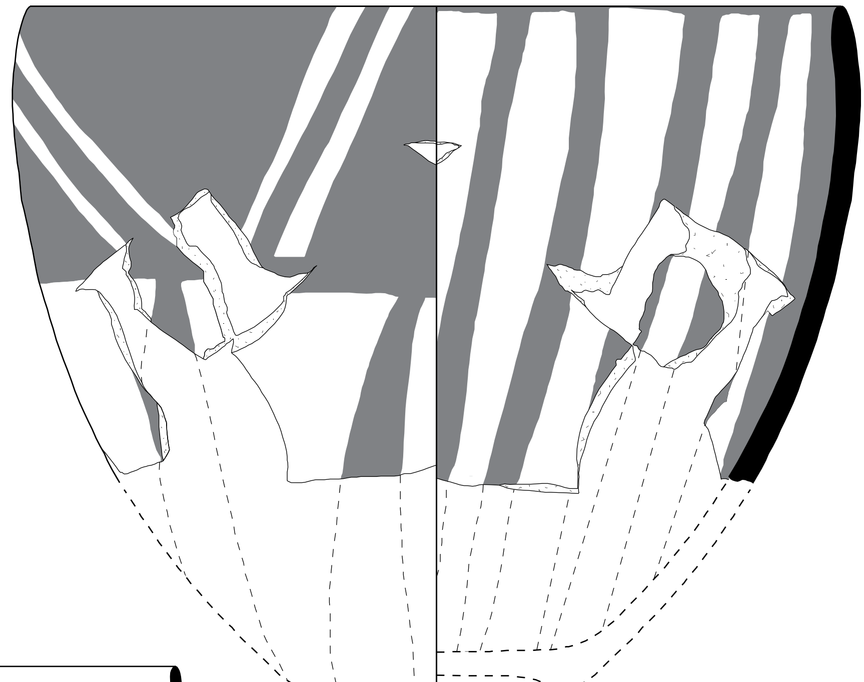


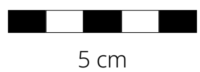
Cat. 10.52.

5 cm

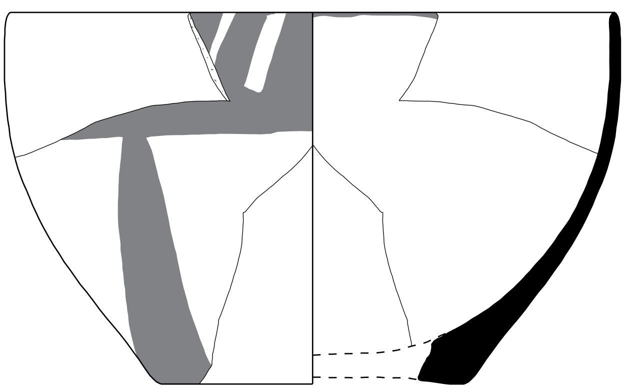
Cat. 10.49 - RN 5008.5, MBB. Mineral and vegetal temper. Ext. + Int.: dark brown paint on buff wash, core greenish buff - Ø 20 cm
Cat. 10.50 - RN 8014.8, MBB. Mineral and vegetal temper. Ext. + Int.: black paint on buff slip, core light gray - Ø 16 cm
Cat. 10.51 - RN 8443.1, MBR. Vegetal temper. Ext.: black paint on brown wash. Int.: black paint, core light gray to brown - Ø 24 cm
Cat. 10.52 - RN 1209.2, MBR. Untempered. Ext. + Int.: black paint on red wash, core reddish - Ø ?

Meana Horizon Pottery, Solid Triangles: Incurved Rim Bowls (Cat. 10.53-56)

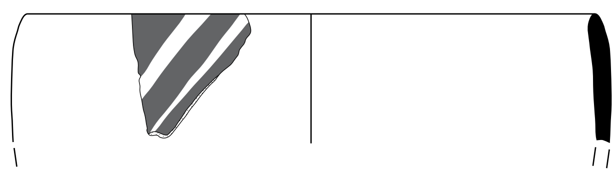




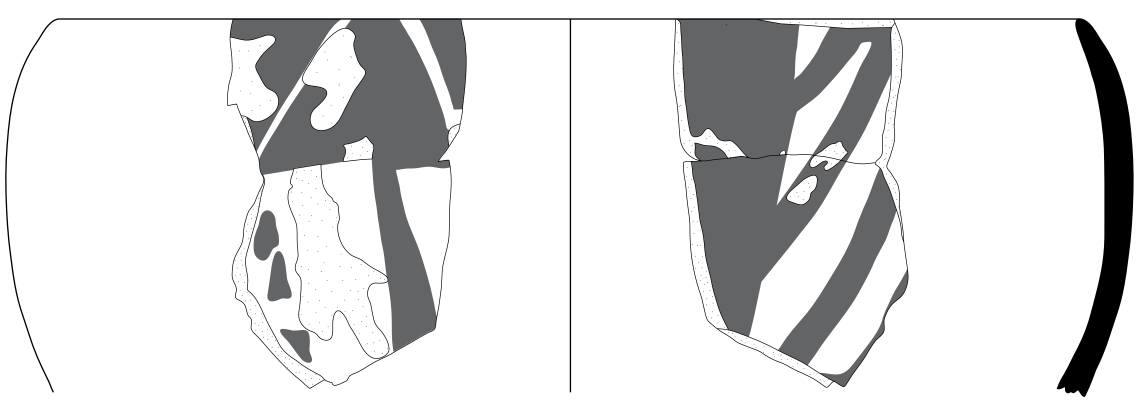
Cat. 10.53.



Cat. 10.54.



Cat. 10.56.



Cat. 10.55.

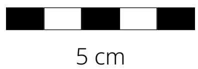
Cat. 10.53 - RN 1070, 1091, 1087, 1029, 1073, 1051, MBR. Ext. + Int.: dark brown paint, red wash on red slip, core grayish buff - Ø 21 cm

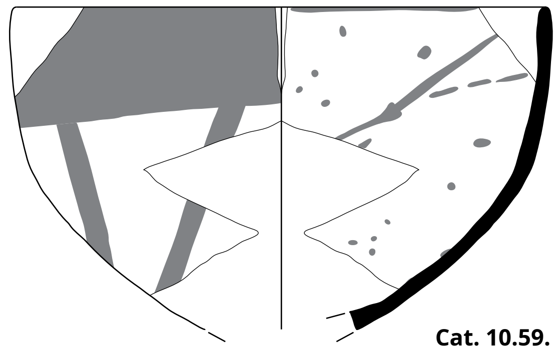
Cat. 10.54 - RN 1070.1-2, MBR. Ext.: dark brown paint, red wash on red slip. Int.: dark brown paint on red wash, core buff - Ø 16 cm

Cat. 10.55 - RN 1190.1, MBR. Ext. + Int.: black paint on red wash, core light gray - Ø 27 cm

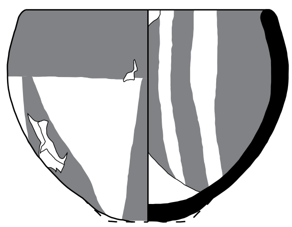
Cat. 10.56 - RN 6216.1, MBR. Mineral and vegetal temper. Ext.: black paint on red wash. Int.: red wash, core brown - Ø 15 cm

Meana Horizon Pottery, Incurved Rim Bowls with Black Band (Cat. 10.57-60) and Diamonds (Cat. 10.61)

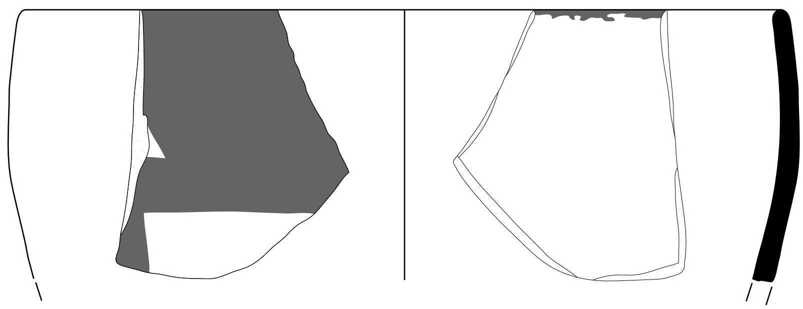




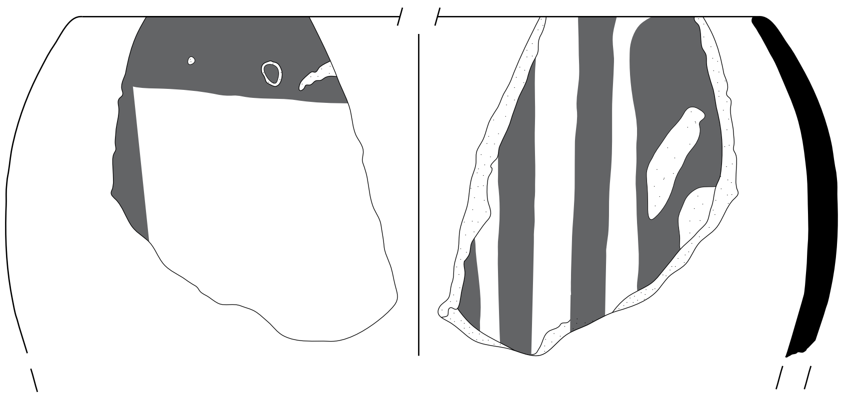
Cat. 10.59.



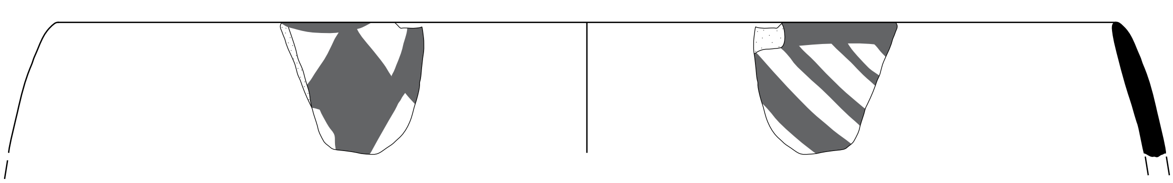
Cat. 10.58.



Cat. 10.57.



Cat. 10.60.



Cat. 10.61.

Cat. 10.57 - RN 1070.3, MBR. Vegetal temper. Ext.: black paint on red slip. Int.: black paint on red wash, core light brown - Ø 20 cm

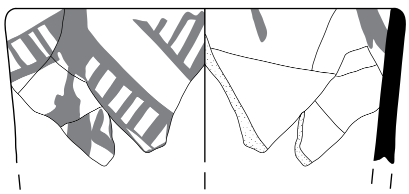
Cat. 10.58 - RN 1130, MBR. Untempered. Ext. + Int.: dark brown paint, red wash on red slip, core reddish buff - Ø 7 cm

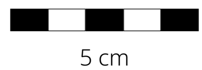
Cat. 10.59 - RN 1745, MBR. Ext. + Int.: dark brown paint on red wash, core reddish - Ø 14 cm

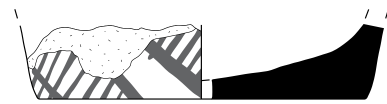
Cat. 10.60 - RN 5550.1, MBR. Vegetal and mineral temper. Ext. + Int.: black paint, red wash on red slip, core reddish buff - Ø ?

Cat. 10.61 - RN 3645.2, MBR. Untempered. Ext. + Int.: black paint on red wash, core reddish brown - Ø 28 cm

Meana Horizon Pottery, Cylindrical vessels with Ladder (Cat. 10.62-63); Incurved Rim Bowls with „Tree in the Wind“ motif (Cat. 10.64-65) and Trellis (Cat. 10.67); Open Bowls with Small Triangles (Cat. 10.66) and interior painting (Cat. 10.68)

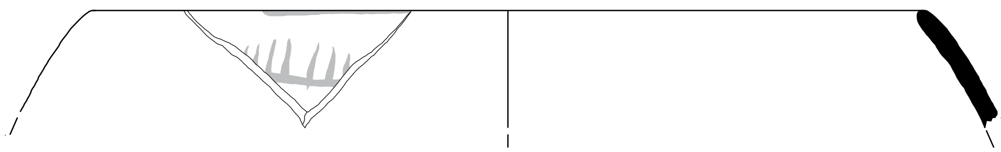






Cat. 10.63.

Cat. 10.62.



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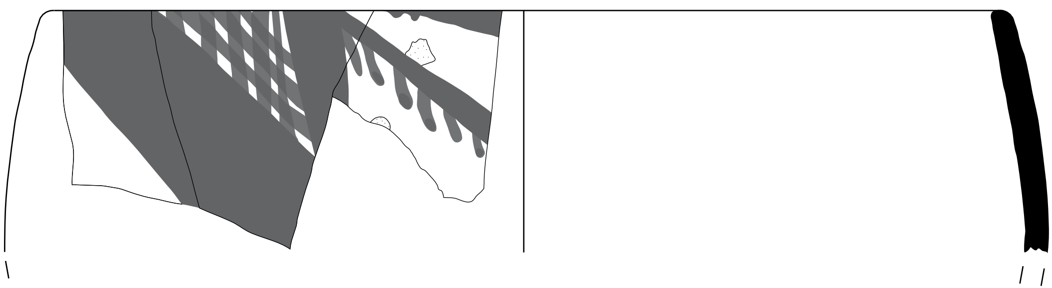
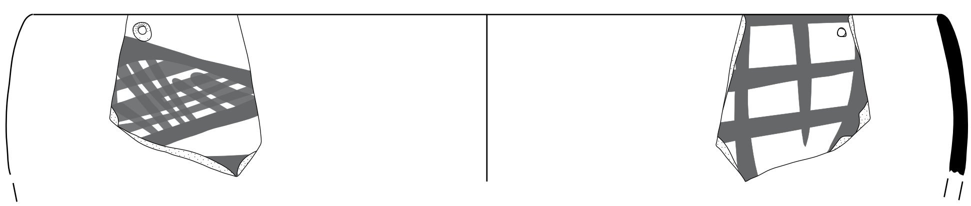
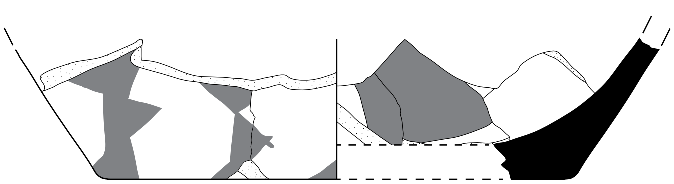
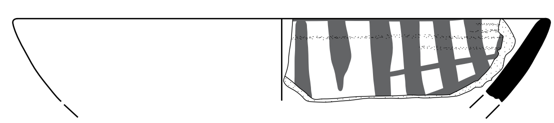


Cat. 10.65.



Cat. 10.67.





Cat. 10.66.

Cat. 10.68.

Cat. 10.62 - RN 4202.3 + 4253.4-6, MBR. Vegetal and mineral temper. Ext.: dark brown paint on reddish brown wash. Int.: brown paint on reddish wash, core reddish - Ø 10 cm

Cat. 10.63 - RN 10074.4, MBR. Sparse mineral temper. Ext.: purple-brownish paint on brown wash. Int.: brown wash, core red - Ø 10 cm

Cat. 10.64 - RN 1047.2, MBR. Mineral temper. Ext.: purple paint on red wash. Int.: red wash - Ø 22 cm

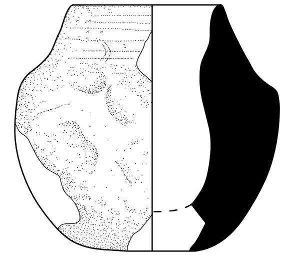
Cat. 10.65 - RN 7011.12,9,6, MBR. Mineral and vegetal temper. Ext.: black paint on red wash. Int.: red wash, core brown - Ø 25 cm

Cat. 10.66 - RN 872.2, 872.3, 921.6, MBR. Mineral and vegetal temper. Ext.: dark brown paint on red wash. Int.: light brown paint on light red wash, core light gray to buff - Ø 12 cm

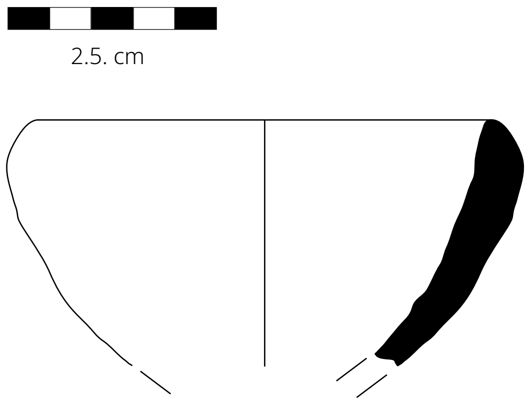
Cat. 10.67 - RN 3794.2, MBR. Vegetal temper. Ext. + Int.: black paint on dark red wash, core red - Ø 24 cm

Cat. 10.68 - RN 8443.2, MBR. Mineral and vegetal temper. Ext. + Int.: black paint on red wash, core brown - Ø 14 cm

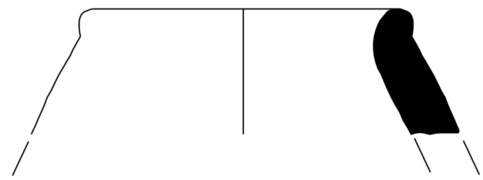
Meana Horizon Pottery, Other (Cat. 10.69-75)



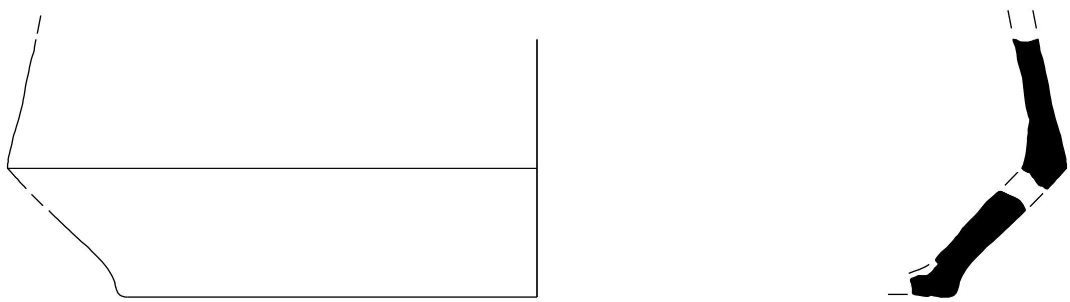
Cat. 10.69.



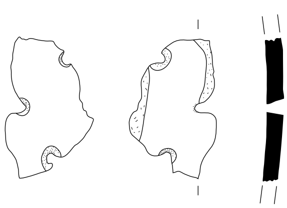
Cat. 10.71.



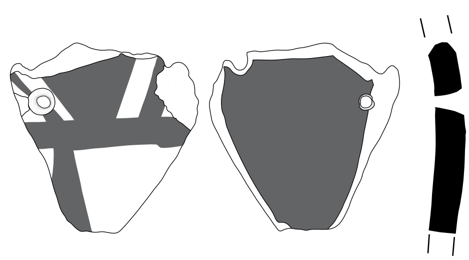
Cat. 10.70.



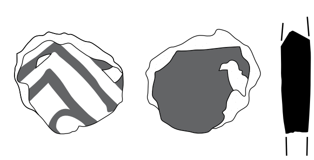
Cat. 10.72.



Cat. 10.73.



Cat. 10.74.



Cat. 10.75.

Cat. 10.69 - RN 7403.1, Miniature vessel, Meana Pinched. Untempered. Plain, core grayish buff - Ø 2 cm

Cat. 10.70 - RN 3012, Miniature vessel, Meana Pinched. Untempered. Ext.: buff wash. Int.: light brown wash, core gray - Ø 4 cm

Cat. 10.71 - RN 9517.6, Miniature vessel, Meana Pinched. Untempered. Ext.: buff wash. Int.: light brown wash, core gray - Ø 6 cm

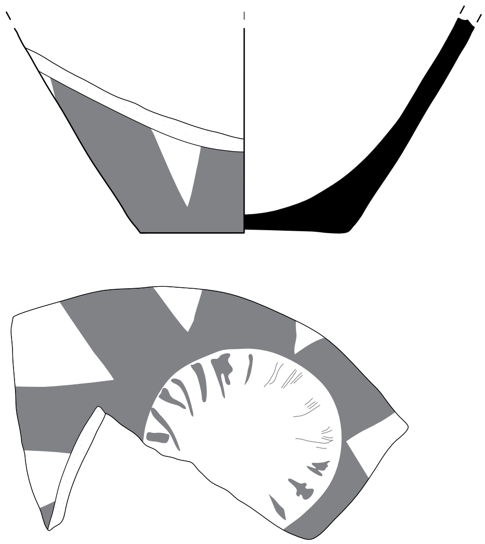
Cat. 10.72 - RN 5297.1, undefinable. Vegetal temper. Ext. + Int.: dark brown to black slip - base Ø 22 cm

Cat. 10.73 - RN 4026.16, MPl. Untempered with two repair holes

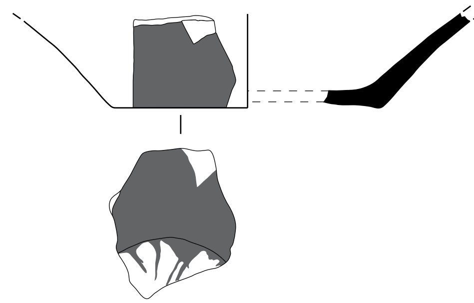
Cat. 10.74 - RN 6967.1, MBR. Ext. + Int.: black paint on red wash, core light gray. One repair hole

Cat. 10.75 - RN 4904.1, MBR. Pottery tool. Ext.: black paint on red slip. Int.: red slip

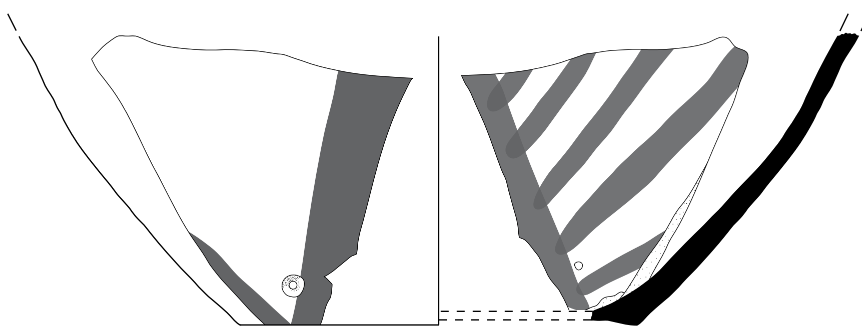
Meana Horizon Pottery Bases with Rays (Cat. 10.76-79)



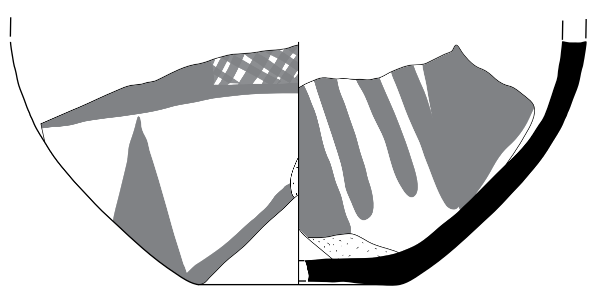
Cat. 10.76.



Cat. 10.78.



Cat. 10.77.



Cat. 10.79.

5 cm

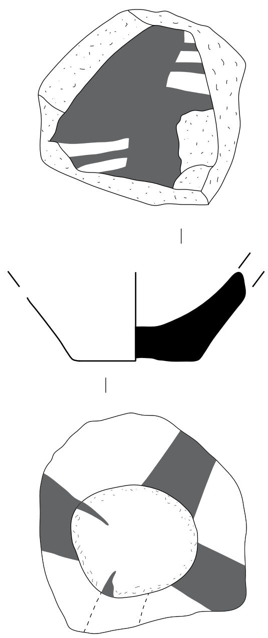
Cat. 10.76 - RN 368.1-2, MBR. Mineral and vegetal temper. Ext. + Int.: dark brown paint on buff wash, core dark buff to light red - Ø 5.5 cm

Cat. 10.77 - RN 750.1, MBR. Vegetal temper. Ext.: black paint on buff slip. Int.: black paint, core reddish brown. One repair hole - Ø 10.5 cm

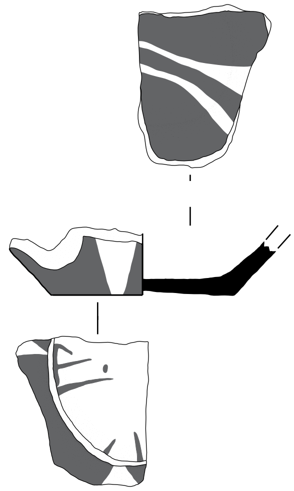
Cat. 10.78 - RN 16203.3, MBR. Untempered. Ext.: black paint on reddish buff wash. Int.: black paint on red slip, core light gray - Ø 7 cm

Cat. 10.79 - RN 3794.1, 4, 7, MBR. Vegetal temper. Ext. + Int.: dark brown paint on red wash, core buff - Ø 5 cm

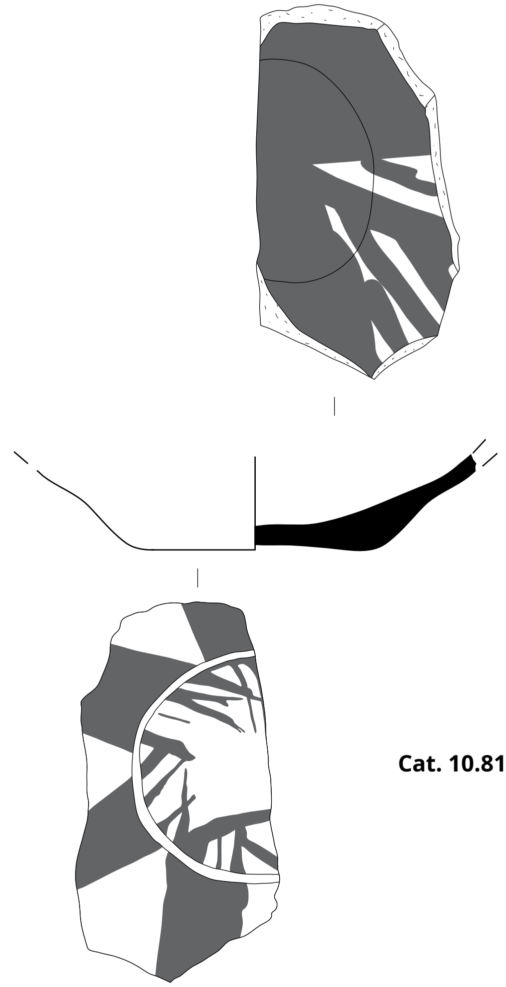
Meana Horizon Pottery Bases with Rays (Cat. 10.80-84)



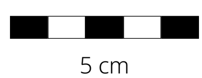
Cat. 10.80.

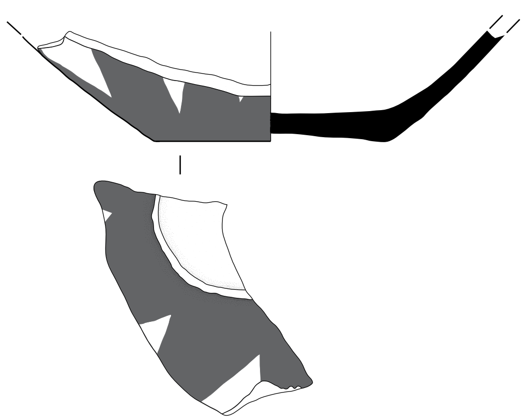


Cat. 10.82.

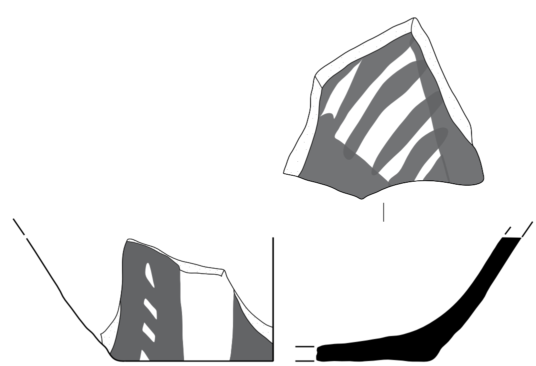


Cat. 10.81.





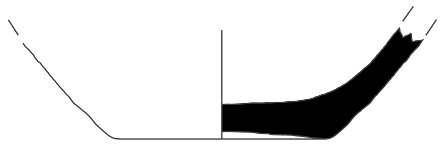
Cat. 10.83.



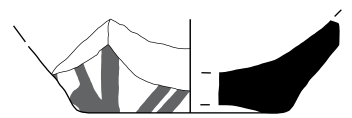
Cat. 10.84.

Cat. 10.80 - RN 5414.3, MBtB. Vegetal temper. Ext.: black paint on red wash. Int.: black paint on buff wash, core buff - Ø 3 cm
Cat. 10.81 - RN 5642.1, MBR. Vegetal temper. Ext. + Int.: black paint on red wash, core brown - Ø 5.5 cm
Cat. 10.82 - RN 10554.1, MPyt - Ø 5 cm
Cat. 10.83 - RN 11623.1, MBR. Sparse mineral temper. Ext.: black paint on red wash. Int.: red wash, core light gray - Ø 6 cm
Cat. 10.84 - RN MT backfill.11, MBR. Vegetal temper. Ext. + Int.: black paint on red wash, core light brown - Ø 8 cm

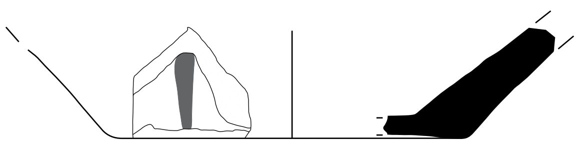
Meana Horizon Pottery Bases (Cat. 10.85-88)



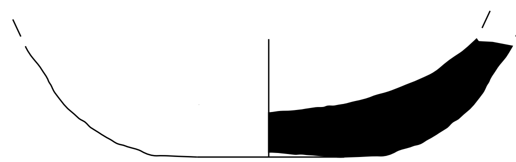
Cat. 10.85.



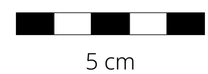
Cat. 10.86.



Cat. 10.87.



Cat. 10.88.



Cat. 10.85 - RN 1639.1-8, MRW. Vegetal temper. Ext.: red wash. Int.: plain, core gray to reddish - Ø 6 cm

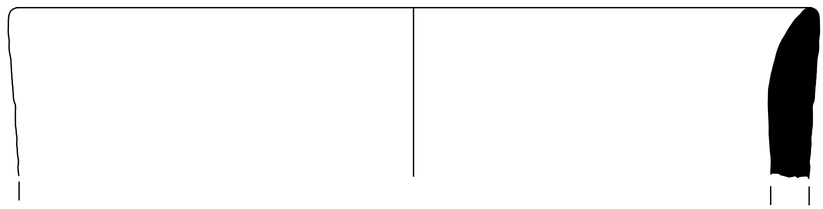
Cat. 10.86 - RN 5280.1, MBR. Mineral temper. Ext.: black paint on reddish brown wash and buff slip. Int.: red wash on buff slip, core n/a - Ø 5 cm

Cat. 10.87 - RN 16391.3, MBR. Untempered. Ext.: black paint on reddish brown wash. Int.: red wash, core light red to light gray - Ø 9 cm

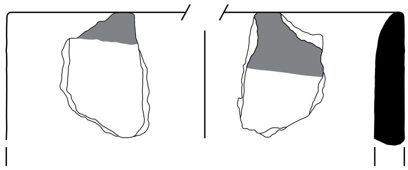
Cat. 10.88 - RN 25112.1, MRW. Untempered. Ext. + Int.: light red wash, core reddish to gray - Ø 6 cm

Pottery from Chagylly and Chakmakly Depe (Cat. 10.89 - 10.116)

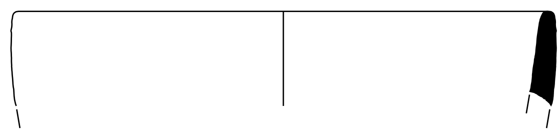
Chagylly Depe. Steep Open Bowls (Cat. 10.89-91); Wide Open Bowl (Cat. 10.92); Everted Rim Bowl (Cat. 10.93.); Bases (Cat. 10.94-96)



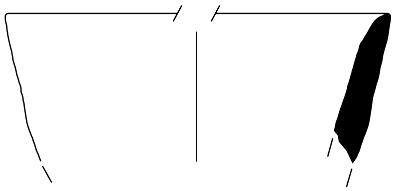
Cat. 10.89.



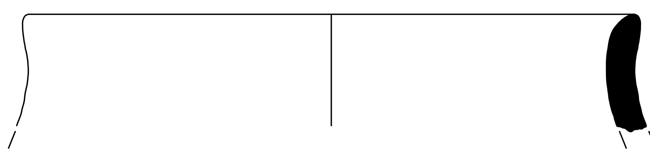
Cat. 10.91.



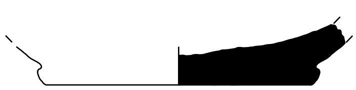
Cat. 10.90.



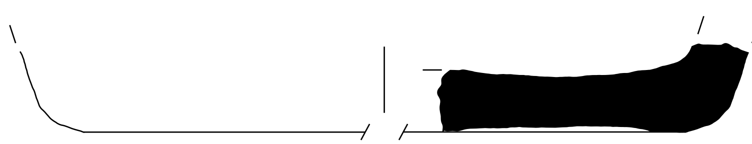
Cat. 10.92.



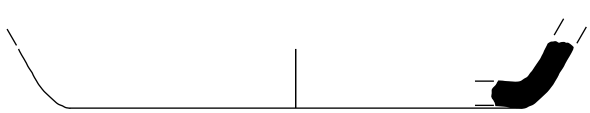
Cat. 10.93.



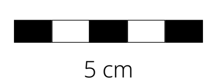
Cat. 10.94.



Cat. 10.95.

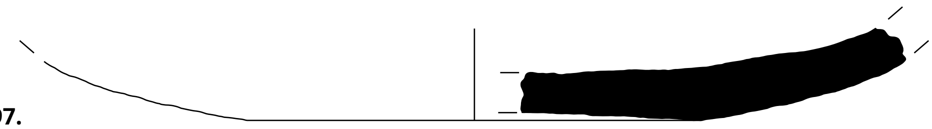


Cat. 10.96.



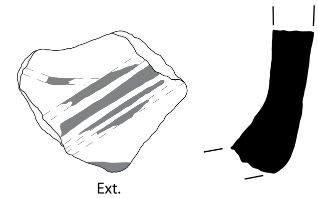
Cat. 10.89 - RN Chag-CMS-30, NBW. Vegetal temper. Ext. + Int.: brown wash on light brown slip, core gray - Ø 21 cm
Cat. 10.90 - RN Chag-F5-4, NRB. Vegetal temper. Ext. + Int.: reddish brown wash on light brown slip, core light orange - Ø 14 cm
Cat. 10.91 - RN Chag-F5-6, NPt. Vegetal temper. Ext. + Int.: dark brown paint on reddish brown wash and light brown slip, core light gray to orange - Ø ?
Cat. 10.92 - RN Chag-F4-6, NRB. Vegetal temper. Ext. + Int.: reddish brown wash on light brown slip, core light orange - Ø ?
Cat. 10.93 - RN Chag-F7-16, NPl. Vegetal temper. Ext. + Int.: no addition, core light orange buff - Ø 16 cm
Cat. 10.94 - RN Chag-CMS-17, NPl. Vegetal temper. Ext. + Int.: light brown slip, core gray - Ø 7 cm
Cat. 10.95 - RN Chag-F4-14, NDW. Vegetal temper. Ext.: dark brown wash on buff slip. Int.: abraded, core light grayish buff - Ø ?
Cat. 10.96 - RN Chag-F6-6, NBW. Vegetal temper. Ext. + Int.: brown wash on gray slip, core gray - Ø 12 cm

Chagylly Depe. Bases (Cat. 10.97-98); Body sherds (Cat. 10.99-101); Worked sherds (Cat. 10.102-103)



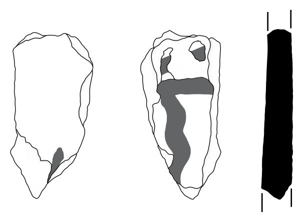
Cat. 10.97.

Cat. 10.98.

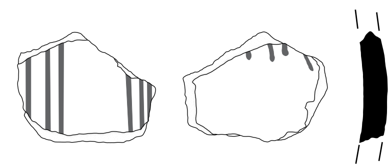


Cat. 10.99.

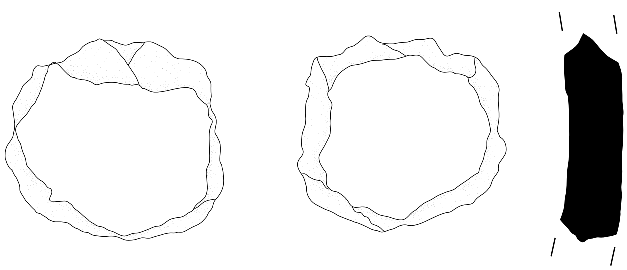
5 cm



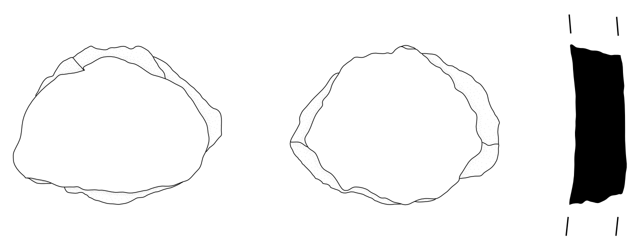
Cat. 10.100.



Cat. 10.101.



Cat. 10.102.



Cat. 10.103.

2.5. cm

Cat. 10.97 - RN Chag-F7-1, NBW. Vegetal temper. Ext.: brown wash on buff slip. Int.: reddish wash on buff slip, core light grayish buff - Ø 12 cm

Cat. 10.98 - RN Chag-CMS-35, NBW. Vegetal temper. Ext. + Int.: brown wash on light brown slip, core light gray to orange - Ø 6 cm

Cat. 10.990 - RN Chag-CMS-40, NPt. Vegetal temper. Ext.: brown paint on yellowish buff slip. Int.: no addition, core light grayish buff

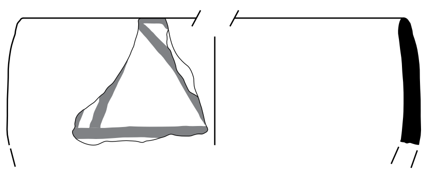
Cat. 10.100 - RN Chag-F7-4, NBR. Vegetal temper. Ext.: black paint on brown wash on light brown slip. Int.: black paint on red wash and light brown slip, core gray

Cat. 10.101 - RN Chag-F7-12, NBR. Vegetal temper. Ext.: black paint on dark brown wash and light orange slip. Int.: black paint on red wash and light orange slip, core light gray to yellowish buff

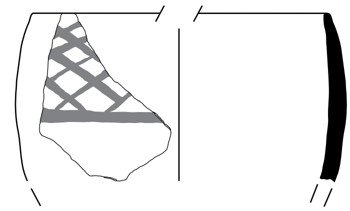
Cat. 10.102 - RN Chag-CMS-26, NBW. Vegetal temper, worked sherd. Ext.: brown wash on light brown slip. Int.: reddish brown wash on light brown slip, core light brown

Cat. 10.103 - RN Chag-CMS-27, NDW. Vegetal temper, worked sherd. Ext. + Int.: dark brown wash on yellowish brown slip, core yellowish buff

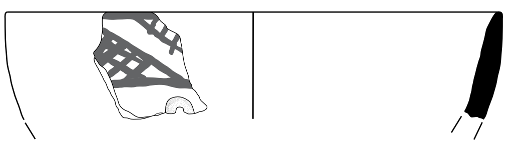
Chakmakly Depe. Incurved Rim Bowls (Cat. 10.104-108); Bases (Cat. 10.109-110)



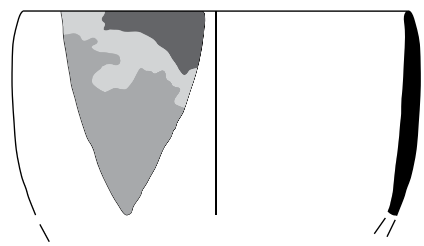
Cat. 10.104.



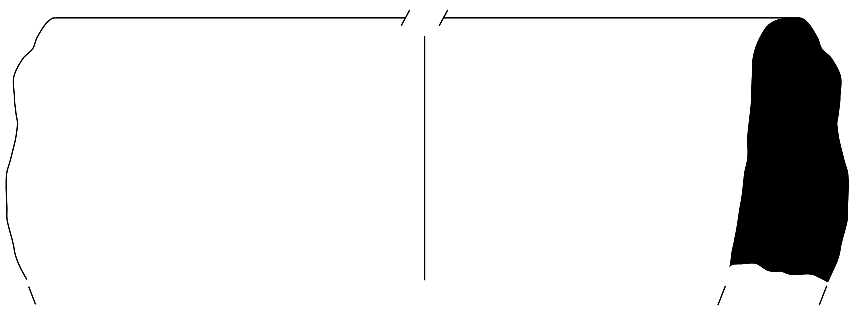
Cat. 10.105.



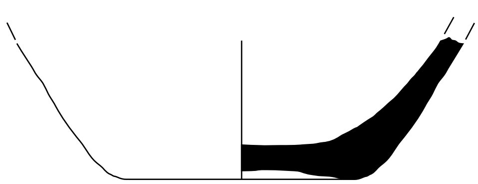
Cat. 10.106.



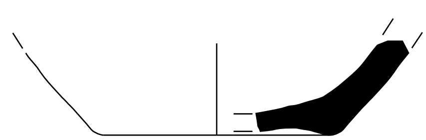
Cat. 10.107.



Cat. 10.108.



Cat. 10.109.



Cat. 10.110.

Cat. 10.104 - RN Chak-CMS-3, MBB. Untempered. Ext.: dark brown paint on buff wash. Int.: buff wash, core light reddish buff - Ø ?

Cat. 10.105 - RN Chak-F4.1, MBB. Untempered. Ext.: dark brown paint on buff wash. Int.: buff wash, core buff - Ø ?

Cat. 10.106 - RN Chak-CMS-5, MBB. Untempered. Ext.: black paint on buff wash. Int.: buff wash on buff slip, core buff - Ø 13 cm

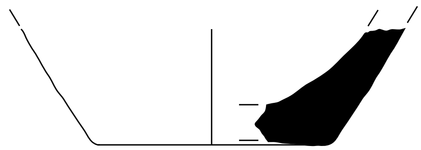
Cat. 10.107 - RN Chak-CMS-6, MRW. Untempered. Ext.: reddish to yellow wash. Int.: reddish buff wash, core orange - Ø 10 cm

Cat. 10.108 - RN Chak-F5.2, AnIB. Vegetal temper. Ext.: dark brown wash on brownish buff slip. Int.: abraded, core brownish buff - Ø ?

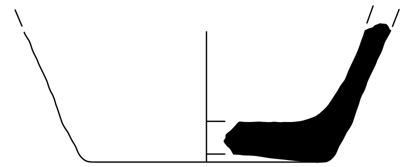
Cat. 10.109 - RN Chak-CMS-8, Mpyt. Untempered. Ext. + Int.: plain, core light red - Ø 6 cm

Cat. 10.110 - RN Chak-F2.1, MPl. Untempered. Ext. + Int.: plain, core light gray to reddish - Ø 6 cm

Chakmakly Depe. Bases (Cat. 10.111-113); Body sherds (Cat. 10.114-116)



Cat. 10.111.



Cat. 10.112.

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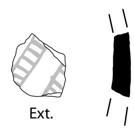

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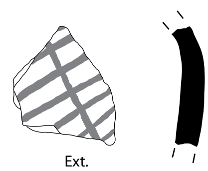
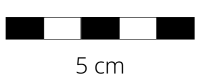
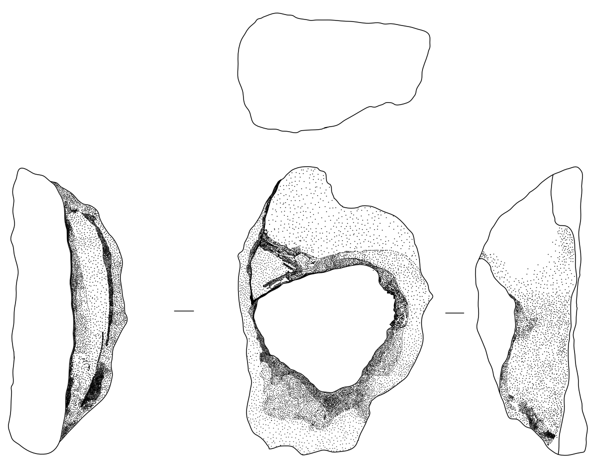


Cat. 10.116.





Cat. 10.115.

Cat. 10.111 - RN Chak-F8.6, Mpyt. Untempered. Ext. + Int.: plain, core light red - Ø 6 cm
Cat. 10.112 - RN Chak-F8-5, MPl. Untempered.Ext. + Int.: plain, core light red - Ø 6 cm
Cat. 10.113 - RN Chak-F8-7, MPl. Untempered. Ext. + Int.: plain, core reddish - Ø 6 cm
Cat. 10.114 - RN Chak-CMS-1, AnRR. Untempered. Ext.: light red paint on light reddish buff wash. Int.: plain, core red
Cat. 10.115 - RN Chak-F7.13, AnIB. Vegetal temper, knob. Ext. + Int.: buff slip, core yellowish buff
Cat. 10.116 - RN Chak-F8.3, MBB. Untempered. Ext.: dark brown paint on buff wash. Int.: plain, core grayish buff

Chapter 11

The Spindle Whorls from Monjukli Depe

Arnica Keßeler

Keywords: *spindle whorl; thread; discard*

Introduction

This chapter is based on my 2013 Master thesis, in which the spindle whorls from the 2010 and 2011 seasons at Monjukli Depe were analyzed. That study included an engagement with the issue of how archaeological objects are named and how functions are thereby implicitly attributed to them. In the case of the objects I examine, the name not only designates an artifact as a spindle whorl but also refers directly to a presumed usage, namely for spinning. A functional attribution actually makes a more in-depth study of the objects that is focused on their functions difficult. This central aspect in my thesis, which draws on the concept of affordance (Gibson 2015 [1979]; Knappett 2004), is not discussed further here (see Keßeler 2016). Instead, I focus on the remaining part of my analysis but extended to include spindle whorls recovered in the 2012 and 2013 seasons. Spindle whorls are, of course, not unique to Monjukli Depe but rather are found in other settlements of the same period in Turkmenistan and elsewhere. In southern Turkmenistan, these include Chakmakly Depe (Berdiev 1974, 18). The funnel-shaped as well as biconical whorls are also found in southwestern Iran at sites such as Tall-i Bakun (Alizadeh 2006, 233) and Tepe Bendebal (Dollfus 1983, 258-259). In this chapter, the whorls from Monjukli Depe are presented in terms of their attributes.

The spindle whorls

Objects characterized as spindle whorls have a rotationally symmetrical shape and a perforation perpendicular to the plane of rotation. These basic requirements can be found in different shapes, designs, and materials. Depending on the type of spinning, the whorl may be combined with a spindle. The spindle is often assumed to have been made of wood and therefore not preserved. However, there are also techniques that work without a spindle. A whorl on a spindle acts as a flywheel that extends the rotation through its weight. The weight, size, and shape of the whorls are crucial for the duration of the rotation. In case only a whorl is used, it acts purely as a weight. In that case, the beginning of the thread is fixed to the whorl, which weights the thread as it is twisted by hand (Barber 1991, 2).

The whorls from Monjukli Depe are all made of clay. Visual inspection as well as the lack of temper suggest that the clay used originated from one source (cf. Daszkiewicz

2011, 193). Archaeometric analyses of a small sample of Neolithic and Aeneolithic pottery from Monjukli Depe showed that the material used comes from the same source (see discussion in Chap. 10). From visual inspection the raw material for the spindle whorl production appears so similar that I also assume the whorls were made with the same clay. In all probability, the source used was local.

The marked color differences among the whorls can be attributed to the heating/baking process. Of the 579 recorded specimens, only 12 show no indication of heat application. The color spectrum of the fired specimens ranges from yellowish through orange to gray-black (Table 11.3). Due to their low level of heating or baking, many whorls have a mottled, non-uniform appearance. For some of the specimens, this could have been the result of drying or storage next to a fireplace, resulting in an unintentional baking. The temperature and duration of this process vary greatly among the individual whorls. There is no standardization; in addition to occasional pieces that were not exposed to fire at all or only very slightly, there are others that show strong firing traces, including a fully oxidized matrix.

Baking or firing goes hand-in-hand with the hardness of the specimens. The more highly-baked artifacts are more robust than the more lightly baked examples. An increased robustness in turn leads to fewer traces of wear. The degree of heating is thus important for an object's potential use life. However, a minimal amount of wear can also point to uses that leave only slight or no traces. Thus, it cannot be decided *a priori* whether the robustness reduces the generation of use wear or whether the use itself leaves no traces. It is also possible that the whorls from Monjukli Depe were not made for regular, long-term use. The different degrees of baking and the few signs of wear could be taken to indicate a one-time or short-term use. In that case, the pieces may have been individually made for a relatively spontaneous use. In the brief time prior to their disposal, they would acquire only limited wear traces. Another possible explanation may be that the spun thread that was formed in the course of the spinning process was wound around the spindle and stored there; neither the whorl nor the spindle would be used further until the thread was needed.

Another effect of firing the whorls is the loss of water stored in the clay. This results in a reduction, albeit only a slight one, in the weight of the objects and a shrinkage in size (Rice 1987, 86-87). In the case of a constant size, unfired whorls are therefore heavier than fired ones, although the decrease in weight is not proportional to the reduction of the size.[181]

181 The ratio of weight loss to the shrinkage of the object depends largely on the starting material (Rice 1987, 89).

Form	Count	Percentage
funnel-shaped	104	18.0 %
conical	295	50.9 %
biconical	11	1.9 %
unidentified	169	29.2 %
total	579	100 %

Table 11.1. Counts and percentages of spindle whorl forms from Monjukli Depe.

Moist clay has a high plasticity and can be turned into many shapes that after drying are more or less stable in form (Rice 1987, 58). The spindle whorls from Monjukli Depe can be categorized into three different shapes: 1) conical whorls (Fig. 11.1), 2) funnel-shaped whorls (Fig. 11.2), and 3) biconical whorls (Fig. 11.3). Among the 579 excavated specimens, fewer than 2 % (n=11) are biconical. Of the remaining 568, most have a simple conical outline, whereas in some cases the shape cannot be specified due to their fragmentary condition. The conical whorls can be further subdivided on the basis of their interior form. While all of the whorls display a tubular hole located more or less in the center of the piece, some have in addition a hollowed-out base.[182] In the latter case, the whorls acquire a funnel-shaped appearance. Of the 579 spindle whorls, 104 are funnel-shaped, 295 are simply conical, 11 biconical, and 169 are fragments that cannot be assigned to a specific form (see Tables 11.1 and 11.3).

The height of the whorls varies from 1.50 to 4.08 cm and the diameter from 1.15 to approximately 4.72 cm.[183] Height and diameter are not directly proportional to one another (Fig. 11.4). Thus, a piece with the lowest height does not necessarily have the smallest diameter. The angle between the base and the sides shows only a slight variance, ranging between 10° and 20°. Some whorls are more pointed than others, but the basic external shape remains conical. In the upper portion of the height and diameter distributions, one finds primarily funnel-shaped whorls.

The perforation that passes vertically through the whorl must have been made during the fashioning of the object, since there are almost no traces of boring. Some specimens have lips or bulges at the end of the channels that perforate the piece at the place where the tool exited the object (e.g., Fig. 11.1 e, h, i). This observation

182 The wider end of the whorl is referred to here as the base, without wishing to imply a differentiation between top and bottom of the objects.

183 The dimensions are taken from complete pieces or those where at least a complete profile is preserved and the diameter can be reconstructed.

confirms that the perforations were made while the clay was still in a moist state. In contrast, the cavities in the base of the funnel-shaped whorls have scraping marks and scratches. These may indicate that the whorls were hollowed out when the clay was already dry; alternatively, the hollowed areas may have been made while the clay was still moist, but the carving traces were not removed. On several whorls fingerprints were present near the

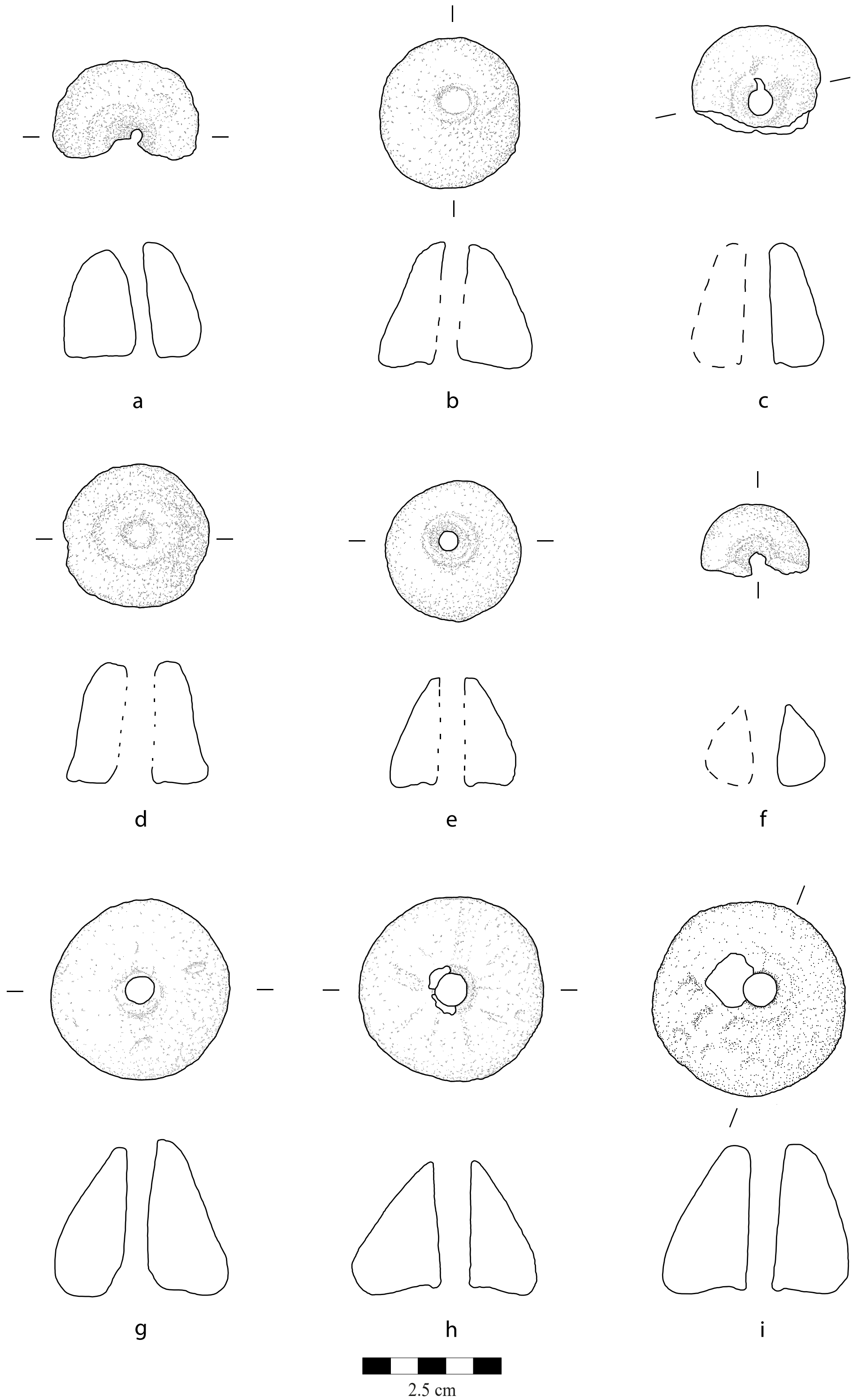


Fig. 11.1. Conical whorls: a: RN 416; b: RN 2802; c: RN 1017; d: RN 3381; e: RN 1313; f: RN 3521.1; g: RN 1056; h: RN 3067; i: RN 1026.

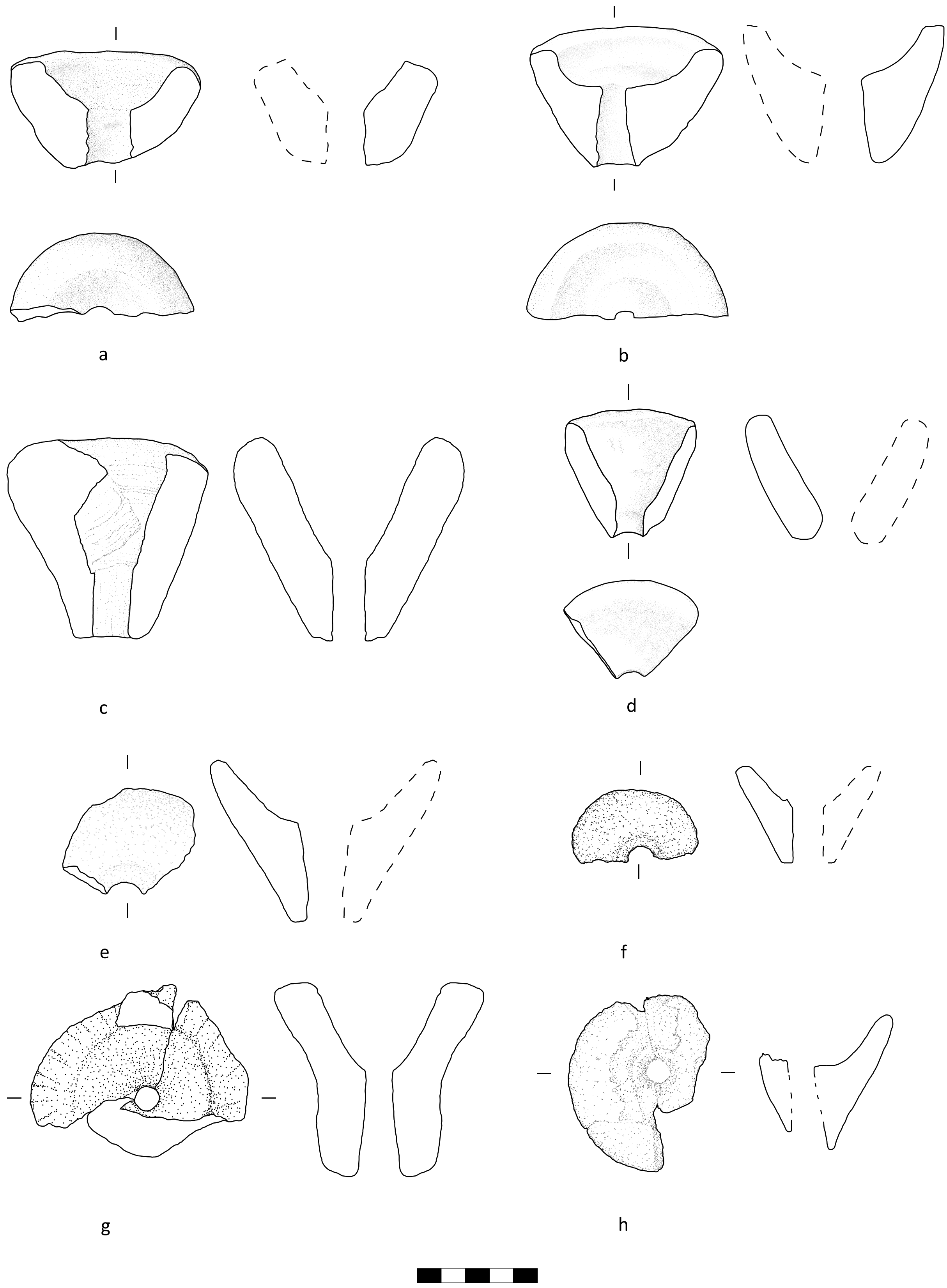


Fig. 11.2. Funnel-shaped whorls: a: RN 25124.3; b: RN 25124.1; c: RN 52; d: RN 2810.1; e: RN 1177; f: RN 3995; g: RN 41; h: RN 3750.

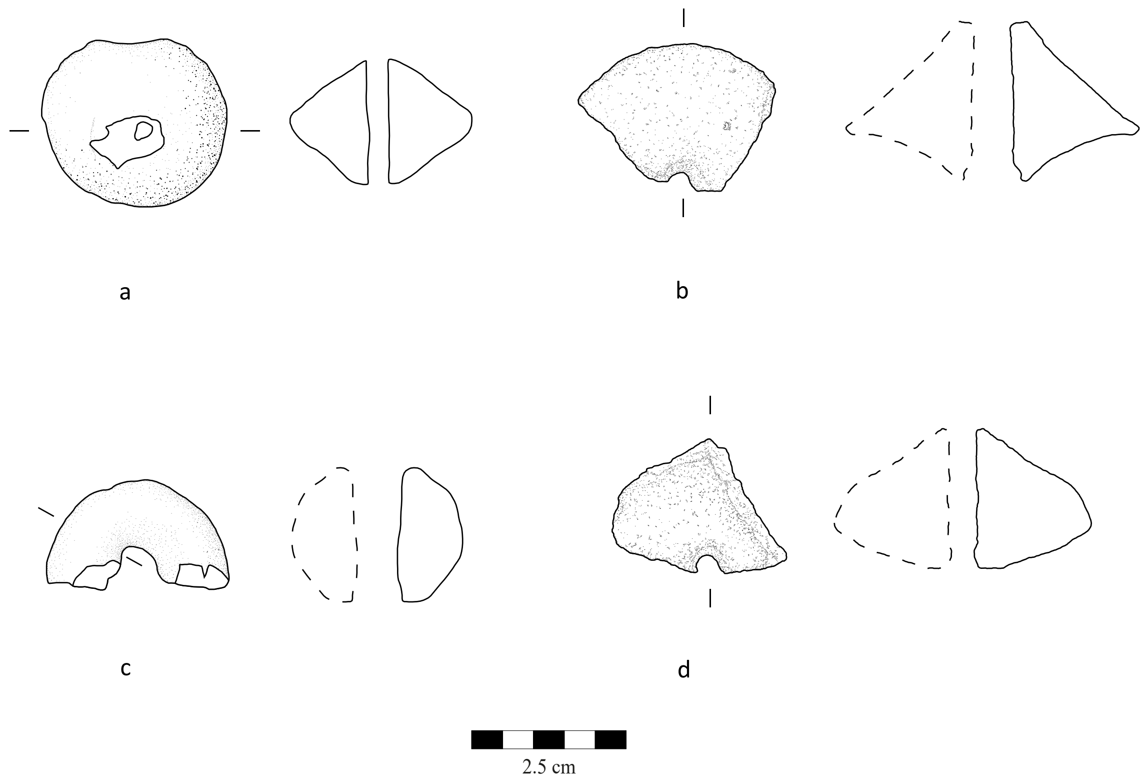


Fig. 11.3. Biconical whorls: a: RN 2820; b: RN 1580; c: RN 25124.2; d: RN 1487.

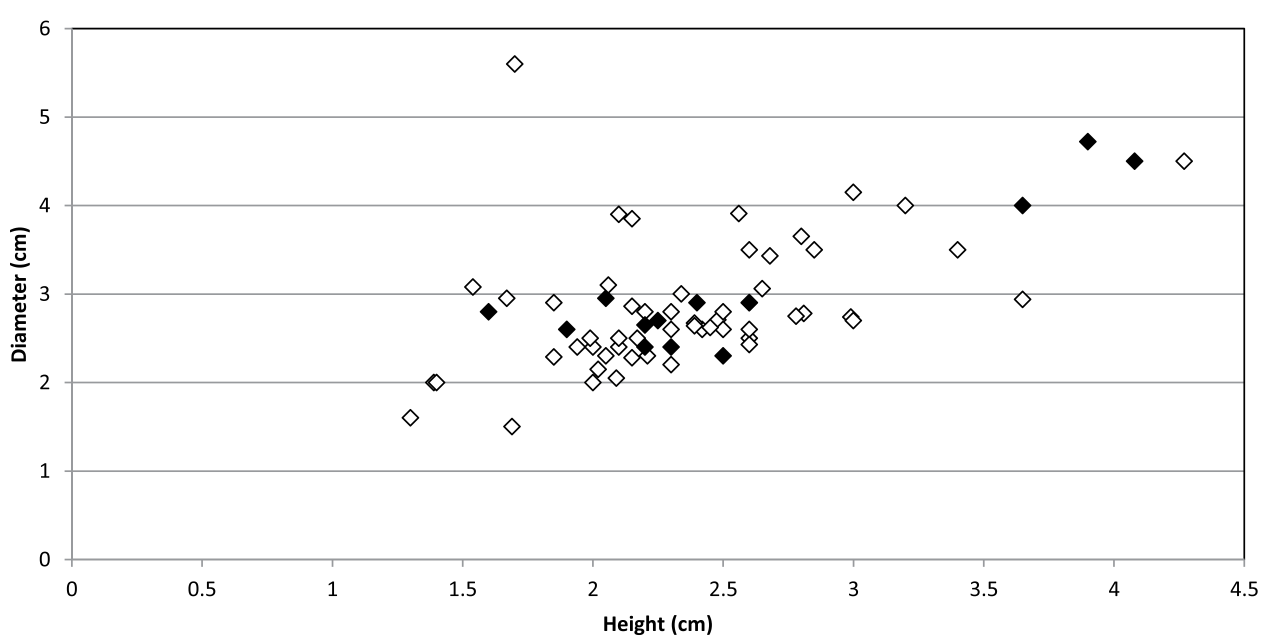


Fig. 11.4. Height-diameter ratio. Funnel-shaped whorls are highlighted in black.

Fig. 11.5. Examples of individualized, non-standardized whorls from Monjukli Depe.

upper end of the perforation, suggesting that the edges were cleaned up. On six whorls percussion traces were observed at the upper end of the hole, indicating that the lip was cleaned after the whorl was dried or fired. In a few cases, the lack of lips or traces of perforating could lead to the conclusion that the pieces were molded around a rod.

Apart from the unretouched lips resulting from the act of perforation, almost all pieces have traces of smoothing on the surface, and indeed the outer surfaces of nearly all whorls can be described as well smoothed. Two different, possibly complementary methods of finishing can be suggested on the basis of the traces of fingers or possible tools that can be detected on the whorls. In the latter case, the small scratch marks could also have been caused by fingernails. The treatment of the surfaces is different from the rest of the process of forming the whorls, which can be described as rather fast and rough. The way the objects were made might be connected to their later uses or be a product of haptic or aesthetic considerations.

Although with the exception of 11 examples, all of the pieces for which the form can be determined have a conical outline, this external uniformity is somewhat deceptive. The shaping of individual pieces was not standardized, and there are no identical examples either in terms of dimensions or weight. Rather, the variations among the whorls must be emphasized. The pieces show a wide color range due to differences in firing. This heterogeneity is increased by minor differences in shape, including the hollowed-out area on the funnel-shaped whorls, the lip at the narrow end, and the rounding of the body of the whorl. There are also variations in the skillfulness of the production, although in general the pieces are rather coarsely fashioned. The holes were often not placed exactly in the middle (Fig. 11.1a, b), and the perfectly circular shape that would be expected for spinning is lacking. Instead, many pieces are asymmetrical and unbalanced (Fig. 11.5), which would not be ideal for rotational purposes.

The material and physical properties discussed here suggest that these tools were made by individuals, with all of the idiosyncratic differences this brings about. Common ideas underlying the production are, however, clear in terms of the shapes and material.

Based on the complete pieces and those that can be confidently reconstructed, the weights of the whorls vary from 3.2 g to 30.8 g and thus can be referred to overall as light- and medium-weight (cf. Kimbrough 2006, 343). This designation indicates the ease of setting the whorl into motion. The potential to bring the whorl into motion comes not only from its lightness but also from its property of being movable. This means that the whorl is not connected to another object that limits its mobility. The combination of light weight and mobility allows movement initiated by an actor that can find expression in a variety of ways.

The rotational speed of a whorl or other body depends on its shape, the distribution of its mass, the energy supplied to set it in motion, and its rotational axis, which is given by the perforation. There is a relationship between weight and diameter that directly impacts the speed of rotation around an axis. I confine myself here to a discussion of the conical and funnel-shaped whorls, as these are present in much larger numbers than the biconical examples and thereby allow comparability. The distribution of mass depends not only on the weight of the object, but also on its distribution within the whorl. Taking the perforation as the location of the vertical axis, the distribution can be described via the maximum diameter of the objects.[184] Consequently, the relative speed of rotation of the whorls can be estimated from the weight and diameter. The fundamental principle here is that the fibers are attached to the spindle, which is weighted with a whorl, and they are twisted through a rotating movement that is maintained for a certain period of time due to the mass

184 I go on the assumption that the clay is identical in its density throughout the whorl; the variance in degrees of baking, water loss, etc. within an individual object is not considered.

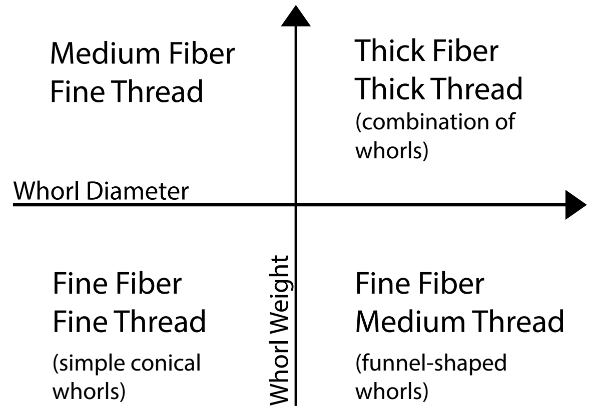


Fig. 11.6. The relevance of weight: diameter ratios for thread production. After Kimbrough 2006, 136, Fig. 4.9.

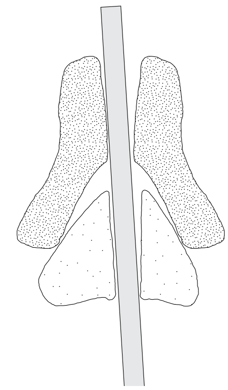


Fig. 11.7. Possible combination of funnel-shaped and conical whorls for thread production.

of the whorl. The result is thread or yarn. The diameter specifies the number of revolutions in a given period of time. Given the same energy input, a smaller whorl of the same mass, i.e. with a smaller diameter at its widest point, rotates faster than an equally heavy whorl with a larger diameter. This creates different torques that affect thread production. The connection of the two properties, weight and diameter, affects how long the spindle weighted with a whorl continues to rotate at a certain speed range after rotation has been initiated.

Different rotational speeds can be postulated for the whorls from Monjukli Depe due to their different sizes. The funnel-shaped whorls are in most cases larger in their dimensions, including their diameter, than the simple conical whorls. This point would be irrelevant if the whorls were solid. However, because they are hollowed out, they have a lower weight than a solid whorl of the same diameter. As a result, funnel-shaped whorls have a lower mass than simple conical whorls with an identical diameter. This means that a simple conical whorl of the same weight but with a smaller diameter rotates faster than a funnel-shaped one. Through this interplay of weight and diameter, conclusions about potential products can be reached. These connections can be illustrated by means of a graph derived from the work of Christine Kimbrough (Fig. 11.6).

A low weight and a small diameter allow the production of a fine thread from fine fibers. By contrast, a greater mass and a large diameter allow the production of thicker threads from thicker fibers (Kimbrough 2006, 136).

There are additional options in the case of the funnel-shaped whorls due to their hollow bases. They can be placed on top of simple conical whorls, a combination that results in an increase in weight (Fig. 11.7). The hollowed-out area also leads to in an increase in diameter, which allows thicker yarn or rope to be produced.

Distribution of whorls within the settlement

I turn now to the spatial distribution of whorls at Monjukli Depe. I focus on the distribution in buildings as well as in various outdoor areas in the settlement. The goal is to determine whether areas with concentrations of spindle whorls can be localized either horizontally or vertically across the excavated areas.

Since 2010, ten units of different size and depth have been excavated. The number of whorls found varies substantially across these units, due among other things to the varied amount excavated. To control for the different volumes excavated, I have undertaken an analysis of densities by buildings and exterior surfaces according to strata, in order to clarify which areas contain high quantities of whorls. The plan in Figure 11.8 illustrates the locations of the whorls in the four excavated Aeneolithic strata I – IV in relation to buildings and outer surfaces.

Through the calculation of densities, it can be shown where a concentration of whorls was present independent of the volume excavated. Only those whorls were included that could be clearly assigned to a stratum and a context. Table 11.2 includes the density calculations for individual buildings and outdoor areas, subdivided by strata. The values in the table indicate the number of spindle whorls found per cubic meter of excavated deposit.

In addition to the 319 whorls assignable to a stratum and/or context, 260 could not be clearly attributed to a stratum, and they were therefore not included in Table 11.2 or in the density calculations.

From the above considerations a picture can be drawn of the distribution of whorls within the settlement of Monjukli Depe. Due to their light weight and mobility, they could be easily transported. Therefore, they could in principle reach any place or room in the settlement. The distributional analysis shows, however, that this did not happen. The whorls were not found equally distributed throughout the site but rather occur in specific places. They were found for the most part in the Eastern and Central Middens and in certain buildings (see Table 11.2).

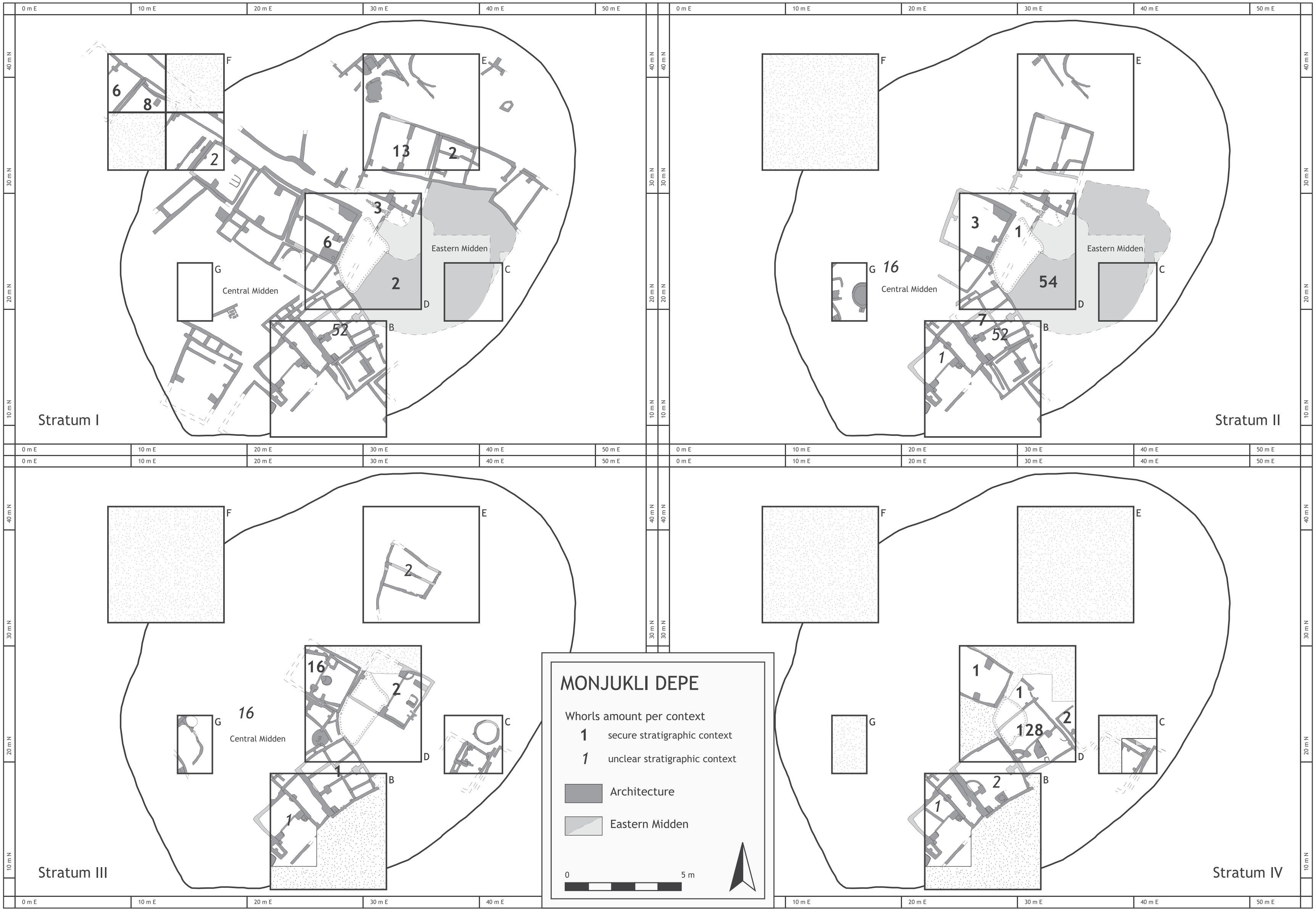


Fig. 11.8. The distribution of whorls in Monjukli Depe, Strata I-IV. The numbers in bold indicate the numbers of whorls found in buildings and open spaces that could be ascribed to a single stratum; the numbers in italics are those that could not be securely assigned to a single stratum.

	I	I – II	II	II – III	III	III – IV	IV
Bd 1	0.53 (1)		0.43 (2)	2.27 (5)	0.95 (2)		
Bd 2	1.15 (11)						
Bd 3		2.52 (1)		6.27 (30)		2.15 (20)	5.20 (2)
Bd 4					1.25 (1)		
Bd 5					1.35 (2)		
Bd 9					4.49 (16)		
Bd 10					0.37 (3)		
Bd 11	2.71 (6)						
Bd 12			1.05 (1)	1.48 (2)			
Bd 13	0.65 (2)						
Bd 14					7.93 (1)		7.94 (137)
Bd 15	3.71 (8)						
Bd 17							1.50 (2)
Bd 19							0.75 (1)
Bd 20							2.24 (1)
EM	0.47 (2)		5.72 (30)	6.57 (11)			
CM				4.22 (16)			
South St.			1.02 (1)				
Berdiev St.			3.26 (2)				

Table 11.2. Densities of whorls (counts per m^3) by building or other feature and stratum. The numbers in parentheses indicate the number of whorls found in the respective locations. EM = Eastern Midden; CM = Central Midden.

Thus, whorls were not left lying around everywhere, despite their low weight and mobility. They are found for the most part in three different contexts: directly on floors, in the fill layers of buildings and in the Eastern and Central Middens. The finds on floors represent areas that were probably for much of the time accessible only to the residents of a house. By contrast, the whorls in fill layers and the Eastern and Central Middens point, in my opinion, to areas where accessibility was not prescribed by the connections of living together in a house. To what extent this more generalized access was dictated by social or political divisions cannot be ascertained, although access to the Eastern Midden was limited by a gate to the northwest, indicating that perhaps not all residents were allowed into this area or at least not at all times.

The whorls that lay on the floors in buildings were left behind when the houses were abandoned. Although houses can be understood as contexts with limited access, where the whorls were available to only a small group of people, with their abandonment this access restriction changed. The previous limit on the number of users was modified from one that was defined by the house to one that may have followed a different social specification. Most houses were probably left open after their use as dwellings, with debris accumulating gradually rather than being intentionally filled.

The different degrees of accessibility to specific areas within the settlement is another element relevant for this interpretation. There are spaces with restricted access that are not parts of buildings, in which whorls were found in fill layers rather than on surfaces. The street areas and outdoor surfaces to which access was unrestricted yielded, however, few whorls. This results in a tripartite division of the find situation:

1. whorls that were found on floors in buildings to which there was restricted access (for abandonment rituals, see Chaps. 4 and 5);
2. whorls that were found in fill layers in buildings after they were left open as well as whorls from streets, the Central Midden and outer surfaces that were probably easily accessible;
3. whorls from the Eastern Midden to which there was semi-restricted access, possibly for some kind of social or political reason.

In addition to individual rooms that were limited in accessibility to residents, the distribution of whorls thus indicates two different locations of use or disposal. First, the whorls that were found on the floors of buildings were effectively removed from use at the same time as the premises. In contrast, the presence of whorls in fill layers shows that they were no longer used, but the rooms still were, in these instances, however, as places for garbage disposal. In both cases the whorls were taken out of a direct context of use, but the meaning of this removal is different. In the one case individual objects were discarded, in the other whole buildings including their abandoned inventory ceased to be used. The objects found in abandoned buildings are not limited to spindle whorls: stone tools and other artifacts were documented on floors. I assume that the whorls as well as these other finds were left behind when the buildings were abandoned rather than being intentionally discarded there (as, for example, the stones left on the floors of Houses 10, 11 and 14; Chaps. 2, 4, and 5).

One possible reason why complete whorls were found on the floors of buildings as well as in fill layers may be a consequence of their quick and simple production. Beyond the three basic forms – conical, funnel-shaped, and biconical – the shapes of the whorls exhibit many variations that suggest ad hoc production. These small deviations can be read in different ways. Exact copies do not appear to have been necessary in order to obtain the results desired from these objects. This is supported by other variable characteristics, such as the different levels of baking. Inexact perforations and working traces that were not smoothed over also indicate a rapid and expedient production. This might point to a very low labor investment in the objects in the sense that they could be easily produced in a short amount of time. Speaking for this interpretation is the fact that they are not, as might be expected, always broken and thus discarded as no longer usable, but rather while they were still intact. It is therefore not a question of throwing away broken things but of leaving or discarding objects with minimal or no value that could be reproduced quickly and easily. In other words, I make a distinction between objects that were left behind on floors that were still intact and fully functional and those that were discarded although they, too, were still in a condition to be used.

The objects exhibit variable degrees of hardness. The robustness of a ceramic body increases with the temperature at which it is baked or fired. This has in turn a direct impact on the possible use life of a whorl: the greater the hardness, the greater the use-life expectancy, as the whorl becomes more resistant to external influences. The mineral structure of the clay is also permanently strengthened by the firing process. Rice compares the state of the clay after firing with “artificial stone” (Rice 1987, 80). A relatively permanent material condition leads to the durability of the objects, which can be impaired primarily through external mechanical influences and not, as in the case of organic materials, through decay. This property of clay/ceramic plays an important role with respect to the spatial analysis of the whorls. Since they were not found everywhere in the settlement, the distribution pattern cannot be explained purely by the previously mentioned low value of the objects. The combination of their spatial occurrence and material permanence suggests a special disposal pattern. The whorls were not simply thrown away anywhere, but rather in special disposal places such as the Central or Eastern Midden and abandoned buildings.

Due to the few materials and tools needed as well as the relatively easy production for someone who was versed in making them, whorls may have been used in everyday situations alongside other work. This could mean that, for example, in the Eastern Midden, which is interpreted as a place where feasts were held (Chap. 7), the production of thread was undertaken together with other events such as participation in feasts.

Conclusion

Based on the properties of the whorls found at Monjukli Depe in combination with the distributional analyses, two main points can be made. First, the objects do not seem to have had a high value as opposed to so-called prestige objects. This can be demonstrated in various ways. One indication is the near absence of decoration,[185] especially compared with whorls from southwestern Iran, which were often decorated (Dollfus 1983, 258-259; Alizadeh 2006, 233). A few whorls contain a kind of decoration; this is shown among other things in fingernail impressions or a red wash. In these cases it is more likely that individual, spontaneous actions led to the decorations rather than an aim of highlighting specific objects.

This indication of low value is complemented by the non-standardized shapes. The utility of the whorls was obviously not limited by divergences from an exact form. An expedient production “on the spot” can be inferred. The necessary means of production were limited to the raw material, clay, a tool to perforate the whorl, a source of heat, and the capability to fashion the whorls. The clay was likely available locally, the remaining materials could be found in the settlement, and the technique could be learned easily. The easy availability of the raw materials could facilitate spontaneous production in the sense that their acquisition and accessibility as well as the necessary work places did not require a major effort. This scenario is further supported by the complete specimens that were found on the floors in buildings, indicating that the objects were left behind relatively quickly after being used.[186] Whether

185 I support this interpretation by comparison with the pottery. The Meana Horizon sherds recovered are in almost all cases painted (Chap. 10), whereas painted designs are not found on the whorls.

186 It could also be the case that the rapid production resulted in some specimens that did not meet use requirements, so that they were discarded directly after being made.

the pieces were used only once is unclear. Use wear was only rarely observed on them. The few use traces speak for either a brief or a one-time use – or for one that left few if any marks.

A second result of my investigation is the establishment of a disposal pattern for the whorls at Monjukli Depe. The distributional analysis shows that they were not left everywhere in the settlement but were rather concentrated in certain contexts. These contexts can be distinguished from the rest, since artifacts or even entire buildings ended their life or use cycle there. Not only whorls, but also animal bones, other clay objects, and other artifacts were discarded in the Eastern Midden. The house contexts seem at first glance to be different, but they served the same purpose: they became disposal spaces following their original phases of use. The fill layers show not the end of the use of a building, but more likely its reuse for other purposes. Different fills were introduced into the exposed building over time. Whether this happened intentionally, resulted from the decay of the house itself, or from discard of rubbish in the empty buildings remains so far unclear. In any case, the whorls found in the fill layers point to people's conscious connection with quickly produced objects. The assumed "low value" of the whorls as a side effect of the quick and easy production underlines the disposal pattern in Monjukli Depe. However, the distribution of the whorls cannot be understood solely through disposal practices. They may have been used at or near places where they were later discarded, implying a disposal shortly after their use. In addition to using the whorls in houses, uses in other social contexts are conceivable: The limited-access spaces of houses can also be interpreted as meeting places for collective interactions. In that case, people would meet in social contexts other than those of the domestic group to spin together, and the whorls would have remained at that location after completion of the task.

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
1017	A4	–	– / – / 2.15	2.28 (b), 1.38-1.55 (t)	8.5	reddish to grayish	conical	~ 3/4
1026	A7	–	2.73	3.40	30.8	reddish	conical	complete
1056	A16	–	3.05	3.17	28.7	buff	conical	complete
1177	A1	–	– / – / 3.65	~ 4.00 (b)	9.8	reddish buff	funnel- shaped	~ 1/3
1191	A52	–	– / – / 2.48	2.71 (b)	7.7	reddish buff	conical	~ 1/2
1196	A52	–	– / – / 1.84	–	1.3	reddish	conical	fragment
1214	A56	II – III	1.84	–	3.0	reddish gray	funnel- shaped	fragment
1230	A57	–	– / – / 2.17	~ 2.50 (b)	3.9	reddish buff to brown	conical	~ 1/3
1234	A56	II – III	– / – / 1.97	–	2.1	reddish buff	conical	fragment
1235	A56	II – III	–	–	3.0	reddish buff	–	fragment
1239	A60	II	– / – / 1.84	–	1.5	reddish	conical	fragment with full profile
1277	A8	–	1.60/ 0.45/ 2.10	–	1.6	reddish	funnel- shaped	fragment
2092	B212	III – IV	– / – / 1.99	2.50	2.8	reddish	funnel-shaped	~ 1/3
3067	B23	–	2.61	3.33	23.4	reddish buff	conical	complete
3069	B22	I – III	2.00/ 1.55/ 0.85	–	2.1	brown	conical	fragment
3160	B51	–	– / – / 2.34	3.00 (b)	8.1	reddish buff	conical	~ 1/3
3168	B51	–	–	–	2.6	reddish buff	–	fragment
3173	B51	–	– / – / 2.50	–	2.1	reddish	conical	fragment
3192	B58	–	– / – / > 1.39	> 2.00	1.5	reddish	conical	~ 1/3
3232	B68	III	– / – / 4.27	≈ 4.50 (b)	8.6	reddish to black	funnel-shaped	fragment
3336	B91	–	3.40	3.63	9.2	reddish	funnel-shaped	1/2
3338	B91	–	2.12	2.40	4.1	reddish	conical	1/3
3353	B96	–	2.40	1.99	2.6	reddish buff	conical	fragment
3353.1	B96	–	2.12	2.36	4.7	reddish buff	conical	1/2 with full profile
3379.1	B105	II – III	2.49	2.07	5.2	reddish	conical	1/2 with full profile

Table 11.3. (continued on next page) Spindle whorls found in Monjukli Depe from the seasons 2010 – 2013. SF = surface field, b = base, t = top, mp = middle part.

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
3379.2	B105	II – III	2.39	> 1.79	3.8	reddish buff	funnel-shaped	fragment
3381	B104	I – II	2.31	2.56	12.6	buff	conical	complete
3383	B103	II – III	1.58	1.15	7.0	reddish buff	conical	fragment with full profile
3397.1	B110	II – III	1.80/ 1.30/ 2.80	–	5.0	reddish	–	fragment
3397.2	B110	II – III	1.30/ 0.50/ 1.50	–	1.3	reddish	–	fragment
3397.3	B110	II – III	1.80/ 0.70/ 1.00	–	1.0	reddish	–	fragment
3397.4	B110	II – III	0.70/ 0.90/ 2.40	–	0.7	reddish buff	–	fragment
3397.5	B110	II – III	1.20/ 0.85/ 2.60	–	2.3	buff	–	fragment
3397.6	B110	II – III	1.60/ 0.80/ 2.45	–	3.2	reddish	–	fragment
3397.7	B110	II – III	2.25/ 1.00/ 1.50	–	3.1	reddish	–	fragment
3415.1	B105	II – III	2.12	2.17	2.7	buff	conical	fragment
3415.2	B105	II – III	2.27	–	3.8	reddish buff	conical	fragment
3421	B114	II – III	1.58	2.33	4.4	buff	conical	fragment
3423.1	B116	II – III	1.68	1.72	2.3	reddish buff	conical	1/4
3423.2	B116	II – III	2.04	≈ 1.95	2.7	reddish buff	–	fragment
3443.1	B118	–	2.78	1.98	3.9	reddish	conical	1/4
3443.2	B118	–	1.13	1.88	1.9	reddish buff	conical	fragment
3460	B127	–	2.81	1.38	3.5	reddish buff	conical	1/4
3470	B118	–	1.45/ 0.85/ 2.30	–	2.6	buff	–	fragment
3486.1	B128	II – III	2.06	2.12	5.2	buff	conical	1/2
3486.2	B128	II – III	1.48	1.13	0.8	reddish buff	conical	1/4 with full profile
3492.1; 3492.2	B126	II – III	2.29	2.67	7.0	reddish	conical	1/3
3492.3 – 5	B126	II – III	0.90 – 0.92	–	2.4	buff	–	fragment
3521.1	B137	II – III	1.50	1.94	3.0	brown	conical	1/2 with full profile
3521.2	B137	II – III	1.08	2.11	2.7	reddish buff	conical	fragment
3574	B142	II – III	1.22	1.76	1.8	reddish buff	conical	fragment
3581	B143	–	1.76	1.89	1.8	gray	funnel-shaped	fragment
3600.1	B128	II – III	1.00/ 0.50/ 1.20	–	0.6	reddish	–	fragment
3601	B144	II – III	1.52	1.65	1.9	reddish buff	conical	1/2 with full profile
3619	B148	II – III	1.14	2.33	3.7	reddish buff	–	fragment
3633.1	B150	II – III	2.46	2.27	6.8	reddish buff	conical	1/2 with full profile
3633.2	B150	II – III	2.06	2.44	3.5	reddish buff	conical	1/3
3633.3	B150	II – III	1.84	1.63	2.6	reddish buff	conical	1/3
3662	B154	III – IV	3.25	2.66	10.7	gray	funnel-shaped	1/3 with full profile
3682	B161	III – IV	2.94	2.41	5.9	reddish buff	conical	1/3
3696	B145	II – III	2.41	2.84	10.6	reddish	conical	1/2 with full profile
3748	B173	III – IV	2.58	2.89	12.9	buff	conical	3/4 with full profile
3750	B173	III – IV	3.14	3.12	13.5	reddish	funnel-shaped	3/4
3771	B174	–	1.32	> 1.80	1.7	reddish buff	conical	fragment
3797	B178	II – III	1.93	1.55	2.1	reddish buff	conical	fragment
3807	B186	III – IV	1.86	> 1.58	1.7	reddish buff	conical	fragment
3824	B180	III – IV	2.30/ 0.50/ 2.20	–	2.3	reddish buff	–	fragment
3841	B191	III – IV	2.62	2.95	20.9	reddish brown	conical	complete

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
3871	B156	II – III	1.29	1.71	2.0	reddish	conical	fragment
3873	B118	–	1.61	> 0.90	1.4	buff	conical	fragment
3874	B103	II – III	2.71	> 1.86	2.0	reddish buff	conical	fragment
3878	B193	III – IV	–	–	4.9	gray	–	fragment
3882	B199	III – IV	3.45	2.62	6.5	reddish buff	conical	1/2 with full profile
3889	B189	–	–	–	9.3	buff	–	fragment
3908	B205	III – IV	1.93	1.98	5.6	buff	conical	1/2
3965.1 – 2	B216	III – IV	1.20 – 1.16	1.89 – 1.72	4.2	reddish buff	conical	–
3995	B219	III – IV	2.44	2.54	4.8	reddish	funnel-shaped	1/2 with full profile
6001	B223	III – IV	1.52	2.35	8.2	reddish	conical	complete
6021	B228	III – IV	3.77	2.76	23.5	brown	funnel-shaped	1/2 with full profile
6026	B230	III – IV	2.22	> 2.18	6.5	gray	conical	1/2
6036.1	B234	III – IV	2.86	2.87	23.7	gray	conical	3/4
6036.2	B234	III – IV	3.18	3.04	26.3	gray	conical	3/4
6036.3	B234	III – IV	2.89	> 1.84	1.9	gray	conical	fragment
5108	C25	III	– / – / 2.05	–	1.6	reddish buff	conical	fragment
5167	C35	III	– / – / 1.81 – 1.85	2.29 (b)	6.3	gray	conical	~ 3/4
5253	C25	III	– / – / 1.69	≈ 1.50	2.0	reddish	conical	< 1/2
5403	C89	VI – VII	2.29/ 1.60/ 0.94	–	2.6	reddish	–	fragment
5430	C96	I	2.01	1.97	3.3	buff	conical	1/2 with full profil
5525	C119	I	2.23	1.86	2.9	grayish buff	conical	1/3 with full profile
5787	C165	III	2.02	2.43	6.5	reddish	conical	1/2 with full profile
5899	C209	III	1.19	1.87	1.4	reddish buff	conical	fragment
5960	C219	III	1.52	> 1.91	2.3	buff	conical	fragment
6628.1	C262	III	2.12	2.71	5.6	reddish	conical	fragment
6628,2	C262	III	1.36	> 2.05	2.6	reddish	conical	fragment
6787	C313	III	2.43	2.85	7.7	reddish	conical	1/2 with full profile
6910	C262	III	1.75	–	0.8	buff	–	fragment
6918	C121	II	2.34	> 2.48	11.3	reddish buff	conical	1/2
25408	C142	III	– / – / 1.72	2.04 (mp)	2.4	reddish	conical	fragment
326	D78	I	1.96	> 1.44	3.4	reddish	conical	fragment
416	D83	–	2.12	2.59	9.3	buff	conical	1/2
423	D105	I	1.67	2.67	12.7	brown	conical	3/4
543	D130	I	2.22	2.13	4.7	buff	conical	1/3
560	D129	II – III	2.09	> 0.26	3.5	buff	funnel-shaped	fragment
569	D66	–	1.89	2.69	7.0	reddish	conical	~ 2/3
613	D135	II	1.80	> 2.31	3.8	reddish buff	conical	1/3
620	D141	–	1.31	> 1.14	0.7	buff	conical	fragment
627	D42	–	1.76	> 2.22	4.1	reddish buff	conical	1/3
643	D90	–	1.74	2.84	7.3	buff	conical	fragment
725	D153	II – III	2.36	2.15	3.3	reddish	conical	1/3
728	D153	II – III	2.72	2.02	5.5	reddish	conical	1/2
776	D161	II – III	1.22	2.01	1.6	reddish	conical	< 1/3

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
930	D279	–	1.54	1.94	2.6	gray	conical	fragment
933	D191	II	2.12	2.46	6.1	reddish buff	conical	1/2 with full profile
1280	D207	II	3.45	2.81	10.1	gray	funnel-shaped	1/2 with full profile
1281	D207	II	2.31	2.30	5.1	brown	conical	1/2 with full profile
1293	D207	II	1.56	> 1.64	1.5	buff	conical	fragment
1313	D208	II	2.04	2.50	11.1	grayish buff	conical	complete
1316	D214	II	1.78	–	1.2	reddish	conical	fragment
1335.1	D208	II	2.39	2.58	8.2	reddish	conical	1/2 with full profile
1335.2	D208	II	1.86	2.26	5.2	reddish buff	conical	1/2 with full profile
1335.3	D208	II	1.84	2.45	6.2	buff	conical	½
1410	D224	–	– /1.61/ 2.02	–	1.7	brown	–	fragment
1425	D212	IV	3.16	3.13	9.3	reddish	funnel-shaped	1/2 with full profile
1487	D240	II	2.16	2.79	8.7	buff	biconical	½
1491.1	D236	II	– / – / 2.60	2.50	6.7	gray	conical	~ 2/3
1538.1	D240	II	– / – / 2.09	2.05	7.9	buff	conical	complete
1538.2	D240	II	2.66/ 0.68/ 1.79	–	3.7	brown	funnel-shaped	fragment
1542.1	D248	II	2.61	2.70	12.2	gray	conical	3/4 with full profile
1542.2; 1542.3	D248	II	1.33	> 2.11	4.7	reddish buff	conical	fragment
1565	D248	II	2.26	2.95	12.3	buff	conical	3/4 with full profile
1580	D251	II	2.37	3.11	10.0	gray	biconical	1/2 with full profile
1581.2	D251	II	2.10/ 2.30/ –	–	4.6	dark gray	funnel-shaped	fragment
1640.3	D257	II	– / – / 1.66	–	4.2	gray to reddish buff	conical	fragment
1651	D265	II	2.17	2.19	5.4	reddish buff	conical	1/2 with full profile
1688.1	D270	II – III	–	2.09	6.0	gray	–	fragment
1688.4	D270	II – III	1.84	2.48	6.0	gray	funnel-shaped	fragment
1700.1	D254	I – II	3.48	2.15	6.0	reddish	funnel-shaped	¼
1700.2	D254	I – II	> 2.30	> 2.66	6.1	reddish	conical	1/3
1725	D275	II – III	3.63	> 2.39	7.8	buff	funnel-shaped	1/3 with full profile
1725.1	D275	II – III	1.94	2.39	5.1	buff	conical	1/2 with full profile
1725.2	D275	II	2.68	2.70	8.1	reddish buff	funnel-shaped	fragment
1734.8	D282	–	1.85/ 1.08/ 2.19	1.23	3.7	buff to grey	–	fragment
1740.1	D281	II – III	2.66	2.39	3.9	brown	funnel-shaped	fragment
1740.2	D281	II – III	2.95	> 2.20	9.5	brown	conical	¼
1740.3	D281	II – III	2.18	1.71	2.7	buff	conical	1/2 with full profile
1740.4	D281	II – III	1.66	> 1.29	1.1	buff	conical	fragment
1758.1	D285	–	– / 2.50/ 1.23	–	3.1	brownish	conical	fragment
1812	D294	–	2.05	2.14	4.4	reddish buff	conical	1/2 with full profile
1812.1	D294	–	2.32	2.72	8.2	gray	conical	½
1842	D208	II	1.70/ 1.20/ 2.35	–	4.1	brown	–	fragment
1845.1	D240	II	2.50/ 1.25/ 1.70	2.50	5.6	reddish buff	conical	fragment
1845.2	D240	II	2.00/ 0.80/ 1.40	–	2.6	greyish	funnel-shaped	fragment
1852.2	D270	II – III	3.30	2.31	6.3	gray	funnel-shaped	fragment
1852.3	D270	II – III	1.07	1.77	1.7	gray	–	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
1852.7	D270	II – III	–	–	1.7	gray	–	fragment
1853	D161	II – III	2.20/ 1.20/ 2.60	–	5.9	reddish	–	fragment
1854.1	D275	II – III	2.56	1.84	3.6	gray	conical	fragment
1854.2	D275	II – III	1.78	1.92	3.2	gray	conical	1/4
1856	D282	–	2.30/ 0.80/ 3.00	–	5.7	brown	conical	fragment
1857	D292	II – III	– / – / 2.30	2.60	5.7	reddish	conical	fragment
1858	D232	II	2.49	> 1.46	2.7	buff	funnel-shaped	1/4 with full profile
1863	D283	–	2.14	2.91	10.5	reddish buff	conical	1/2
1867	D236	II	1.70/ 0.90/ 1.70	–	1.6	buff	–	fragment
1881	D267	–	2.13	> 1.65	2.0	reddish	conical	fragment
1883	D284	II – III	1.90/ 1.30/ 2.40	–	4.0	reddish	conical	fragment
1887	D153	II – III	1.00/ 1.20/ 2.25	–	1.6	reddish	–	fragment
1890	D251	II	2.35	1.88	3.9	reddish buff	funnel-shaped	fragment
1898	D240	II	2.00/ 1.00/ 1.70	–	2.7	reddish buff	–	fragment
1899	D207	II	2.76	2.85	10.0	gray	conical	1/2 with full profile
1900.1	D208	II	1.20/ 0.70/ 2.00	–	1.8	reddish	–	fragment
1900.2	D208	II	0.90/ 0.40/ 1.20	–	0.4	reddish	–	fragment
1901	D208	II	3.14/ 1.59/ 0.77	–	2.4	brown	funnel-shaped	fragment
1904	D275	II – III	4.21	> 1.93	6.1	reddish	funnel-shaped	1/4 with full profile
1905	D198	I	2.55	2.55	6.5	reddish buff	conical	1/2 with full profile
1907	D175	–	1.80/ 0.70/ 1.80	–	1.5	reddish	conical	fragment
1942	D321	II – III	2.86/ 0.98/ 2.09	≈ 4.00	5.2	gray	biconical	fragment
1996	D333	II – III	2.52/ 1.19/ 2.05	< 3.00	4.1	reddish buff to dark grey	conical	< 1/2
2088	D240	II	– / – / > 1.52	–	2.4	buff	–	fragment
8059	D347	II – III	– / 1.67/ 2.65	> 2.76	6.8	reddish	conical	< 1/2
8088	D339	III	– / – / 1.85	1.18(t) – 2.17 (b)	4.5	reddish	conical	1/2
8145	D352	III	3.10	–	11.7	reddish	conical	fragment
8161	D356	III	1.5/ 2.45	–	1.9	buff	–	fragment
8212	D352	III	1.98/ 0.87/ 1.98	–	3.2	reddish	conical	< 1/2
8214	D359	III	2.47	3.50	4.0	reddish buff	conical	fragment
8235	D368	III	1.90/ 1.10/ 2.40	–	5.5	reddish	–	fragment
8356.3	D411	II	2.84/ 1.05/ 1.65	–	5.6	buff	conical	fragment
8359	D44	–	2.29/ 1.36/ 2.35	–	6.5	brown	conical	fragment
8385	D413	II	– / – / 2.65	1.54(t) – 3.04 (b)	9.7	brown	conical	1/2
8385.2	D413	II	– / – / 2.20	≈ 2.76	4.9	brown	biconical	~ 1/3
8388	D416	II	– / – / 1.85	1.29(t) – 2.39 (b)	11.7	buff	conical	complete
8423	D419	II – III	3.02/ 1.05/ 3.05	–	8.4	orange	funnel-shaped	fragment
8468	D433	–	– / – / 3.42	1.75(t) – 3.34 (b)	15.8	reddish	conical	1/2
8471	D431	II – III	– / 0.94 – 1.46/ 2.58	≈ 2.69	7.7	brownish	conical	~ 1/2
8530.1	D308	II – III	2.45/2.52	2.50	6.8	reddish to grey	conical	< 1/2
8532	D307	II – III	2.00/ 1.46/ 1.21	–	3.1	brown	conical	fragment
8535	D305	III	1.94/ 1.08/ 1.93	–	3.4	red to grey	conical	fragment
8731	D459	IIIa	2.32	3.23	13.5	black	funnel-shaped	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
8734	D445	IIIb	– / – / 2.64	3.61 (b)	11.3	reddish buff	funnel-shaped	~ 1/2
8765	D308	–	1.52/ 1.32/ 1.95	–	3.7	gray	conical	fragment
8797	D458	IV	– / – / 2.00	3.50	2.7	gray	conical	fragment
8835.1	D458	IV	– / – / > 3.25	3.00	7.7	gray	funnel-shaped	~ 1/3
8835.2	D458	IV	– / – / > 2.70	–	6.8	buff to gray	–	~ 1/3
8835.3	D458	IV	– / – / > 1.60	–	3.4	buff to gray	–	fragment
8835.4	D458	IV	– / – / > 1.70	–	2.7	reddish buff to gray	–	fragment
8835.5	D45	–	– / – / > 2.10	≈ 2.50	2.6	reddish buff	conical	fragment
8835.6	D458	IV	– / – / > 2.40	3.00	5.7	gray	biconical	fragment
8835.7	D458	IV	– / – / > 2.00	2.00	3.9	reddish buff to gray	conical	fragment
8835.8	D458	IV	– / – / > 2.10	–	2.4	reddish gray	conical	fragment
8835.9	D458	IV	– / – / > 2.40	3.00	9.1	reddish buff	–	fragment
8848.1	D471	IIIa	– / – / 2.75	3.17	17.2	buff	conical	complete
8848.2	D471	IIIa	> 2.80	–	5.1	reddish	funnel-shaped	fragment
8848.3	D471	IIIa	–	–	5.5	brownish	conical	fragment
8848.4	D471	IIIa	– / – / > 1.35	–	0.8	reddish buff	–	fragment
8897	D487	–	– / – / > 1.90	2.50 – 2.60	10.5	light brown	conical	> 1/2
9080	D397	III	–	–	2.1	reddish	–	fragment
9104	D366	III	– / – / > 3.10	≈ 4.00	7.4	reddish buff	conical	fragment
9123	D501	III	2.60	–	9.9	gray to reddish	–	fragment
9132.1	D501	III	– / – / 1.90	2.30	6.4	reddish buff	conical	~ 2/3
9132.2	D501	III	> 2.00	–	2.7	gray	–	fragment
9140	D508	III	– / – / 2.10	2.50	6.4	buff	conical	~ 1/2
9169	D512	III	2.07/ 1.01/ 2.03	–	6.2	buff	conical	fragment
9173.1	D501	III	– / 2.80/ 2.05	2.95	13.0	reddish	conical	fragment
9173.2	D501	III	2.30/ 1.25/ 2.30	–	6.1	gray	conical	fragment
9173.3	D501	III	2.00/ 0.70/ 2.20	–	2.8	gray	–	fragment
9173.4	D501	III	2.25/ 1.30/ 1.40	–	2.8	buff	–	fragment
9173.5	D501	III	2.00/ 1.00/ 1.30	–	2.9	reddish	conical	fragment
9173.6	D501	III	1.50/ 0.60/ 1.10	–	0.8	reddish	–	fragment
9184	D501	III	2.79	2.68	16.7	reddish	conical	2/3
9187	D512	III	3.10/ 1.20/ 2.10	–	9.8	brown	–	fragment
9213.1	D459	IIIa	2.00/ 0.90/ 1.90	–	3.1	gray	conical	fragment
9213.2	D459	IIIa	–	–	2.1	reddish	–	fragment
9233	D305	III	2.30/ 1.00/ 2.20	–	5.8	gray	conical	fragment
9246	D380	III	2.40	–	6.6	buff	conical	fragment
9256	D368	III	2.10	3.00	8.4	brown	–	fragment
9297.1	D485	IV	2.40/ 0.90/ 2.20	2.40	6.6	reddish	conical	1/2
9297.2	D485	IV	2.40/ 1.00/ 2.30	2.40	5.4	reddish buff	conical	1/2
9297.3	D485	IV	1.20/ 1.10/ 1.50	–	1.9	reddish buff	–	fragment
9298	D462	IIIa	1.85/ 1.26/ –	–	0.3	buff	–	fragment
9834.1	D489	IV	– / – / 2.90	3.00	11.7	brown	conical	~ 1/2 with full profile
9834.2	D489	IV	– / – / > 3.10	3.00	12.0	brown	funnel-shaped	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
9834.3	D489	IV	– / – / > 3.30	–	6.6	brown	funnel-shaped	fragment
9834.4	D489	IV	– / – / > 2.20	–	5.9	brown to reddish brown	conical	fragment
9854.2	D495	IV	2.30 / 1.50/ –	–	2.7	brown	–	fragment
9912	D555	IV	– / – / 2.00	2.40	3.2	reddish buff	biconical	~ 1/2
9923.1	D419	II – III	1.80 / 0.96/ –	–	3.3	brown	–	fragment
9925	D456	III	– / – / 2.10	2.60	6.6	reddish	conical	1/2
9940	D457	IIIa	> 2.00	≈ 3.50	3.3	gray	conical	fragment
9969	D488	IV	2.10	2.50	4.7	reddish buff	biconical	~ 1/2
9977	D557	IV	3.23/ – / 0.85	–	4.7	reddish buff	–	fragment
10059.1	D575	IV	– / – / 2.20	2.80	11.7	brown	conical	3/4
10059.2	D575	IV	2.00/ 1.30/ 2.50	–	5.6	reddish buff	conical	fragment
10067	D569	IV	1.10/ 0.90/ 1.85	–	1.8	reddish	–	fragment
10072.1	D576	IV	1.75/ 1.75/ –	–	3.2	dark brown	–	fragment
10072.2	D576	IV	– / 1.75/ –	–	5.1	dark brown	–	fragment
10087.1	D578	IV	– / 2.00/ 2.10	–	5.2	buff	conical	fragment
10087.2	D578	IV	– / 1.80/ 3.00	–	5.4	buff	conical	fragment
10087.3	D578	IV	2.50/ 1.00/ 2.50	–	6.9	dark brown	funnel-shaped	fragment
10087.4	D578	IV	2.00/ 2.10	–	3.8	reddish	conical	fragment
10087.5	D578	IV	1.60/ 0.40/ 1.50	–	1.1	reddish	–	fragment
10087.6	D578	IV	1.15/ 0.40/ 2.30	–	2.1	reddish	–	fragment
10087.7	D578	IV	1.80/ 1.05/ 1.10	–	2.4	buff	–	fragment
10087.8	D578	IV	2.10/ 1.00/ 1.20	–	2.7	buff	–	fragment
10103	D580	IV	2.10/ 1.00/ 2.20	–	3.7	brown	conical	fragment
10143.1	D594	IV	1.60/ 1.20/ 1.60	–	2.2	black	–	fragment
10143.2	D594	IV	3.10/ 1.00/ 0.70	–	4.2	reddish buff	–	fragment
10203.1	D601	IV	3.00/ 1.60/ 2.50	2.80	11.4	reddish	conical	fragment
10203.2	D601	IV	1.70/ 0.90/ 1.70	–	2.3	reddish	–	fragment
10203.3	D601	IV	1.80/ 1.20/ 2.50	–	3.8	reddish	conical	fragment
10203.4	D601	IV	1.60/ 0.80/ 2.00	–	2.2	reddish	–	fragment
10208	D487	–	1.60/ 1.10/ 1.80	–	2.4	brown	–	fragment
11595	D542	IV	– / 1.52/ 1.78	–	1.6	reddish	–	fragment
11570	D535	III	3.50/ 1.40/ 2.60	3.50	12.8	reddish	conical	fragment
11607	D545	III	– / 1.86/ 1.62	–	2.8	reddish	conical	fragment
11624	D549	IV	– / 2.32/ 2.84	–	4.6	red	conical	fragment with full profile
11631	D545	III	0.85-2.12/ – / 1.46	–	3.7	reddish	–	fragment
11643.1	D551	III	– / – / 1.68	2.54 (t)	10.1	dark gray	conical	complete
11643.2	D551	III	– / – / 2.00	2.00 (b)	9.2	light grey	–	complete
15041.7	D701	IV	– / – / 2.15	3.16 – 3.85	21.9	buff	conical	complete
15041.8	D701	IV	1.10 – 1.70/ 1.94/ –	–	2.4	reddish	–	fragment
15068.1	D704	IV	1.95 – 2.54/ 1.23 – 0.67/ –	–	2.9	reddish	–	fragment
15164.3	D707	IV	0.79 – 2.03/ 0.82 – 0.93/ –	–	3.7	reddish buff	–	fragment
15242	D717	IV	– / 1.35 – 1.38/ 1.54	–	3.1	buff	–	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
15333.1	D727	IV	– / 1.89/ 1.38	–	2.1	reddish	funnel-shaped	fragment
15401	D736	IV	– / – / 2.43	2.60 (mp)	5.8	reddish	conical	fragment
15409	D706	IV	1.89/ 1.19/ 2.05	–	2.7	brown	conical	fragment
16187	D642	IV	2.22/ 0.65/ 2.21	–	2.8	reddish	–	fragment
15003	D607	IV	3.10/ 0.77/ 3.82	–	11.0	dark brown	funnel-shaped	fragment
15010	D608	III	1.44/ 0.38/ 1.61	–	0.9	reddish	–	fragment
15016	D701	IV	1.59/ 0.29/ 1.42	–	0.9	reddish	–	fragment
15016.1	D701	IV	1.56/ 0.80/ 1.55	–	1.8	dark gray	conical	fragment
15016.2	D701	IV	2.50/ 1.45/ 1.95	2.50	6.7	dark gray	–	fragment
15026	D703	IV	1.50/ 0.80/ 1.90	–	2.4	reddish	conical	fragment
15027	D702	IV	1.10/ 0.80/ 1.60	–	1.4	brown	conical	fragment
15053	D704	IV	2.09/ 1.16/ 2.53	–	5.1	reddish buff	conical	fragment
15071.1	D704	IV	3.00/ 1.22/ 1.64	–	3.6	reddish	–	fragment
15071.2	D704	IV	1.48/ 0.64/ 2.97	–	1.8	reddish	–	fragment
15071.3	D704	IV	2.07/ 0.62/ 2.12	–	1.7	reddish	–	fragment
15075	D705	III	–	–	3.4	brown	–	fragment
15087.1	D706	IV	2.40/ 1.20/ 2.50	–	6.3	brown	conical	fragment
15087.2	D706	IV	– / 0.80/ 1.40	2.00	3.1	reddish buff	conical	fragment
15087.3	D706	IV	3.00/ 0.70/ 1.50	–	3.2	dark brown	funnel-shaped	fragment
15087.4	D706	IV	2.50/ 1.10/ 1.40	–	3.7	reddish buff	conical	fragment
15087.5	D706	IV	1.15/ 1.10/ 2.15	–	2.2	reddish	–	fragment
15087.6	D706	IV	1.80/ 0.90/ 2.10	–	1.4	reddish	funnel-shaped	fragment
15087.7	D706	IV	1.50/ 1.00/ 2.50	–	2.7	reddish	–	fragment
15087.8	D706	IV	2.10/ 0.80/ 2.40	–	2.7	dark gray	–	fragment
15087.9	D706	IV	1.50/ 0.70/ 2.10	–	2.3	brown	funnel-shaped	fragment
15087.10	D706	IV	1.60/ 0.80/ 0.80	–	1.5	brown	conical	fragment
15087.11	D706	IV	–	–	5.8	reddish	–	fragment
15102.1	D708	IV	– / – / 2.60	2.90	17.1	gray	conical	fragment
15102.2	D708	IV	2.40/ 1.00/ 2.10	2.40	7.6	reddish	conical	fragment
15102.3	D708	IV	1.60/ 1.00/ 2.10	–	2.5	brown	–	fragment
15102.4	D708	IV	2.00/ 1.00/ 1.80	–	2.5	reddish	–	fragment
15102.5	D708	IV	1.50/ 0.80/ 3.20	–	3.5	brown	–	fragment
15102.6	D708	IV	1.30/ 1.15/ 1.35	–	1.3	reddish buff	–	fragment
15102.7	D708	IV	1.75/ 0.70/ 1.90	–	1.9	buff	–	fragment
15112.1	D706	IV	1.80/ 1.00/ 1.90	–	2.4	reddish	conical	fragment
15112.2	D706	IV	–	–	5.4	reddish	–	fragment
15125.1	D701	IV	2.89/ 0.63/ 3.15	–	6.9	brownish	funnel-shaped	fragment
15125.2	D701	IV	– / 1.92/ 1.41	–	2.1	dark brown	–	fragment
15125.3	D701	IV	– / – / 1.60	2.18 (mp)	2.7	buff	–	fragment
15125.4	D701	IV	2.93/ 1.23/ 1.40	–	3.1	dark brown	conical	fragment
15125.5	D701	IV	1.68/ 0.94/ 1.35	–	2.1	dark brown	conical	fragment
15131	D701	IV	– / – / 1.94	2.40 (b)	7.5	reddish buff	conical	1/2
15146.1	D706	IV	2.50/ 0.60/ 2.10	2.50	5.7	reddish	funnel-shaped	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
15146.2	D706	IV	2.60/ 1.10/ 2.60	2.60	6.9	buff	conical	fragment
15146.3	D706	IV	2.40/ 1.10/ 2.60	–	6.5	reddish	–	fragment
15146.4	D706	IV	1.60/ 1.10/ 2.05	–	3.0	reddish	–	fragment
15146.5	D706	IV	1.20/ 0.70/ 2.30	–	1.6	reddish	–	fragment
15146.6	D706	IV	2.10/ 0.70/ 1.40	–	2.4	reddish	–	fragment
15146.7	D706	IV	2.60/ 1.00/ 1.90	–	4.8	brownish	conical	fragment
15146.8	D706	IV	1.85/ 0.65/ 1.30	–	2.2	buff	–	fragment
15146.9	D706	IV	1.10/ 0.60/ 2.40	–	1.8	reddish	funnel-shaped	fragment
15146.10	D706	IV	2.00/ 1.15/ 1.25	–	3.1	reddish	conical	fragment
15146.11	D706	IV	2.10/ 0.90/ 1.40	–	2.7	gray	conical	fragment
15146.12	D706	IV	1.60/ 0.60/ 1.30	1.60	1.1	reddish	conical	fragment
15146.13	D706	IV	–	–	5.9	–	–	fragment
15157.1	D706	IV	3.50/ 1.35/ 3.40	3.50	21.9	reddish	conical	fragment
15157.2	D706	IV	2.3 / – / 2.60	–	5.6	gray	funnel-shaped	fragment
15157.3	D706	IV	2.40/ 0.70/ 3.00	–	6.1	reddish	funnel-shaped	fragment
15157.4	D706	IV	2.60/ 0.60/ 2.35	–	4.8	reddish	funnel-shaped	fragment
15157.5	D706	IV	1.60/ 0.80/ 1.70	–	1.8	brown	–	fragment
15157.6	D706	IV	1.70/ 0.80/ 1.20	–	1.3	reddish	conical	fragment
15157.7	D706	IV	1.70/ 0.70/ 1.70	–	1.6	reddish	–	fragment
15176	D710	IV	– / 2.56/ 2.18	–	6.2	brownish	conical	fragment
15188.1	D712	IV	1.70/ 1.00/ 2.40	–	3.5	brown	conical	fragment
15188.2	D712	IV	2.80/ 1.10/ 1.80	–	6.5	reddish	conical	fragment
15188.3	D712	IV	2.25/ 1.00/ 1.10	–	2.1	brown	conical	fragment
15198	D712	IV	– / – / 2.45	2.62 (b)	6.8	red	conical	~ 1/2
15206	D713	IV	– / 1.36/ 2.20	–	1.1	reddish	–	fragment
15214.1	D706	IV	– / – / 2.78	2.75 (b)	8.8	reddish buff	conical	~ 1/2
15214.2	D706	IV	– / – / 2.15	2.86 (b)	9.9	brown	conical	1/2
15214.3	D706	IV	2.20/ 0.98/ 1.85	–	4.6	dark brown	conical	fragment
15223	D716	IV	1.46/ – / 1.89	–	1.8	gray	funnel-shaped	fragment
15240.1	D715	IV	– / – / 2.60	2.43 (b)	9.5	brownish	conical	1/2
15240.2	D715	IV	– / – / 2.05	2.30 (b)	6.3	reddish buff	conical	~ 1/4
15248	D717	IV	– / 2.81/ 1.83	–	2.2	dark brown	–	fragment
15265.1	D718	IV	– / – / 2.21	2.30	5.2	dark brown	conical	1/2
15265.2	D718	IV	– /1.90/ 1.56	–	3.2	dark brown	conical	< 1/2
15265.3	D718	IV	– / – / 2.00	2.40 (b)	6.0	reddish	conical	3/4
15265.4	D718	IV	– /1.34/ 2.09	–	1.3	reddish	–	fragment
15281	D721	IV	– / 1.74 – 1.73/ 0.83 – 1.95	–	0.6 – 2.8	reddish buff	conical	fragment
15287.1	D722	IV	3.49/ – / 3.03	–	10.1	dark gray	funnel-shaped	fragment
15287.2	D722	IV	– / – / 2.39	2.67 (b)	8.4	brownish	conical	1/2
15287.3	D722	IV	– / 2.73/ 2.32	–	7.3	brownish	funnel-shaped	~ 1/3
15287.4	D722	IV	– / 2.48/ 2.28	–	6.4	reddish buff	conical	fragment
15287.5	D722	IV	– / 1.65/ 3.15	–	4.7	reddish buff	funnel-shaped	fragment
15287.6	D722	IV	– / – / 2.30	2.80	9.6	buff	conical	1/2

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
15287.7	D722	IV	– / 1.85/ 2.20	–	4.0	buff	conical	fragment
15287.8	D722	IV	– / 2.75/ 1.98	–	2.5	buff	conical	fragment
15299.1	D723	IV	– / 2.09/ 2.06	–	4.0	brown	conical	fragment with full profile
15299.2	D723	IV	– / – / 2.34	2.10 (b)	6.7	reddish buff	conical	~ 1/2
15306	D722	IV	– / 1.94/ 2.06	–	2.9	reddish	conical	fragment
15347	D728	IV	– / 2.09/ 2.90	–	3.4	reddish	conical	1/2
15369	D732	IV	– / – / 2.02	2.15 (b)	5.6	reddish	conical	~ 2/3
15373.1	D730	IV	– / – / 2.39	2.64 (b)	14.4	reddish	conical	complete
15373.3	D730	IV	– / – / 3.00	2.70 (b)	14.3	reddish	conical	1/2
15373.4	D730	IV	– / 2.96/ 2.81	–	11.5	reddish	conical	~ 1/2
15398	D734	IV	– / – / 3.65	≈ 2.94 (b)	8.6	dark brown	funnel-shaped	< 1/2
15473.2	D730	IV	– / 2.56/ 3.37	–	8.9	reddish	conical	~ 1/3
16109	D634.1	III	2.78/ 1.24/ 2.81	2.78	13.8	reddish	conical	fragment
16184	D643	IV	– / – / 1.54	3.08 (b)	8.6	brownish	conical	fragment
16223	D649	IV	– / – / 2.65	3.06	14.7	red	conical	~ 2/3
16349	D680	IV	– / – / 2.99	2.74 (b)	8.6	reddish	conical	1/2
16364	D674	IV	– / 2.65/ 2.93	–	7.3	reddish	conical	< 1/2
16372	D684	IV	– / 2.40/ 2.40	–	3.7	gray	funnel-shaped	fragment
4038	E2	–	2.25	1.69	3.2	reddish	conical	1/4
4057	E16	I	1.86	2.29	7.5	buff	conical	2/3
4097	E27	I	1.68	2.05	1.9	reddish buff	conical	fragment
4109	E27	I	1.78	> 2.46	1.9	buff	conical	fragment
4118	E39	I	1.65	1.98	3.0	reddish buff	conical	fragment
4146	E39	I	1.89	> 0.94	0.9	buff	conical	fragment
4191	E35	I	0.91	–	0.4	buff	conical	fragment
4192	E39	I	1.77	> 1.48	1.4	reddish	conical	fragment
4193	E39	I	1.61	> 1.68	1.7	reddish buff	conical	fragment
4195	E39	I	2.34	> 2.33	2.9	reddish	conical	fragment
4213	E39	I	2.29	≈ 2.20	4.0	reddish buff	conical	1/4
4214	E39	I	1.21	> 1.41	0.8	reddish buff	–	fragment
4223	E50	II – III	2.32	2.11	3.8	buff	conical	1/4
4370	E59	I	2.21	> 1.28	1.7	reddish buff	conical	fragment
4514	E73	I	1.80/ 1.40/ 2.00	–	2.7	buff	–	fragment
4645	E112	I	1.51	–	1.0	reddish	conical	fragment
4652	E146	I	3.16	3.22	12.0	reddish	funnel-shaped	3/4 with full profile
4679	E101	II – III	1.79	1.43	1.0	reddish buff	conical	fragment
4733	E79	I	0.69 – 1.95	1.23 – 2.22	7.3	buff	–	fragment
4752	E166	I	1.51/ 0.96/ 2.42	–	2.2	reddish buff	conical	fragment
4768	E184	I	1.90/ 1.34/ 2.13	> 1.90	3.3	reddish to grey	conical	< 1/4
4787	E180	I	– / – / 3.34	2.02 – 3.16	27.6	reddish	conical	~ complete
4797.1	E189	I	1.64/ 1.10/ 1.80	–	–	reddish buff to grey	conical	fragment
4797.2	E189	I	1.95/ 1.94/ 1.82	–	–	reddish buff to grey	conical	fragment
4841	E197	I	1.77/ 0.98/ 1.84	–	1.90	reddish	funnel-shaped	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
4891	E303	–	– / – / 3.65	1.57(t) – 3.29 (b)	16.2	orange	conical	fragment
4900	E208	I	2.50/ 1.90/ 2.50	2.60	7.7	reddish	conical	~ 1/3
4913	E205	I	2.16/ 0.57/ 2.19	≈ 3.00	2.6	reddish. brownish	funnel-shaped	fragment
4968	E213	I	2.50	–	5.1	black	conical	fragment
7656	E238	I	1.90/ 1.70/ 0.90	–	2.5	reddish buff	conical	fragment
7689	E249	I	– / – / 2.70	2.80	18.2	reddish	conical	complete
7738	E251	II	1.30/ 1.00/ 2.10	–	2.6	reddish	–	fragment
7746	eastern profile	–	– / – / 2.40	2.90	16.0	reddish buff	conical	~ complete
7755	E265	I	– / – / > 2.40	≈ 4.00	3.8	reddish buff	conical	fragment
7870	E255	I	–	–	3.6	reddish buff	–	fragment
7899	E214	I	2.93	3.22	15.8	brown	conical	fragment
7958	E198	I	2.10/ 0.65/ 1.20	–	1.0	reddish buff	–	fragment
7962.1	E267	I	2.25/ 1.40/ 2.30	–	7.3	reddish buff	–	fragment
7962.2	E267	I	2.20/ 1.20/ 1.90	–	5.2	reddish	conical	fragment
7962.3	E267	I	1.10/ 1.00/ 3.00	–	4.3	reddish	–	fragment
7962.4	E267	I	2.20/ 0.70/ 2.40	–	2.7	reddish	–	fragment
7962.5	E267	I	2.30/ 0.90/ 2.55	–	4.5	reddish	–	fragment
7962.6	E267	I	1.20/ 1.00/ 2.60	–	2.1	reddish buff	–	fragment
7962.7	E267	I	1.20/ 1.10/ 2.40	–	3.2	reddish	–	fragment
7962.8	E267	I	2.30/ 0.70/ 0.90	–	1.1	reddish	–	fragment
7962.9	E267	I	1.30/ 0.40/ 1.60	–	0.8	reddish	–	fragment
7962.10	E267	I	1.20/ 0.50/ 1.00	–	0.6	reddish	–	fragment
10535.1	E298	I	2.50/ 1.00/ 2.20	–	6.4	buff	funnel-shaped	fragment
10535.2	E298	I	–	–	3.6	reddish	–	fragment
10551	E295	I	2.85	2.30	11.7	brown	conical	complete
10556	E290	I	– / – / 2.30	2.20	8.6	reddish	conical	complete
10569	E296	I	1.20/ 1.00/ 2.10	–	2.8	reddish buff	–	fragment
10600	cleaning	–	– / 1.70/ 3.45	–	13.3	black	conical	fragment
6149	F6	–	– / – / 2.86	1.44 – 2.44	9.1	reddish to grey	conical	~ complete
6223	F5	I – III	1.96/ 1.48/ 2.67	–	5.5	reddish	conical	~ 1/3
6232	F5	I – III	– / 1.578/ 1.96	> 2.79	7.0	brown	funnel-shaped	< 1/2
6434	F23	–	– / – / 2.35 – 2.40	2.52 – 2.56	16.1	gray	conical	complete
6449	F51	–	> 2.56	2.98	9.3	gray	conical	< 1/2
6458.1	F51	–	– / – / 2.16	2.84	7.8	black	–	fragment
6458.2	F51	–	– / – / 3.32	–	2.9	–	conical	fragment
6458.3	F51	–	– / – / 2.68	0.77 (t)	9.2	reddish	conical	fragment
6458.4	F51	–	2.05/ 0.81/ 1.85	–	4.0	–	funnel-shaped	fragment
6458.5	F51	–	– / – / 2.45	–	5.8	brownish	–	fragment
6458.6	F51	–	– / – / 1.80	–	3.0	light brownish	funnel-shaped	fragment
6458.7	F51	–	–	–	0.2	–	–	fragment
6458.8	F51	–	–	–	0.9	–	–	fragment
6458.9	F51	–	–	–	1.6	–	–	fragment
6458.10	F51	–	–	–	1.9	–	–	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
6458.11	F51	–	–	–	4.3	–	–	fragment
6458.12	F51	–	–	–	2.0	–	–	fragment
6458.13	F51	–	–	–	2.3	–	–	fragment
6458.14	F51	–	–	–	2.4	–	–	fragment
6458.15	F51	–	–	–	2.3	–	–	fragment
6460.1	F51	–	1.5 0/ 1.20/ –	–	1.9	reddish buff	–	fragment
6468	F23	–	2.04	2.24	9.4	brownish	conical	complete
9504.1	F64	I	– / – / 1.90	2.60	6.7	reddish	conical	fragment
9504.2	F64	I	2.90/ 1.50/ 2.40	2.90	8.6	reddish	conical	1/2
9504.3	F64	I	2.50/ 1.40/ 3.40	–	9.3	reddish	conical	fragment
9504.4	F64	I	2.30/ 1.50/ 2.70	–	8.0	reddish	conical	fragment
9504.5	F64	I	2.65/ 1.40/ 2.20	2.65	7.8	reddish buff	conical	fragment
9504.6	F64	I	1.50/ 1.00/ 2.40	–	4.3	gray	–	fragment
9504.7	F64	I	1.85/ 0.60/ 1.90	–	2.7	gray	funnel-shaped	fragment
9504.8	F64	I	–	–	9.8	buff	–	fragment
9519.1	F69	I	3.00/ 1.85/ 2.60	2.90	13.1	reddish	conical	1/2
9519.2	F69	I	– / – / 1.60	2.80	8.6	buff	conical	3/4
9519.3	F69	I	2.00/ 1.00/ 2.10	–	3.8	reddish	–	fragment
9581	F77	–	– / – / > 2.30	–	3.2	reddish buff	conical	fragment
9591.4	F80	I	3.07/ 1.40/ –	–	5.3	black	–	fragment
9669	F89	I	2.20/ 1.10/ 2.30	–	5.2	reddish buff	conical	fragment
9675	F23	–	3.70	≈ 4.00	10.4	reddish	funnel-shaped	~ 1/4 with full profil
9712	F87	I	1.80/ 2.30	–	4.5	dark brown	funnel-shaped	fragment
9732	F94	–	2.10/ 0.80/ 1.20	–	1.4	reddish	–	fragment
2091	G65	II – III	– / – / > 1.61	–	1.7	reddish buff	conical	fragment
7016	G12	II – III	2.94/ 0.95/ 2.73	–	6.7	reddish	biconical	~ 1/4
7073	G22	II – III	1.47/ 1.04/ 1.75	–	2.1	reddish	conical	fragment
7075.1	G20	II – III	2.69/ 2.46/ 1.87	–	7.0	orange	conical	~ 1/3
7164	G22	II – III	> 3.00	–	3.5	reddish buff	funnel-shaped	fragment
7178.1	G37	II – III	1.60/ 1.00/ 2.30	–	2.9	buff	–	fragment
7178.2	G37	II – III	1.60/ 0.70/ 1.90	–	2.0	buff	–	fragment
7178.3	G37	II – III	1.30/ 1.00/ 1.00	–	1.4	reddish buff	–	fragment
7178.4	G37	II – III	–	–	7.2	reddish buff	–	fragment
7178.5	G37	II – III	–	–	6.1	buff	–	fragment
7178.6	G37	II – III	2.10/ 1.30/ 2.25	2.70	7.5	reddish buff	conical	1/3
7203.1	G37	II – III	0.13 – 0.26/ – / –	–	7.4	gray	–	fragment
7223.1	G37	II – III	2.20 – 2.90/ – / –	–	1.7 – 5.3	light gray	–	fragment
7246	G45	II – III	2.20	2.60	5.8	reddish	conical	fragment
7262	G44	II – III	–	3.00	5.9	reddish buff	conical	fragment
7305	G45	II – III	– / – / 2.40	–	2.30	reddish buff	–	fragment
7315	G58	II – III	> 2.25	–	1.7	reddish buff	funnel-shaped	fragment
7398	G27	II – III	1.25/ 0.85/ 1.20	–	0.8	reddish	–	fragment
7418	G69	II – III	– / – / > 2.60	≈ 2.50	4.1	reddish buff	conical	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
7690.1	G238	–	2.80/ 0.60/ 1.50	–	3.0	orange	funnel-shaped	fragment
7690.2	G238	–	– / 0.30/ 1.00		0.3	red	–	fragment
7154.1a	G37	II – III	1.50/ – / 2.70	2.70	7.7	beige	conical	fragment
7154.1b	G37	II – III	3.00/ 1.30/ –	–	6.1	dark brown	funnel-shaped	fragment
7154.1c	G37	II – III	1.88/ 0.87/ –	–	3.1	reddish	funnel-shaped	fragment
7154.1d	G37	II – III	2.70/ 1.65/ –	–	6.7	brown	–	fragment
8909.1	H5	–	3.00/ 1.00/ 3.00	–	7.2	buff	funnel-shaped	fragment
8909.2	H5	–	1.00/ 0.35/ 1.00	–	0.5	buff	–	fragment
8909.3	H5	–	–	–	2.5	buff	–	fragment
8919	H7	–	– / – / 2.60	3.70	9.8	buff	funnel-shaped	< 1/2
8947	H14	–	2.80	4.10	20.4	reddish buff	funnel-shaped	1/2
10413	H26	–	2.40/ 1.30/ 2.30	–	5.2	reddish	–	fragment
25000.1	H45	–	3.10/ 1.00/ 1.90	–	7.7	reddish	funnel-shaped	fragment
25000.2	H45	–	3.10/ 1.30/ 1.15	–	3.4	reddish	–	fragment
25020.1	H45	–	– / – / 1.67	2.95	4.3	brown	funnel-shaped	fragment
25020.2	H45	–	2.66/ 0.78/ 1.68	–	2.3	brown	funnel-shaped	fragment
25025.1	H47	–	2.32/ 1.65/ –	–	5.1	reddish buff	–	fragment
25027.1	H47	–	– / – / 2.56	3.91	12.3	buff	funnel-shaped	fragment
25027.2	H47	–	1.82/ 0.61/ 2.07	–	1.9	buff	–	fragment
25027.3	H47	–	3.30/ 1.50/ 2.25	–	5.1	reddish buff	conical	fragment
25027.4	H47	–	1.50/ 0.80/ 1.00	–	0.9	buff	–	fragment
25027.5	H47	–	1.10/ 0.75/ 2.70	–	2.0	reddish	conical	fragment
25031	H44	–	1.95/ 0.65/ 1.91	–	2.0	buff	conical	fragment
25046	H48	–	1.82/ 1.06/ 2.53	–	5.6	buff	funnel-shaped	fragment
25050.2	H50	–	1.56/ – / 1.64	–	1.6	brown	–	fragment
25057.1	H50	–	3.10/ 0.80/ 2.70	–	6.7	brown	funnel-shaped	fragment
25057.2	H50	–	3.00/ 1.10/ 2.90	–	8.6	buff	funnel-shaped	fragment
25064	H50	–	1.30/ 0.75/ 1.50	–	1.2	brown	–	fragment
25070	H51	–	2.70/ 1.30/ 2.85	–	7.0	reddish	conical	fragment
25087	H55	–	2.41/ 0.80/ 2.38	–	4.3	buff	funnel-shaped	fragment
25099.1	H56	–	3.70/ – / 3.00	–	8.1	reddish	funnel-shaped	fragment
25099.2	H56	–	1.80/ 0.90/ 1.55	–	2.6	buff	–	fragment
25099.3	H56	–	2.05/ 0.90/ 1.70	–	2.9	reddish	conical	fragment
25099.4	H56	–	2.80/ 0.90/ 2.80	–	6.9	buff	conical	fragment
25099.5	H56	–	2.10/ 0.90/ 1.05	–	2.2	dark gray	–	fragment
25099,6	H56	–	2.60/ 0.75/ 2.25	–	2.7	reddish buff	funnel-shaped	fragment
25114.1	H58	–	3.26/ – / 3.39	–	9.2	reddish	funnel-shaped	fragment with full profile
25114.2	H58	–	– / – / 2.10	≈ 2.35 (mp)	5.3	buff	conical	~ 1/2
25114.3	H58	–	≈1.85	2.90 (b)	5.9	buff	conical	~ 1/2
25114.4	H58	–	– / – / 2.68	≈ 3.43 (b)	5.9	buff	funnel-shaped	fragment
25114.5	H58	–	– / 2.65/ 1.70	–	3.4	buff	funnel-shaped	fragment
25114.6	H58	–	– / 1.93/ 1.66	–	2.6	buff	–	fragment
25114.7	H58	–	– / 2.62/ 1.69	–	2.8	buff	funnel-shaped	fragment

Table 11.3. (continued).

RN	Locus	Stratum	Length/ width/ height (cm)	Diameter (cm)	Weight (g)	Color	Form	Preservation
25114.8	H58	–	– / 1.68/ 2.80	–	4.5	reddish	funnel-shaped	fragment
25114.9	H58	–	– / 2.51/ 2.23	–	2.4	buff	–	fragment
25121.1	H59	–	2.44/ 0.96/ 2.70	–	5.5	buff	–	fragment
25121.2	H59	–	–	–	6.5	buff	–	fragment
25124.1	H60	–	– / – / 3.00	4.15	10.9	brown	funnel-shaped	1/2
25124.2	H60	–	2.50/ 1.00/ 2.00	2.00	8.5	reddish	biconical	1/2
25124.3	H60	–	– / – / 2.10	3.90	10.0	reddish	funnel-shaped	1/2
25124.4	H60	–	– / – / 2.80	3.65	10.1	buff	funnel-shaped	1/2
25124.5	H60	–	1.60/ 1.40/ 2.90	–	6.5	buff	funnel-shaped	fragment
25124.6	H60	–	– / – / 3.20	4.00	12.9	reddish buff	conical	fragment
25124.7	H60	–	2.90/ 1.40/ 3.50	–	7.2	buff	–	fragment
25124.8	H60	–	2.50/ 1.00/ 2.80	–	7.9	buff	funnel-shaped	fragment
25124.9	H60	–	3.10/ 1.00/ 2.60	–	4.6	reddish	funnel-shaped	fragment
25124.10	H60	–	1.50/ 0.80/ 1.90	–	1.4	reddish	–	fragment
25140.1	H61	–	– / – / 2.50	2.30	8.4	gray	conical	1/2
25140.2	H61	–	2.10/ 1.00/ 3.00	–	5.8	reddish	funnel-shaped	fragment
25140.3	H61	–	3.30/ 1.20/ 2.95	–	7.3	buff	funnel-shaped	fragment
25140.4	H61	–	– / – / 2.30	–	5.7	buff	conical	fragment
25149	H62	–	– / 3.03/ 2.55	–	4.9	reddish buff	funnel-shaped	fragment with full profile
25153	H63	–	– / – / 2.06	3.10 (b)	6.6	reddish buff	funnel-shaped	1/2
25158	H64	I – IV	– / 1.68/ 2.56	–	5.1	reddish	funnel-shaped	fragment with full profile
25223	H80	I – IV	– / – / 2.42	2.60	6.7	brownish	biconical	1/2
25261	H93	I – IV	– / 2.75/ 2.94	–	5.9	reddish	funnel-shaped	fragment
12007	K2	–	1.35/ 0.80/ 1.65	–	1.4	gray	–	fragment
13060	L12	I – IV	– / 2.57/ 1.45	–	3.2	buff	conical	lower part
13077	L14	I – IV	– / – / 2.85	3.50 (b)	8.7	brownish	conical	~ 1/2
13104	L23	I – IV	– / – / 1.56	2.20	3.9	tan	–	1/2
25420	L13	I – IV	– / 0.66/ 1.39	–	0.7	reddish buff	–	fragment
2810.1	–	–	2.79	> 3.64	10.1	reddish	funnel- shaped	fragment
2810.2	–	–	2.92	2.71	7.0	reddish	funnel- shaped	~ 1/3
2813	–	–	2.98	3.00	11.6	reddish	conical	~ 1/3
41	–	–	– / – / 3.85-3.90	4,72 (b) – 1.99 – 2.10 (t)	23.3	greenish buff	funnel- shaped	> 1/2
52	–	–	– / – / 4.08	~ 4.50 (b)	19.9	reddish buff	funnel- shaped	~ 1/2
35	–	–	2.49	~ 3.00	8.1	reddish	–	< 1/2
2801.1	surface near fox holes	–	2.91	4.13	10.7	reddish	funnel- shaped	fragment
2801.2	surface near fox holes	–	2.18	2.74	5.1	reddish buff	funnel- shaped	fragment
2802	-	–	2.35	2.56 – 2.72	13.8	reddish buff	conical	complete
2820	–	–	2.00	3.10	11.3	reddish	biconical	complete

Table 11.3. (continued).

Chapter 12

Narrowing Down the Real World

Zoomorphic Figurines from Monjukli Depe

Jana Eger

Keywords: *zoomorphic figurine; clay horn; miniaturization; human-animal relation; faunal remains*

Introduction

> People depict animals because they are food for thought rather than just food (Russell 2012a, 14)

During four excavation seasons at Monjukli Depe (2010-2013), a total of 68 clay objects in the likenesses of animals were recovered.[187] This chapter examines human-animal relations that go beyond economic aspects of ancient animal husbandry by studying this assemblage of zoomorphological clay objects from the early Aeneolithic settlement.

I first examine the ways animal bodies were represented. Using a method of grouping influenced by a study conducted by Louise Martin and Lynn Meskell (2012) by means of which the figurines are arranged into related zoomorphological types,[188] I explore representational variations and, where appropriate, differentiate forms that indicate a living counterpart by drawing on the Monjukli Depe faunal remains. A number of general questions form the basis for documenting and exploring issues of bodily representation and its potential meanings. Which elements of an animal body are represented in these small clay objects, which of them are emphasized or deemphasized? What do the features suggest about the possible reasons for modeling them in specific ways? Are different taxa depicted?

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187 A short preliminary report on the clay objects includes a summary of the figurines from the 2010 and 2011 excavation seasons (Öğüt 2013, 77-81).

188 In my analysis grouping relies on the detailed database entries recorded in field as well as on photographs and drawings of the figurines. Martin and Meskell explicitly excluded figurines from their analysis that they could only study from photographs, since observations on manufacturing techniques, surface treatments, and standardized forms are better recognized by examining the whole assemblage together and, especially, firsthand (Martin and Meskell 2012: 406). Prior to the beginning of my analysis, I had the chance to examine the Monjukli figurines firsthand, but this was not possible at the time that I worked on this analysis. However, I did follow Martin and Meskell in examining morphological consistency and form variance for each figurine prior to assigning it to a specific taxon.

The second part of my research consists of a contextual analysis that highlights diachronic and synchronic (dis-)continuities across households and communal spaces in the village. The temporal and spatial analyses provide a background for understanding the zoomorphic figurines, their circulation, and their deposition at the site. Where were the objects discovered? Are there differences in the distribution over time, specifically over the course of the four Aeneolithic strata at Monjukli Depe? What does the use of those miniaturized forms in certain spaces reveal?

In conclusion I will offer a range of possible interpretations, including some thoughts on the use of miniaturization, which may have held important symbolic value for the inhabitants of the village. I will suggest that miniaturization was an important symbolic act with reference to the real world: Quadruped figurines reflect an alliance between the inhabitants of Monjukli Depe and particular kinds of animals, allowing humans to interact with these animals in specific ways and animals to be incorporated into social relations that extended beyond their usefulness as livestock.

Overview of the sample

In four excavation seasons 57 figurines in the likenesses of animals were recovered from the Meana Horizon occupation. They were found in most excavation units and in all four Aeneolithic strata. There is only one clay object with a zoomorphic appearance from our excavations of Neolithic levels at Monjukli Depe (Cat. 12.11). Ten other figurines were recovered from the fill of a large pit dating to a slightly later Aeneolithic phase than the main Meana Horizon occupation of the site; it is probably attributable to Namazga I (cf. Solovyova 2005). I have excluded the latter ten pieces as well as the single Neolithic animal figurine from my investigation but have incorporated them in the catalog (Cat. 12.1-11). The entire collection of figurines and fragments thereof has been recorded in the project's data base, but I have included in the grouping analysis only those where the body is more than half complete.[189] As a result, a majority of the figurines are excluded from the grouping due to their fragmentary state and the ensuing difficulties of identification (Table 12.1). Fragmentary figurines were, however, included in the spatial analysis.

With one somewhat ambiguous exception, the entire figurine collection portrays small quadrupeds manufactured from unfired clay; no clearly anthropomorphic objects have been found in the Meana Horizon at Monjukli Depe.[190] All of them were dried or occasionally lightly baked, but none was subject to high-temperature firing. The lengths of complete figurines vary from 2.5 to 6.0 cm with heights ranging from 1.8 to 4.5 cm. A direct relation between height and length is evident when they are plotted against one another, for those examples where both dimensions were measurable (Fig. 12.1). Note that the measurements in the catalog refer not only to complete figurines but also to fragments, whereas the dimensions in Figure 12.1. are from pieces where the full height and length were preserved. The regression line in the graph shows a relatively high correlation ($r^2 = 0.76$), highlighting the figurines' closely balanced proportions. There are, however, hints of two size groups in the distribution in Fig. 12.1, one less than 4.5 cm in length and one greater than 4.5 cm.

Figurine types	n
straight back; erect head; stubby tail	16
massive, undifferentiated neck; short torso; stocky physique; hump on neck or back; droopy tail	12
straight back; head unraised; round, pointed snout; massive, stocky frame; tiny, stubby tail	2
fat-tailed; hollow back	2
straight back; erect head; erect ears; tail standing straight up	1
curved body posture; pinched tail standing straight up	1
markedly protruding snout	1
'beak'-shaped top	1
uncertain form; fragment	21
Total	**57**

Table 12.1. Frequencies of figurine categories.

Figurines and their zoomorphic characteristics

The archaeological literature contains varied approaches to the analysis and interpretation of prehistoric figurines (e.g., Hamilton 1996; Kuijt and Chesson 2005; Nanoglou 2008; 2009; Lesure 2011). An intriguing one is offered by Douglass Bailey (2005) who focuses on the process of size reduction of objects, that is, miniaturization. In his work, Bailey points out that human beings are visually, physically, and even emotionally affected by the handling of objects that have been reduced in size in comparison to what they represent. In the process of miniaturization, a separate – or miniature – space is created, differing from the real world of daily life and thereby allowing us to

189 Three animal figurines were unsuitable for a contextual analysis because they were recovered from poorly stratified contexts: an old backdirt pile in a deep sounding dug in 1959 (Pollock et al. 2011, 174), a washed-in layer, and an inaccurate contextual assignment. These three figurines are included in the morphological analysis and in the catalog (Cat. 12.28, 44, and 49).

190 A common category of objects from the site, the tokens, may include some highly abstract anthropomorphic forms (Chap. 13). Some of the post-Meana Horizon figurines (Cat. 12.1-10) also appear to be abstract representations of humans.

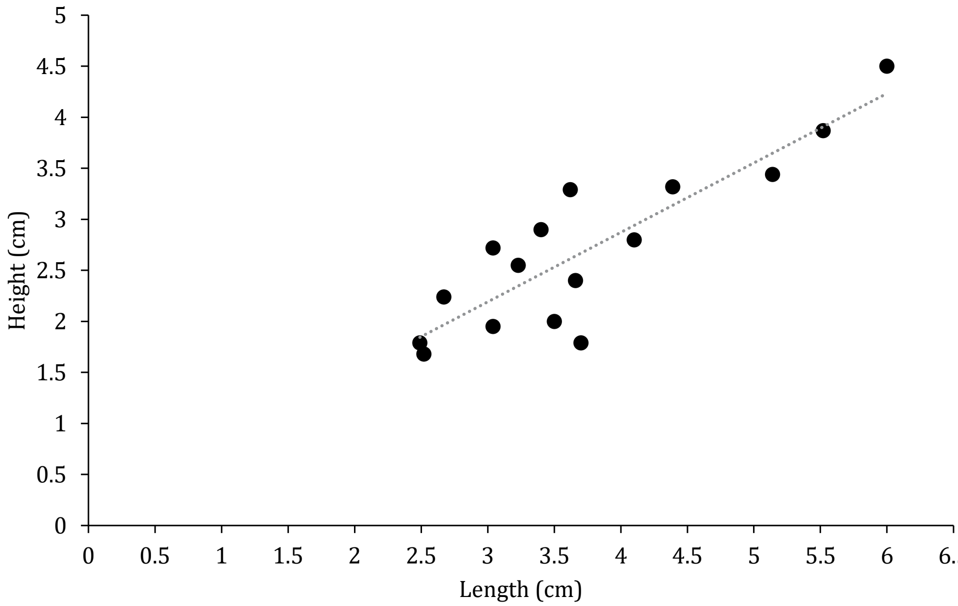


Fig. 12.1. Scatterplot of length and height of the measurable figurines with a regression line showing their degree of correlation (r^2=0.76).

perceive other, differently scaled realities. Furthermore, playing with or handling a three-dimensional object, such as the zoomorphic miniatures from Monjukli Depe, generates intimacy between the beholder and the object through the close contact that is produced in part by the small size. Although the range of personal space may vary cross-culturally, a figurine is well suited to bear symbolic meaning by entering easily into a person's "comfort zone": not only the handling but also the recognition and understanding of a small object take place in direct proximity to the human body (Bailey 2005, 34-35, 38-39).

Various scholars have examined Aeneolithic figurines from Turkmenistan. Alexey Kasparov (2000) has attempted to identify animal species by calculating an index that can be used to compare body proportions of real animals with measurements of ancient figurines. He tries to differentiate between wild and domestic animals in the figurine assemblage as well as to determine sex on the basis of external characteristics such as size or height differences, orientation of the horns, or other features that might distinguish male wild animals.

Figurines in the form of quadrupeds have been found in the Aeneolithic occupation of Anau. Based on Kasparov's criteria they are all said to represent bulls (Hiebert et al. 2003a, 95). Most of the numerous animal figurines from the Aeneolithic occupations in the Geoksyur Oasis have been interpreted as representing billy goats, some bulls, and others camels and possibly dogs (Khlopin 1969, 44-45). A few animal figurines from the Neolithic sites of Jeitun and Chagylly Depe have been identified taxonomically as cattle, dogs, martens, and equids; by virtue of a rendition of horns, sex was assigned for some of them, resulting in their identification as bulls and billy goats (Berdiev 1966, 22-23; Masson 1971, 43-44). In contrast to Kasparov's work, however, no concrete criteria for these designations were offered.

Zoomorphic figurines from Monjukli Depe

The starting point of my analysis is the description and classification of forms, postures, and elements such as tails or humps depicted on the clay objects independently of any specific animals they might represent. The goal is to address the question of which parts of the animal body were represented or emphasized. This approach is based on the work of researchers studying figural representations of animals in western Asian prehistory (Martin and Meskell 2012; Vila and Helmer 2014). On the premise that the zoomorphic figurines at Monjukli Depe represent specific kinds of animals, the miniatures would have been conceptualized as recognizable types of animals that could be easily identified by the inhabitants. Such kinds of animals do not necessarily have to be equivalent to a biological species: figurine types recognized by people at the time might have been, for instance, "horned animals" or "animals with a hump or an upright tail." Given their form I do not assume that the representations depict individual animals, but rather that they display categories or stereotypes of taxa, despite the fact that the measurements do not point to a strict standardization.

My analysis does not begin with a presumed identification of what animal each figurine represents. Rather, my aim is to first categorize them into groups on the basis of systematic observations and evaluation of the levels of consistency in depicting particular body parts. Only then do I use these observations in order to suggest identifications of animal taxa based on the most characteristic features of living animals. I avoid attempts to assess whether a figurine represents a wild vs. domestic and/or a male vs. a female animal, because I consider such attributions to be tenuous given the mostly schematic ways in which the figurines are formed. Eight or nine different morphological types can be discerned, with particular categories clearly favored.

It should be acknowledged that the figurines might have reflected conceptions of other realities, or they exhibit the creativity of Aeneolithic people in Monjukli Depe; as is well known from an anthropological perspective, there are different symbolic systems with which the world can be classified (Martin and Meskell 2012, 402). Depictions were fashioned according to conventions of representation that may have changed over the course of time, even within one local community. People need not invariably have sought accuracy in reproducing the form of a living counterpart in miniature clay objects. According to Bailey, precision or accuracy in miniaturized representations is not required; these small objects are not made with the goal of exact likeness. With reference to Lévi-Strauss, Bailey describes the process of forming miniatures as a result of human examinations and perceptions of the physical world, with a strong involvement of cultural creativity (Bailey 2005, 29).

The largest number of figurines from Monjukli Depe (n=16) can be assigned to a group that is characterized by the specific bodily features of a straight back, erect head, and a more or less upright, stubby tail (Cat. 12.12-27). The first two characteristics are crucial features used to class them as caprines.[191] Iconographic studies of objects from western Asia have suggested that this body posture is typical for representations of sheep and goat from the Chalcolithic (Aeneolithic) period onwards (Vila and Helmer 2014, 30-34). Given the more or less upright tail, I suggest a closer similarity to goats, since the tails generally hang down in sheep but stand up among goats. In order to highlight my judgment of a closer morphological similarity to goats, I use the term "goats" for this group of figurines.

The second group differs markedly from the first. The figurines are defined by a massive, undifferentiated neck, a short torso, and an overall stocky physique (Cat. 12.28-34). I suggest that this group of figurines represents miniature versions of cattle. A subgroup of them is characterized by a similar body form and posture, but in addition some sort of hump was attached to the neck or back (Cat. 12.35-39). Two of them are depicted with a droopy tail (Cat. 12.35 + 39). Based on these morphological details, the figurines in this category cluster into a "zebu" group.[192] The humps on these figurines are diverse in appearance. For instance, two have a fairly small hump just behind the head between the ears (Cat. 12.36-37), another has its hump just in front of the tail (Cat. 12.39), others are quite "fatty" (Cat. 12.38). Overall the ratio of the "zebu" group to the non-humped "cattle" group is 5:7. It might seem rather unlikely to have these two cattle breeds in one village. Thus, the question of what these figurines with a hump actually represent remains to be resolved. Taken as a whole, the group of miniatures resembling cattle includes 12 pieces, including the "zebu"-like figurines.

The third category of figurines consists of only two examples (Cat. 12.40-41). This group is defined by a straight back along with an unraised head and a round, pointed snout. The trunk is characterized by a massive to stocky frame, and the tail is tiny and appears stubby. Taken together, these features could be considered typical of pigs, which are attested in the faunal collection from Monjukli Depe by only a few bones of a wild taxon.

Lastly, there are single figurines that stand out in terms of their posture and form, but vary individually so much that it is not possible to assign them to a larger group. This is not to suggest that they represent individual animals, but rather that the small sample size makes them appear to be unique. One quadruped is depicted with a hollow back and an upright head (Cat. 12.42). The animal appears to be fat-tailed. A second figurine displays only the hind limbs, but also a fatty tail (Cat. 12.43). Whether this feature can signify fat-tailed sheep, a common species in present-day Turkmenistan and attested from depictions in ancient West Asia since the end of the 4th millennium BCE (Vila and Helmer 2014, 32), cannot be definitively ascertained on the basis of these two figurines. Another indeterminate quadruped has a curved body posture (Cat. 12.44). The head is bent slightly forward forming an S-shape together with the neck and back, whereas the pinched tail sticks straight up. The raised position of the tail could be indicative of a goat (Vila and Helmer 2014, 30), although the curvature of the rest of the body not only stands in contrast to representations of goats common in Chalcolithic Mesopotamia but more importantly to the posture and body form of real goats. Considering the distinct position of the tail, the piece could also be a representation of a dog, but here, too, the S-shaped body of the figurine contrasts with the posture and body

191 Domestic sheep and goats are most commonly grouped together in zooarchaeology under the rubric of "caprines," as their bones are difficult to separate from one another morphologically.

192 Zebu cattle are a subspecies of domestic cattle that originated in South Asia and are characterized by a fatty hump on the shoulders, among others features. Zoomorphic figurines with a zebu-like appearance as well as depictions of zebu on seals, plaques, or painted pottery are documented from western Asia from the 5th and late 4th/early 3rd millennia BCE. These are considered to be highly questionable occurrences; depictions of humped animals from 2500 BCE onwards are assumed to more reliably represent zebu (Matthews 2002, 442-444).

form of real dogs. There are, however, representations of dogs with S-shaped bodies from 5th mill. BCE in southwest Iran (Hole and Wyllie 2007).

Another quadruped exhibits a straight back, an upright head modelled together with erect, pointed ears, and a large pointed snout (Cat. 12.45). The tip of the snout is slightly flattened to one side. Most striking is a thick tail that sticks straight up and was pressed against the back of the body. Not only is the snout flattened but also the whole body is pressed flat. In this way, one has even from the side a three-dimensional perspective with all four legs visible at once. Whether this was intentional or whether it was, for example, inadvertently stepped on while the clay was still drying remains unclear. By virtue of its features in comparison to those of living animals, a classification as a dog is conceivable. Some representations described by Masson as panther-like with erect tails are found in a wall painting at the Neolithic site of Pessejik in southern Turkmenistan and can likewise be interpreted as illustrations of dogs (Berdiev 1970, 18-19, Fig. 2; Masson 1971, 51; Müller-Karpe 1982, 19).

There is one unique figurine that I have classified as a representation of an equid. The primary feature on which I base this categorization is the markedly protruding snout (Cat. 12.46). The head and the relatively long neck are also curved but display in comparison to the previous S-shaped example (Cat. 12.44) a rather strong upright shape that ends in a long face with a pointed snout. Unfortunately, no ears were preserved, but breakage of something that stood up above the long face can be recognized. Another exceptional case is constituted by an ambiguous object that possesses a conical body and an element on top that seems to be beak-shaped (Cat 12.47). This would be a characteristic of birds, but such an interpretation is not entirely convincing given the absence of other zoomorphic figurines that represent animals that are not quadrupeds. Instead, this particular object could also be placed morphologically in the category of tokens (Chap. 13).

21 other zoomorphic figurine fragments were more difficult to assign to a group due to their fragmentary state (for a selection of illustrations, see Cat. 12.48-54). It is nonetheless possible to identify these figurines as zoomorphic (rather than anthropomorphic or as depictions of other beings) based on their appearance (Table 12.1). The groups identified for the Monjukli Depe assemblage are quite easy to distinguish from each other. A consistency in depiction within each group might imply the intentional modelling of a representation of specific taxa or other conventional category so that the miniatures would be widely recognizable among people living in the village.

In addition to the quadruped figurines, there are 38 clay objects in the form of horns (for a selection, see Cat. 12.55-62). They seem to have been initially attached to something, based on the evidence for breakage on one end in some cases, but not necessarily to the zoomorphic miniatures. There is no preserved clay figurine with horns, and, given the diameter of the horn bases, they would not in most cases fit onto the head of the small animal figurines. Even though clay horns might have easily broken off some larger objects, they could have been at least in some cases a way of representing horned animals, both wild and domestic, *pars pro toto*, for example, as a visual substitute for a group of animals.

Comparisons with the faunal remains from Monjukli Depe

Faunal remains recovered at Monjukli Depe are heavily weighted toward domestic species (Benecke 2011; 2018). I summarize them only briefly here. Nearly 96% of the identified Aeneolithic bones derive from domesticated animals (Tables 7.6-7.7). Domestic caprines are the dominant taxa, with sheep outnumbering goats by a proportion of 2.74:1. They are followed by cattle and dog, the latter of which occurs in very small numbers. In addition to the fact that cattle represent a large provider of meat, these animals carried a substantial symbolic weight at Monjukli Depe (Chap. 7). This may also apply to another domestic animal: the largest portion of the animal horns found in corner deposits or on house floors, presumably having been attached to walls from which they fell off, were from domestic goats (Table 12.2). Apart from serving as *pars pro toto* representations, one could also postulate that it was just the horns of goats that were of importance or rather that goats as a kind of animal were also symbolically special because of their horns.

Among the approximately 4% of the bone collection that is comprised of wild animals, larger mammals, such as gazelle and onager, represent the most common hunted animals, closely followed by wild sheep. There is evidence for a symbolically weighted status of the two wild, horn-bearing taxa – gazelle and wild sheep – in Monjukli Depe, indicated by *in situ* discoveries of horns on floors. Two horns of gazelles were found on floors inside houses, three on floors or deposits immediately below them. Two wild sheep horns were recovered from deposits in close vicinity of floors (Table 12.2).

Fox is also attested, and there are occasional occurrences of other wild taxa, such as hare, large felids, wild pig, and wild camel along with species of birds, fish, rodents, and tortoise.

In view of the zooarchaeological data, the high percentage (33%) of miniatures suggested to be likenesses of cattle is remarkable (Table 12.3). Judging by the animal bone collection alone, one might expect sheep and goat to be portrayed most frequently due to their significant role in quotidian herding practices and therefore their ubiquity in the lives of the prehistoric inhabitants. In fact, caprines make up the highest proportion at 44%, but this represents

	Floors/surfaces and deposits immediately above or below		Corner deposits		Total	
Taxa	**NISP**	**NISP (%)**	**NISP**	**NISP (%)**	**NISP**	**NISP (%)**
sheep/goat	10	33.3	0	0.0	10	27.0
sheep	2	6.7	1	14.3	3	8.1
goat	8	26.7	5	71.4	13	35.1
cattle	3	10.0	1	14.3	4	10.8
wild sheep	2	6.7	0	0.0	2	5.4
gazelle	5	16.7	0	0.0	5	13.5
Total	30	100	7	100	37	100

Table 12.2. Number (NISP) and taxonomic identification of animal horns found on surfaces or the deposits immediately above or below them and in corner deposits.

Zoomorphic appearance	n	%
“goats”	16	44.4
“cattle”	12	33.3
“pig”	2	5.6
fat-tailed/hollow back	2	5.6
“dog”	1	2.8
curved body, tail standing straight up	1	2.8
“onager”	1	2.8
“bird”	1	2.8
Total	36	100

Table 12.3. Attribution of animal figurines to taxa according to their zoomorphic appearance.

only one third more than cattle. The ratio of the “mid-sized livestock” figurine group to the group of “cattle” figurines does not correspond to the zooarchaeological data.

For a different reason, however, one might expect that cattle would be common in the figurine assemblage. These animals played only a minor role in community herding practices, but according to my analysis of the faunal remains from the Eastern Midden, cattle in particular were connected to feasting (Chap. 7). Hence, the miniaturization of cattle may have been a strategy to further emphasize the emblematic value of their already symbolically weighted living counterparts.[193] The relatively high percentage of miniature “caprines” might also have been a way to enhance the value of actual sheep and goats. However, their symbolic connotations were likely different from those of cattle, as their role seems to have been different in daily life. As the most common animals that were kept for subsistence in Monjukli Depe, sheep and goat were certainly important in a more functional way through their exploitation for milk, meat, and possibly fibers. Although goat horns seem to have had a symbolic importance, cattle clearly had a significance above and beyond any purely subsistence-based needs.

The Monjukli Depe figurines in archaeological context

A contextual analysis of the four Aeneolithic strata reveals that the majority of figurines, nearly 50 % of both complete examples as well as fragments, were found in ashy layers (n=26). 12 figurines were recovered from ashy layers inside buildings and 14 in the ashy layers of the Eastern Midden (Fig. 12.2). The latter was a place in which a wide range of activities including those involving animals and feasting are attested. Ashy contexts represent ideal conditions for preservation, and it is therefore not surprising that a substantial portion of the figurines were found in such deposits. The second most common context type from which the figurines come are (non-ashy) fills in buildings (n=16). These deposits include rubbish that was dumped into buildings or material that was used to fill the rooms after the life cycle of a house as a residential place was complete, as has been observed in several buildings at Monjukli Depe and at other prehistoric sites as well (Chap. 4; Meskell et al. 2008, 144-145). Only a few figurines were found in external (non-ashy) fill (n=3), wall fall (n=3), or in a pit inside a house (n=1). It is also unusual for figurines to be placed intentionally in installations in houses (n=1) or abandoned or discarded on floors (n=4). Together these observations show that a high proportion of figurines was found in room fills and

193 Oliver Pilz has drawn such a conclusion on the basis of his investigations of Geometric, Early Archaic, and Classical Greek miniature objects, such as clay or metal vessels, furniture, and miscellaneous tools and utensils. However, he explicitly excluded anthropomorphic and zoomorphic figurines from his analysis, since, in his opinion, figurative depictions of living beings would be a category on their own (Pilz 2011, 16, 23-24). But in light of my discussion here, his argument regarding miniaturized artifacts can also apply to the representation of animals as miniatures at Monjukli Depe.

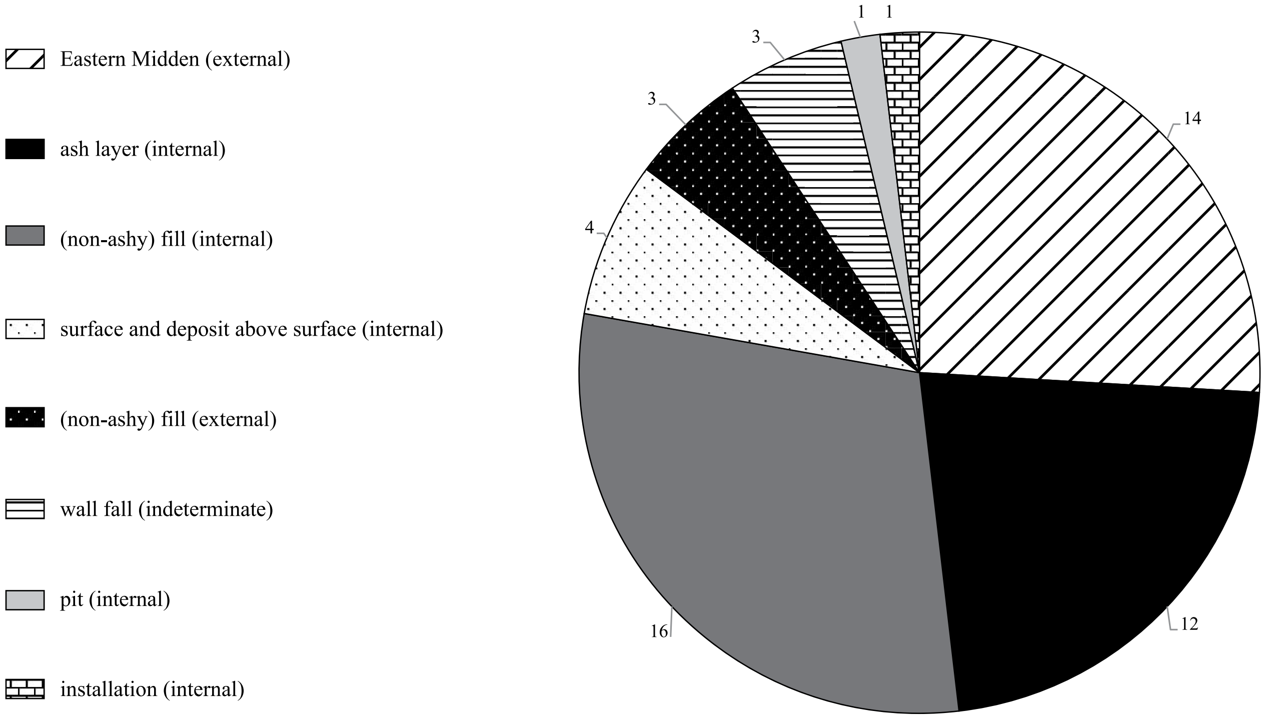


Fig. 12.2. Numbers of Meana Horizon figurines recovered from different kinds of contexts. Internal and external refer to contexts inside and outside houses.

	Aeneolithic strata				
Context type	**IV**	**III**	**II**	**I**	**Total**
Eastern Midden (external)			10	4	14
non-ashy fill (external)			1	2	3
non-ashy fill (internal)		11	3*	2	16
pit (internal)		1			1
ash layer (internal)	8			4	12
installation (internal)		1			1
surface and deposit above (internal)	3	1			4
wall fall (indeterminate)	2	1			3
total internal areas	11	14	3	6	34
total external areas			11	6	17
Total	13	15	14	12	54

Table 12.4. Temporal and contextual distribution of the Monjukli Depe figurines. Numbers indicate counts of figurines; both complete figurines and fragments are included. * It is possible that these three figurines should be attributed to Stratum III rather than Stratum II.

ashy layers in buildings, something that might result from discard or redeposition within the site, rather than from an original, intentional placement of the objects in installations.

A detailed look at the four strata of the Meana Horizon reveals further differences (Table 12.4). In the two oldest Aeneolithic Strata IV and III, figurines are found in internal spaces rather than in outdoor areas. The small areas of external surfaces and fills excavated in these two levels need, however, to be taken into consideration; in Stratum IV merely one-sixth of the area excavated consisted of outside spaces, in Stratum III, however, it was roughly one third.

An examination of the depositional contexts in the later phases (Strata II and I) shows a shift towards a more widespread distribution of figurines in external and internal spaces. The proportion of excavated exterior space in Strata II and I is half of the total. 17 miniature objects were found in exterior spaces, and nine in interior contexts. This contrasts markedly with the older Aeneolithic strata, in which all of the recovered figurines were discarded inside buildings. To elucidate this discontinuity, I plotted the figurine distribution within the settlement on plans of the four Aeneolithic strata (Figs. 12.3-5[194]). The clay horns are illustrated on the plans as well.

In Stratum IV only Building 14 yielded zoomorphic clay objects and clay horns (Fig. 12.3). While this is partially due to the fact that a large amount of the depositional

194 Strata I and II are shown together on a single plan, as some structures cannot be stratigraphically differentiated into Stratum I versus II.

Fig. 12.3. Spatial distribution of zoomorphic figurines (rectangles) and clay horns (circles) in Stratum IV. The number of objects is displayed, but not their precise location within each house.

Fig. 12.4. Spatial distribution of zoomorphic figurines (rectangles) and clay horns (circles) in Stratum III. The number of objects is displayed, but not their precise location within each house. Note that there are three figurines and one horn in Building 3 (shown on Fig. 12.5) that might be attributable to this stratum.

Fig. 12.5. Spatial distribution of zoomorphic figurines (rectangles) and clay horns (circles) in Strata I and II. The number of objects is displayed, but not their precise location within each house or external area. Note that three figurines and a horn shown in House 3 might belong to Stratum III.

contexts in Building 14 consisted of ashy layers and many parts of other units were not excavated down to the level of Stratum IV, it is nevertheless a quite striking result, especially because three out of the 13 figurines were located on surfaces and in deposits directly above them. A similar pattern emerges in the more extensively excavated Stratum III. There it is only Building 9 that contained figurines (Fig. 12.4), apart from a single one found in wall fall in an exterior area next to the large oven, FI 5, in Unit C. There are also three figurines and one horn from fill contexts in Building 3, displayed in Figure 12.5, that might be attributable to Stratum III. The distribution of clay horns is similar to that of the figurines. Four out of six (or seven) horns were found in Building 9. The other two were located in an outside space south of Building 10, apart from the aforementioned horn found in the fill in Building 3.

Both Buildings 14 and 9 are centrally located in the village and can be regarded as non-public spaces, as houses were most likely restricted in terms of accessibility. Given this spatial patterning in the early phases of the Aeneolithic village, it appears that zoomorphic clay objects tended to be connected with "private" and thereby less accessible domains such as individual houses. A change begins to emerge in Stratum III, with the appearance of two horns and one figurine in exterior areas.

The situation is strikingly different in the later settlement phases, Strata II and I (Fig. 12.5). Figurines together with clay horns were discarded across the whole settlement in different areas, from house interiors to open spaces, from non-public spaces to communal spheres. In Unit E in an area with large ovens that may have been collectively accessible at the northern periphery of the settlement, two quadruped figurines and four horn fragments were recovered. The high number of zoomorphic figurines found in the Eastern Midden might be an indication that they were made for feasts that took place there, perhaps involving a use that was connected to the feasting, and discarded in the framework of such an event shortly after their production. In some cases, the places where clay horns and zoomorphic figurines were recovered differ. In the centrally located Building 1, no horns were recovered, whereas figurine fragments were found. The same applies in the case of three rooms of Building 3 (rooms 3b, 3c and 3h), although these three figurines may belong to Stratum III. Conversely, clay horns occur in the absence of figurines not only in an open-access area in Unit G but also in Building 15 and in one room (3f) of Building 3; again, this latter horn may perhaps be assignable to Stratum III.

This observed shift in the distribution of zoomorphic figurines and clay horns indicates a marked change in practices involving these objects, from more exclusive handling to public contexts; internal household use changed into collective and communal utilization. A second interesting aspect is a change from concentration in a single house or at most two – House 14 in Stratum IV and House 9 and possibly House 3 in Stratum III – to presence in multiple houses at one time. Although the total number of figurines at Monjukli Depe is relatively low, their apparent ubiquity in Strata II and I might reflect their free availability in these later occupation levels. It seems as if figurines increasingly became everyday objects that the inhabitants handled and used on a regular basis.

In summary, there is a remarkable change through time from the oldest Aeneolithic Stratum IV to the youngest Stratum I in terms of the depositional contexts of figurines within the settlement. Initially, non-public spaces – and even exclusively one building in the center of the village – were the spatial focus, perhaps indicating that only certain kinds of people or specific parts of the community were involved in activities that involved the use or disposal of zoomorphic miniatures. Later, these practices moved into public spaces or the practices themselves changed in a fashion that was independent of a specific location, with the result that we find them in a variety of places. Figurines as well as clay horns became widespread in the settlement, discarded in most buildings, thereby suggesting a less regulated handling of zoomorphic figurines in Strata II and I. The exclusivity evident in Strata IV and III disappears over time. Ongoing studies will assess whether there are similar changes in the proportions of different taxa within the animal bone collection.

Conclusion

The zoomorphic figurine assemblage from Aeneolithic Monjukli Depe is diverse in appearance. One can group the figurines, albeit from a western-centric perspective and keeping in mind that the classificatory systems of the inhabitants of Monjukli Depe quite likely differed from ours today.

The zoomorphic figurines may have stood for something that was not permanently present: although domestic animals were indeed kept nearby, they may not have had access to the living areas of the site.[195] Dogs are an exception; they are known to have entered houses, as indicated by dog footprints on the floors of two buildings (Chap. 4), pointing to a close relationship between these animals and humans. Dogs had this privileged status in contrast to livestock such as sheep and goat or cattle,

195 The possibility that a considerable portion of the herds stayed year-round at grazing grounds in the vicinity of the settlement is not only supported by the results from an examination of wear stages on sheep/goat teeth, but also by the initial results of stable oxygen and carbon isotope analysis on third molars of caprines (Eger 2018; Eger et al. in press).

for which there is no evidence of their presence as living animals in houses.

The Meana Horizon inhabitants made the choice to reproduce animals in miniature forms but not to do so for humans. Seemingly they made a fundamental difference between humans and at least those animals that were modeled as figurines, implying a particular ontological perspective in which exterior differences between humans and other animals were emphasized (e.g., Viveiros de Castro 2004; Ingold 2006; Descola 2013). Making a human image implies a depiction of the self, whereas a person regarding a goat or sheep likely does not see him- or herself, unless she or he held animistic or totemic beliefs. Even then, there was evidently a difference made, whatever its ontological status, between humans and quadrupeds, since the latter were modeled in miniature and the former were not. A distinction existed not only between humans and animals, but apparently also between wild and domestic animals: Miniaturized depictions of humans and wild animals were avoided, whereas domestic quadrupeds were modeled as figurines.

The absence of human portrayals in figurine form highlights the significance of the animal representations. I argue that a central issue was to bring the (non-human) animal into the village sphere as an important part of the social life of the village, involving a symbolism that was evoked through the miniaturization of a living being. An established local identification system may have enabled the recognition of figurines as specific kinds of animals. The zoomorphic miniatures from Monjukli Depe did not have to be modeled accurately or precisely in order to be perceived as a distinct and specific kind of animal. Certain details, for instance a massive neck or a straight back, serve as *pars pro toto* representations that can fill in visual gaps and allow prehistoric figurines to connect real worlds and realities that they themselves create (Kohring 2011, 36).

From the analysis of contextual data and patterns of deposition, a broader social meaning behind the figurines becomes clear. In all four Aeneolithic strata, figurines as well as clay horns were found, but with significant differences in their spatial distribution over time. Miniatures were incorporated into practices at Monjukli Depe that represented another aspect of human-animal relations beyond that between living humans and animals, whereby either practices connected with the figurines or the places where they were conducted changed over the course of time.

The contextual study provides insights into the social world through exploration of the disposal of zoomorphic figurines as well as those that remained or were intentionally deposited on house floors before a house was finally abandoned. Especially interesting is the extension of that which was close: the figurines represent primarily domestic animals, hence those with which the inhabitants interacted on a regular basis, integrating them into everyday life. My analysis has suggested that it was domestic animals rather than wild ones that were brought into the house and the human living sphere in the form of figurines. Miniaturization permits the handling of metaphorical animals by humans and might also introduce a different order of domination over those animals chosen for depiction. In the case of domesticated animals, such figurines could therefore be said to enhance an already existing domination created by taming, herding, extracting raw materials, etc. But in contrast, the depictions could be read instead as a reversal of hierarchical structures, a sign of something more balanced in human-animal relationships, a representation of a harmonious symbiosis between people and animals. In my view it is reasonable to assume that they might simply reflect the importance of animals, since domesticates played an essential part in the everyday life of this early village society.

The findspots of the figurines stand in contrast to those of the horns of wild animals, including wild sheep and gazelle, that were found in buildings on the floors or deposits immediately above or below them. The clay objects in the form of horns could be *pars pro toto* representations of wild bovids, although their domestic status cannot be excluded. Considering the overwhelming proportion of domestic horned ungulates in the faunal assemblage – especially sheep and goat, and to a lesser extent cattle – which demonstrates their significance to the village economy and a visual preference for these species in daily life, it seems reasonable to suggest that common domestic animals were rendered figurally rather than the much rarer wild

	"Cattle"		"Goat"
	"zebu"	"other"	
Hs. 1	1	0	0
Hs. 3	1	0	1
Eastern Midden	0	3	5
Hs. 9	0	3	5
Hs. 14	3	0	2

Table 12.5. Distribution of "goats" and "cattle" miniatures in houses and the Eastern Midden.

	IV	III	II-I	Total
"goat"	2	4	8	14
"cattle"	3	4	5	12
ratio "goat" to "cattle"	0.66:1	1:1	1.6:1	

Table 12.6. Distribution of "goats" and "cattle" miniatures by stratum.

horned ungulates. However, it is equally possible that the clay horns were made and used with an entirely different purpose in mind, thus representing, for instance, something rare rather than that which was present in everyday life.

Overall, acts of miniaturization and the social value of miniatures in animal form continue without any visible stylistic change in the categories of animals over time.

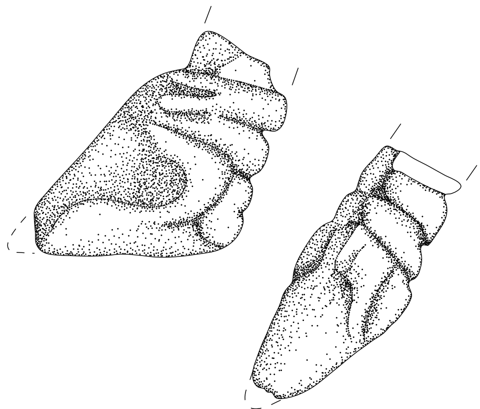
Apart from the general distribution of the figurines in the settlement over time, some interesting observations can be made in terms of the most represented miniature types. “Zebu” figurines appear only inside buildings, with the highest number in House 14 in Stratum IV (Table 12.5). They are absent in external areas and decrease somewhat over time. “Other cattle” figurines do not appear in the earliest Stratum IV, but are present in House 9 in Stratum III. They do not occur inside buildings in Strata II and I, where they appear solely in the Eastern Midden. “Goats” are represented in external and internal areas, increasing over time. In general, there is not only an increase in the number of “goat” miniatures, but also of “cattle”, which is not surprising considering the higher volume excavated in Strata II and I (Table 12.6). Also important is the relative increase of goat versus cattle figurines over time. Rather than animal types, it seems to be the location of symbolic handling that changed over the four Aeneolithic levels in Monjukli Depe: from segregated to public areas or from exclusive to unrestricted spheres. This points strongly towards changing human-animal relations in this small village that were far more complex than an instrumental relationship with underlying economic rationality would suggest.

Catalog

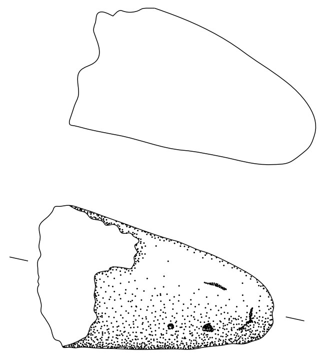
Cat. #	RN	Locus	Context	Preserved length/width/ height (cm)	Category	Drawn	Photo
1	25094.1	H56	pit fill	3.60/1.78/1.99	anthropomorphic	x	x
2	25094.2	H56	pit fill	3.15/	anthropomorphic	x	x
3	25114.13	H58	pit fill	2.45/1.45	anthropomorphic	x	x
4	25114.11	H58	pit fill	2.55/1.5/2.5	anthropomorphic	x	-
5	25114.12	H58	pit fill	2.99/1.29/2.1	anthropomorphic	x	-
6	25114.14	H58	pit fill	3.39/1.54	anthropomorphic	x	-
7	25126	H60	pit fill	2.46/1.46/2.14	anthropomorphic	x	x
8	25115	H59	pit fill	2.18/3.37/2.38	anthropomorphic	-	x
9	8940	H13	-	3.4/1.9/0.9-2.0	anthropomorphic	x	x
10	2504	H50	pit fill	3.11/1.88/2.04	anthropomorphic	-	-
11	5522	C318	fill (Neolithic)	3.06/1.00-1.08/1.59	goat	x	x
12	1723	D275	Eastern Midden	2.52/1.22-1.25/1.68	goat	x	x
13	1632	D252	Eastern Midden	3.63/1.89-2.08/2.32	goat	x	-
14	1603	D240	Eastern Midden	3.66/1.67-1.88/2.40	goat	x	x
15	712	D153	fill (Building 3)	3.26/1.66/2.29	goat	x	-
16	1714	D279	Eastern Midden	2.63/1.48-1.51/1.55	goat	x	-
17	6454	F51	ashy layer	3.23/1.57/2.55	goat	x	x
18	6455	F51	ashy layer	2.5/2.3/2.8	goat	x	x
19	1514	D240	Eastern Midden	2.47/1.49-1.78/2.28	goat	x	-
20	5638	C139	wall fall	2.48/1.85/2.28	goat	x	-
21	9165.3	D501	fill (Building 9)	2.1/2.1/3.41	goat	x	x
22	8029	D344	pit fill	2.49/1.05/1.79	goat	x	x
23	15392	D733	deposit above surface (Building 14)	5.14/2.22/3.44	goat	x	x
24	15135	D706	ashy layer (Building 14)	3.17/1.92/1.88	goat	-	x
25	9135	D501	fill (Building 9)	3.2/1.7/1.9	goat	-	x
26	9229.1	D380	fill (Building 9)	n.a./1.96/3.11	goat	-	x
27	9229.2	D380	fill (Building 9)	2.2/1.8/1.6	goat	-	x
28	2823	-	backdirt	7.0/3.23/4.33	cattle	x	x
29	2087	C96	Eastern Midden	3.04/2.21/2.72	cattle	x	-
30	8357	D411	Eastern Midden	3.4/1.85/1.76-2.9	cattle	x	x
31	9165.1	D501	fill (Building 9)	3.78/2.1/2.97	cattle	x	x
32	9165.2	D501	fill (Building 9)	3.3/2.1/3.1	cattle	x	x
33	5439	C98	Eastern Midden	5.52/2.45-2.73/3.87	cattle	-	-
34	9285	D514	floor (Building 9)	5.11/2.16-2.70/2.25-2.34	cattle	-	-
35	544	D129	fill (Building 3)	4.39/2.09-2.63/3.32	zebu	x	x
36	15250	D718	wall fall (Building 14)	3.62/2.69/3.29	zebu	x	x
37	15356	D729	deposit above surface (Building 14)	6.23/3.82/5.34	zebu	x	x
38	11562	D536	fill (Building 1)	2.67/1.44/2.24	zebu	x	x
39	15134	D706	ashy layer (Building 14)	5.7/3.1/3.83	zebu	x	x
40	1528	D251	Eastern Midden	3.04/1.58-1.73/1.78-1.95	pig	x	x
41	11560	D535	installation (Building 9)	3.00/2.49/2.19	pig	-	x
42	15227	D715	wall fall (Building 14)	6.0/4.5	fat-tailed/hollow back	x	x

Cat. #	RN	Locus	Context	Preserved length/width/ height (cm)	Category	Drawn	Photo
43	10553.1	E290	fill	2.57/2.18/2.75	fat-tailed	x	x
44	16414	D698	profile	3.70/1.43/1.79	curved body/tail standing straight up	x	x
45	2011	D240	Eastern Midden	4.1/1.0/2.8	dog	x	-
46	15275	D722	ashy layer (Building 14)	4.22/3.46/5.45	onager	x	x
47	1283	D207	Eastern Midden	1.81/1.30/1.49	bird	x	-
48	1797	D288	Eastern Midden	3.36/1.96-2.32/1.55	unidentified	x	-
49	6467	F23	washed-in deposit	2.96/n.a./2.15	unidentified	x	-
50	15274	D722	ashy layer (Building 14)	6.48/3.54/3.58	unidentified	x	x
51	7632	E203	fill	4.2/3.2/4.35	unidentified	x	-
52	15276	D712	ashy layer (Building 14)	2.35/1.98/2.70	unidentified	-	-
53	15225	D716	ashy layer (Building 14)	2.28/1.60/1.11	unidentified	-	x
54	15395	D734	deposit above surface (Building 14)	3.49/3.41/2.92	unidentified	x	x
55	1478	D208	Eastern Midden	3.17, ⌀ 1.52-2.11	horn	x	-
56	8772.1	D463	fill	2.43, ⌀ 0.86-1.38	horn	x	x
57	10144	D594	fill (Building 14)	1.29/ ⌀ 0.7	horn	x	-
58	6456	F51	ashy layer	2.87/ ⌀ 0.5-1.2	horn	x	x
59	9804.1	D486	ashy layer (Building 14)	6.85/ ⌀ 1.01-2.73	horn	x	x
60	9804.2	D486	ashy layer (Building 14)	3,92/ ⌀ 0.5-1.42	horn	x	-
61	6460	F51	ashy layer	3.4/ ⌀ 0.6-2.4	horn	x	-
62	7261	G44	ashy layer	2.9/ ⌀ 1.4	horn	-	x

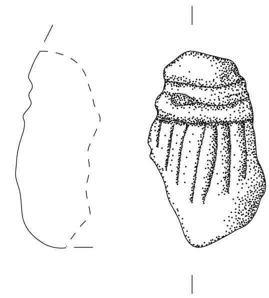
Clay figurines: “anthropomorphic”



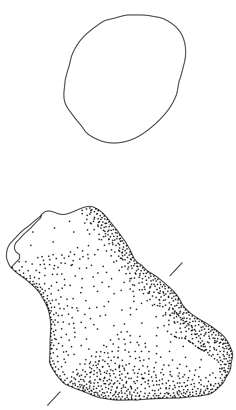
Cat. 12.1.



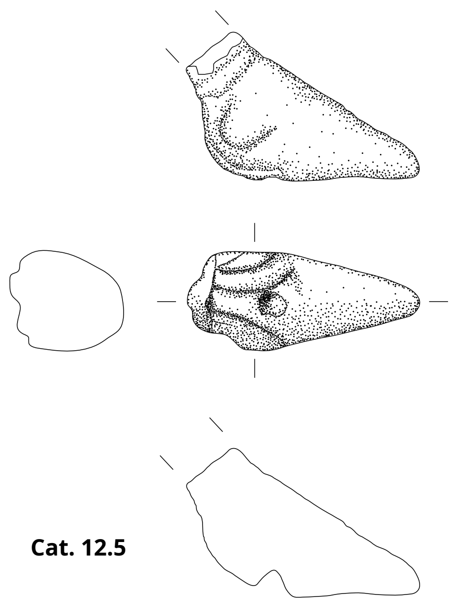
Cat. 12.2



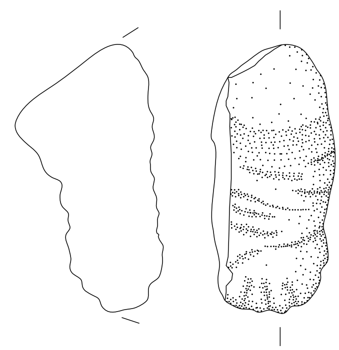
Cat. 12.3



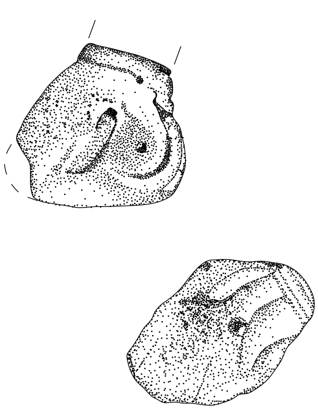
Cat. 12.4



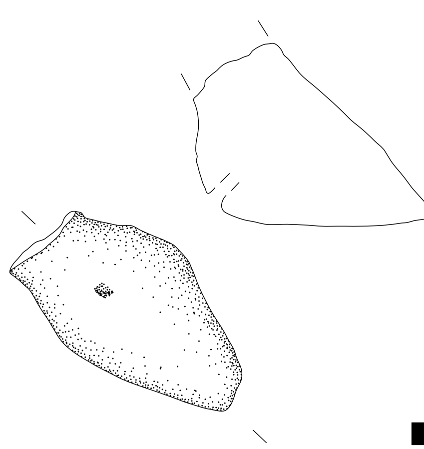
Cat. 12.5



Cat. 12.6



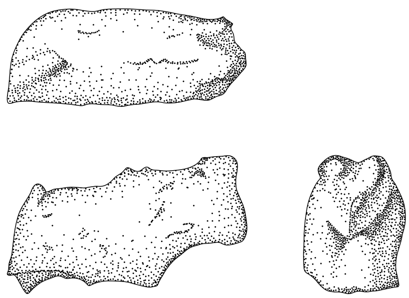
Cat. 12.7



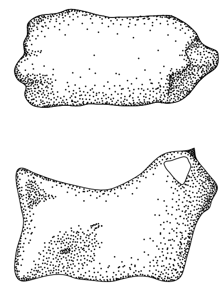
Cat. 12.9

2.5 cm

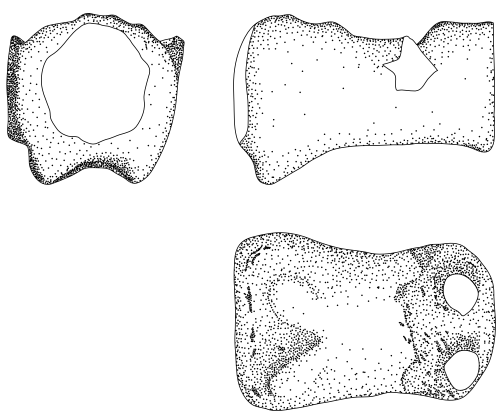
Clay figurines: “goats”



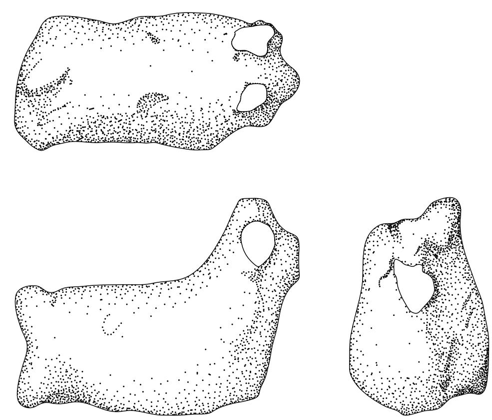
Cat. 12.11



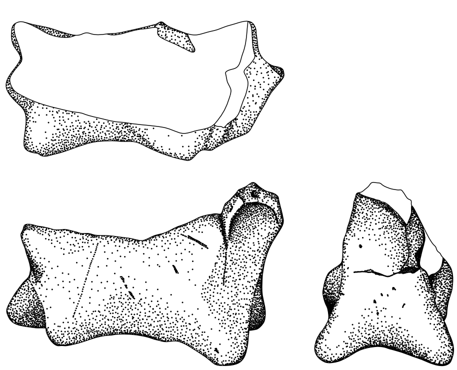
Cat. 12.12



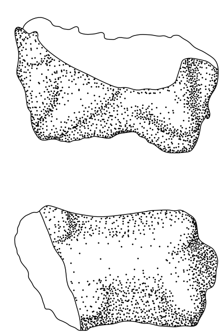
Cat. 12.13



Cat. 12.14



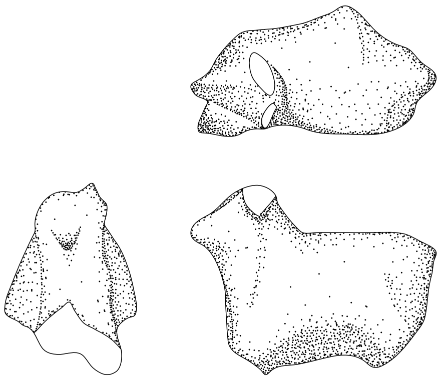
Cat. 12.15



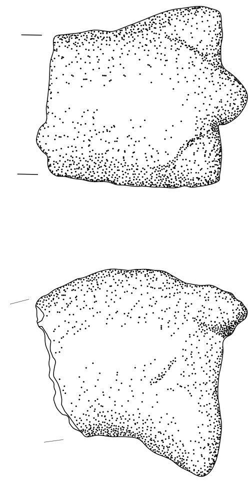
Cat. 12.16

2.5 cm

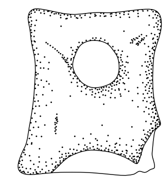
Clay figurines: “goats”



Cat. 12.17

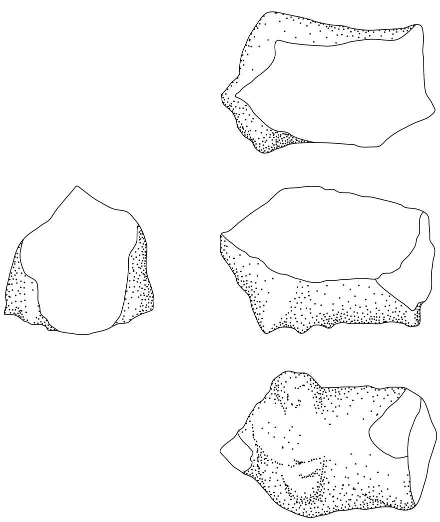


Cat. 12.18

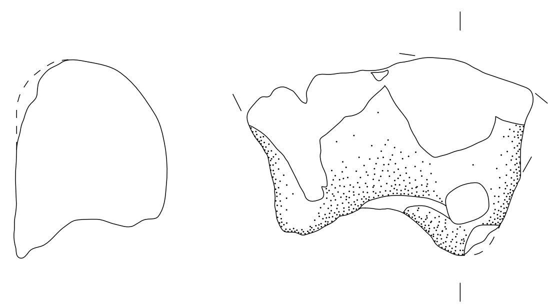


frontal view

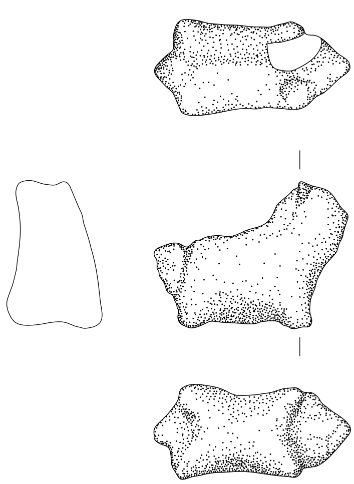
Cat. 12.20



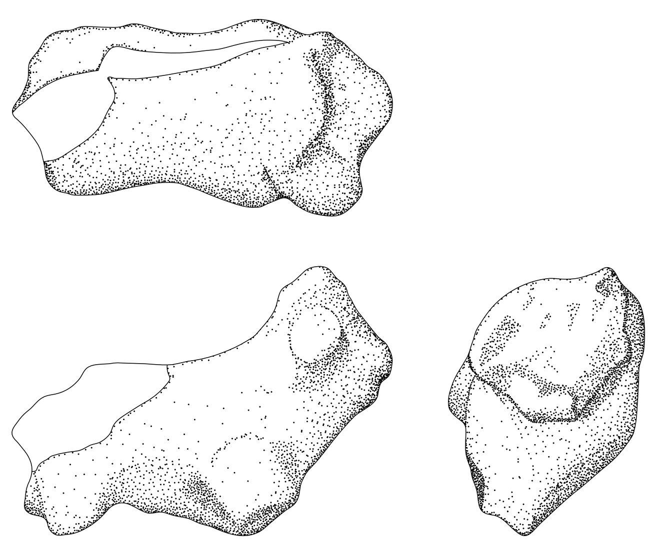
Cat. 12.19



Cat. 12.21



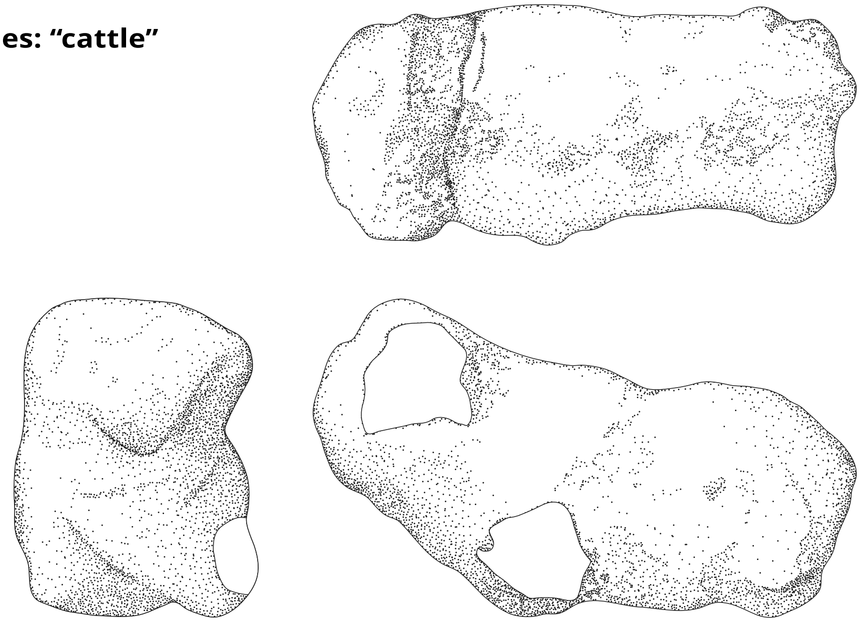
Cat. 12.22



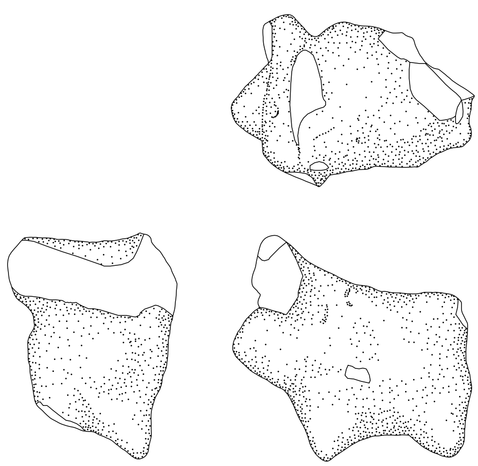
Cat. 12.23

2.5 cm

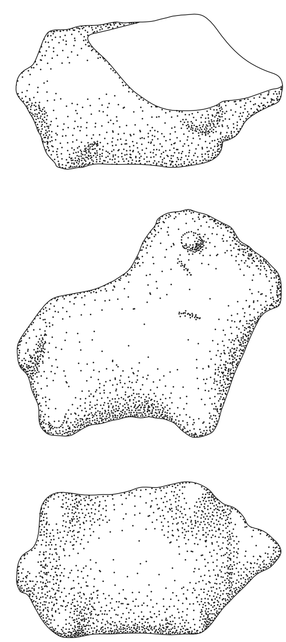
Clay figurines: "cattle"



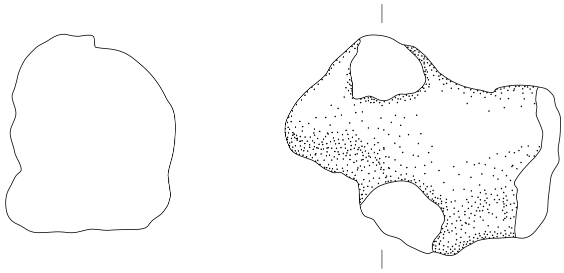
Cat. 12.28



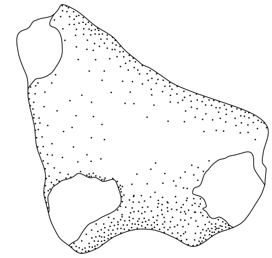
Cat. 12.29



Cat. 12.30



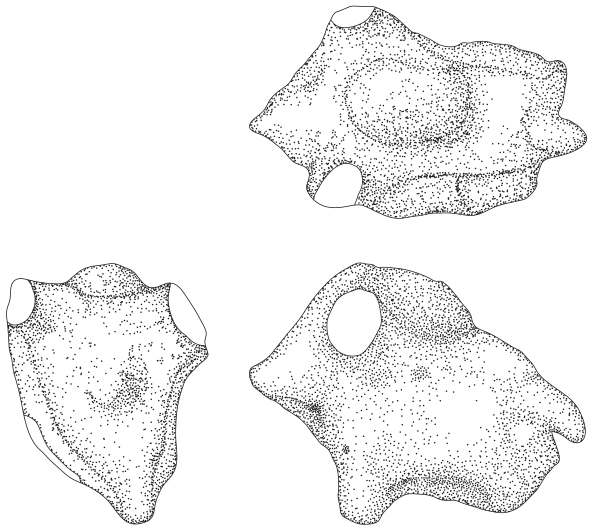
Cat. 12.31



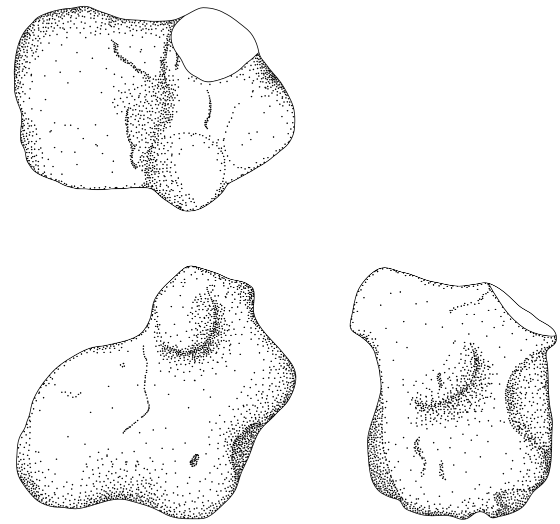
Cat. 12.32

2.5 cm

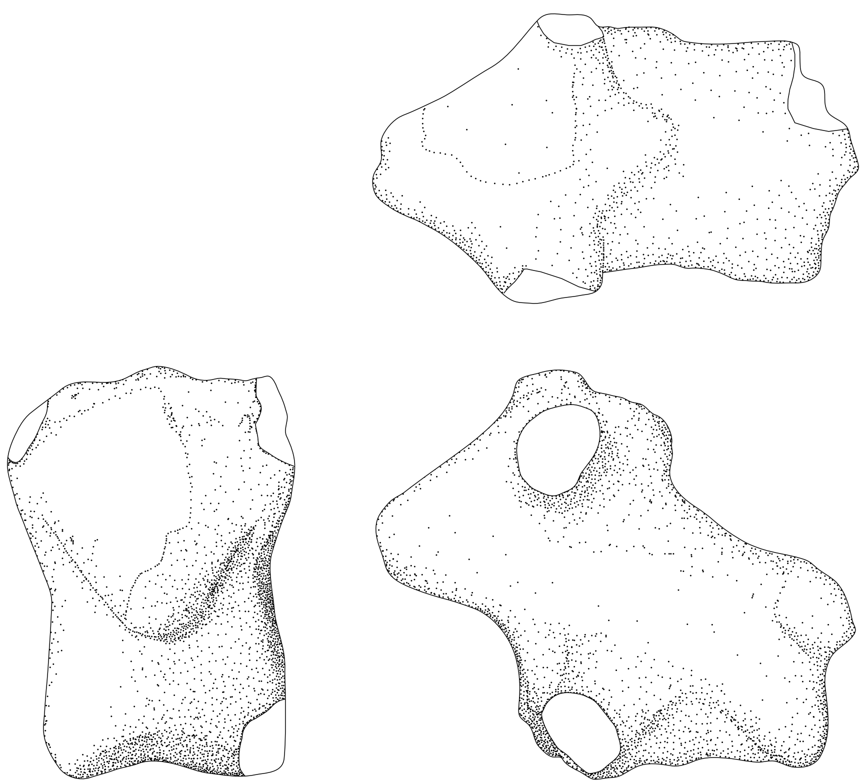
Clay figurines: “zebu”



Cat. 12.35



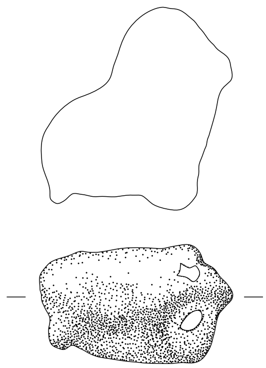
Cat. 12.36



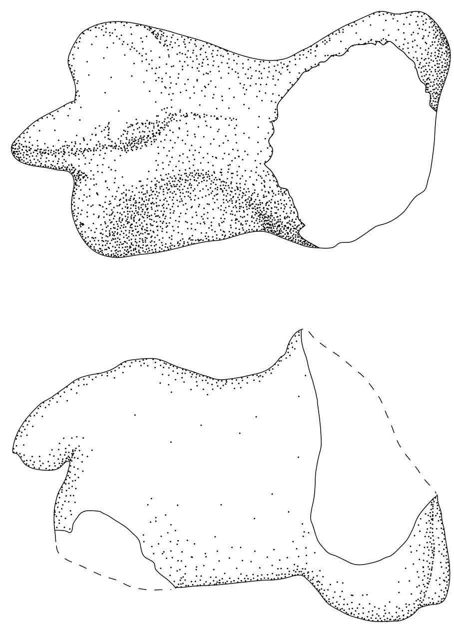
Cat. 12.37

2.5 cm

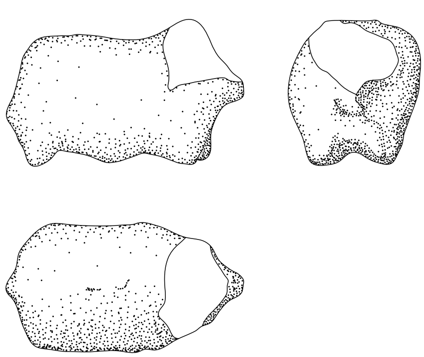
Clay figurines: “zebu” (Cat. 12.38-39), “pig” (Cat. 12.40) and “fat-tailed/hollow-back” (Cat. 12.42)



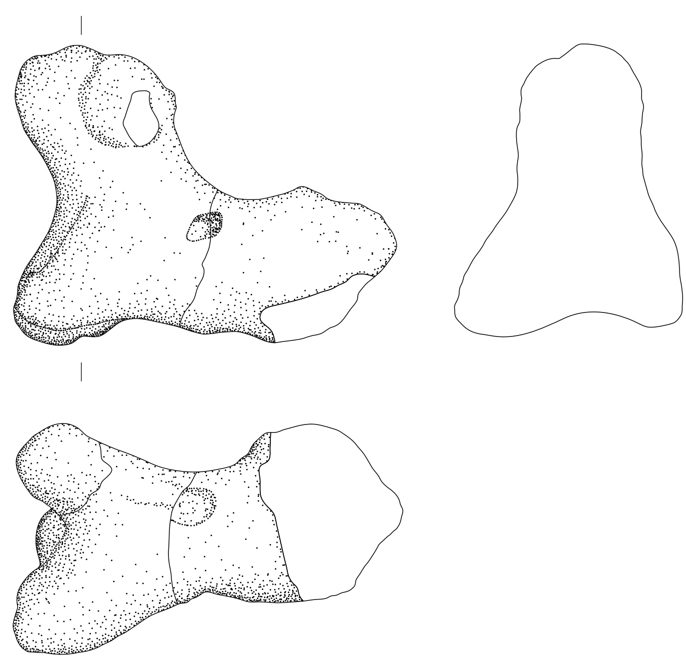
Cat. 12.38



Cat. 12.39



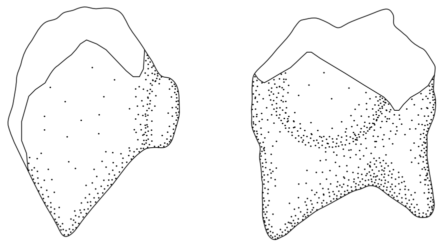
Cat. 12.40



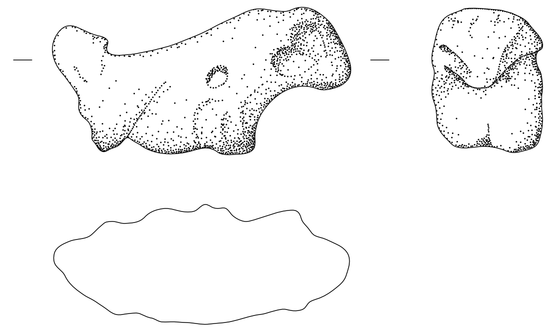
Cat. 12.42

2.5 cm

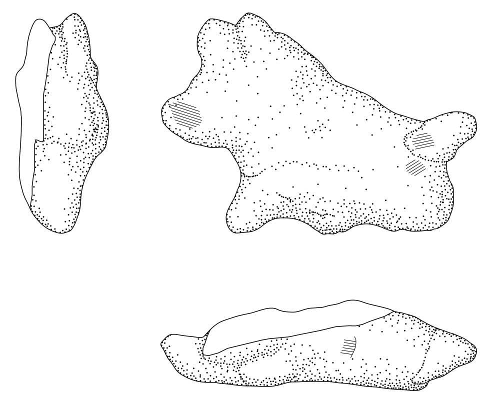
Clay figurines: “fat-tailed” (Cat. 12.43), “curved body/tail standing straight up” (Cat. 12.44), “dog” (Cat.12.45), “onager” (Cat. 12.46) and “bird” (Cat. 12.47)



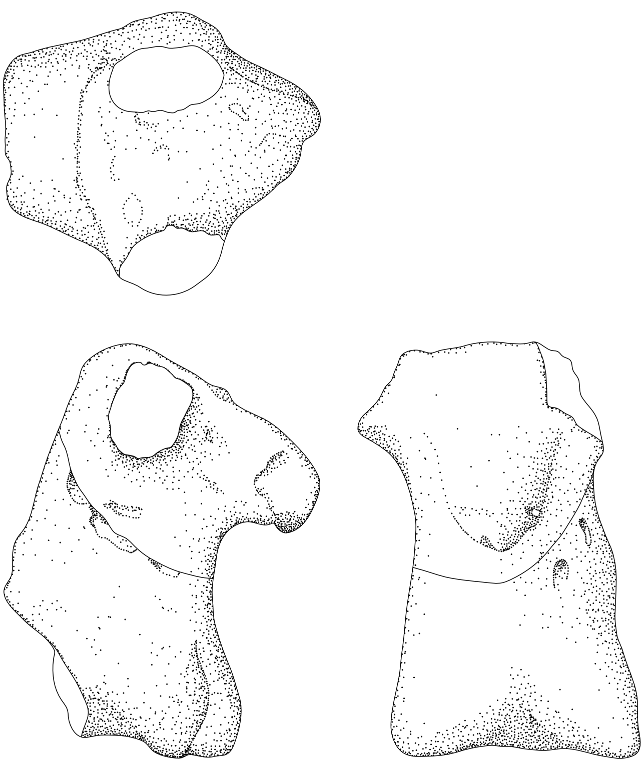
Cat. 12.43



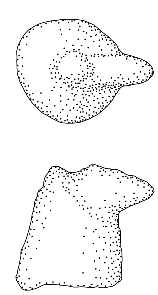
Cat. 12.44



Cat. 12.45



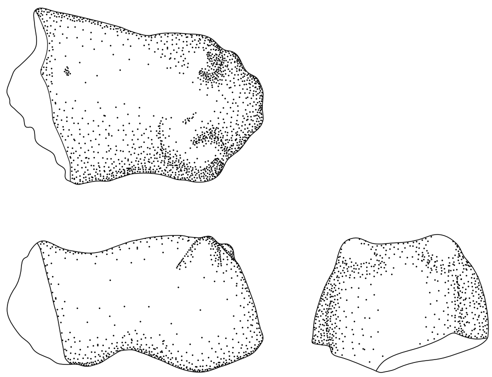
Cat. 12.46



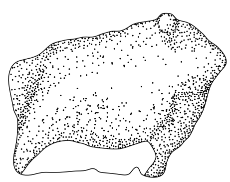
Cat. 12.47

2.5 cm

Clay figurines: unidentified

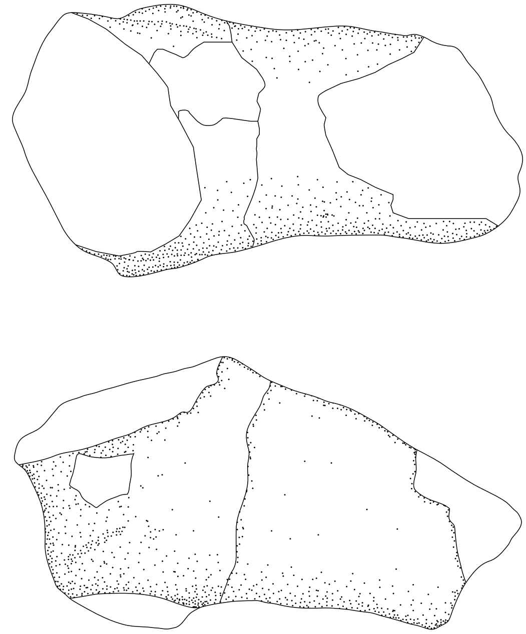


Cat. 12.48

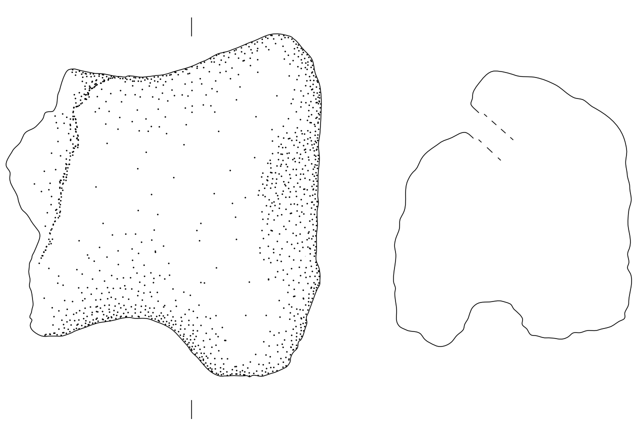


side view

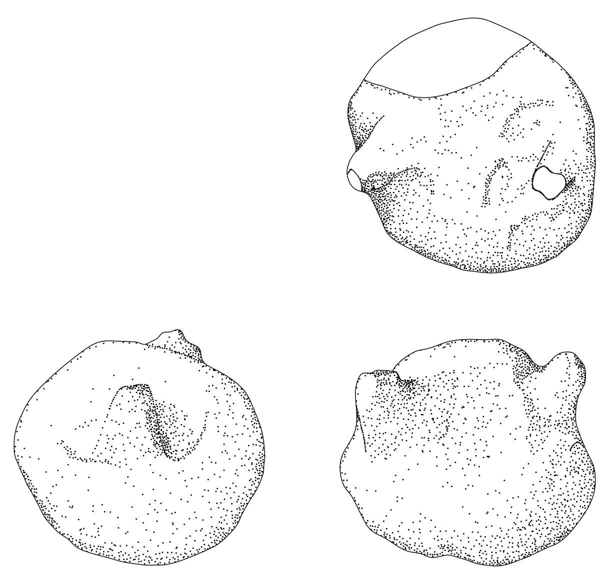
Cat. 12.49



Cat. 12.50



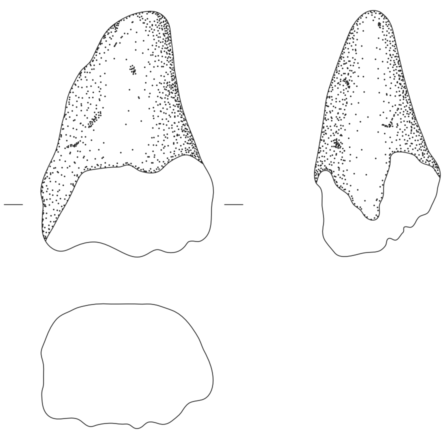
Cat. 12.51



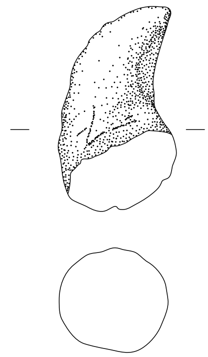
Cat. 12.54

2.5 cm

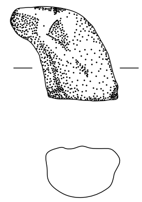
Clay "horns"



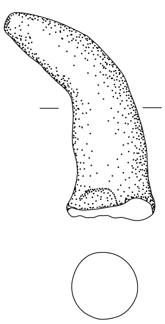
Cat. 12.55



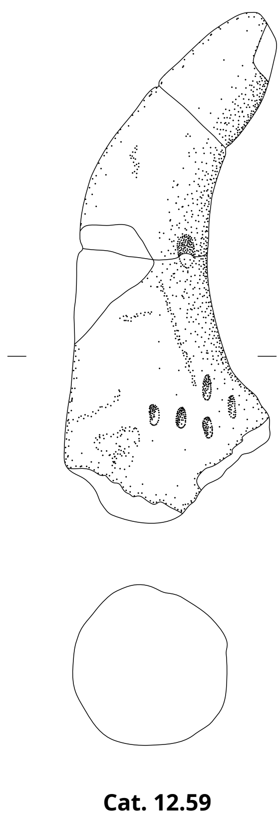
Cat. 12.56



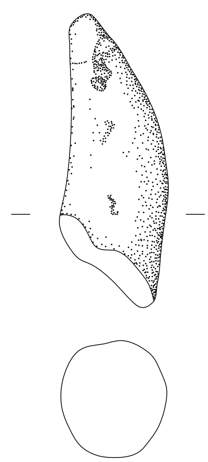
Cat. 12.57



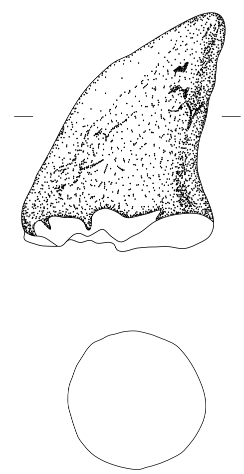
Cat. 12.58



Cat. 12.59



Cat. 12.60



Cat. 12.61

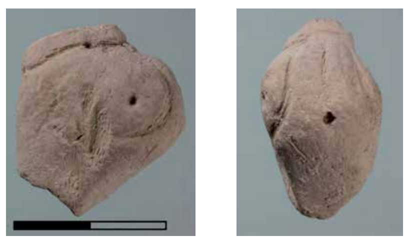
2.5 cm

Clay figurines: "anthropomorphic"

Cat. 12.1

Cat. 12.2

Cat. 12.3



Cat. 12.7

Cat. 12.8

Cat. 12.9

Clay figurines: “goats”

Cat. 12.11

Cat. 12.12

Cat. 12.14

Cat. 12.17

Clay figurines: “goats” (Cat. 12.24-27), “cattle” (Cat. 12.28)

Cat. 12.24

Cat. 12.25

Cat. 12.26

Cat. 12.27

Cat. 12.28

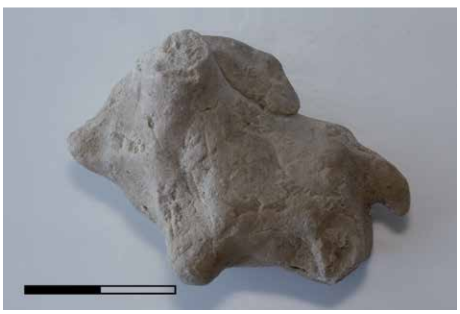
Clay figurines: “cattle”

Cat. 12.30

Cat. 12.31

Cat. 12.32

Clay figurines: “zebu”



Cat. 12.35

Cat. 12.37

Cat. 12.36

Clay figurines: "zebu" (Cat. 12.38-39), "pig" (Cat. 12.40-41), "fat-tailed/hollow-back" (Cat. 12.42) and "fat-tailed" (Cat. 12.43)

Cat. 12.38

Cat. 12.40

Cat. 12.42

Cat. 12.41

Cat. 12.39

Cat. 12.43

Clay figurines: “curved body/tail standing straight up” (Cat. 12.44), “onager” (Cat. 12.46) and unidentified (Cat. 12.50)

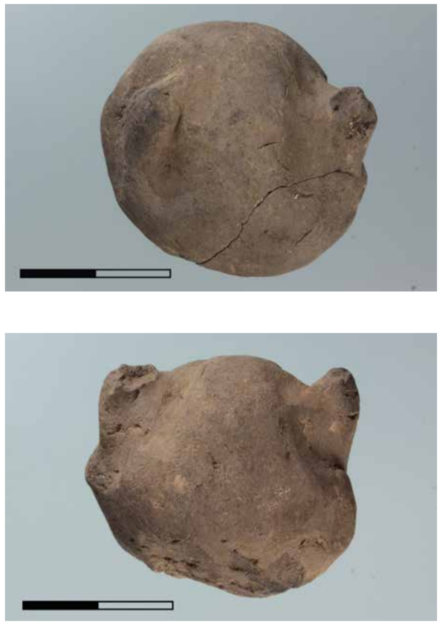
Cat. 12.44

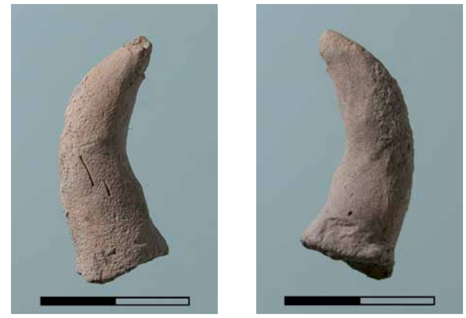
Cat. 12.46

Cat. 12.50

Clay figurines: unidentified (Cat. 12.53-54); clay “horns” (Cat. 56, 58-59, 62)

Cat. 12.53





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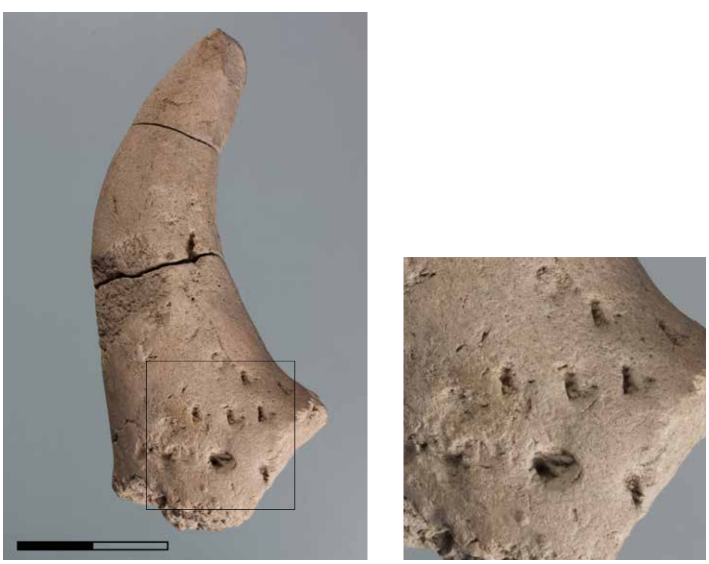

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Chapter 13

The Tokens from Monjukli Depe

Julia Daitche

Keywords: *token; geometric clay object; discard; memory tool; sympathetic magic; gaming piece*

Introduction

Tokens are small, geometric clay objects. While often considered to be counters, I discuss evidence for the potential functions of the Monjukli Depe tokens only after providing a descriptive and contextual analysis. This study includes all objects assigned to the category of tokens (n=406) from the 2010 – 2013 excavation seasons at Monjukli Depe.[196]

The clay from which the tokens were made was generally untempered, although somewhat fewer than one-third of them have fine to coarse chaff impressions. The tokens were sun dried or hardened by an indirect heat source such as a nearby fire. The clay color varies from buff to beige, brown, red-brown, and darker colors such as dark gray.[197] Most are buff colored. In most cases, production seems to have been fast and rough. The surfaces are rarely completely smoothed and still clearly show the final steps taken in forming a piece. The sizes of the objects vary depending on the type, with heights ranging from 1 to 3 cm and diameters likewise from ca. 1 to 3 cm. An exceptionally large piece is 6 cm tall and has a diameter of 4 cm (Table 13.1; Fig. 13.1 f).

Table 13.1. Count and average dimensions of the five forms of tokens from Monjukli Depe.

	Number of tokens	Mean height (cm)	Mean diameter (cm)
conical	71	2.6	2.0
cylindrical	27	2.4	1.7
squat	73	1.9	2.0
disc-shaped	111	0.9	1.7
spherical	83	-	1.3

196 It is possible that some geometric clay pieces were included in collections of "shaped clay," not all of which have been recorded; thus, the final number of tokens could increase.

197 The color was not determined by means of a standardized color scale, such as the Munsell color chart, but rather was recorded descriptively. It is difficult to specify a single color for a token, because the surface shading often varies from reddish to beige to gray within a single object.

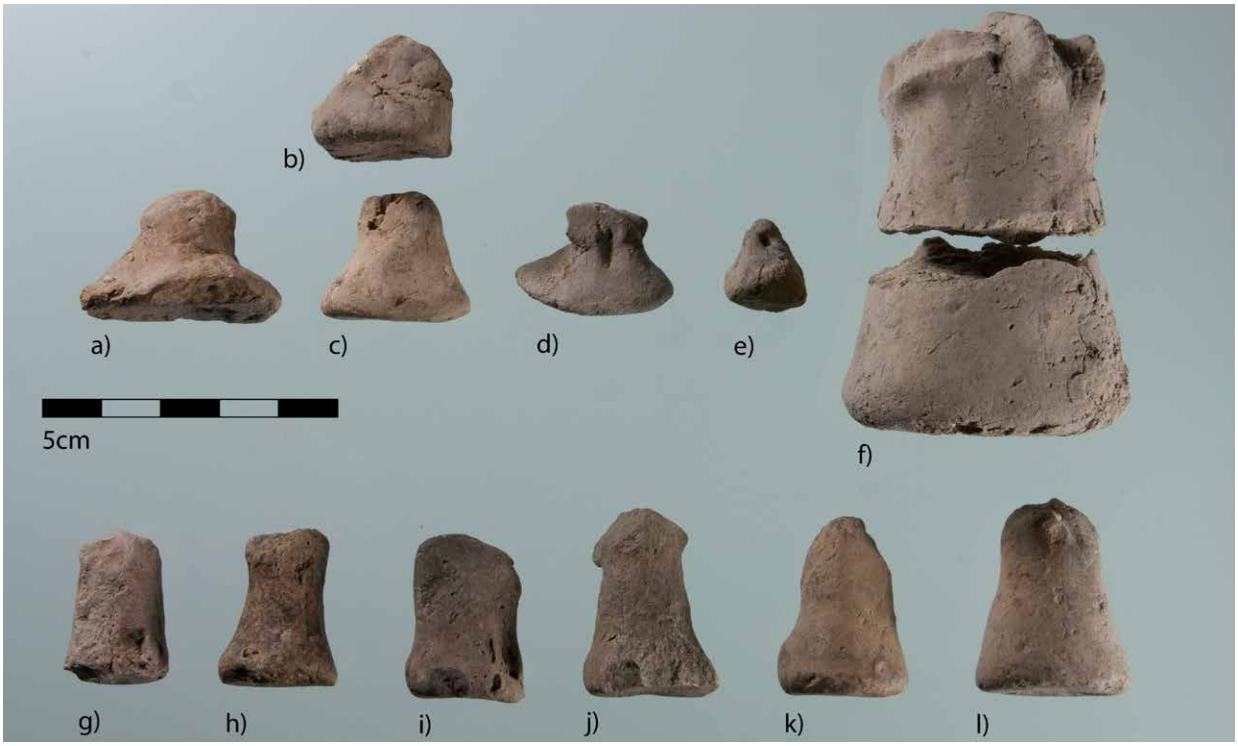


Fig. 13.1. Various forms of standing tokens: a-e: squat tokens with punctures – RN 5613, 7863.1, 7863.3, 9658, 1724.3; f: an especially large example of a cylindrical token with a crown formed out of pinches, H: 6.0 cm D: 4.3 cm – RN 7898; g-l: cylindrical tokens with and without pinches – RN 7535, 6994, 8533.1, 1734.1, 1550.1, 8356.1.

Classification

The categories used here are based on observations made on the pieces themselves, on drawings, and using descriptions in database entries. The tokens exhibit general forms that can be grouped into categories, although each piece is unique in its details. The classes should therefore be understood as tendencies and by no means as rigid groups (Fig. 13.2). The catalog illustrates common forms through drawings and photos; other examples are included in the text in order to illustrate relevant particularities of shape and modifications.

Forms

The tokens were first divided into those with a base on which they could stand and those without a base. Standing tokens have flat or concave bases. The tokens without a base could lie on a surface. These two basic groups of tokens are more or less equally represented, with 171 pieces with a base and 194 without. Standing tokens can be divided into conical (n = 71, e.g. Cat. 13.29-31, 13.59, 13.85-86, 13.90-93), squat (n = 73, Figs. 13.1 a-e, 13.6-7; e.g. Cat. 13.35, 13.44-48, 13.94-95), and cylindrical examples (n = 27, Figs. 13.1 f-l, 13.3; e.g. Cat. 13.21, 13.23-25,13.61, 13.87-89). Tokens without a base include disc-shaped (n = 111, Figs. 13.8-9; e.g. Cat. 13.5, 13.96) and spherical forms (n = 83, Fig. 13.10-12). Additionally, three tokens could not be grouped into one of the aforementioned forms and are listed as diverse. Two of these have a base and are in the form of an hourglass with depressions on the upper part. The third piece has the shape of a star (Cat. 13.84). Of the 406 studied tokens, only 38 pieces could not be assigned to a form due to their fragmentary state (Table 13.2).

Form	Number	%
Tokens that stand	171	42%
conical	71	17%
squat	73	18%
cylindrical	27	7%
Tokens that do not stand	194	48%
disc-shaped	111	27%
spherical	83	21%
fragmentary	38	9%
*diverse**	3	1%
Total	**406**	**100%**

Table 13.2. Number and percentage of tokens by form. *Two could be considered standing tokens, but they have depressions on the top, the third is star-shaped.

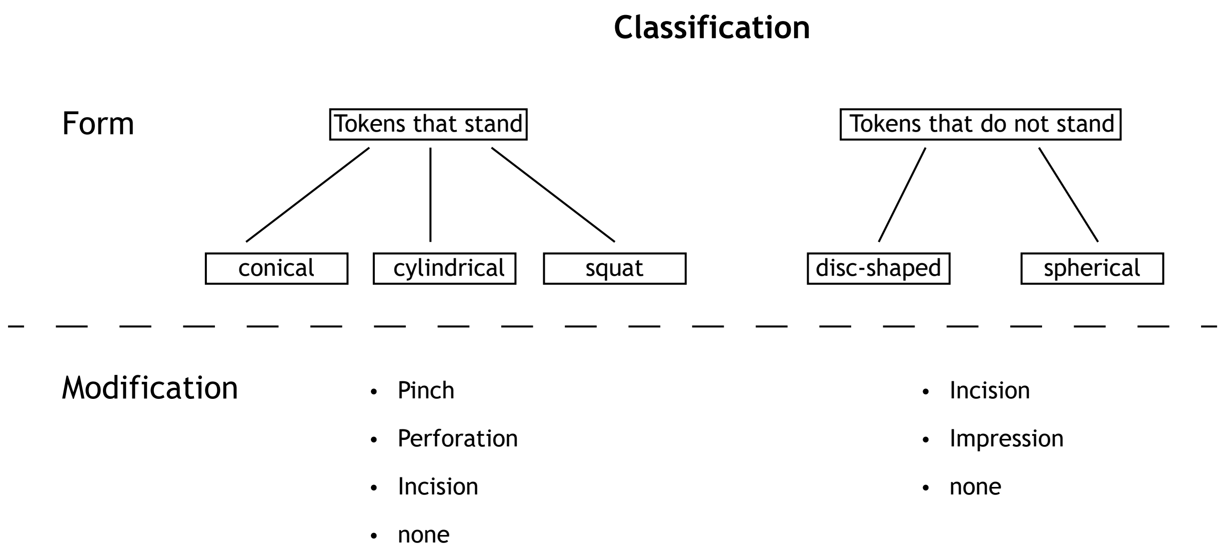


Fig. 13.2. Classification scheme for the tokens.

Modifications

The basic token forms were modified by pinching, incisions, punctures, and impressions. Modifications are observable on more than one-third (n = 155) of all tokens. All modifications were made while the clay was still moist and were therefore part of the manufacturing process. Among the standing tokens all forms of modifications – pinching, incisions, punctures, and impressions – are represented. Only incisions and impressions are attested on tokens without a base.

In the first case, elements were formed by pinching them out of the basic token form. A maximum of eight pinches on one piece is attested. They appear in both regular and irregular distributions and always on the upper part of the token (Cat. 13.61). The regularly positioned pinches produce individual ridges (Cat. 13.32, 13.59, 13.74, 13.77, 13.85). Out of several pinches, crosses (Cat. 13.65, 13.86) or little crowns were created (Fig. 13.3 c, d; Cat. 13.25, 13.57, 13.87, 13.94). In other instances, the modified objects are reminiscent of zoomorphic figures (Fig. 13.1 h, l; Cat. 13.23-24, 13.36, 13.41, 13.88, 13.91). The zoomorphic elements are especially associated with conical and cylindrical tokens (Table 13.3).

Incisions are rare elements and consist of fine to relatively deep cuts. In most cases, incisions occur individually. The resultant lines vary from straight (Fig. 13.3 b) to slightly curved (Cat. 13.96). Relatively fine, elongated tools were used, possibly made of wood or something similar. Incisions can be observed especially on flat tokens. Single incisions appear on seven tokens, comprising 64% of all incised pieces. Two tokens carry two or more incisions (36%).

	Standing tokens			Tokens that do not stand			
	Conical	Squat	Cylindrical	Disc	Spherical	Fragmentary	Total
irregular	9	-	8	1	-	6	**24**
zoomorphic	5	2	3	-	-	1	**11**
comb	4	1	2	-	-	-	**7**
crown	2	2	1	-	-	-	**5**
cross	3	-	1	-	-	-	**4**
three parallel folds	-	-	-	-	-	2	**2**
four corners	-	2	-	-	-	-	**2**
round	1	-	-	-	-	1	**2**
Total	**24**	**7**	**15**	**1**	**-**	**10**	**57**

Table 13.3. The frequency of token shapes with specific types of pinches.

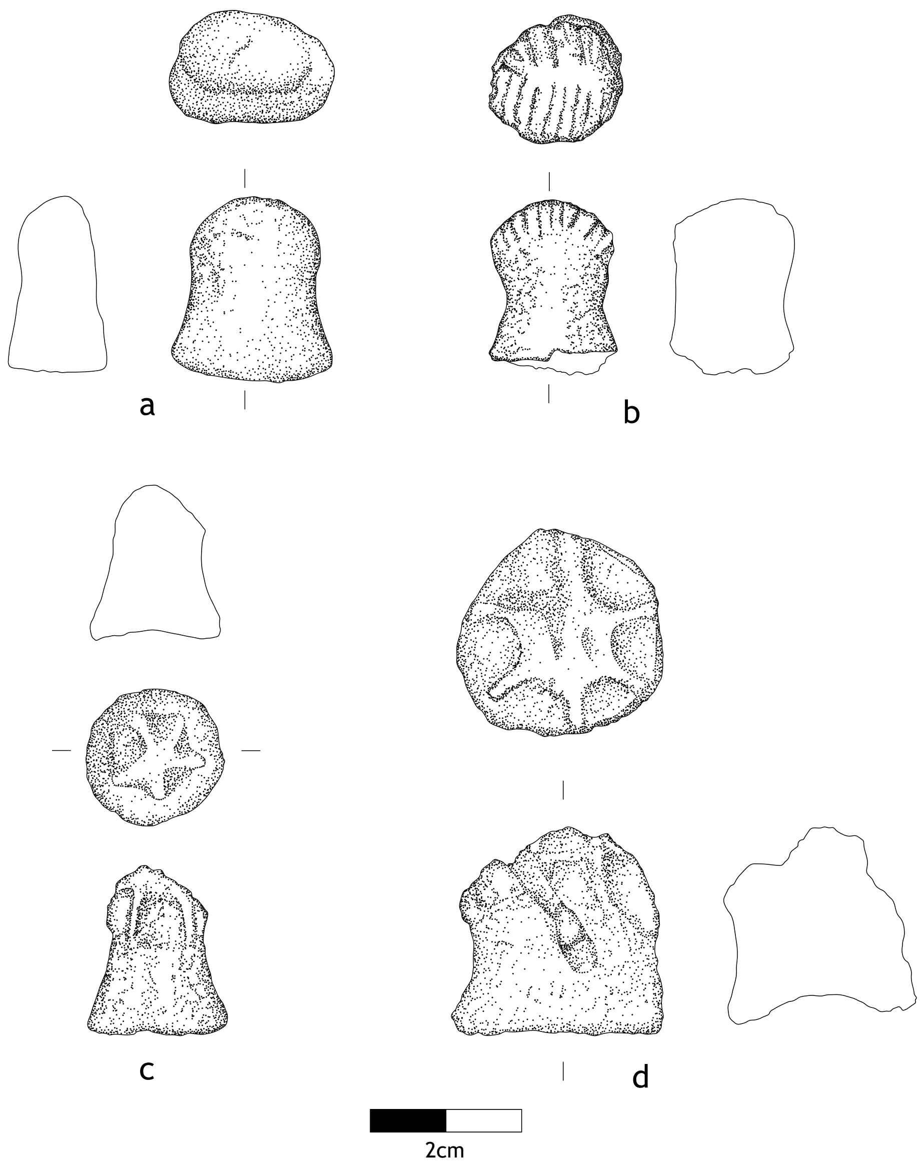


Fig. 13.3. Cylindrical tokens with and without modifications: a: cylindrical token (H: 2.4 cm, D: 1.4-2.0 cm), b: cylindrical token with incisions (H: 2.3 cm, D: 1.7 cm), c and d: cylindrical tokens with pinches in the shape of a crown (H: 2.2 cm, D: 1.4 cm; H: 2.7 cm, D: 2.7cm) – RN 10565.

I include under the term punctures holes that perforate or deeply penetrate the objects (Fig. 13.7; Cat. 13.78, 13.79, 13.81, 13.83, 13.89, 13.95) as well as relatively shallow, superficial holes (Figs. 13.1 e, 13.6). The majority of the punctures perforate the objects completely (18 out of 28). The places where the punctures first entered a token are usually larger (0.1 – 0.5 cm in diameter) than the exit points. The number of punctures on a single token varies between one and eight; most frequently a single perforation was observed. Elongated objects were used as tools to create the punctures, but in this case more stable kinds of tools were necessary than for making incisions (Table 13.4).

Impressions occur relatively frequently, with chaff or other vegetal impressions (Fig. 13.9) and imprints of fingers and reed being most common (Cat. 13.5). One token shows a possible textile imprint (Fig. 13.10). Presumably these traces are passive in nature and not intentionally produced, and in this way they differ from the other three forms of modifications for which an intentional production seems clear (Table 13.5).

In most cases a token was modified in only one way. However, on 16 pieces, or 10% of the total modified tokens, there is a combination of two different kinds of modifications. The most common combination consists of pinches and punctures (n = 7; Cat. 13.89), followed by pinches with impressions and incisions with impressions, attested by four tokens each; only one example showing a combination of pinches and incisions is attested (Cat. 13.88). Just less than half of the incised tokens have two modifications. However, the number of pieces with incisions is quite small, and most of the accompanying

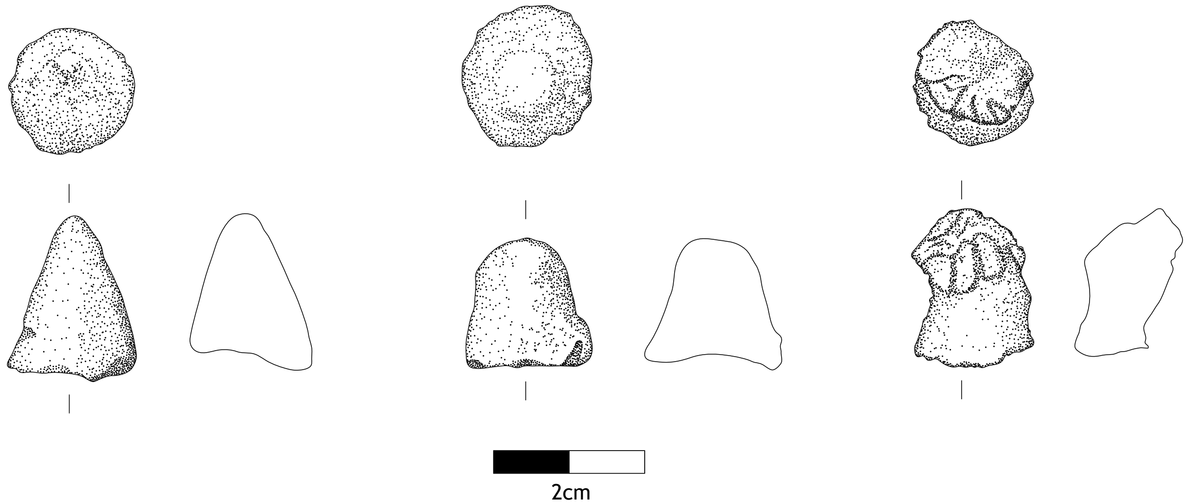


Fig. 13.4. Standing tokens from Stratum II, EM: conical (left, H: 2.1 cm, D: 1.6 cm), squat (middle, H: 1.7 cm, D: 1.8 cm), cylindrical with pinches in the shape of a crown (right, H: 1.9 cm, D: 1.5 cm) – RN 1739.

Punctures	Count	%
1	11	39%
2	6	21%
3	6	21%
5	1	4%
6	1	4%
8	1	4%
multiple*	2	7%
Total	**28**	**100%**

Table 13.4. Number of punctures and percentage of tokens in each category. * In two cases the number of punctures was not recorded and instead only “some holes” were mentioned.

Fig. 13.5. Conical tokens (middle and right) and fragment (left) – RN 7296.

Fig. 13.6. Squat tokens with and without punctures, Stratum I, Bd 2, H: 1.4-1.8 cm, D: 1.7 -1.9 cm – RN 7990.

Fig. 13.7. Squat token (left) and cylindrical token (right) with punctures – RN 1724.

Fig. 13.8. Disc-shaped tokens – RN 1474.

Impressions	Count	%
plant	22	37%
plaited material	12	20%
finger	10	17%
lines	6	10%
fingernail	4	7%
unclear	3	5%
round	1	3%
textile	1	1%
Total	**59**	**100%**

Table 13.5. Count and percentage of different types of impressions.

modifications are impressions. If one excludes impressions as passive phenomena, it is on tokens with pinches that combinations of modifications most commonly occur. Punctures appear exclusively in conjunction with pinches. Combinations of puncture and incision or puncture and impression do not occur (Table 13.6).

Fig. 13.9. Disc-shaped token with chaff impressions (middle) and spherical tokens (left and right) – RN 483.

Fig. 13.10. Spherical tokens, one with a textile impression (upper middle) – RN 1724.9 & 10.

Form groups and modifications

Standing tokens are particularly frequently modified. For cylindrical tokens the percentage of modified pieces reaches 85%; most are pinches. Approximately half of the conical and squat tokens have modifications (Fig. 13.13).

Tokens without a base are largely unmodified. 81% of the spheres and 65% of the discs have no additional modifications. Impressions are a frequently occurring attribute of both spheres and discs, and approximately two-thirds of all impressions are found on tokens without a base. Similar kinds of impressions occur on both spheres and discs, deriving from plants, plaited materials, textiles, and fingers. Most plant and plaited imprints, which constitute up to half of the impressions, occur on the flat, disc-shaped tokens.

The objects were modeled with the hands and fingers while still in a wet and malleable state. Subsequently, they may have been placed to dry on a plaited mat or on the ground. In this way, the pattern from plaiting and from plant remains scattered on the ground could be impressed on the damp clay mass. The high number

	Pinch	Incision	Puncture	Impression	Number of modifications	% with 2 modifications
Pinch	-				57	21
Incision	1	-			11	45
Puncture	7	0	-		28	25
Impression	4	4	0	-	59	14
Total	**12**	**5**	**7**	**8**	**155**	

Table 13.6. Combinations of modifications. In total 16 tokens have two modifications.

Fig. 13.11. Spherical tokens and one piece with a rounded depression, possibly part of a game – RN 7142, 9522, 8036, 1661, 1734.3.

Fig. 13.12. Spherical tokens plus a clay object with a rounded depression, possibly part of a game – RN 1724.6, 1724.5.

of impressions, especially on tokens without a base, could be an indication that less effort was expended in the manufacture of this group, and they were simply laid out to dry on the closest surface. Fingerprints and fingernail impressions occur especially on tokens without a base. The standing tokens contain relatively few impressions, and those that do occur mainly on the squat form. The production and drying of tokens with a base were carried out somewhat more carefully than those without, judging by the minor occurrence of such unintended impressions. Unlike the other tokens, standing ones may have been placed to dry on another

	Conical	Cylindrical	Squat	Disc	Spherical	Total	Percentage
plant	2		3	10	7	**22**	39
plaited material	-	-	-	10	1	**11**	19
finger	1	-	1	3	4	**9**	16
lines	1	-	1	3	1	**6**	10
fingernail	-	1	2	-	1	**4**	7
unclear	-	-	1	2	-	**3**	5
round	-	-	-	1	-	**1**	2
textile	-	-	-	1	-	**1**	2
Total	**4**	**1**	**8**	**30**	**14**	**57***	**100%**
%	7%	2%	14%	52%	25 %	100%	-

Table 13.7. Co-occurrence of token shapes and impressions. * In addition, two kinds of impressions occur on fragmentary tokens, one of which was an impression of plaited material and one a finger.

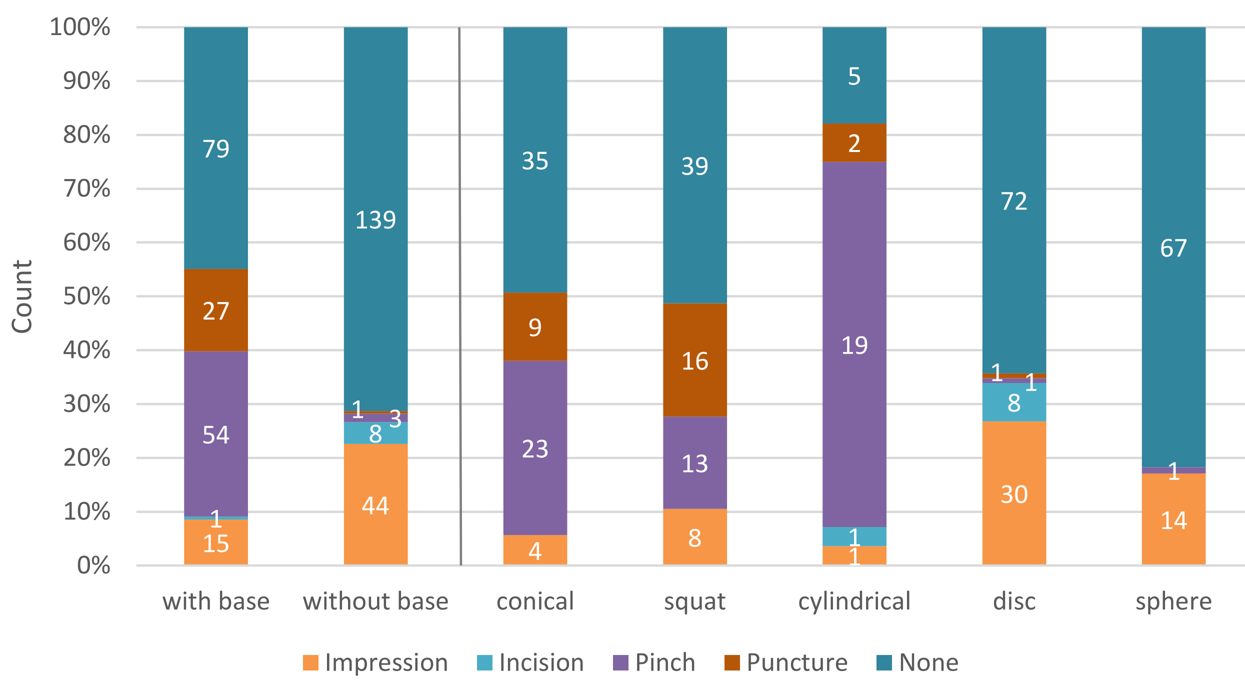


Fig. 13.13. Tokens classified according to morphological groups and their modifications.

separate, smoother kind of surface. These traces are not a sign that the surfaces of tokens without a base were less well smoothed, since some of the standing tokens also display a relatively rough surface (for example, Cat. 13.95, Table 13.7).

Pinches (57) and impressions (57) are the most frequent modifications. However, taking into consideration the passive nature of impressions, pinching must be considered the most common active modification, followed by puncturing and incising (Fig. 13.13).

Spatial distribution of the tokens

Distribution by stratum

Of the 406 documented tokens, 358 can be assigned positions in the stratigraphic sequence. The majority of the token assemblage is derived from the two most recent strata, II and I, comprising 66% of the total (238 out of 358). The contexts attributed to Strata III/II/I contain 60 tokens. The remaining earlier strata yielded a total of 60 tokens: 43 in Stratum III, 13 in Stratum IV,

Stratum	Count	Density (count per m³)
I	103	0.60
II	136	7.37
I/II/III	60	2.47
III	43	0.10
IV	13	0.04
V	1	0.02
VI	/	/
VII	1	4.34
VIII	1	0.02
Total	**358**	**0.30**

Table 13.8. Densities of tokens by stratum.

	I	II	I/II/III	III	IV	Total
building (fill)	46	11	-	17	11	**85**
Eastern Midden	6	108	-	-	-	**114**
Central Midden	-	-	56	-	-	**56**
burial	1	1	-	-	-	**2**
use surface (exterior)	5	13	4	-	-	**22**
use surface/ floor (interior)	1	-	-	1	-	**2**
fire installation	1	-	-	-	-	**1**
pit	3	2	-	-	-	**5**
fill, unspecified	40	1	-	25	2	**68**
Total	**103**	**136**	**60**	**43**	**13**	**355**

Table 13.9. Distribution of tokens by stratum and context for the Aeneolithic levels.

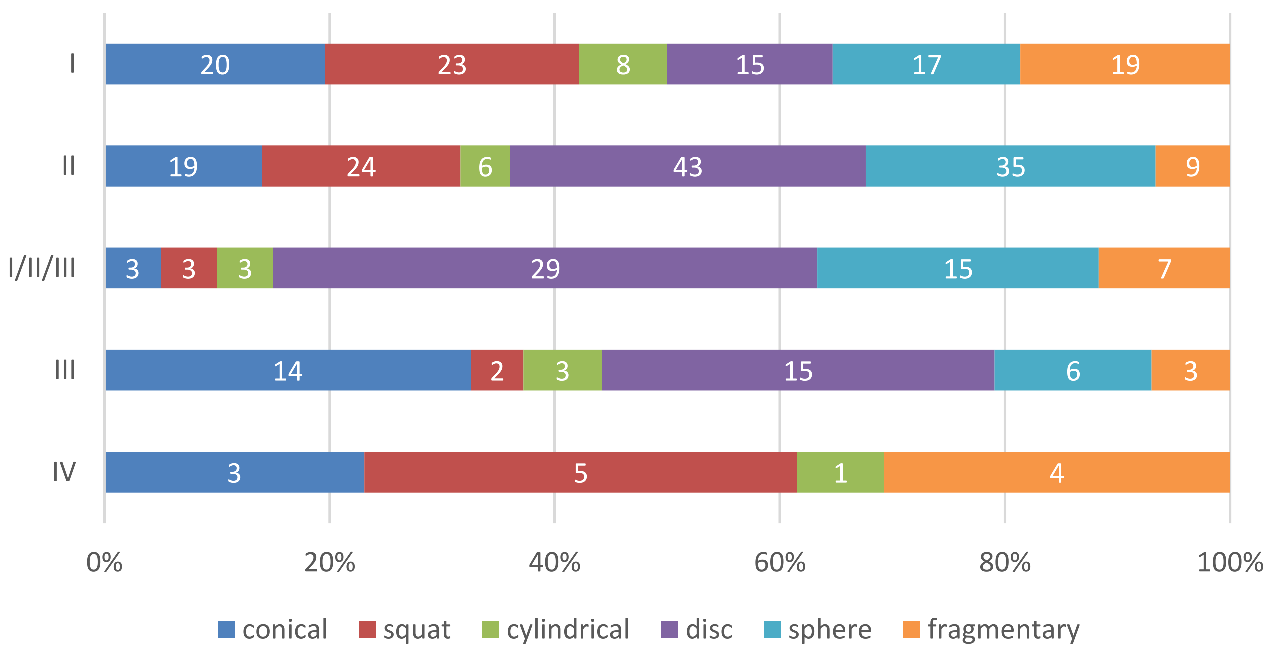


Fig. 13.14. Counts and percentages of token forms by stratum.

and three in Strata VIII to V. Examining the trend from older to younger strata, a sudden increase is notable in Stratum II due to the high token density in the two middens[198] (Tables 13.8-9).

All five token forms are attested in Strata III-I (Fig. 13.14, Table 13.10). Only small fluctuations occur in the proportions of individual forms, and the changes do not appear to be significant.[199] No consistent developments can be observed from the oldest to youngest strata; rather, there are fluctuating quantities of individual token groups between strata. Furthermore, no similarities in proportional distribution or successive development of standing tokens compared to those without bases could be recognized. In Stratum III the percentage of tokens with and without bases is evenly

198 The separation of deposits of the Eastern Midden (EM) into Strata II and I was not always possible.

199 Due to the small number (13) of tokens from Stratum IV, I have removed it from the stratigraphic comparison.

balanced at approximately 50% each. In Stratum I/II/III, however, there is a markedly greater proportion of tokens without a base, comprising more than 80% of the total. Stratum II contains 61% and the youngest Stratum I 39% tokens without bases.

Modified tokens occur in all strata, however, pieces without modification tend to predominate. Stratum II has the highest percentage of tokens with modifications (approximately 50%). Particularly frequent are impressions (36) and pinches (19). Stratum I follows with the second highest occurrence of modified tokens, with punctures (14) and impressions (12) as well as a small number of tokens with pinches. It is particularly interesting to note that there is an anomaly in the distribution of modifications in the Central Midden (Strata III/II/I) similar to the stratigraphic distribution of basic forms: approximately 90% of the tokens are unmodified (Fig. 13.15).

Stratum	Conical	Squat	Cylindrical	Disc	Spherical	Total
I	20	23	8	15	17	**83**
II	19	24	6	43	35	**127**
I/II/III	3	3	3	29	15	**53***
III	14	2	3	15	6	**40**
IV	3	5	1	-	-	**9**
Total	**59**	**57**	**21**	**102**	**73**	**312**

Table 13.10. Counts of token shapes per stratum. * Of the 56 tokens from the Central Midden, three were too fragmentary to be assigned to a form.

Distribution by context

A relatively small number of tokens was recovered in primary contexts. 24 pieces were found on surfaces; of these, two come from floors, 15 from outdoor surfaces, four from Berdiev Street, and three from South Street (Table 13.9). The previously mentioned example of an especially large token was found on an exterior surface, E262 (Fig. 13.1 f). It is surprising that the large token is still quite well preserved, apart from a break in the middle, and did not completely disintegrate despite its location on an outdoor surface. Perhaps it was in a corner that was not heavily frequented and was thereby protected.

The largest proportion of the tokens was found in secondary and tertiary contexts such as fill layers. Mostly these are ash layers or ash interspersed with other material. Two-thirds of all tokens were recovered from such ashy fills. The tokens discarded in ashy deposits probably became hardened and thereby better preserved than those deposited elsewhere. The ash may still have been warm or even glowing and protected the tokens from other environmental impacts, thereby favoring their preservation. This taphonomic process is reflected in the large number of tokens from the Eastern and Central Middens, as the deposits in both middens contained large quantities of ash mixed with other waste. These two middens plus fills in buildings and in open areas constitute

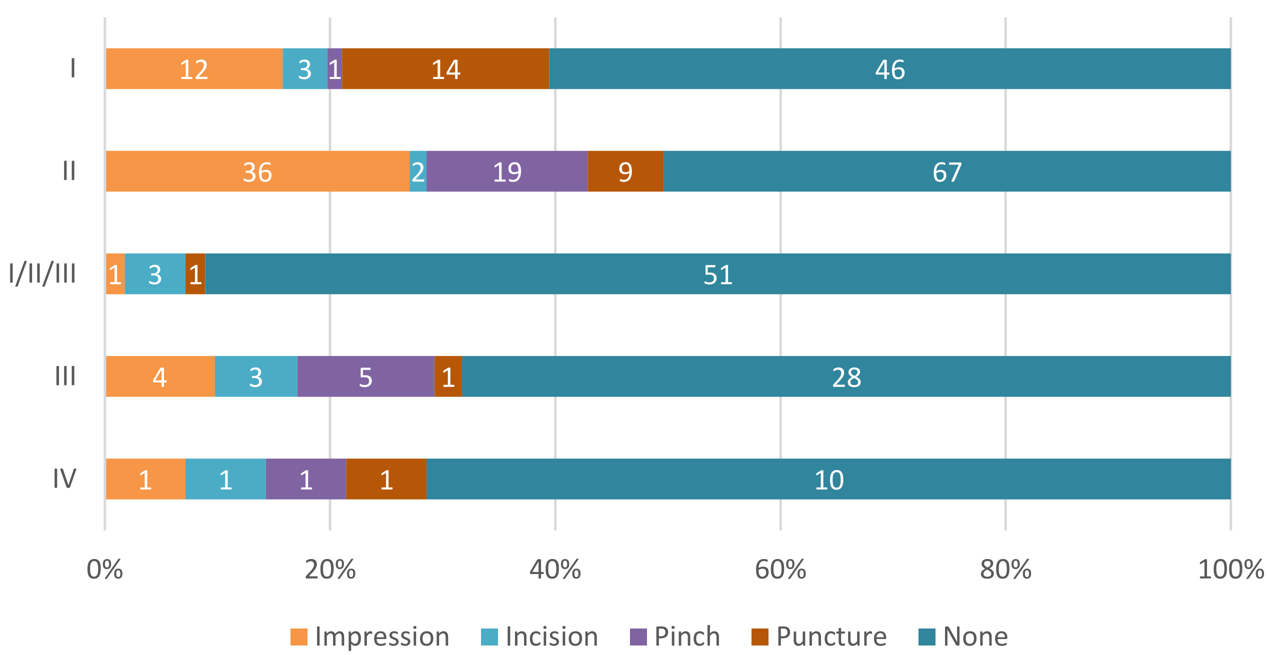


Fig. 13.15. Counts and percentages of token modifications by stratum.

Building	Stratum	Count	Density (per m³)
Bd 1	II	9	0.74
Bd 2	I	25	2.59
Bd 3	IV-I	8	0.48
Bd 4	IV-II	1	0.12
Bd 9	III	16	2.90
Bd 10	III	1	0.13
Bd 11	I	3	1.36
Bd 13	I	1	0.32
Bd 14	IV	11	0.64
Bd 15	I	10	4.65
all buildings	**IV-I**	**85**	**0.87**

Table 13.11. Density of tokens in buildings (Bd = building).

the four secondary and tertiary context categories that yielded tokens.

A total of 85 tokens were recovered in 10 of the 21 excavated buildings (Table 13.11), of which only two occur in primary contexts on floors; the others come from fills in the buildings. About half of all tokens from buildings were found in the structures assigned to Stratum I. The buildings in this stratum have relatively high densities of tokens compared to the earlier ones, with the highest in Building 15, followed by Buildings 2 and 11. Interestingly, Buildings 11 and 15 are in close proximity to each other on the western periphery of the village. The second highest token density overall is in Building 9 in Stratum III, which also included a high number of figurines.

Token densities and forms vary greatly between buildings; no significant distribution pattern can be discerned. Instead, every building has its own range of token forms. With the exception of Building 9, no building contains all five token forms (Fig. 13.16). To be taken into account are also ten buildings from which no tokens were recovered, something that may have to do in many cases with the fact that only a rather small portion of them was excavated.

The two major dumps, the Eastern and the Central Midden, yielded the largest quantity of tokens. The Eastern Midden was in use from Stratum II to I, whereas the Central Midden can only be attributed to Strata III/II/I. The Eastern Midden yielded 114 tokens, of which an exceptionally large portion (108) belongs to Stratum II. From the Central Midden 56 tokens were recovered, a smaller number in absolute terms. The comparison of densities shows, however, a reverse relationship. The Central Midden has a density of 3.96 tokens per m³, the Eastern Midden only 2.01 tokens per m³. An additional 93 tokens come from fill layers in outdoor areas, especially in Stratum I (27) and Stratum III (25).

When the spatial distribution of tokens from the four secondary and tertiary context categories are compared, there appears to be a relatively balanced distribution

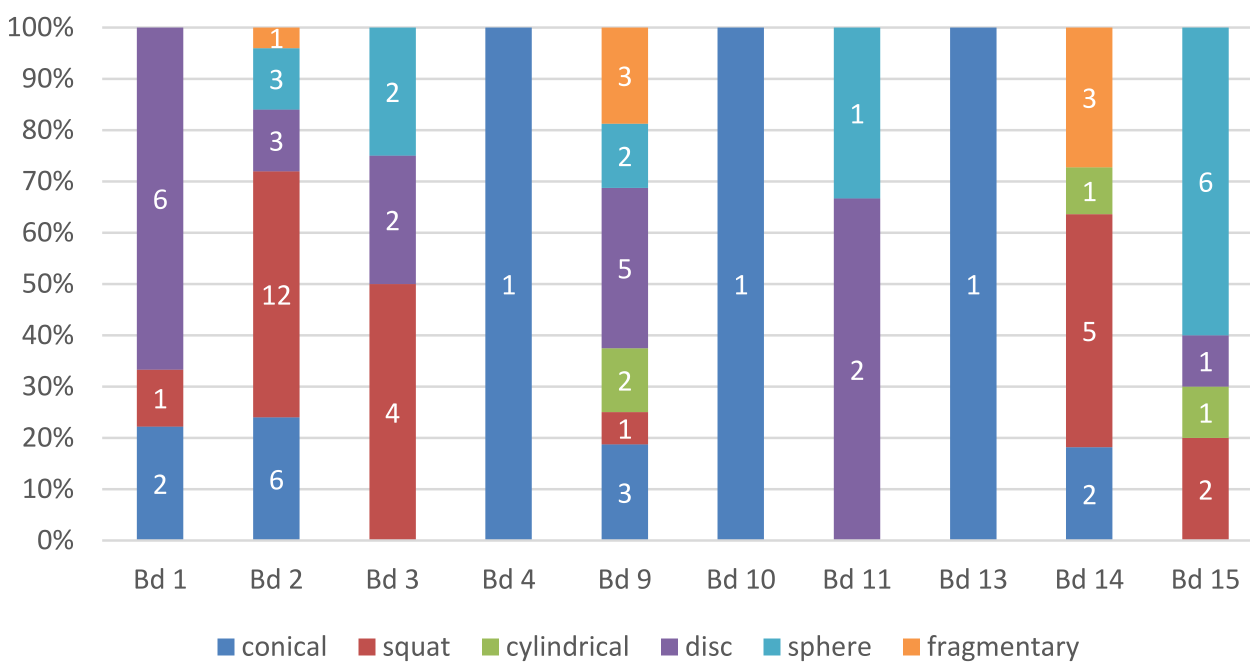


Fig. 13.16. Distribution of token forms by building.

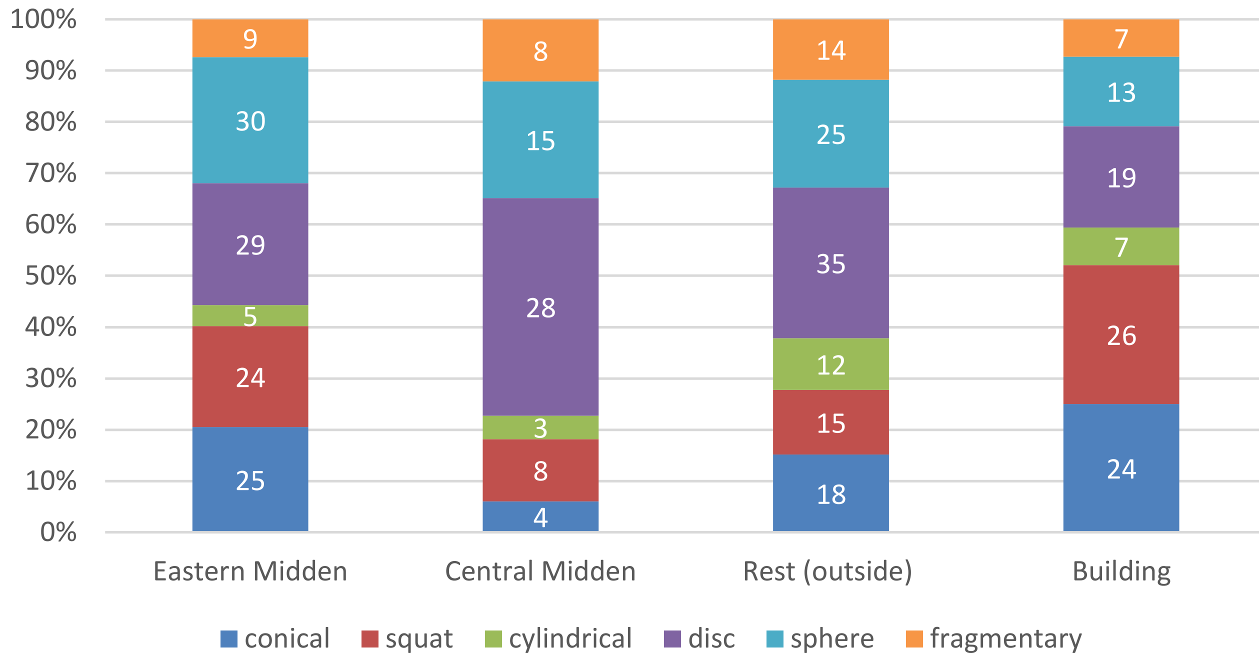


Fig. 13.17. Distribution of token forms by context category.

of those with and without bases in buildings and in the Eastern Midden. Only the relationship in the Central Midden differs significantly from the other contexts, where tokens without bases make up 80% of the assemblage (Fig. 13.17).

The distribution pattern of tokens in secondary and tertiary contexts can be interpreted as a result of discard routines. Building fills, the Eastern Midden, and the Central Midden appear to have been deliberately chosen as disposal locations.

In Stratum II the Eastern Midden yielded the highest number of tokens. The Central Midden may have been used as a second disposal area. Depending on their location in the village, either the Central or the Eastern Midden was available for people in the adjacent houses to discard unneeded tokens and other waste (see Figs. 2.46 and 2.48). In Stratum I there was a shift toward disposal of tokens in abandoned buildings.

It appears that in each stratum members of the village had preferred areas for the discard of tokens. The relatively balanced distribution of token forms across the strata and context categories suggests that there was no correlation between token shape and discard in certain places. However, the Central Midden differs from the rest of the contexts through its token repertoire, as a large proportion of tokens without base was found there. Since these kinds of tokens tend to be unmodified, this characteristic is also underrepresented in the Central Midden.

Function of tokens

No clear functional interpretation of the Monjukli Depe tokens can be derived from the spatial analysis of their contexts. The locational evaluation has shown that tokens are linked to specific spaces, but these are primarily rubbish dumps, at least in the case of the Eastern Midden of a special sort connected to feasting (Chap. 7). Tokens can also be found in all sorts of fill layers inside and outside buildings. Comparisons between levels yield a similar picture: Especially in the two younger strata, tokens are omnipresent. However, there is no clear link between one specific token form and a particular location, apart from the fact that the Central Midden has mostly tokens without bases. Otherwise, there are few significant differences between contexts. Diachronic or synchronic distribution patterns based on token forms do not emerge.

Although the production of some forms took somewhat more time and skill, in general tokens could be relatively quickly and easily fashioned for an anticipated purpose and may have been discarded immediately after use in an abandoned building, in one of the garbage dumps, or simply outside the door. One can only conjecture about the length of time they were used, but it is conceivable that it was very limited. This is suggested by the fast and to some extent careless production, the simplicity of the clay preparation, and the absence of firing. A brief or non-intensive use is also supported by the low level of fragmentation. Two-thirds of all tokens are intact or show little damage in the form of breakage, and 88% have no signs of other use wear. In a few cases there is some abrasion, scratches, or chipping. The tokens were made for a particular purpose, and apparently after it was fulfilled they were discarded. That purpose did not include a permanent or an intensive and repeated use. These reflections help to explain the omnipresence of tokens in terms of their ad hoc production and their low value.

A low value can also be observed among other categories of objects at Monjukli Depe. Related characteristics, such as a fast production and brief use, were also observed by Arnica Keßeler for the spindle whorls (Chap. 11). One could describe tokens as a form of expedient production for spontaneously emerging needs (after Binford 1979, 269). Whether this should be understood as an expedient production for longer-term routine practices or as a response to spontaneously emerging needs remains to be ascertained.

In summary, no definitive use(s) can be specified for the tokens from Monjukli Depe. I turn now to some functional interpretations that are found repeatedly in the literature and consider the extent to which they are plausible in the case of Monjukli Depe.

Tokens as counters or mnemonic devices

Based on the suggestions of A. Leo Oppenheim (1959) and Pierre Amiet (1966), Denise Schmandt-Besserat developed the thesis that proto-cuneiform arose in western Asia out of a history of token use in a system of counting (Schmandt-Besserat 1977; 1992; 1996). She envisioned the use of tokens as occurring especially in an economic context. With their help different kinds of goods were counted and administered. A form was used solely for one counted unit such as a specific number or quantity of a particular product (Schmandt-Besserat 2009, 147). For example, five sheep might have been counted with a disc, but five cows were represented by another material symbol. In this way Schmandt-Besserat understands counting as a one-to-one correspondence by which one object symbolizes another, including both its quality and quantity. Consequently, that number or quantity cannot be transferred to another kind of object (Akkermans and Duistermaat 1996, 19; Schmandt-Besserat 1996, 7).

Tokens from Monjukli Depe offer no evidence of having been used in an administrative environment, and there is no indication that the five forms with their respective modifications could have stood for specific units in a counting system. Despite modifications of the basic shapes, the differences between token forms seem too small to separate them clearly from one another. The transitions among tokens with bases seem to me to be particularly gradual, as visible, for example, in Fig. 13.6. They give the impression of being individual, which would have made counting difficult, because they could not have been unequivocally classified as one specific form. In principle, a more precise differentiation could have been provided by the modifications, but these do not occur with sufficient regularity.

The tokens without bases might, however, have been usable as counting or mnemonic elements. They might have stood for counted units or for specific products (Schmandt-Besserat 2009, 147). That spheres were used for one category of things and discs for something else presupposes, however, a kind of agreement among users concerning the meaning of the shapes as numbers or number-object combinations. One could also postulate that the choice of spheres or discs was an individual one. Individuals might have used the objects as counters for purposes of personal – or household-internal – memory rather than for exchange. Since the diameters of spheres and discs vary only slightly, it is conceivable that they could have served as reminders or counting devices. In this way, 10 little balls might have stood for 10 sheep, for 10 bricks, or for an abstract number that was not easy to recall.

Tokens as gaming pieces

Another interpretation of the tokens is as gaming pieces, although no associated game boards have been found (Le Breton 1957, 112, Fig. 33; Lenzen 1965, 32 as cited in Delougaz and Kantor 1996, 120; Berdiev 1966, 16, Fig. 8; Masson 1971, 42). Depending on the kind of game, however, it is possible that boards either were not required or that they were marked on the ground as also observed by Vadim Masson in Turkmenistan in the 1970s (Murray 1952, 1; Masson 1971, 42). It is also possible that boards were made from perishable materials such as textiles or bast.

In this regard, it is useful to draw attention to two clay pieces among the objects from Monjukli Depe that contain depressions as well as a stone weight found in Monjukli Depe in 2010 that has shallow rounded depressions on its surface (Keßeler 2011, 207, Fig. 27). The depressions are round in form and could have served as a place to hold spherical tokens (Fig. 13.11, RN 1734.3; Fig. 13.12, RN 1724.5). The spherical pieces may have served multiple purposes, for counting as well as for games, as there is always “a thin line between the concept of gaming counter and accounting” (Oates 1993, 151).

The modeling of clay into tokens or any other shapes can also be understood as having a playful aspect in and of itself, serving as a kind of amusement, a way to pass the time, or to learn to deal with clay. In the former cases, this may have been something like “doodling,” an act carried out primarily to pass the time. In the latter case, the goal and the means of the practice would be the same.

Tokens as bodily adornment

Another possible alternative for the use of tokens is as decorative elements on the body, for example, as jewelry in the lips or ears, as beads (Oates 1993, 151), or charms, with the latter having primarily an apotropaic function (Forest 1989, 211). Based on ethnographic observations,[200] cylindrical plugs and conical objects are often seen as lip or ear plugs (e.g., Hole 1977, Fig. 92 k-t; Pollock 2010, Figs. 9.2, 9.6, 189). However, objects that could be envisioned as ear or lip/cheek decoration are scarce at Monjukli Depe. The cylindrical tokens are those that could most likely be used in the ear. The fact that tokens are unfired speaks against such a use as lip inserts, since unfired clay begins to dissolve when it comes into contact with liquids. Ear ornaments can also be damaged by bodily fluids. Clay jewelry is usually fired, because firing makes it more robust and lighter in weight. The punctured tokens are unlikely to have been used as pendants, since the holes were often irregular or pierced at an angle and in other cases did not completely penetrate the piece.

Tokens as sling balls

Spherical or biconical clay objects are traditionally interpreted as projectiles for use with slings (Hiebert et al. 2003a, Fig. 7.2: 11-13, 7.6: 15; Delougaz and Kantor 1996, 253, Plate 65: L, 231: I-M). The use of spherical tokens from Monjukli Depe as sling balls cannot be excluded. At least the larger examples with diameters from 1.0 to 2.7 cm (66 pieces) might have been slingshots for hunting small animals. In the context of excavations at Rahmatabad in southern Iran, boys were observed making small balls out of the clay from nearby irrigation canals. After drying in the sun, they were used as slingshots for hunting birds (Bernbeck et al. 2005, 95).

Tokens as figurines

Tokens with bases could be seen as highly abstracted figurines. A separation between anthropomorphic or zoomorphic cannot really be made, and some tokens have remote similarities to both humans and animals.

Eleven of the standing tokens are modified in ways that suggest zoomorphic figures, in which the pinches can be interpreted as mouths, beaks, or snouts. These are not naturalistic depictions of animals but rather highly abstract forms. When comparing such tokens with the animal figurines from Monjukli Depe, some resemblances can be observed (Cat.13.91; see Chap. 12, Cat. 12.30). No birds were identified among the animal figurines, but in some cases, the pinched tokens are strongly reminiscent of bird shapes. One piece bears two additional small depressions and a small pinch on the sides so that the figure has features of a human face (Cat. 13.90).

The remaining tokens with pinches but also those without any modifications might be highly abstract anthropomorphic or zoomorphic forms. Standing tokens could be interpreted as human-like figures, similar to the king, queen, bishop, and pawn in chess or parcheesi games. These represent anthropomorphic figures in the broadest sense but do not have a human form and thereby combine abstract anthropomorphism with gaming. That there are variable interpretations of anthropomorphic figurines and geometric objects can be shown by a comparison of objects from Chogha Bonut in Iran (Alizadeh 2003) and Ilgynly Depe in Turkmenistan (Solovyova 2005). These sites contain both anthropomorphic figurines and geometric clay objects. However, the geometric objects in Chogha Bonut are interpreted as abstract figures or administrative elements/tokens (Alizadeh 2003, Figs. 30, 32, 36), whereas in Ilgynly Depe geometric clay objects are understood as anthropomorphic figurines (Solovyova 2005).[201] In the Meana Horizon at Monjukli Depe there are no clearly identifiable anthropomorphic objects.[202] However, stylized anthropomorphic motifs are visible on a wall painting that was partially exposed in 2013 and consists of geometric elements where the torsos of two human figures consist of inverted triangles (Bernbeck and Pollock 2016, Fig. 5; Chap. 5, Fig. 5.4). The head of one of the two figures bears similarities to a bird. In this way, geometry was used as a connecting element to construct a relationship between tokens and anthropomorphic representations. There seems to be a fluid transition between human and bird. The tokens RN 333 (Cat. 13.88) and RN 1334.1 (Cat. 13.90) are possible examples of such an ambiguous symbolization.

Whether tokens are anthropomorphic or zoomorphic representations or something completely different, their production may have been part of a kind of sympathetic magic in which a material object stands for another person or living being and thereby takes on a substitutive role. Everything that the object undergoes during a magic spell is transferred to the object in focus (Mauss and Hubert 1989; Tambiah 1990). Since modifications of tokens could only be produced when they were still in a damp state, they must have been prepared for a particular

200 For example, the Kayapo from the southern part of the Brazilian Amazon region modify their ears and lower lips with wooden plugs (Turner 1995, 153-154). The Nayas of the northwest coast of North America use medial and labial labrets as lower lip jewelry (Moss 1999). Today, labret piercings are common in many parts of the world.

201 The range of clay objects from Ilgynly Depe includes pieces that would be classified at Monjukli Depe as tokens (for example, Pl. LXXI) as well as anthropomorphic figurines.

202 The possible exceptions are a few examples of angular clay objects similar to those that are interpreted at Ilgynly Depe as human representations. These ten pieces, however, probably date to the later Aeneolithic Namazga I phase and therefore post-date the Meana Horizon (Chap. 12, Cat. 12.1-10).

purpose at the time of their fashioning. In this connection, punctures and incisions could be considered as part of such magic. Pierced animal figurines have usually been interpreted as part of hunting magic (e.g., Rollefson 1986, Pl. II: 4; Gebel 2005, 54) “mim[ing] the animate in the inanimate” (Nakamura 2005, 22). Since punctures are a feature of tokens with bases, their use in magical practices can be envisaged as tangible presentations of wishes that increased their imaginary impact by using materiality (Nakamura 2005, 23-24). But piercing may not only have been a way to ensure the wounding or killing of animals and perhaps humans, but may also have been understood as a way to promote healing, rejuvenation, or something sexual, such as the desire for offspring. Piercing is not attested on zoomorphic tokens or on animal figurines at Monjukli Depe, but if standing tokens are thought to embody anthropomorphic or zoomorphic beings, their use in a voodoo type of magic might be conceivable.

Geographical distribution

Parallels north of the Kopet Dag

Some Neolithic and Aeneolithic sites on the edge of the piedmont zone north of the Kopet Dag have yielded clay tokens comparable to those from Monjukli Depe. Unfortunately, details are rarely available regarding their number or the contexts in which they were found. It is therefore impossible to make a definite statement about how characteristic they were for a specific site. In particular, the forms I have referred to as tokens with bases are found in other excavation reports, with conical, cylindrical, and squat tokens mentioned more or less equally often. Tokens without bases are comparatively underrepresented (Table 13.12). Disc-shaped tokens do not appear at all in excavation reports, either because they were not identified as such or because they were not regarded as important enough to be published. It is often unclear whether tokens were made of clay or stone.

In close proximity to Monjukli Depe, geometric clay objects were found at Neolithic Chagylly Depe and at the Aeneolithic settlements of Chakmakly Depe, Monjukli Depe II, and Ilgynly Depe (see Table 13.12 for references). The old publication on Monjukli Depe also includes an example of a conical object/token. Continuing to the northwest, there are further parallels with the Neolithic settlements of Jeitun, Pessejik, Chopan Depe, and Aeneolithic Anau.

From a review of Soviet literature on the aforementioned sites, it appears that tokens are mainly associated with the Neolithic Jeitun period (Masson 1960c, 14-15; Masson and Sarianidi 1972, 42; Berdiev 1976, 48-49) and less so with the Aeneolithic or especially with the early Aeneolithic sub-phase of Anau IA. The excavation report on Jeitun includes many examples of tokens

Monjukli form	Parallels
conical	Chopan Depe (nl): Berdiev 1971, Tab. VI: 19 Chagylly Depe (nl): Berdiev 1966, Fig. 8: 2-9, 28, 29 Jeitun (nl): Masson 1971, Tab. XL: 16, Tab. XLI: 12 Pessijik Depe (nl): Berdiev 1970, Fig. 7: 3-4 Chakmakly Depe (aenl): Coolidge 2005, Fig. A2.44 Ilgynly Depe (aenl): Solovyova 2005, Pl. LXXIX: 434, Pl. LXXXI
cylindrical	Jeitun (nl): Masson 1971, Tab. XL: 6, 9, 11 Pessijik Depe (nl): Berdiev 1970, Fig. 7: 2 Anau (aenl): Pumpelly 1908, Pl. 47: 7, 8 Chakmakly Depe (aenl): Berdiev 1976, Fig. 12: 29 Ilgynly Depe (aenl): Solovyova 2005, Pl. LXXIX: 458, 460, Pl. LXXX
squat	Chagylly Depe (nl): Berdiev 1966, Fig. 8: 2 Jeitun (nl): Masson 1971, Tab. XL: 10, XLI: 111, 15 Pessijik Depe (nl): Berdiev 1970, Fig. 7: 1 Monjukli Depe II (aenl): Berdiev 1974, Fig. 6: 12-13
spherical	Chagylly Depe (nl): Berdiev 1966, Fig. 9: 16, 10: 11-12 Pessijik Depe (nl): Berdiev 1970, Fig. 7: 20-21 Anau (aenl): Hiebert et al. 2003a, Fig. 7.2: 13
disc	(none)

Table 13.12. Parallels for tokens from sites north of the Kopet Dag (nl=Neolithic; aenl=Aeneolithic).

(Masson 1971). A series of conical objects are also listed for Chagylly Depe and Pessejik Depe. Publications of other Neolithic settlements mention the appearance of such objects among the assemblage of artifacts (e.g., Berdiev 1966, 16, Fig. 8; Berdiev 1970, 25-26, Fig. 7).

The situation is different in Aeneolithic settlements. According to the Anau publications (Pumpelly 1908; Hiebert with Kurbansakhatov 2003), hardly any tokens were found. The reports include oval to biconical clay objects, so-called “sling balls” (Pumpelly 1908, 168; Hiebert et al. 2003a, Fig. 7.2 (Anau IA), Fig. 7.6 (Anau II)), but only in Pumpelly’s publication are two examples of cylindrical tokens (with pinches) illustrated; they come from the southern Anau mound (Pumpelly 1908, Plate 47: 7, 8, South Kurgan, Culture III). Berdiev’s first publication on Monjukli Depe (1972) describes a conical object (Berdiev 1972, 26), and the only publication on the excavations at nearby Chakmakly Depe contains a small, hardly noticeable drawing of a cylindrical object (Berdiev 1976, Fig. 12: 29). On the other hand, Masson and Sarianidi mention a large number of conical clay objects in early Aeneolithic contexts (Masson and Sarianidi 1972, 58). This statement is only a casual remark, however, with no further discussion of the objects either interpretatively or in the form of illustrations. This stands in clear discrepancy to the assemblage of more than 400 tokens recovered in our renewed excavations at Monjukli Depe. This is presumably in part a function of the contexts excavated as well as our extensive program of screening.

Parallels south of the Kopet Dag

The sites of Tappe Hissar and Tappe Sang-e Chakhmaq are two of the closest excavated locations in Iran just south of the Kopet Dag mountain range that date to the prehistoric

Monjukli form	Parallels
conical	Tappe Khaleseh (nl): Valipour et al. 2013, Fig. 11.36 Tappe Sialk North (nl/cl): Ghirshman 1938, Pl. LII: 27 Tappe Zagheh (tcl): Malek Shahmirzadi 1977, Pl. XVIII: 22-30 (dried/untempered); Fazeli Nashli and Moghimi 2013, Fig. 5 (fired) Tal-e Bakun A (cl): Alizadeh 2006, Fig. 71: G-H, J, L-N (fired) Tappe Yahya VII/VI (cl): Beale 1986: Fig. 7.18: h-j Tappe Hissar, Level I (early cl): Schmidt 1937, Pl. XIV A: H3804, H3727 Tappe Hissar Level III (late cl): Schmidt 1937, Pl. XLV: H2021
cylindrical	Tappe Sang-e Chakhmaq West, Level 2 (nl): Masuda et al. 2013, Fig. 14.20: 9 Tappe Hissar, Level II (middle cl): Schmidt 1937, Pl. XXVII B: H3735, XLIV: H1687
squat	Tappe Sang-e Chakhmaq West (nl): Masuda et al. 2013, Fig. 14.17: 21
spherical	Tappe Khaleseh (nl): Valipour et al. 2013, Fig. 11.36 Tol-e Bashi (nl): Javeri et al. 2010, Fig. 10.1 Tappe Zagheh (tcl): Malek Shahmirzadi 1977, Pl. XVIII: 12-21 (dried/untempered), Fazeli Nashli and Moghimi 2013, Figs. 6, 7 (left; fired) Tappe Yahya (cl, Period VI): Beale 1986: Fig. 7.18: a, c-f Rahmatabad (cl): Bernbeck et al. 2005, 95 Tal-e Bakun A (cl): Alizadeh 2006, Fig. 71: M (fired)
disc	Tappe Zagheh (tcl): Fazeli Nashli and Moghimi 2013, Fig. 7 (right; fired) Tal-e Bakun A (cl): Alizadeh 2006, Fig. 72: E-F (fired)

Table 13.13. Parallels for tokens from sites south of the Kopet Dag (nl=Neolithic; tcl=Transitional Chalcolithic; cl=Chalcolithic).

periods treated here and from which tokens were recovered. From the West Mound of the early Neolithic occupation of Sang-e Chakhmaq[203] comes a cylindrical token with oblique head and pinches (Masuda et al. 2013, Fig. 14.20: 9, second layer; Roustaei et al. 2015). Cylindrical and conical clay objects are attested in Hissar layers I to III (Schmidt 1937, Plates XIV A, XXVII B, XLIV, XLV). Hissar I is dated to ca. the 5th millennium BCE: according to Dyson (2009) IA dates shortly after 5000 BCE and IB around 4000 BCE. In the two later horizons, Hissar II and III, of the 4th to 3rd millennium BCE,[204] a few clay objects appear that have morphological similarities to those from Monjukli Depe.

Other temporally and/or spatially close sites, such as Cheshmeh Ali (Fazeli et al. 2004) and Shir-i Shian (Dyson and Thornton 2009), include no similar tokens. However, in the excavations of the Neolithic settlement of Tappe Khaleseh in the Abhar-Rud basin northwest of Tehran, 253 clay tokens of different shapes came to light, among them spherical, flat, and conical examples (Valipour et al. 2013, 172). The Transitional Chalcolithic levels in Tappe Zagheh in the Qazvin Plain contained nearly 130 tokens (Fazeli Nashli and Moghimi 2013), with parallels to the tokens from Monjukli Depe in the form of spherical, conical, and flat clay objects (Table 13.13).

Conclusion

Tokens occur mainly in the two younger Strata II and I as well as the Central Midden, which reaches back into Stratum III at Monjukli Depe, and, to a lesser extent, in Strata III and IV. At Monjukli Depe they seem to be primarily an Aeneolithic phenomenon, although this picture could be partially a function of the small volume of Neolithic deposits excavated.

The classification proposed here resulted in two groups of tokens – those with and without a base on which they could stand – as well as five subcategories. The difficulty of recognizing specific standard forms within the group of standing tokens might be a result of the users' preferences, suggesting that those living in Monjukli Depe may have required no clear separation between the groups as I have recognized them. Due to the ambiguity of token classification, it can be proposed that in Monjukli Depe things were categorized in a freer and more relaxed fashion than we are accustomed to today. The diversity of objects grouped under the rubric "token" is striking, especially in today's world of standardized, industrial products. The individual traits of the objects complicate our classification of them. Perhaps the needs for abstraction and typological order in the modern sense were expressed differently, or there was less need of them in prehistoric Central Asia, so that things were more diverse and not necessarily grouped under one overarching name or category.

The classification of tokens presented here is meant as a tool for further evaluation. A spatial analysis yielded no clearly identifiable synchronic or diachronic distribution patterns of token forms in particular areas within the settlement. However, shifting disposal patterns could be observed. In Stratum II discard was concentrated around the Eastern and possibly the Central Midden. A simultaneous use of the two disposal areas cannot be ascertained, because the Central Midden cannot be assigned definitively to Stratum I, II, or III. In the most recent Stratum I the discard of clay tokens was no longer bound to middens, but instead shifted to garbage dumps in abandoned buildings.

203 Sang-e Chakhmaq contains anthropomorphic, zoomorphic, and a few geometric tokens. However, the anthropomorphic and zoomorphic pieces do not show a resemblance to the tokens found at Monjukli Depe, and the geometric tokens are not depicted (Roustaei et al. 2015, 577; Fig. 4).

204 IC/IIA: 3980-3865 cal BCE, IIB: 3365-3030 cal BCE, IIIB/C: 2400-1900 cal BCE (Dyson 2009).

My initial assumption that it would be possible to utilize distribution patterns as aids in functional interpretation did not prove to be the case. Nevertheless, concentrations of tokens could be observed in certain contexts. The ubiquity, the method of manufacture, and the likely short use lives of tokens indicate that they were objects of limited material value, although their use value could change through the practices associated with them (see also Chap. 11). If, for example, a spell were performed with the aid of tokens, their value would be particularly high, since attention would be centered on influencing the fate of people or other animals. Nevertheless, the fulfillment of a purpose, whatever it was, apparently did not lie in the creation of a long-lasting material object.

Since tokens at Monjukli Depe have variable forms, they could quite likely have been put to different uses. Among the frequently articulated ideas on the functions of tokens in the archaeological literature, four interpretations are plausible for some or all of the tokens at Monjukli Depe: counting or memory tools, gaming pieces, projectiles for use with slings, and animal/human representations. A token or a token group may not have been limited to one of these purposes, but rather a versatile use can be suggested.

In regional and interregional comparisons, the token assemblage from Monjukli Depe stands out. With its over 400 tokens, Monjukli Depe seems to have a nearly unique assemblage for these time periods. The lack of substantial quantities of tokens at other sites, with the exception of Tappe Khaleseh and Tappe Zagheh in Iran, may be due in part to the limited use of rigorous recovery techniques, especially screening. Basic geometric shapes are widely distributed, but modifications of such forms are rarely observed. Both north and south of the Kopet Dag one finds almost exclusively basic forms of tokens, but hardly any evidence for modified examples that differ through the use of pinches, punctures, incisions, or other additional individualizing modifications of the basic shapes.

Catalog

Pages 426-429 list the illustrated tokens (Cat. 13.1-96); catalog numbers may refer to individual or to groups of tokens. Pages 430-440 list tokens that are not illustrated in the catalog.

Cat. #	Group	Shape	Modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	RN	Context	Comments	Illustration
Cat. 13.1	without base	spherical	-	buff	-	-	1.74-1.98	6.3	II	D207	1443.1	EM		
Cat. 13.2	without base	spherical	impression: plant	gray	-	-	1.25-1.35	1.5	II	D207	1443.9	EM		
Cat. 13.3	without base	spherical	pinch: 1x	dark gray	-	-	2.10-2.54	11.7	-	D282	1734.3	pit		Fig. 13.11
Cat. 13.4	without base	spherical	-	gray	-	-	2.08-2.19	7.5	II	D135	638.1	South Street		
Cat. 13.5	without base	disc	impression: reed; incised: curved cut	buff	-	0.70	1.9	2.2	I	C110	5484	EM		
Cat. 13.6	without base	disc	impression: plant	gray	-	0.56	1.69-1.71	1.6	II	D232	1474.6	EM		Fig. 13.8
Cat. 13.7	without base	spherical	1x impression: fingerprint 6x impression: plant	brown to reddish buff	-	-	1.05-1.30	8.5	II	D275	1724.6	EM	7 pieces	Fig. 13.12
Cat. 13.8	without base	disc	impression: plant	buff		0.70-1.00	1.20-1.48	3.7	II	D275	1724.9	EM	3 pieces	Fig. 13.10
Cat. 13.9	without base	disc	impression: textile	buff	-	0.98	1.50	1.6	II	D275	1724.10	EM		Fig. 13.10
Cat. 13.10	without base	disc	-	bufft to gray	-	0.74	1.35-1.80	8.2)	II	D275	1724.7	EM	7 pieces	
Cat. 13.11	with base	squat	2x impression: plant	buff	-	1.21-1.34	1.55	6.4	II	D275	1724.8	EM	3 pieces	
Cat. 13.12	with base	squat	punctured: 2 holes, incomplete	gray	-	2.30	2.35	10.7	I	E223	7713	-		
Cat. 13.13	without base	disc	impression: reed incised: 1 cut	gray	-	1.71	2.51-2.68	-	III	D518	9245.1	-		
Cat. 13.14	without base	spherical	-	black to reddish	-	-	1.1	1.3	I	F51	6460.2a.b	-	2 pieces	
Cat. 13.15	without base	spherical	-	buff	chaff	-	1.7	3.6	II	D253	1550.2b	EM		
Cat. 13.16	without base	spherical	-	buff	-	-	2.4-3.40	23.9	III	D501	9175.1b	Bd 9		
Cat. 13.17	without base	spherical	-	brown	chaff	-	4.55-5.14	79.8	III	D366	9103.1a			
Cat. 13.18	without base	spherical	-	buff	-	-	0.80-1.36		III-II	G37	7223.2a-f	CM	6 pieces	
Cat. 13.19	without base	disc	1x incised: linear cut	buff	-	0.73-0.83	1.22-1.58		III-II	G37	7223.2g-o	CM	9 pieces	
Cat. 13.20	with base	conical	pinch: comb	gray	-	2.20	2.25	7.5	II	D207	1292	EM		
Cat. 13.21	with base	cylindrical	pinch: 3x	buff	-	2.77	1.73	11.0		A34	1138	wall		
Cat. 13.22	with base	conical	pinch: 1x	dark gray	-	2.90	1.74	10.3	II	D253	1550.1	EM		Fig. 13.1k
Cat. 13.23	with base	cylindrical	pinch: zoomorphic	dark brown	-	2.98	2.22	10.4	-	D282	1734.1	pit		
Cat. 13.24	with base	cylindrical	pinch: zoomorphic	brown	chaff	2.56	1.90	7.9	III-II	G12	6994	CM		Fig. 13.1h
Cat. 13.25	with base	cylindrical	pinch: crown	reddish buff	-	2.64	1.93	7.6	III	D514	9282.1	floor		

Cat. #	Group	Shape	Modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	RN	Context	Comments	Illustration
Cat. 13.26	with base	squat	pinch: 3x	buff	-	2.46	2.05	7.8	II	D275	624	EM		
Cat. 13.27	with base	cylindrical	pinch: 5x	buff	-	2.43	1.70	6.7	II	E235	7535	burial MDB9		Fig. 13.1g
Cat. 13.28	with base	cylindrical	pinch: several	buff	-	2.20	1.78	5.2	II	D135	638.2	South Street		
Cat. 13.29	with base	conical	-	buff	-	2.51	2.19	9.4	-	A16	1055a	-		
Cat. 13.30	with base	conical	-	buff	-	2.06	1.90	5.9	-	A16	1055b	-		
Cat. 13.31	with base	conical	-	buff	-	2.35	2.24	9.8	-	Bldg. 3 rm. 3h	3791.1	-		
Cat. 13.32	with base	cylindrical	pinch: comb	buff	-	2.58	2.07	8.9	-	Bldg. 3 rm. 3h	3791.2	-		
Cat. 13.33	with base	squat	pinch: cornered “hat”	buff	chaff	2.67	2.11	14.4	-	Bldg. 3 rm. 3h	3791.3	-		
Cat. 13.34	with base	conical	impression: line	brown	chaff	2.03	1.78	3.9	III-I	F57	6450.3	Berdiev Street		
Cat. 13.35	with base	squat	-	buff	-	1.68	2.80	9.2	III	D356	8213	fill		
Cat. 13.36	with base	cylindrical	pinch: zoomorphic	reddish buff	-	2.42	1.84	10.3	III-I	F57	6450.2	Berdiev Street		
Cat. 13.37	with base	conical	-	brown	-	0.93	0.85	0.8	IV-II	B76	3275	Bd 4		
Cat. 13.38	fragment		pinch: 3 parallel	buff	-	1.67	1.69	4.4	-	D285	1915	pit		
Cat. 13.39	with base	squat	punctured: 1 hole, incomplete	buff	-	1.45	1.81	2.9	II	D268	1698	Bd 1		
Cat. 13.40	with base	conical	-	dark gray	-	1.35	1.30	1.9	II	D207	1284	EM		
Cat. 13.41	with base	cylindrical	pinch: zoomorphic	brown	-	1.49	1.30	2.9	II	D207	1283	EM		
Cat. 13.42	with base	squat	punctured: 1 hole, incomplete	reddish buff	-	1.40	1.65	3.1	I	E298	7990.4	Bd 2		Fig. 13.6
Cat. 13.43	with base	conical	punctured: 1 hole, incomplete	reddish buff	-	1.63	1.88	4.2	I	E298	7990.1	Bd 2		Fig. 13.6
Cat. 13.44	with base	squat	punctured: 2 holes, incomplete	brownish	-	2.01	2.09	7.2	I	E298	7990.2	Bd 2		Fig. 13.6
Cat. 13.45	with base	squat	punctured: 1 hole, incomplete	brownish	-	1.60	2.10	5.8	I	E298	7990.3	Bd 2		Fig. 13.6
Cat. 13.46	with base	squat	-	brownish	chaff	2.29	2.24	6.6	I	E298	7990.7	Bd 2		Fig. 13.6
Cat. 13.47	with base	squat	impression: reed	brownish	chaff	1.50	2.14	3.3	I	E298	7990.8	Bd 2		Fig. 13.6
Cat. 13.48	with base	squat	-	reddish buff	-	1.57	1.77	4.0	I	E298	7990.6	Bd 2		Fig. 13.6
Cat. 13.49	with base	conical	punctured: 3 holes, incomplete	reddish buff	-	1.76	1.92	5.8	I	E298	7990.5	Bd 2		Fig. 13.6

Cat. #	Group	Shape	Modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	RN	Context	Comments	Illustration
Cat. 13.50	with base	cylindrical	-	buff	chaff	2.4	1.4-2.0	7.1	I	E296	10565.2b	round structure		Fig. 13.3
Cat. 13.51	with base	cylindrical	incised: lines	dark gray	chaff	2.3	1.7	6.5	I	E296	10565.2a	round structure		Fig. 13.3
Cat. 13.52	with base	cylindrical	-	buff	chaff	2.2		7.3	I	E296	10565.2c	round structure		
Cat. 13.53	with base	cylindrical	pinch: crown	buff	chaff	2.16	1.36	4.0	I	E296	10565.3b	round structure		
Cat. 13.54	with base	cylindrical	pinch: crown	brown	-	2.67	2.15	5.2	I	E296	10565.3a	round structure		Fig. 13.3
Cat. 13.55	with base	conical	pinch: several pinches	grayish	chaff	2.67	1.85	7.1	I	E296	10565.4	round structure		
Cat. 13.56	with base	squat	pinch: crown; punctured: 1 hole, incomplete	buff	chaff	2.65	2.70	16.4	I	E296	10565.1	round structure		Fig. 13.3
Cat. 13.57	with base	conical	pinch: crown	buff	-	2.20	2.22	6.9	III	C139	5641	wall fall		
Cat. 13.58	with base	conical	pinch: cross	gray	-	2.59	2.34	13.6	-	D536	11561	-		
Cat. 13.59	with base	conical	pinch: comb	gray	-	2.70	2.00	7.3	II	D105	465.1	Bd 1		
Cat. 13.60	with base	conical	pinch; impression: finger nail	reddish buff	-	3.20	1.79	4.3	II-III	G57	7327	CM		
Cat. 13.61	with base	cylindrical	pinch: several	buff	chaff	3.86	2.20	18.2	II	D253	1550	EM		
Cat. 13.62	with base	cylindrical	pinch: zoomorphic	gray	-	3.12	1.93	11.5	III	D455	8696	Bd 10		
Cat. 13.63	with base	cylindrical	pinch: zoomorphic?	buff	-	2.90	2.50	11.0	III	D501	9186.1a	Bd 9		
Cat. 13.64	with base	cylindrical	pinch: 5x	buff	-	3.40	1.90	9.5	I	F51	6457.1b	-		
Cat. 13.65	with base	conical	pinch: cross	dark gray	-	3.10	2.70	14.9	I	F51	6457.1a	-		
Cat. 13.66	with base	squat	-	reddish buff	-	1.60	1.28	2.4	I	F51	6457.2b	-		
Cat. 13.67	fragment		pinch: 3 parallel	reddish brown	chaff	2.70	2.50	22.3	I	F51	6457.1c	-		
Cat. 13.68	with base	conical	-	gray	-	3.50	-	19.6	I	F51	6457.4	-		
Cat. 13.69	with base	cylindrical	-	gray	chaff	1.85	1.97	7.9	II	D207	1407.1j	EM		
Cat. 13.70	without base	spherical	-	dark gray	-				II	D207	1407.1b	EM		
Cat. 13.71	without base	disc	impression: reed	brown	-	0.7	1.84	1.8	II	D207	1407.1e	EM		
Cat. 13.72	with base	cylindrical	-	brown	chaff	1.60	1.60	3.7	II	D252	1629a	EM		
Cat. 13.73	with base	cylindrical	pinch: 1x	reddish buff	-	2.05	1.77	5.2	IV	D701	15117	Bd 14		

Cat. #	Group	Shape	Modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	RN	Context	Comments	Illustration
Cat. 13.74	with base	cylindrical	pinch: comb	buff	sand	3.60	3.20	33.3	I	E290	7928c	-		
Cat. 13.75	with base	conical	pinch: cross	buff	-	2.40	1.90	6.7	I	E290	7928b	-		
Cat. 13.76	with base	conical	-	buff	-	1.90	2.30	7.3	I	E290	7928a	-		
Cat. 13.77	with base	cylindrical	pinch: comb	buff	sand	3.40	2.50	20.0	I	E290	7928d	-		
Cat. 13.78	with base	conical	punctured: 2 holes, unclear if complete	reddish buff	-	2.44	2.73	12.3	IV	D727	15331	Bd 14		
Cat. 13.79	with base	conical	punctured: 1 hole, incomplete	buff	chaff				I	E298	10533.1a	Bd 2		
Cat. 13.80	with base	squat	-	brown	-	2.50	-	10.7	I	E298	10533.1f	Bd 2		
Cat. 13.81	with base	conical	punctured: 1 hole, incomplete	reddish buff	chaff				I	E298	10533.1b	Bd 2		
Cat. 13.82	with base	squat	-	dark gray	chaff				I	E298	10533.1c	Bd 2		
Cat. 13.83	with base	squat	punctured: 2 holes, incomplete	buff	chaff				I	E298	10533.1d	Bd 2		
Cat. 13.84	diverse	diverse	pinch	brown	fine chaff	3.4 x 3.4	-	11.2	IV	D482	8877	Bd 14		
Cat. 13.85	with base	conical	pinch: comb	reddish	-	3.30	2.17	7.4	I	C96	5429	EM		
Cat. 13.86	with base	conical	pinch: cross; punctured: 2 holes, incomplete	buff	-	2.58	2.37	9.7	II-I	B172	3749	Bd 3		
Cat. 13.87	with base	cylindrical	pinch: crown	reddish gray	-	2.76	2.83	17.4	I	C110	5481	EM		
Cat. 13.88	with base	cylindrical	pinch; impression	reddish buff	-	1.93	1.74-2.20	10.3	I	D70	333	burial MDB5		
Cat. 13.89	with base	cylindrical	punctured: 1 hole, complete	black	-	1.65	1.43	2.1	III	D508	9189	-		
Cat. 13.90	with base	conical	pinch: anthropomorphic	grayish buff	-	3.07	2.19-2.31	11.4	II	D208	1334.1	EM		
Cat. 13.91	with base	conical	pinch: zoomorphic	gray	-	2.83	1.70-1.85	6.3	II	D240	1481	EM		
Cat. 13.92	with base	conical		-	-	2.83	2.20	8.8	I	E246	10562	Bd 13		
Cat. 13.93	with base	conical	pinch: 1x	gray	-	3.18	3.05-3.10	26.2	II	D243	1494	South Street		
Cat. 13.94	with base	squat	pinch	gray	-	1.70	1.9-2.6	5.3	I	F86	9658	Bd 15		
Cat. 13.95	with base	squat	punctured: 2 holes. 1 complete	dark gray	-	1.73	2.38	6.2	-	D529	11599	-		
Cat. 13.96	without base	disc	impression: reed; incised: 2 cuts	brownish	chaff	0.64	1.00	0.7	I	D189	866	EM		

Conical tokens										
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Illustration
1334.2	-	grayish buff	-	1.85	1.88-1.95	5.4	II	D208	EM	
1334.3	punctured: 3 holes, incomplete; pinch: unclear	gray	-	1.53	1.61-1.79	4.2	II	D208	EM	
1443.5	-	buff	-	1.14	1.37-1.51	2.3	II	D207	EM	
1538.2b	impression: fingerprint	reddish	-	1.26	1.75-2.3	4.4	II	D240	EM	
1538.2a	pinch: comb	buff	-	2.07	1.98-2.2	6.3	II	D240	EM	
1620	-	reddish buff	-	1.15	1.68	2.4	-	D255	-	
1724.3	punctured: 3 holes, incomplete	reddish buff	-	1.59	1.35	1.7	II	D275	EM	
1739.7	-	reddish buff	-	2.13	1.61	4.0	II	D281	EM, surface	Fig. 13.4
1949.1	-	buff	-	2.80	2.12-2.27	9.4	II	D321	EM	
5411	-	brownish	-	1.71	2.20	7.0		C91	-	
6450.4	-	buff	chaff	1.59	1.84	6.3	III-I	F57	Berdiev Street	
7180.1a	-	reddish buff	chaff	1.56	1.41	2	III-II	G37	CM	
7296.1	-	gray	-	2.30	1.94	6.1	III-II	G56	CM	Fig. 13.5
7296.2a	-	gray	-	1.3-1.50	1.0-1.60	2.6	III-II	G56	CM	Fig. 13.5
7482.1	-	brownish	-	2.9	1.49-1.85	10.3	III-II	G78	CM	
7781	-	brownish	-	2.75	1.45-2.05	8.4	I	E269	fill	
7832	-	brown	chaff	1.56	2.17	5.3	-	E267	-	
7839	pinch: round	buff	-	1.80	2.4-2.6	9.6	I	E255	Bd 2	
7846	-	light gray	-	1.70	0.82-2.4	4.6	-	E267	-	
7863.1	pinch: 4x; punctured: 5 holes, incomplete	buff	-	2.02	2.3-2.50	8	I	E255	Bd 2	
7950.1	pinch: 4x	buff	-	2.41	2.09	6.9	I	E214	exterior surface	
7950.3	pinch: 8x	buff	-	2.30	1.86	6.7	I	E214	exterior surface	
8139	-	light gray	-	2.20	2.26	8.6	III	D332	-	
8217	-	buff	chaff	2.16	2.03	5.2	III	D366	-	
8356.1	impression: lines; pinch: zoomorphic	buff	-	3.24	2.36	16.0	II	D411	EM	Fig. 13.1 l

Conical tokens										
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Illustration
8772.2	-	buff	chaff	1.94	2.34	5.0	III	D463	-	
9036	-	buff	-	2.00	2.10	5.9	III	D388	-	
9061	-	buff	chaff	2.25	2.18	10.7	III	D368	wall fall	
9075	incised: 1 line	brown	-	1.73	2.30	7.1	III	D393	-	
9090	-	buff	-	2.50	2.20	7.2	III	D356	-	
9175.1f	-	buff	-		1.51		III	D501	Bd 9	
9175.1g	pinch: unclear	buff	-		1.51		III	D501	Bd 9	
9186.1b	-	buff	-	1.70	1.34	2.9	III	D501	Bd 9	
9624	-	-	-	2.3	1.8	5.2	I	F78	Bd 15	
10553.2	-	gray	-	2.15	1.90	6.4	I	E290	-	
16005	pinch: zoomorphic	buff	chaff	3.50	2.45-2.94	22.1	-	D608	-	
16191	-	gray	-	3.73	3.32	33.8	IV	D645	-	
16256	-	buff	-	2.23	2.60	5.5	IV	D650	-	
25060	-	brown	-	1.80	1.86	4	-	H50	pit fill	
13014.1	pinch: zoomorphic	buff	-	2.08	1.47	3.8	recent	L5	-	

Squat tokens

RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
366	-	gray to brownish	-	2.18	2.01	9.7	II	D89	exterior space		
367	pinch: 1x	brown	-	1.43	1.86	3.5	II	D89	exterior space		
411	-	gray	-	1.84	1.81	6.8	II	D83	Bd 1		
603	-	reddish buff	-	1.68	1.73	4.2	-	D138	-		
663	impression: fingerprint; pinch: comb	gray	-	2.23	2.07-2.32	9.1	II	D240	EM		
765	-	brown	-		1.17	1.1	II	D161	Bd 3		
1055c	-	buff	-	2.04	-	7	-	A16	-		
1305	impression: unclear	buff	-	1.44	2.6-2.9	10	II	D208	EM		
1334.4	punctured: 2 holes, 1 complete	gray	-	1.82	1.73-1.99	5.5	II	D208	EM		
1334.5	impression: plant	reddish gray	-	0.60	1.78	1.5	II	D208	EM		
1407.1k	-	brown	chaff	1.83	2.18	8.5	II	D207	EM		
1407.1l	-	reddish	-	2.76	2.70	13.6	II	D207	EM		
1443.2	-	gray to brown	-	0.84	0.99-1.10	0.8	II	D207	EM		
1443.4	-	gray	-	0.79	1.05-1.33	1.2	II	D207	EM		
1474.1	-	brown	-	1.58	1.89	6.7	II	D232	EM		
1474.2	-	brown	-	1.65	2.21	7.2	II	D232	EM		
1591	-	buff	-	2.18	1.66	5.6	II	D251	EM		
1564	-	buff	-	2.42	1.90	9.0	II	D248	EM		
1629	-	yellowish buff	-	0.90	0.9-1.10	0.9	II	D252	EM		
1724.1	punctured: 8 holes, incomplete	gray	-	1.59-1.69	1.90-1.98	5.6	II	D275	EM		Fig. 13.7
1739.1	-	gray	-	1.59-1.73	1.64-1.93	4.5	II	D281	EM, surface		Fig. 13.4
1739.12	-	buff to gray	-	2.21	1.76	8	II	D281	EM, surface		
1739.2	-	reddish gray	-	1.72	2.14	5.6	II	D281	EM, surface		
1739.3	punctured: 3 holes	gray	-	1.94-2.04	2.17-2.32	10.8	II	D281	EM, surface		
1739.5	pinch: several	reddish gray	-	1.89	1.47	3.3	II	D281	EM, surface		Fig. 13.4
1954.1	punctured: 3 holes	brown	-	2.40	2.55-2.90	14.6		D320	-		

Squat tokens											
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
3493	pinch: 2x	buff	-	2.68	2.06	10.2	II-I	B126	Bd 3		
3668	impression: plant	buff	-	3.87	2.55-2.63	20.2	II-I	B158	Bd 3		
4732a	-	dark gray	-	1.32	1.49	2.7	I	E79	pit		
6457.2a	-	brown	-	2.35	2.00	6.4	I	F51	-		
7263	-	brownish	-	1.90	1.8-1.90	3.9	-	G44	CM		
7128.2	-	reddish buff	-	1.01	1.12	15.1	III-II	G28	CM		
7154.3	-	buff	-	2.07	2.76	12.6	III-II	G37	CM		
7154.4	-	buff	chaff	0.79-1.25	1.1-2.00	0.9-4.8	III-II	G37	CM	4 pieces	
7261.3a	-	dark brown	-	1.40	1.42	1.7	-	G44	CM		
7261.3b	-	dark brown	chaff	1.02	1.22	1.5	-	G44	CM		
7686a	-	buff to brownish	-	2.12	1.90	7.3	I	E254	Bd 2		
7686b	-	buff to brownish	chaff	2.19	2.04	10	I	E254	Bd 2		
7863.3	-	buff	-	1.90	2.3-2.50	7.7	I	E255	Bd 2		Fig. 13.1c
8111	-	buff	-	2.30	2.20	10.3	III	D351	pit		
8893.3	impression: lines	brown	coarse chaff	1.65	2.77	11.3	IV	D485	Bd 14		
9230.3a	-	buff	chaff	1.71	1.31	4	III	D380	-		
9293	-	brown	-	1.67	2.3	3.1	IV	D584	Bd 14		
9504.9	punctured	brown	-	2.88	2.82	13	I	F64	Bd 15		
9821.1a	-	brown	chaff	2.30	2.75	20.5	IV	D488	Bd 14		
9821.1b	-	brown	coarse chaff	2.58	2.86	17.8	IV	D488	Bd 14		
10533.1e	punctured	dark gray, reddish buff, brownish	-	1.3-1.80	1.8-2.00	3.1-5.2	I	E298	Bd 2	5 pieces	
10565.7	-	buff	chaff	2.38	1.25-2.10	6.9	I	E296	round structure		
11641	-	buff	chaff	1.67	2.02	6.2	III	D551	Bd 9		
25010.2	-	reddish buff	-	1.73	2.35	5.7	-	H47	pit fill		
25116.1	pinch: zoomorphic	buff	-	3.01	1.41	8	-	H59	pit fill		

Cylindrical tokens										
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Illustration
1724.2	punctured: 1 hole, complete	brown	-	2.13	1.94-2.27	9.3	II	D275	EM	Fig. 13.7
7898	pinch: crown	gray	chaff	6.04	3.23-4.33	93.3	I	E262	exterior surface	Fig. 13.1 f
8533.1	pinch: unclear	brown	chaff	2.64	1.91	9	-	D307	-	Fig. 13.1 i

Disc-shaped tokens											
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
422	impression: plant	buff	-	1.00	1.15	1.7	II	D105	Bd 1		
411a	-	gray	-	-	1.51-1.82	3.2	II	D83	Bd 1		
411b	-	gray	-	0.57	-	1.6	II	D83	Bd 1		
411c	-	gray	-	0.60	-	1.7	II	D83	Bd 1		
465.2	impression: reed	gray	-	0.68	1.60-1.95	2.0	II	D105	Bd 1		
483.1	impression: reed	gray	fine chaff	0.84	2.50	5	II	D89	exterior space		Fig 13.9
533.3	-	reddish	-	0.60	1.07-1.21	0.7	II	D89	exterior space		
958.1	-	gray	-	1.75	3.40	17.5	II	D197	Bd 1		
1334.8	punctured: 1 hole, incomplete	buff	-	1.26	1.72	4.4	II	D208	EM		
1407.1	impression: reed (1x)	dark gray; brown (3)	-	0.55-0.90	1.2-1.54	0.9-2.5	II	D207	EM	4 pieces	
1407.1f	impression: reed	-	-	0.70	1.84	1.8	II	D207	EM		
1474.10	impression: fingerprint	buff	-	0.77	1.32	1.5	II	D232	EM		Fig. 13.8
1474.4	-	buff	-	0.50	1.20	0.9	II	D232	EM		Fig. 13.8
1474.5	-	gray	-	0.65	1.61-1.75	2.1	II	D232	EM		Fig. 13.8
1474.8	-	gray	-	0.66	1.48-1.65	1.6	II	D232	EM		Fig. 13.8
1474.9	impression: unclear	buff	-	0.72	1.40-1.82	1.8	II	D232	EM		Fig. 13.8
1491.2a	incised: 2 parallel cuts	buff	-	0.49	1.65	1.2	II	D236	EM		
1538.2d	-	brown	-	1.00-1.20	1.70	4.6 (together)	II	D240	EM	2 pieces	
1582a	impression: unclear	brownish	chaff	1.10	1.70	2.4	II	D251	EM		
1582b	-	brownish	-	0.60	1.47	1.6	II	D251	EM		

Disc-shaped tokens											
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
1724.9c	impression: plant	dark gray	-	0.70-1.00	1.2-1.48	1.2	II	D275	EM		
1734.5	-	buff	-	0.80-0.87	1.25-1.45	2.2 (together)	-	D282	pit	2 pieces	
1788.1	-	buff	-	0.25	1.85	0.9	-	D80	-		
1788.2	-	reddish buff	-	0.65	1.45	1.3	-	D80	-		
1884.1	-	buff	-	0.60	1.99	1.6	II	D232	EM		
3709	-	buff	-	0.66	1.91	2.4	II-I	B163	Bd 3		
4731.2	-	brown	chaff	0.86	2.35	2.8	I	E79	pit		
4732b	impression: plant	brownish	fine chaff	1.20	1.74	2.8	I	E79	pit		
4910	punctured: 2 small holes; impression: lines	reddish brown	-	1.20	1.54	2.7	I	E209	Bd 2		
5613	pinch: 1x	reddish buff	-	2.02	3.57	9.8	II	C128	-		
6047	-	light gray	-	1.87	3.75	24.7	IV-III	B237	Bd 3		
6460.2	-	buff	-	0.30-0.40	0.90	1.6 (together)	I	F51	-	2 pieces	
6493.1c	impression: dots	reddish buff to grayish buff	-	0.70	1.61	1.9	I	F64	Bd 15		
7028.1	-	reddish buff	-	0.46	1.05	0.4	recent-III	G8	-		
7128.1	incised: curved cut	reddish buff	-	0.75	1.50	1.6	III-II	G28	CM		
7154.4	-	buff, reddish buff, dark gray, brownish	-	0.44-0.65	1.24-1.98	1.1-2.4	III-II	G37	CM	7 pieces	
7179.2	incised: linear cut	reddish orange, brownish	-	0.41-1.00	1.20-1.77	0.8-2.2	III-II	G37	CM	9 pieces	
7203.2	-	gray	-	0.80-1.58	1.20-1.30	0.7-1.7	III-II	G37	CM	2 pieces	
7232.2	-	brownish, reddish buff	-	0.60-0.81	1.38-1.59	4.2	-	G44	CM	3 pieces	
7482.2	-	brownish	-	1.18	1.4-1.78	3	III-II	G78	CM		
7714	-	light gray	-	1.42	3.12-3.57	15.9	I	E223	-		
8344.3	-	buff	chaff	0.47-1.37	1.57	4.2	II	D408	EM		
8465	-	buff	chaff	1.04	1.92	3.30	II	D431	EM		
8725.1	impression: fingerprint	reddish buff	-	1.07	2.50	6.7	II	D459	-		

Disc-shaped tokens											
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
9175.1a	-	buff	-	0.8-1.39	1.48-3.00	1.3-11.1	III	D501	Bd 9	4 pieces	
9175.1b1	-	buff	-	2.40	3.40	23.9	III	D501	Bd 9		
9230.3b	impression: linear cuts	buff	chaff	1.04	1.30	4.0	III	D380	-		
9230.4	impression: plant (3 pieces)	buff to reddish	-	1.43-1.56	2.21-3.23	39.7	III	D380	-	5 pieces	
9230.5	-	brownish	chaff	1.79	3.12	1.7	III	D380	-		
9279.1	-	gray	-	1.81	2.14-2.43	10.2	III	D380	-		
9507	-	light gray	-	1.22	1.14-1.52	2.6	I	F68	Bd 11		
9932	impression: fingerprint	dark gray	-	1.90	2.84	10.1	IV	D485	Bd 14		
10534.2a	impression: reed	dark brown	-	0.75	1.16	1.85	I	E298	Bd 2		
10534.2b	-	dark brown	-	0.75	1.47	1.85	I	E298	Bd 2		
10547.1	impression: finger nail	brown	-	5.4	1.68	1.6	I	E301	Bd 2/ Bd 13		
10570.1	impression: line	buff	-	0.39-1.20	1.30-2.30	5.2 (together)	I	E296	round structure	2 pieces	
25181.1	-	brown	-	0.90	1.30	1.5	V-VI	H69	-		

Spherical tokens											
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
328	impression: fingerprint	buff	-	-	1.75-2.43	8.8	I	D78	-		
483.2	-	reddish brown	chaff	-	1.90	4.1	II	D89	exterior space		Fig 13.9
483.3	-	reddish	-	-	1.49	2.6	II	D89	exterior space		Fig 13.9
629	-	brownish	-	-	1.40	2.6	- --	D142	-		
684.1	-	reddish	-	-	1.47	2	II	D153	Bd 3		
737	-	light gray	-	-	1.61	-	-	D148	-		
1312	-	gray	-	-	1.02-1.14	1.4	II	D208	EM		
1334.6	impression: plant	gray	-	-	1.23-1.34	1.7	II	D208	EM		
1334.7	-	gray	-	-	1.64-1.73	3.8	II	D208	EM		

Spherical tokens

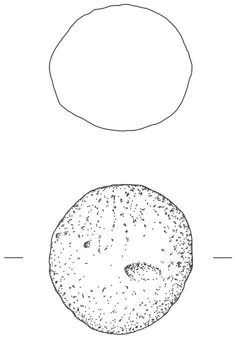
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
1407.1	-	buff, dark gray	chaff (1 piece)	-	0.77-1.24	0.6-2.2	II	D207	EM	4 pieces	
1408	-	brownish	-	-	1.10	1.0	-	D224	pit		
1474.7	impression: fingerprint	gray	-	-	1.14-1.24	1.5	II	D232	EM		
1491.2b	impression: 1 cut	buff	-	-	1.21	1.7	II	D236	EM		
1538.2	-	whitish	fine chaff	-	1.20-1.40	1.5	II	D240	EM		
1550.2	-	buff	chaff (1 piece)	-	0.77-1.38	3.5 (together)	II	D253	EM	4 pieces	
1661	impression: plant	gray	chaff	-	1.49	2	II	D257	EM		Fig. 13.11
1739.10	impression: curved cut	brown	-	-	1.43-1.65	2.5	II	D281	EM, surface		
1739.6	-	reddish buff	-	-	1.21-1.37	2.1	II	D281	EM, surface		
1875	-	yellowish to greenish buff	coarse chaff	-	1.20-2.48	11.6	I	D182	EM		
3442.2	impression: finger nail	brown	-	-	1.00	1.0	I-II	B118	Bd 3		
6493.1a	-	reddish buff to grayish buff	-	-	1.06	1.0	I	F64	Bd 15		
6493.1b	-	reddish buff to grayish buff	-	-	1.59	4.2	I	F64	Bd 15		
7142	-	buff	-	-	1.12-1.32	1.6	III-II	G22	CM		Fig. 13.11
7154.2	-	reddish buff	sand	-	2.60	7.9	III-II	G37	CM		
7154.3	-	dark gray	-	-	1.24	1.5	III-II	G37	CM		
7154.4	-	reddish buff, brownish	chaff (2 pieces)	-	1.10-2.00	0.9-4.8	III-II	G37	CM	4 pieces	
7179.3	-	brown	-	-	2.30	6.1	III-II	G37	CM		
7203.2a	-	gray	-	-	1.2-1.30	2.1	III-II	G37	CM		
7203.2b	-	gray	-	-	1.77	2.1	III-II	G37	CM		
7261.3c	-	reddish buff	-	-	1.03	1.7	-	G44	CM		
7684a	-	light gray	-	-	1.39	0.7	I	E249	Bd 2		
7684b	-	light gray	-	-	1.05	0.7	I	E249	Bd 2		
7757	-	buff	-	-	1.55	2.7	I	E265	Fl 2		
7971	-	buff	chaff	-	1.20	1.1	I	E278	Bd 2		

Spherical tokens											
RN	Kind of modification	Color	Inclusions	Height (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Context	Comments	Illustration
8036	-	reddish buff	-	-	1.3-1.35	2.5	III	D344	pit		Fig. 13.11
8382.1	-	dark brown	-	-	1.7-1.99	6.5	II	D413	EM		
9030	-	buff	coarse chaff	-	1.23	1.0	III	D388	-		
9103.1b	-	brown	-	-	2.58-2.71	15.4	III	D366	-		
9131.1a	-	creamy buff	sand	-	1.10	1.2	III	D501	Bd 9		
9131.1b	-	creamy buff	sand	-	-	10.7	III	D501	Bd 9		
9502.1a	-	buff	-	-	1.71	5.5	I	F64	Bd 15		
9522	-	brown	-	-	1.20-1.30	2.1	I	F71	Bd 15		Fig. 13.11
9591.2	-	buff	-	-	0.79	0.5	I	F80	Bd 11		
9642.2	-	buff	-	-	1.20-1.25	2.4	I	F82	Bd 15, surface		
10516.1a	-	light gray	-	-	0.80	1.0	-	E267	-		
10516.1b	-	light gray	-	-	0.98	.01	-	E267	-		
10570.1a	-	buff	-	-	0.09	0.9	I	E296	round structure		
10570.1b	-	buff	-	-	1.00	0.9	I	E296	round structure		
16406.1	impression: reed	creamy	-	-	2.37	12.7	VII	D693	cleaning locus		
25098.1	-	reddish buff	-	-	1.55-1.84	4.5	-	H56	pit fill		
25125.1	-	buff	-	-	2.04-2.59	15.8	-	H60	pit fill		

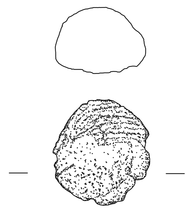
Fragments										
RN	Kind of modification	Color	Inclusions	Dimensions (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Attribution	Illustration
1443.6	-	buff	-	1.54/1.11/0.97	-	1.7	II	D207	EM	
1474.3	-	buff	-		1.28-1.40	3.2	II	D232	EM	
1588.1	punctured: 1 hole, complete	brown	chaff	3.1/2.4	-	1.7	II	D207	EM	
1640.1	pinch: circular; impression: round	light brown	-	-	2.37	4.7	II	D257	EM	
1734.2	-	dark gray	-	1.88	2.3	9.1	-	D282	pit	
1734.7	-	gray	-	0.89-1.0/1.31	1.23	1.6	-	D282	pit	
1739.4	-	gray	-	1.37	2.34-2.61	11	II	D281	EM	
1739.8	-	reddish buff	-	-	2.28-2.53	7.7	II	D281	EM	
1739.9	-	brown	-	1.09	1.79-2.02	2.5	II	D281	EM	
4934	-	light gray	-	1.88-2.17/1.1-1.3	-	6.0	I	E215	exterior surface	
5485	-	gray	-	1.48	1.78-1.86	5.3	I	C110	EM	
6459	-	reddish buff	-	2.4	2.3	5.4	I	F51	-	
6457.3a	-	grayish	-	1.7/1.6	-	2.9	I	F51	-	
6457.3b	-	reddish	-	1.87	2.4	8.4	I	F51	-	
6774	-	-	-	2.3/2.0	-	7.7	VIII	C312	exterior surface	
6460.5	-	gray	-	3.65/1.32	-	8.4	I	F51	-	
7154.3	-	gray	-	0.86	1.87	3.2	III-II	G37	-	
7180.1b	-	red	chaff	1.32	1.29	2	III-II	G37	-	
7296.2b	-	gray	-	1.3-1.5/1.0-1.6	-	2.6	III-II	G56	CM	Fig. 13.5
7930	-	light gray	sand (?)	2.47/2.28/1.9	-	8.6	I	E290	-	
7950.2	-	buff	chaff	1.05	1.82	4.3	I	E214	exterior surface	
8530.2	-	gray	-	1.38/1.42	2.36	3.6	-	D308		
6450.1	pinch: 1x	gray	chaff	2.81	1.86	8.2	III-I	F57	Berdiev Street	
8822.1	-	brown	-	1.68/1.23	-	1.8	III-II	D458	Bd 14	
9131.1c	-	creamy buff	-	1.9/2.3	1.97-2.5	7.1	III	D501	Bd 9	
9175.1h	-	buff	-	1.57	2.2	5.7	III	D501	Bd 9	

				Fragments						
RN	Kind of modification	Color	Inclusions	Dimensions (cm)	Diam. (cm)	Wt. (g)	Stratum	Locus	Attribution	Illustration
9175.1i	-	buff	-	1.51/ 1.93-2.7	-	3.2-7.3	III	D501	Bd 9	
9502.1b	-	buff	-	-	1.6	3.1	I	F64	Bd 15	
9648	-	gray	-	2.18	2.84	18.4	I	F89	Bd 11	
15238	-	brown	-	2.55	2.46	13.2	IV	D715	Bd 14	
15288	-	brown	chaff	1.74	1.88	5	IV	D722	Bd 14	
25041	-	reddish buff	-	0.77	1.65	1.4		H48	pit	
10565.5	-	buff	chaff	1.49/1.75	2.1	3.7	I	E296	round structure	
10570.1	-	buff	-	2.5	3.2	19.9	I	E296	round structure	
10588.1	-	light gray	-	1.2	1.59	3.9	I	E296	round structure	
25025.2a	-	reddish buff	chaff	1.58/ 1.63/1.73	-	2.6	-	H47	pit	
25025.2b	-	reddish buff	-	1.98	1.98	2.8	-	H47	pit	

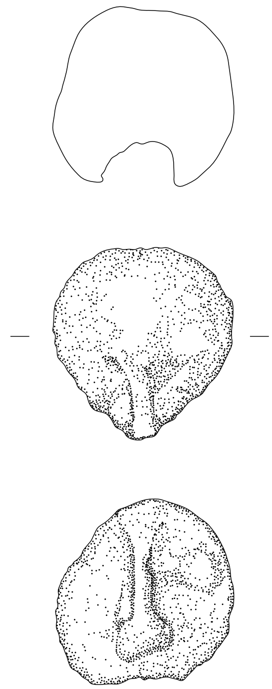
Tokens: Cat. 13.1-6, 13.20-22



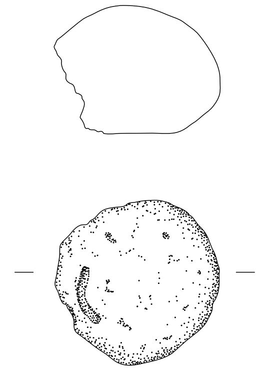
Cat. 13.1.



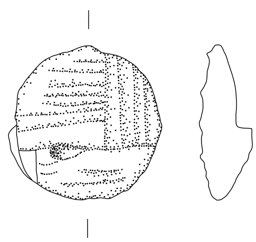
Cat. 13.2.



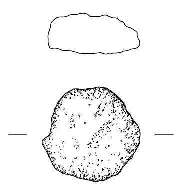
Cat. 13.3.



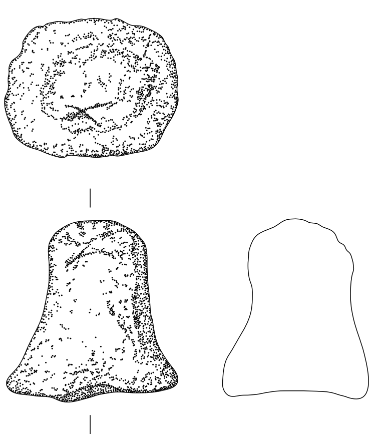
Cat. 13.4.



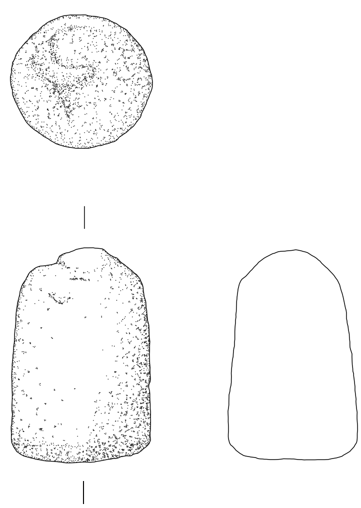
Cat. 13.5.



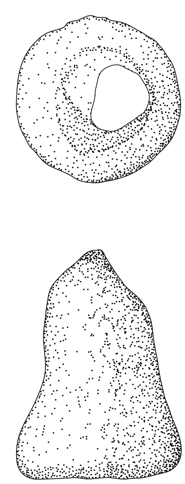
Cat. 13.6.



Cat. 13.20.



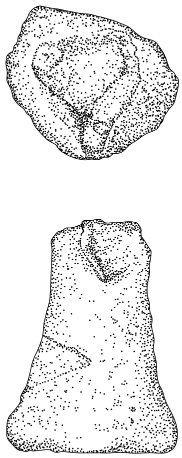
Cat. 13.21.



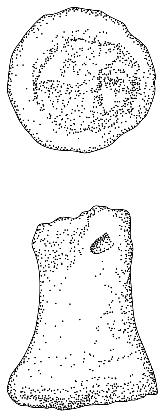
Cat. 13.22.

2.5 cm

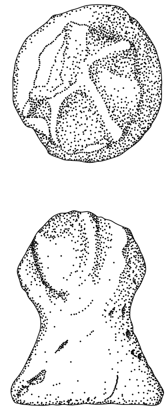
Tokens: Cat. 13.23-31



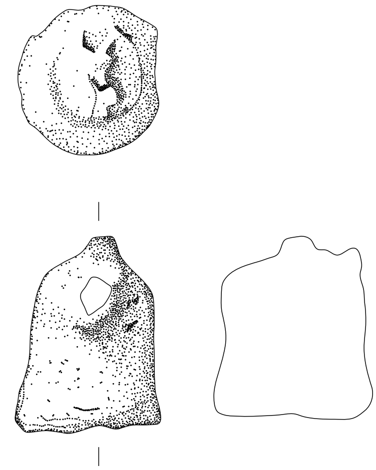
Cat. 13.23.



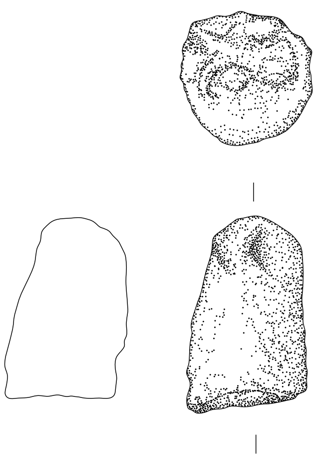
Cat. 13.24.



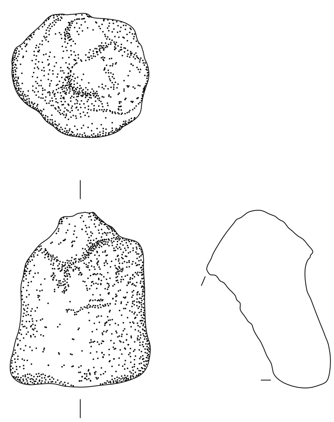
Cat. 13.25.



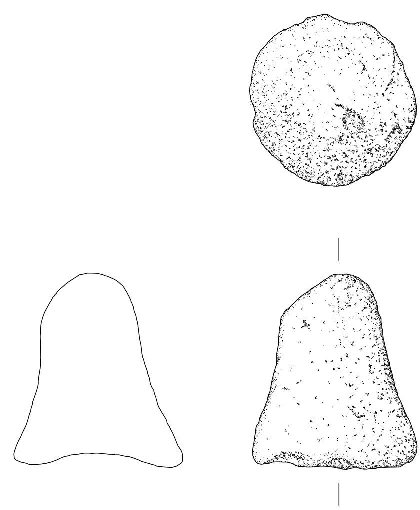
Cat. 13.26.



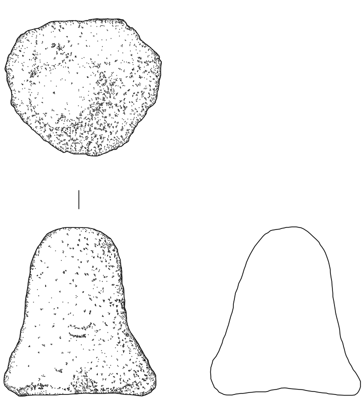
Cat. 13.27.



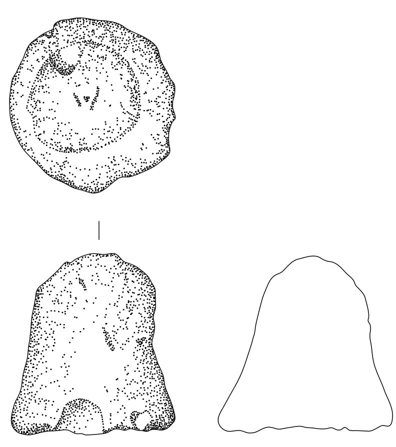
Cat. 13.28.



Cat. 13.29.



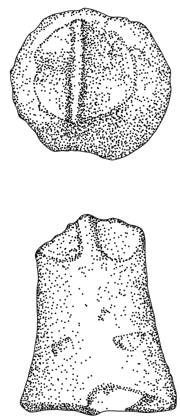
Cat. 13.30.



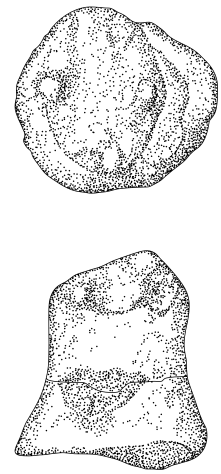
Cat. 13.31.

2.5 cm

Tokens: Cat. 13.32-39

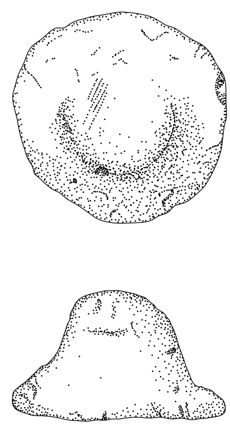


Cat. 13.32.

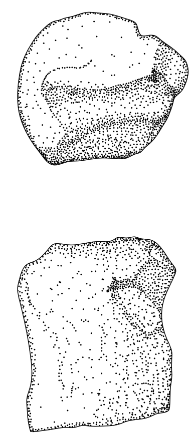


Cat. 13.33.

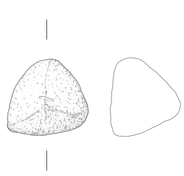
Cat. 13.34.



Cat. 13.35.



Cat. 13.36.



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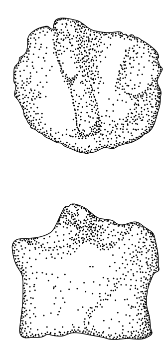

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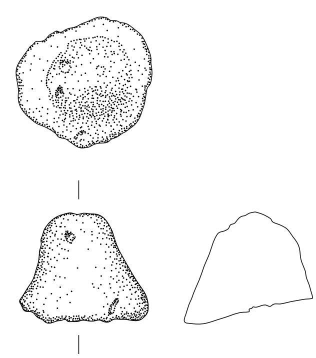
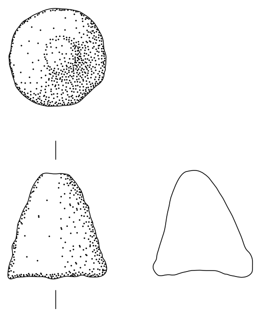


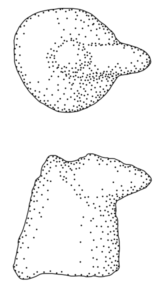
Cat. 13.39.

2.5 cm

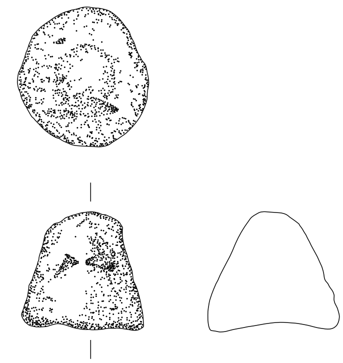
Tokens: Cat. 13.40-48



Cat. 13.40.

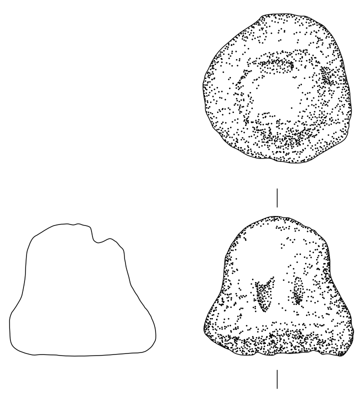


Cat. 13.41.

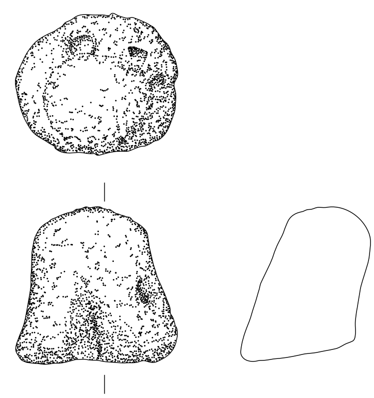


Cat. 13.42.

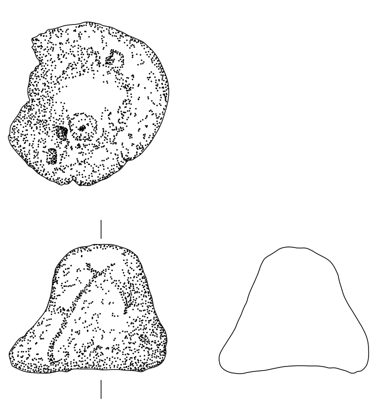
Cat. 13.43.



Cat. 13.44.

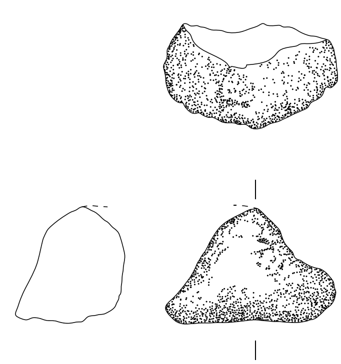


Cat. 13.45.



Cat. 13.46.

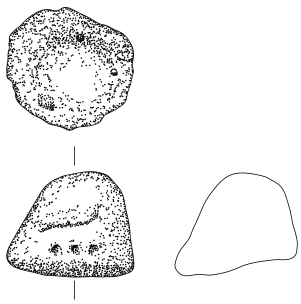
Cat. 13.47.



Cat. 13.48.

2.5 cm

Tokens: Cat. 13.49, 13.59, 13.61, 13.85-86



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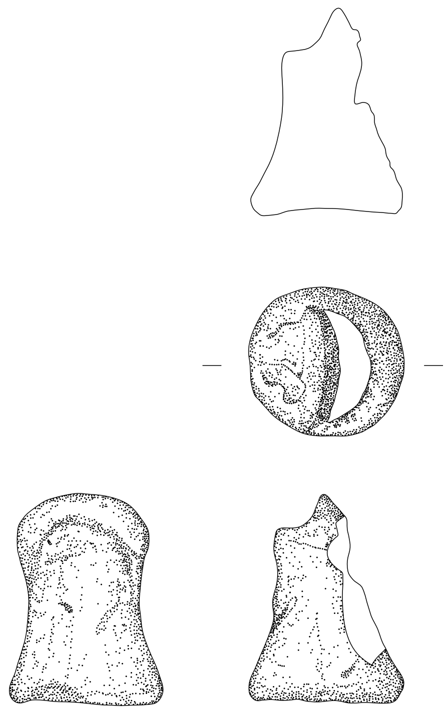

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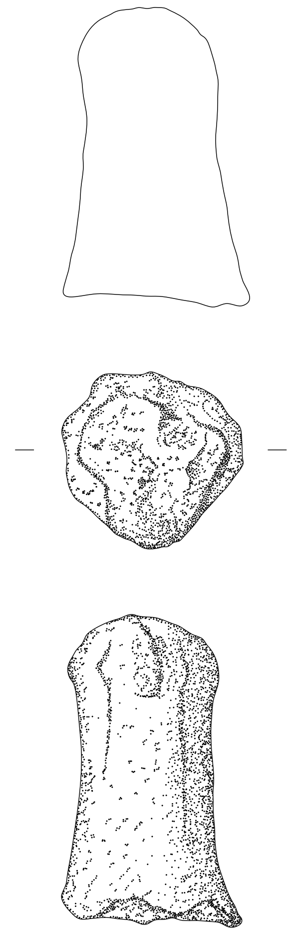

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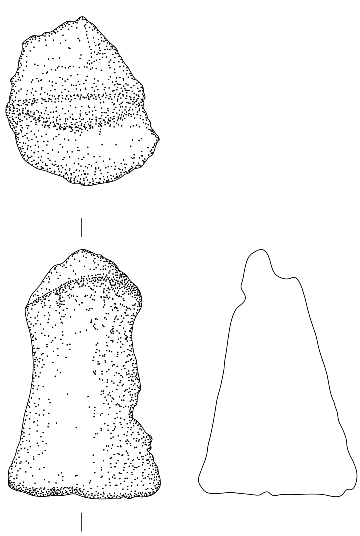

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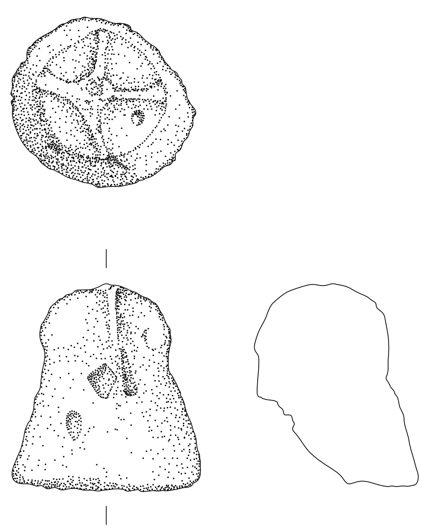

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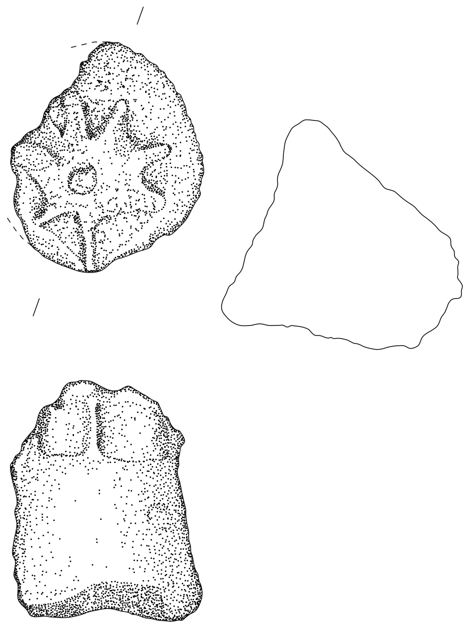

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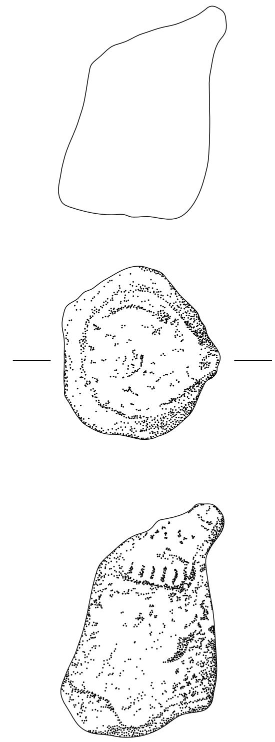

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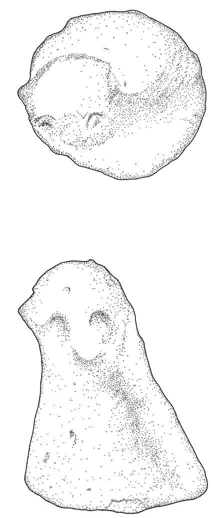

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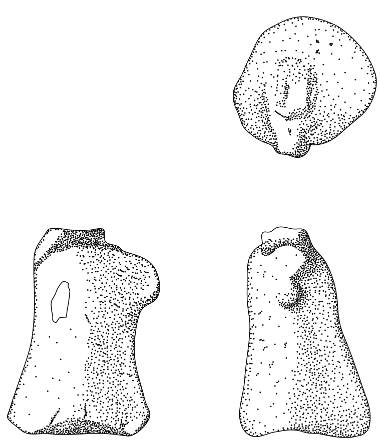

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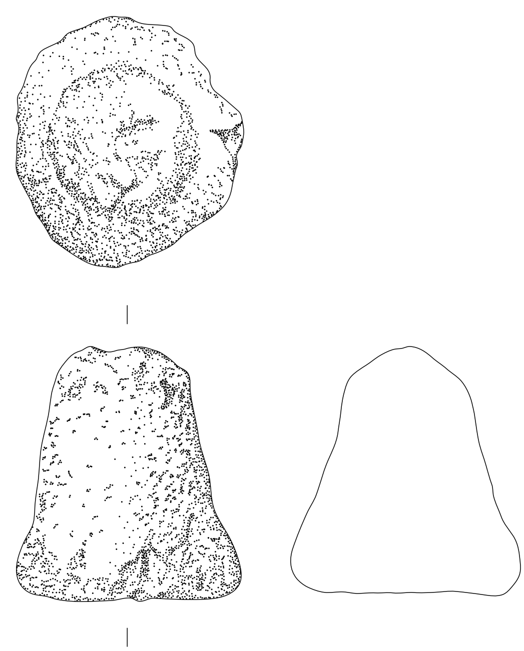

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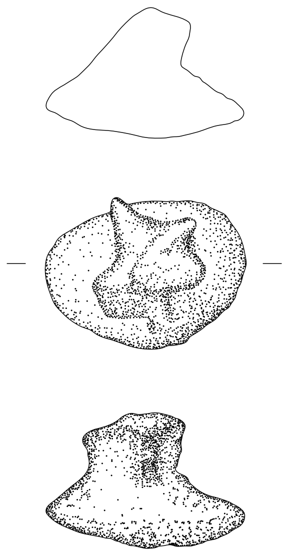

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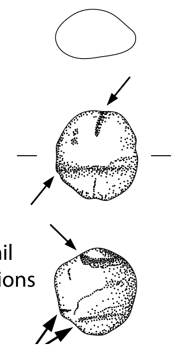

Cat. 13.96.

Tokens: Cat. 13.7-11

Cat. 13.7.

Cat. 13.9. Upper row.
Cat. 13.8. Lower row.

Cat. 13.10. Seen from above.

Cat. 13.10. Seen from the side.

Cat. 13.11.

Tokens: Cat. 13.12-19, 13.35

Cat. 13.12.

Cat. 13.13.

Cat. 13.14.

Cat. 13.15.

Cat. 13.16.

Cat. 13.17.

Cat. 13.35.

Cat. 13.18. Middle row.
Cat. 13.19. Upper and lower row.

Tokens: Cat. 13.50-56

Cat. 13.50, 13.51, 13.52. Upper row.
Cat. 13.53, 13.54, 13.55, 13.56. Lower row.
Upper photo: view from above.
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Tokens: Cat. 13.57-63

Cat. 13.57.

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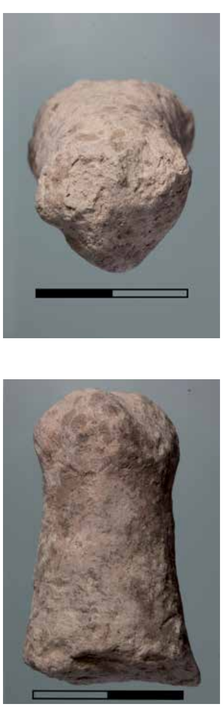

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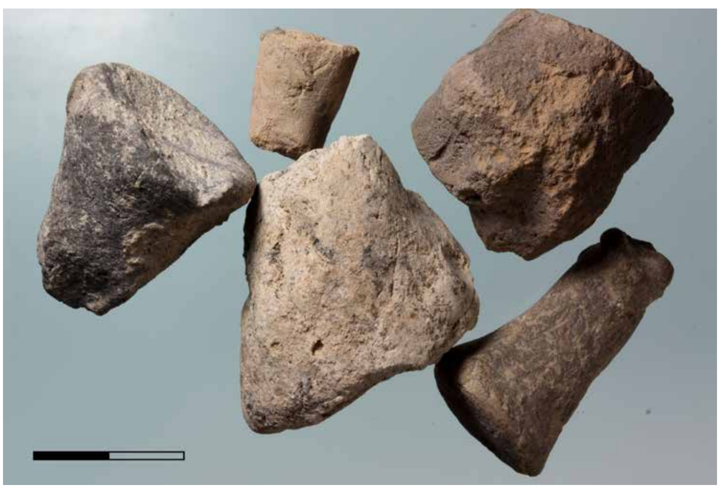

Cat. 13.64, 13.65, 13.66. Upper row, upper photo.
Cat. 13.67, 13.68. Lower row, upper photo.
Upper photo: view from above.
Lower photo: view from the side.

Cat. 13.69, 13.70, 13.71.

Cat. 13.72, 13.73.

Tokens: Cat. 13.74-78

Cat. 13.78. Lower photo from below.

Cat. 13.74, 13.75 (above)**, 13.76.** (below)**, 13.77.**
Upper photo: view from above.
Lower photo: view from the side.

Tokens: Cat. 13.79-84, 13.89, 13.92, 13.95-96

Cat. 13.79, 13.82, 13.80, 13.81, 13.83. In columns from upper left to lower right.

Cat. 13.84.

Cat. 13.84. Second view.

Cat. 13.89.

Cat. 13.92.

Cat. 13.95.

Cat. 13.96.

Chapter 14

Looking Closely, Looking Back

Susan Pollock and Reinhard Bernbeck

Keywords: *cultural technique; pyrotechnology; burial practice; work; political ecology; house; collective memory; dwelling; regime of visibility*

Introduction

In this final chapter we return to a number of topics that have been addressed in the volume, from *Kulturtechniken* to the structure of the village and individual houses. We also examine themes that are only implicitly present in the previous discussions, in particular, elements of a political economy, manifest in kinds of activities and work, as well as regimes of visibility and their role in framing social life in the village.

Kulturtechniken through a microhistorical lens

As outlined in Chapter 1, we began our work at Monjukli Depe with a proposal to investigate cultural techniques (*Kulturtechniken*). We understand these as everyday, routinized practices that constitute and are constituted by practical dispositions and preferences and that reproduce them. Of the seven realms of *Kulturtechniken* mentioned in the first chapter, it is the pyrotechnological and ideological spheres as well as practices related to the configuration of spaces (architecture and village layout) that have been discussed in depth in this volume.

Pyrotechnologies

Production of fire

Fire was an important part of life in preindustrial and pre-electric contexts, providing light in the dark, warmth in the cold, and transforming materials into tools and food. Julia Schönicke remarks on the ambivalence of fire as a naturally occurring, at times dangerous phenomenon that is always "alive" (Chap. 6). Fire is a process, a dynamic and unruly transformation of matter – fuel plus oxygen – that produces heat and light.

The fire installations recovered in Neolithic contexts at Monjukli Depe were all simple fireplaces, that is, they lacked any constructed elements. This limited variety may be due to the very restricted amount of Neolithic architecture excavated; at the sites of Jeitun and Chagylly Depe, each house typically contained a substantial fire installation (Berdiev 1966; Masson 1971).

The Aeneolithic inhabitants of Monjukli Depe developed a number of material means to separate different affordances of fire by making and using a large variety of fire installations. These included single- and double-chambered ovens, hearths with and without pebbled surfaces, fireplaces, and even one chimney-like installation. Fire installations were located both indoors and outside buildings: all single-chambered ovens were outdoors, whereas double-chambered ones might be in either location; hearths without pebbled surfaces were inside structures, while those with pebbles were found both inside and outside; fireplaces were more commonly located outdoors, often in the ruins and fill of abandoned buildings. Most houses contained at least one fire installation; those that did not (Houses 6-7, 11-13, 15-20) were buildings of which we only excavated small portions. The widespread occurrence of fire installations in the Aeneolithic village speaks for a regularly perceived need for light, warmth, and facilities for cooking, baking, roasting, or related heat-based food processing and other preparation techniques. The transformative power of fire was also used to harden clay figurines and spindle whorls as well as to make pottery, although we have no definitive evidence for ceramic production at the site.

The use of fire has a number of outcomes. One of the most obvious at Monjukli Depe is the production of ash. Not only is ash a major component of the Eastern and Central Middens, but substantial quantities of ash were found in other outdoor areas, such as that on which House 10 was constructed (Chap. 4) and within some houses (especially 10, 14, and 15). As discussed by Hana Kubelková (Chap. 5), mud-brick houses do not burn easily, and when they did, as was the case with House 14, it is therefore likely that the fire was intentional or that the house contained considerable quantities of organic material – textiles or plant materials, for example – that fed a fire. An intriguing question when considering the quantities of ash in excavated contexts is how and why so much was preserved in place. Given the often-violent winds in the region, why did ash not blow away? Did the dense architecture produce wind breaks that protected ash in many contexts? Or were there reasons to accumulate ash or to prevent it from escaping?

An apparent interest in preserving ash, or at least the absence of efforts to remove it, is also attested at the 5th millennium BCE site of Tal-e Bakun A in the Fars region of southwestern Iran. There, a number of houses in a densely constructed neighborhood in the northern portion of the site were covered by a thick ash layer, and the excavation also revealed large, ash-filled mud chests and pottery vessels (Langsdorff and McCown 1942, 12-13, 15). The latter suggest the deliberate storage of ash for later purposes. At Monjukli Depe, no direct evidence for the use of ash exists, but its properties make it eminently suitable as a fertilizer as well as for cleaning purposes.

Fire is a dynamic phenomenon that requires significant effort to produce and reproduce. It may be for this reason that we find evidence for technologies of keeping fire. If fires were used every day, there is likely to have been a premium on maintaining glowing embers so that they did not need to be lit anew each day. Perhaps doing so also represented a way to save fuel. FI 18 in House 1 may have been a container for embers, and the separate lower and narrower chamber extending beyond the oven FI 44 (House 10) may also have served to preserve and retrieve glowing coals. This tradition of double-chambered installations (see also FI 1) developed into “raised box hearths” in the third millennium BCE in Turkmenistan and Iran, likely for the same reason.

The handling of fire appears to have been a major preoccupation at other Aeneolithic sites in the region as well. Although fire installations are noted much less frequently at Chakmakly Depe (Berdiev 1968), they were regular occurrences in sites of slightly later Aeneolithic date in the Geoksyur delta of Turkmenistan (Müller-Karpe 1984). Further afield, early Chalcolithic/Bakun-period sites in Fars province in Iran, including Tall-e Bakun and Rahmatabad, contain considerable numbers of fire installations and, as already noted at Tall-e Bakun, large quantities of ash. It would be interesting to investigate whether Central Asia and Iran formed an early “pyrotechnological region” where – in distinction to surrounding regions – the dynamic character of fire was “tamed” by storing it. People who developed such technologies may have perceived fire as a more static “thing” than other groups that saw it as dynamic, with a frequent need for renewal.

Pottery and the use of fire as a transformative agent

As discussed above, fire was used in Monjukli Depe in multiple ways. However, there are two uses of fire encountered all over Western Asia that do not play a particularly important role at the site: for pottery making and, possibly, food preparation. Nowhere at Monjukli Depe have we identified a kiln, whether for pottery or other craft-related production, nor were any ceramic wasters recovered in the excavations. Archaeometric studies nonetheless suggest that Neolithic and Aeneolithic ceramic vessels were produced locally (Daszkiewicz 2011; 2013). Taken together, this evidence implies that while pottery production did not take place *in* the settlement, it did so somewhere at the edges or perhaps at some distance outside the village.

The purposes for which Aeneolithic pottery was made remain puzzling. There are no indications that the vessels were used for cooking, as there are neither sooting marks nor oxidized patches that would point to contact with fire. Although numerous fire-cracked rocks were found in the excavations, the fragility of most Meana Horizon vessels make it very unlikely that they could have been used for stone boiling of food.

The lack of evidence for the use of pottery as cooking vessels raises the question of whether other kinds of containers were employed for that or related food-processing purposes. Although small in number, our excavations yielded unfired clay vessels, a basket, and stone bowls. Most of these containers were small, although the basket and some of the stone vessels were of medium size. None show traces of use in association with fire, leading to the conclusion that cooking, roasting, grilling, and/or baking took place largely or completely without the use of durable vessels. It is also possible that heat-related food preparations were only occasionally practiced and that the fire-cracked rocks were used for other kinds of heating purposes.

The wide-mouthed, open Aeneolithic vessel forms, combined with bases so narrow that they could not stand up without support, are unsuitable for long-term storage. Schönicke proposes that in addition to their use as ordinary containers, they could have functioned as lids designed to protect food from dust (Chap. 10). This suggestion can be supported by the frequent abrasion of the rims, implying that they were often placed and perhaps moved on the rim. However, the edges of the bases also show considerable wear, indicating contact between the base and an abrasive surface. Despite the amount of wear, the Monjukli villagers seem to have handled vessels with some degree of care: the limited quantity of sherds suggests that efforts were made to avoid breaking them. In addition to occasional repairs indicated by pieces with mending holes, sherds were sometimes recycled by turning them into tools for scraping or smoothing.

The difference between the Aeneolithic and the Neolithic pottery at Monjukli Depe is striking, something that may be due in part to the long hiatus between these periods. Neolithic pottery consisted exclusively of open shapes, and they, too, exhibit heavy abrasion on the bases. Unlike the Aeneolithic Meana Horizon ceramics, Neolithic vessels had relatively wide bases, not much narrower than the rims, thereby ensuring their stability. Their thick walls and dense vegetal temper – possibly from the inclusion of animal dung – lent the vessels quite different properties than the Aeneolithic pottery, and their thick slips and frequently burnished surfaces impart a distinct appearance. Technologically the Neolithic pottery from Monjukli Depe bears close similarities to a widespread Neolithic ceramic tradition extending from the Zagros highlands to the north-central Iranian plateau and northeastern Iran. Vessels from this supraregional techno-complex were made using the sequential slab technique (Vandiver 1987) and generally display S-shaped walls and a dimpled base.

In contrast to tendencies observable in most other regions of western Asia, the density of pottery at Monjukli Depe declined markedly from the Neolithic to the Aeneolithic. The decrease in quantity of ceramic vessels along with changes in technology and form point to distinct *Kulturtechniken* of making and using pottery that included but were not limited to its appearance.

The estimate of extremely low numbers of vessels – one or two – per household (Chap. 10), also poses the question of how the skills needed for a complex craft such as pottery making were maintained and reproduced. If this activity was carried out only once every few years, would one not expect a significant loss in skills from each production event to the next? How was the necessary know-how transmitted intergenerationally? One possible answer is that there were traveling potters, even though there is no evidence elsewhere for the specific Meana Horizon painted decoration. This observation implies that itinerant potters, if there were any, probably did not travel very far, and most of the settlements for which they produced vessels are now buried under thick alluvial deposits (see Berking et al. 2017).[205]

Burying the dead

A small number of burials were encountered in the course of Berdiev's as well as our excavations. The limited number of interments and the absence of deceased between the ages of 25 and 50 years make clear that by no means all members of the village were interred within the settlement (Chaps. 8-9). The practices of treating the dead who were buried in the village exhibit marked similarities, almost all of them being flexed burials with few if any grave goods. But, as Nolwen Rol demonstrates (Chap. 8), there nonetheless existed considerable scope for individual variation.

Within the small group of settlement burials, age seems to have been the most important structuring social dimension. Based on an admittedly small sample, adults were buried only outdoors, children and adolescents in either occupied or abandoned houses, whereas fetuses and infants were interred in all locations. The use of ocher in association with the dead was very common, albeit rare for the very young. A variety of means of application were used, including smearing paste on the body, sprinkling powdered ocher on the body or the shroud, or covering the walls of the grave with ocher. Grave goods were restricted in number and variety and were confined primarily to adults and children; apart from a single infant, fetuses and infants were interred without (imperishable) objects.

205 That there must be considerable numbers of invisible buried settlements became clear during a brief sounding some 60 meters north of the mound of Monjukli Depe in 2014 where we discovered traces of an Anau IB site some 2m below the present surface of the plain.

Isolated human bones were also found in all Aeneolithic strata and in a wide range of contexts, from occupied to abandoned houses, outdoor areas including the Eastern Midden, and in one case in a corner deposit. While some may derive from nearby burials, others show no such association. The bones are typically vertebrae and cranial fragments, but pieces of long bones, jaws, hands, and feet were also identified. Whether this represents a deliberate scattering of specific body parts, as seems to have been the case in some Halaf-period settlements in northern Mesopotamia (Pollock 2011), or whether isolated bones were distributed unintentionally due to frequent digging or other disturbances is difficult to assess given the small sample size. However, a substantial piece of a skull and two fragments of maxilla found near each other in a rubbish-filled pit dug into the ashy layers of House 14 (Chaps. 5 and 8) suggest that at least some deliberate selection occurred.

Dawnie Steadman's examination of health indicators among the buried population shows that there were some nutritional deficiencies, demonstrated by porotic lesions of the skull and linear enamel hypoplasias on the teeth (Chap. 9). The incidence of caries was relatively low, but tooth wear and abscesses abounded. An important point that could be pursued via future isotopic analyses is whether the tooth wear and nutritional data combined with the large quantities of animal bones recovered (Chap. 7) are indications of a meat-rich diet with limited consumption of grain.

The various pathologies recognized on the skeletal material may suggest that at least some people experienced significant degrees of pain on a frequent to chronic basis. From abscesses associated with the teeth to arthritis and possible tuberculosis, there is no lack of possible sources for such physical-sensorial states. This poses the question of how culturally based feelings of pain and dealing with them differ. Although pathologies are not uncommon in the Monjukli Depe skeletal sample, blunt force trauma is lacking, implying a general absence of both high-risk activities and interpersonal violence. This is corroborated by the near complete absence of any remains that could be interpreted as weapons, one copper blade excepted (Fig. 3.16).

Work, economy, environment, and interregional connections

The contributions to this volume point repeatedly, albeit often implicitly, to the variety of kinds of work in which the residents of the Aeneolithic village of Monjukli Depe were engaged. Work and its associated technologies were not simply part of the extraction of materials from the sphere of "nature." Rather, it is to be expected in the sense of a political ecology (cf. Escobar 1999; Bauer 2018) that the Monjukli Depe villagers did not conceive of the distinction between nature and culture in the stark terms that were – and in some contexts still are – customary in western societies until recently. The notions of *Mitwelt*, "that part of the *Umgebung* [overall environment] envisioned as having some specific degree of agency" and *Umwelt*, "the portion of the *Umgebung* that is subject to practical action" (Bernbeck et al. 2016, 50), offer more nuanced possibilities for thinking about peoples' engagement with the material worlds in which they found themselves and which they also in part constructed (Fig. 14.1).

In this sense, any work aimed at extracting livelihood from the surroundings of Monjukli Depe was part of the *Umwelt*, that is, it depended on an instrumentalist disposition. However, the areas adjacent to the village may not have been perceived solely as resources to be exploited, but rather included *Mitwelt* agents such as weather, particular wild animals, or certain plants that were seen as having a will and purpose – as coherent beings in and of themselves.

Work is most directly connected to the exploitable realm of the *Umwelt*. Among the most intensive forms of extraction of something usable from "natural resources" were probably subsistence activities: agriculture and animal tending (Chap. 7; Miller 2011; Ryan 2011; Miller and Ryan 2011). Preliminary results of isotopic analyses of sheep and goat bones from Monjukli Depe suggest that at least some herds were kept within close range of the settlement (Eger et al. in press), and a study of dental attrition on teeth of sheep and goat point to a similar conclusion (Eger 2018). Nonetheless, even if these animals were not taken to distant pastures, considerable effort would have been required to ensure that they did not interfere with growing crops. Local herding practices may be an indicator of a subsistence economy based mainly on animal products and only secondarily on crops as a food resource. This possibility is supported by a high-power microscopic usewear analysis of a small sample of lithics from Monjukli Depe (Pope 2011; n.d.), according to which many chipped stone tools were used for hide or wood working, others for animal butchery, and only a relatively small number for grain harvesting.

The keeping of domestic herds close to the village has as a further consequence the substantial need for water for these animals on a daily basis. Paleolandscape reconstructions suggest that the distance from Monjukli Depe to the nearest stream was no closer than it is today to the Wadi Meana, although unlike in the present, the Meana and Chaacha Rivers may have been perennial at the time of Monjukli Depe's occupation. However, the lower level of the floodplain may have increased the frequency with which floodwaters extended as far as Monjukli Depe (Berking and Beckers 2018, 9-10), making it easier to procure water at some times of the year. In the drier seasons, the nearest natural water source would

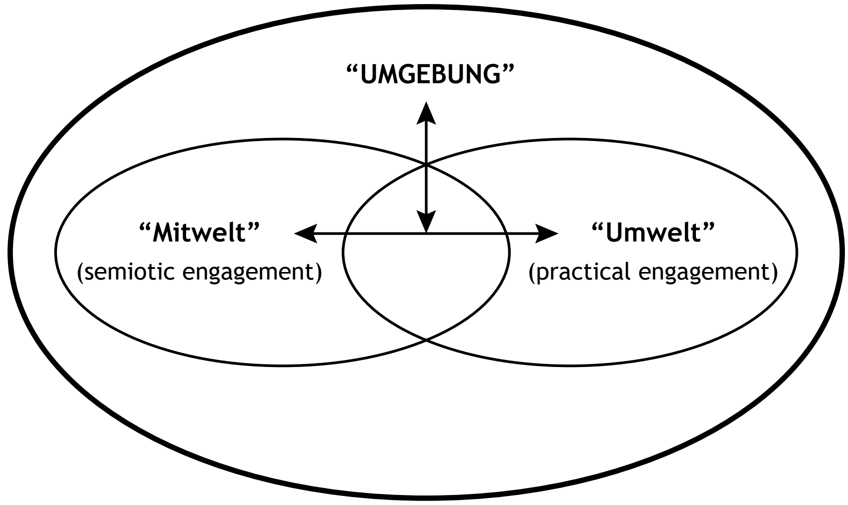

Fig. 14.1. The relationships among *Umwelt*, *Mitwelt*, and *Umgebung*.

have been approximately three km away, a considerable journey to make on a daily basis for human consumption alone. Such a scenario becomes even less likely when considering that pack animals were unavailable and therefore heavy containers full of water – even if they consisted of animal skins – would have had to be carried back to the village. It would therefore seem likely that some other source of water was available, perhaps a well or a *takyr*, a dense clay surface that acts as a natural collection point for shallow surface water, similar to installations close to the modern village (Berking et al. 2017; Fleskens et al. 2007). Indications from plant remains point in the direction of a simple irrigation system as well (Miller and Ryan 2011). Because of industrial use of water, the water table in the region today is very low – and sinking – and all water is brought in with tankers. This does not necessarily imply that the water table in Neolithic and Aeneolithic times was inaccessible. While the date of the first use of wells in Turkmenistan is unknown, the fifth-millennium sites of Tal-e Bakun A and B yielded evidence for wells (Alizadeh 2006: 40, 65, Fig. 19). In the Levant, wells are known from the much earlier PPNC period onward and in Cyprus from the early PPNB (Gebel 2010).

Drinking, providing water for animals, and cooking were not the only uses for water, even if they were probably the most constant ones. Water was needed to make mud bricks, plaster, pottery, unfired clay vessels, figurines, tokens, clay rings, and spindle whorls. Many of these would not have required substantial quantities of water even if such objects were made and discarded relatively frequently, as seems to have been the case for spindle whorls and tokens (Chaps. 11 and 13). Building materials, in contrast, necessitated large amounts of water. The preparation of bricks and plasters may have been confined to the spring and early summer when floods brought water closer to the settlement, so that villagers did not need to trek the full distance to the river and back with heavy loads. Whether they made attempts to channel or contain water, in what would amount to a direct intervention in their *Umwelt*, is something for which we have at present no evidence.

The construction of houses was a labor-intensive activity, albeit one that most likely occurred relatively infrequently, judging by the estimated duration – maximally 60 years – of the Aeneolithic settlement at Monjukli Depe and hence the occupational spans of most houses (Chap. 3). Materials had to be assembled and prepared – the mud bricks, mortar, plasters, wood, and plant material for the roof. The bricks had to be laid, the floors and walls plastered, and in many cases ocher had to be procured and ground to the proper consistency for coloring walls and floors. Subsequent repairs and modifications required similar tasks, even if in a reduced scope. We might estimate the person-hours required for the construction of such houses, but such an objective measure omits the subjective character of the work. Was it perceived as drudgery? That depends not only on the time and physical efforts required for the construction of a house but also on its place in people's lives and imaginations, as will be discussed below.

Fibers were spun in Aeneolithic Monjukli Depe, as indicated by the large numbers of spindle whorls found (Chap. 11). A relevant question is which kinds of fibers were used, in particular whether plant or animal-derived. Most spindle whorls are light or occasionally middle-weight. Lightweight spindle whorls are best for spinning short fibers such as wool, whereas the longer fibers of plants such as flax are typically spun with heavier whorls (Keith 1998; Grabundzija and Schoch n.d.). Sheep and goat were by far the most common animal taxa at Monjukli Depe, comprising more than 90% of the identifiable animal bones recovered from the site. Of those that were further specifiable, approximately three times as many bones are from sheep than goats (Benecke 2018, 33). Despite this, reconstructed kill-off patterns of caprines do not suggest that herds were kept *predominantly* for their fibers but rather for milk and meat (Eger 2018, 35-36). Although flax seeds are present, they are very few and found in only a small number of the analyzed macrobotanical samples (Masoumeh Kimiaie, pers. comm., 2016), so that flax seems an unlikely candidate for the fiber of choice.

The production of textiles is directly attested by only a single impression on a token (Fig. 13.10), but the large quantity of spindle whorls recovered at Monjukli Depe is testimony to the spinning of fibers, at least some of which were likely used to make woven fabrics.[206] The enormous surge in numbers of spindle whorls in the Meana Horizon in comparison to their near absence in Neolithic levels is a clear indication of dramatic shifts in *Kulturtechniken* associated with the making and use of fiber products. This likely went hand-in-hand with changing ways of engaging with animals and/or plants that (increasingly) became seen as sources of fiber and thus bearers of raw material to be harvested. This fundamental change between people and parts of (domesticated) nature presumably took place over the course of a long hiatus between the Neolithic and Aeneolithic at Monjukli Depe, leaving us in the dark about the processes that brought it about and the concomitant objectivizing of specific plants and animals in their *Umwelt*.

From the object world to economic structures

The spindle whorls recovered at Monjukli Depe appear to have been individually made and often discarded after limited use (Chap. 11). Arnica Keßeler speaks of their low value – limited strictly to their use value – which is evident in their frequent discard. Julia Daitche comes to a similar conclusion with regard to the tokens (Chap. 13). The patterns of spindle whorl disposal might imply that thread was spun intermittently, so that the necessary equipment – spindle whorls – was made only when needed, then used and discarded, rather than being saved for the next round of spinning. The production of spindle whorls was unlikely to have been time consuming or labor intensive, quite unlike spinning itself, which is often one of the most time-intensive tasks in preindustrial contexts.

We take this constellation in the realm of fiber processing as a hint at general property relations at Monjukli Depe: spindle whorls are means of labor that likely had no use beyond spinning, and they were apparently produced anew with each spinning episode. Modifying Woodburn's (1982) analysis of gatherer-hunter economic systems, we can conceptualize this mode of production as one that was based on a system of *singularized return of means of labor.* We might postulate that anyone could make tools at any time whose primary purpose was the production of other tools. This implies that these implements would not have been owned. At Monjukli Depe, they may have included tokens, figurines, and perhaps part of the stone assemblage in addition to spindle whorls. These objects were per definition socialized: they did not belong to anyone specifically. This relation between people as producers of objects and the material means for doing so likely had consequences for a subjective understanding of the work that went into making things. The spontaneity of tool production may also have meant that contributing to such an effort as well as its timing did not follow strict social rules but were rather *ad hoc*, small group decisions. Collectively used installations such as FI 1, 2, and 34 (Chap. 6) fit such economic conditions quite well. Under these circumstances, people would not have experienced working conditions as labor; rather, that part of the productive realm was carried out in a spirit that more closely resembled Marx's normative formulation (1970 [1875]): “From each according to his [sic] ability, to each according to his needs.”

Other tools that show long-term use, such as some grinding stones, are signs of *means of labor with a recurrent return.* They may have been owned by specific people: they include an appropriative potential that makes them fundamentally different from singular return means of labor. Parallels in southern Turkmenistan are meager. However, a comparison with approximately contemporary sites in neighboring Iran is instructive in this regard. For instance, sites of the Bakun tradition on the southern Iranian plateau differ substantially with respect to the longevity of means of labor in comparison to the earliest Aeneolithic sites in Turkmenistan. Bakun-period spindle whorls and figurines were made of high-fired ceramic, while tokens occur rarely and are unfired. Spindle whorls in the Bakun tradition are frequently painted or otherwise decorated (Javeri et al. 2010, 196-201; Good 2012, 115; Kainert 2012; Schoch 2018). Most importantly, seals and sealings are well attested at Tal-e Bakun A (Alizadeh 1988), whereas not a single seal has been found in 5th millennium Turkmenistan or north-central and northeastern Iran. In the Bakun tradition, many means of labor had a recurrent, longer period of use and could thus have been accumulated and owned. Their greater durability and frequent decoration offer clear evidence for greater temporal engagement in their production and a fundamentally different temporality of work with tendencies towards alienated labor. Bakun seals and sealings point to a concern to protect collective or individual possessions.

206 Other possibilities include the production of rope, string, or nets.

This difference in the making of small objects must not be underestimated, as beyond insights into the general means of production at Monjukli Depe, the means of labor also open a window into *relations of production*. Such relations manifest themselves in the cultural and economic concept of property – or rather, in the case of Monjukli Depe, in its near absence. Ubiquitous or immediately producible items cannot easily be appropriated in the sense of securing exclusive access to them. Making and using chipped and ground stone tools or simply employing a stone in its existing shape occurred commonly in the village of Monjukli Depe, judging by the relatively large quantities of used and worked stones found in the excavations (Pollock and Bernbeck 2011, 193-194; Rogasch and Teuwsen 2013; Öğüt in preparation). Much of the stone raw material that was used for larger implements was procured locally (Öğüt 2018).

We can, however, identify two other object categories set into relations of production that differ from the dominant ones, first and foremost because they are not ubiquitous in the village. One is highly unusual as a "thing": fire. As noted already, fire has a transformative power, for example, when it is used to melt ore or to harden pottery and other clay objects, or when it is employed to transform foodstuffs into a digestible or storable condition. Fire can thus be considered to be a means of labor. It is striking that something so difficult – constantly changing and potentially damaging – was tamed and turned into a *recurrent means of labor* through the construction of brazier-like basins for keeping embers, whether as a section of a double-chamber oven or as a small container for glowing charcoal. Keeping a fire meant also "objectivizing" it and making it "ownable."

A qualitatively different category of things lacks ubiquity because it is non-local and/or occurs only rarely. Chert and chalcedony for making chipped stone tools were brought from substantial distances (Pollock and Bernbeck 2018, 41). Chipped stone tools range from ad hoc implements with little or no modification to carefully and almost microscopically retouched pieces with consistently shaped edges. The latter would have necessitated the development of special skills as well as excellent eyesight.

Chalcedony was probably brought from the southern side of the Kopet Dag (Pollock and Bernbeck 2018, 41, note 125), while lapis lazuli – found at Monjukli Depe in the form of a handful of beads (Keßeler 2011, 208-209) – ultimately came from the Badakhshan area of northeastern Afghanistan. Although not large in either volume or weight, this material testifies to an interregional network in which the Monjukli Depe villagers were engaged. Geographically, this can only have consisted of an indirect, down-the-line exchange from Badakhshan to the Meana region, implying that there must have been a string of fifth millennium BCE camps or villages, either on the banks of the Amu Darya or in the foothills north of the Hindukush.[207] Considering the very small size of the beads made from exotic materials combined with the lack of evidence for on-site production,[208] it seems likely that small strings or pouches of beads, or cloths with beads sown on to them were exchanged for other materials.

Apart from stones used for the production of tools, a number of other materials or in some cases finished objects were acquired from outside the immediate vicinity of the village. The distinct forms of procurement and most likely of knowledge concerning their sources and production most probably led to them occupying distinct places in the villagers' *Mitwelt*. For example, a small number of copper objects were recovered from Monjukli Depe, mostly in the form of pins or needles approximately 6-8 cm in length, but in one case a large blade (Fig. 3.16; see also Berdiev 1972, 29, Fig. 6.14). There is no indication for on-site production of metal objects or evidence for ores in the region, so it is probable that copper artifacts were acquired by the villagers as finished pieces. At present, we have no evidence as to where they originated, although somewhere in present-day Iran is quite possible, given the widespread presence of copper deposits and early indications for metallurgy there (Thornton 2009).

In summary, the evidence regarding Monjukli Depe's political economy suggests that there were economic spheres in which there were no relations of property between people, at least not in terms of objects that served as means of production. Some of the finished goods may well have been individual or household possessions, however, the almost complete lack of any burial goods underscores the low relevance of material things for single persons.

From *Umwelt* to *Mitwelt* at Monjukli Depe

The handling of animals provides us with important clues about the ontological world of Monjukli residents. While some animals were "kept at a distance", others were closely integrated into the domestic sphere in a variety of ways and likely into a *Mitwelt* as well, that part of the environment on which people bestowed a will to act on its own. Anthropologists have noted that ontologies often impart highly specific types of agency not just to other animals, but also to "natural" elements, specific mountains, etc. We have tried to identify some of these elements for the lifeworld of the Meana horizon (Bernbeck et al. 2016).

207 It is worthwhile mentioning here that pieces of lapis lazuli are known to have been swept down the Kokcha river to its confluence with the Amu Darya (Francfort 2015, 171).

208 This holds for the Aeneolithic occupation. In the Neolithic levels, there is some indication for bead production, albeit made from local stone.

Ontological facets of the world of Monjukli residents come to the fore most clearly in their relations to animals. During the Aeneolithic period in the Meana region, these relations may have been quite complex: the focus on meat and milk and the "commodification" of a specific set of animal species suggest that herd animals played a central role as "things." The high proportion of sheep and goats gives the impression of a kind of "proto-monoculture," and it likely enhanced the conceptual separation of this functionalized part of the animal *Umwelt* from other animals that were part of a ritually loaded *Mitwelt*. An ontologically separate category can be inferred from the impressions of dog paws in two houses. Dogs were co-residents in the Monjukli houses, and Jana Eger distinguishes them as "pets" from other domesticates (Eger in preparation). Cattle clearly had a status of their own and an ambivalent one. Skulls and limb bones of cattle were treated very differently from smaller domesticated ruminants and suggest that the animals were not consumed in their entirety after slaughter. Single bones of hunted animals were not necessarily trophies but in some cases may have been accidentally encountered remains of already scavenged skeletal remains that were brought home. As collectibles, they provide a sense of what was of value and/or curiosity for people in the ancient village of Monjukli Depe. They leave us with the unanswerable question of whether the ancient Monjuklians knew the kinds of animals whose remains they had collected.

There is an intriguing distinction between the figurines, overwhelmingly representing domesticated animals, and at least some of the standing tokens that bear a resemblance, however abstract, to anthropomorphized beings and in one case to a bird (Chap. 13). Julia Daitche notes the frequency with which standing tokens are punctured, a practice that has been understood in other contexts as a sign of attempted control and domination. No such piercing is found on the Monjukli Depe figurines, which represent already domesticated beings subject to human control. We might understand this distinction as one between the controlled, protected, subjugated animals – domesticates – and beings such as other humans, but also perhaps other animals or supernatural creatures that were not yet subjected to human domination and that they could only be influenced by manipulating their images. If this was so – and that is not entirely clear due to the abstract form of the non-mammalian figurines – we might infer that interspecies control at Monjukli Depe was a step in the direction of intraspecies control, the domination of people over each other (Horkheimer (1972 [1934]).

The importance of the house

The Meana Horizon architecture at Monjukli Depe is striking at first sight because of its apparent uniformity. The same basic squarish house plan of relatively standardized size and furnished with opposing buttresses, the same size mud-brick building materials, and the same building techniques, consisting of plastered walls a single brick wide and mud-plastered floors, were used throughout the 120-300 years that Ilia Heit (Chap. 3) estimates for the duration of the Aeneolithic settlement. The buttresses were both functional and symbolic elements, most likely supporting a central beam for the roof and affording installations of various kinds, but they were also the subject of special attention in the form of plastering, in one case painting, and occasionally as the location of animal horns. Simple buttresses came to be favored over T-shaped ones in the course of time, as shown in Table 14.1.

Stratum	T-shaped	Simple	Relation
I	1 (11)	6 (2, 4, 15, 16, 22, 24)	1 : 6
II	1 (1)	2 (2, 4)	1 : 2
III	1 (9)	3 (4, 7, 10)	1 : 3
IV	3 (3, 14, 17)	3 (4, 7, 20)	1 : 1

Table 14.1. The number and proportion of houses with T-shaped and simple rectangular buttresses in the four Aeneolithic strata. The numbers in parentheses are the house designations.

In some cases, there are hints that textiles or other organic materials were hung on the walls. In the main use phase of House 10, a gap between the floor and the walls indicates the presence of perishable materials covering at least the lower parts of that wall (Fig. 4.16), and the thick ash near the walls in the front area of House 14 may have resulted from a concentration of organic materials there (Chap. 5). There is also evidence for the occasional use of mats on floors; due to the vagaries of preservation, this may have been a more common practice than we know. Houses often have red pigmented floors and walls.

Houses as well as burials and pottery can be considered to be containers of a kind, whether for people (houses and burials) or for food and other things (houses and pottery). Houses also included internal sites of storage. Bins are present in some, albeit by no means in all houses. They come in different sizes and shapes, but they are too small to have been receptacles for keeping substantial quantities of foodstuffs. At least some of the bins were not (solely) destined for such a use, as shown by the quantity of stone tools in one sizable bin in the early phase of House 3 (Fig. 2.23). Indeed, few bins yielded evidence of organic contents. Meana Horizon pottery vessels were not, as already discussed, well suited for storage purposes, and – on the admittedly slim evidence of one preserved example – perishable containers such as baskets do not seem to have been large enough to have held significant volumes. Rather, grain storage may have been confined to building annexes, such as the one to the north of House 7 (C47) where both macro- and microbotanical remains offer consistent evidence that it was used for keeping cereals (Miller and Ryan 2011, 227). Cubicles, such as those on the northwestern ends of Houses 3 and 4, as well as north of House 24 (see Fig. 2.46), may have been used in a similar way, although we have at present no empirical evidence to support this suggestion.

House floors were generally kept clean, apart from a small quantity of macroremains, or perhaps they were cleaned prior to replastering. Microdebris analysis reveals a different picture, with ample evidence of activities that left material traces (Sturm in preparation). Once the occupation of houses ended, they became one of the preferred places for refuse disposal. They also served as locations for making informal fires, whether for light, for cooking purposes, or both. Preliminary evaluation of the microremains shows that despite their apparent similarities in structure and construction, houses were not all inhabited in the same ways. This conclusion can be further supported by the variety of installations present in the houses as well as differences in the ways the Monjukli Depe inhabitants "closed" them prior to ending their occupational uses.

Houses and collective memory

All of the architectural structures we have excavated at Monjukli Depe fit the general understanding of a house as a domestic location. Their features, including the elaborate buttresses, often with numerous layers of plaster, the colored wall and floor plasters, the presence of corner deposits as well as animal horns that may have hung on the walls, and the absence of other sorts of buildings all point to the house as a place of symbolic importance for the villagers of Monjukli Depe.

In the past two decades, archaeologists working in various parts of the world have found Claude Lévi-Strauss' notion of the house society (*société à maison*) to be a productive way to approach the understanding of the house. In such cases, houses are corporate units that represent a significant organizing principle of society. They are a major symbol, a focus of ritual, a "moral person"; significantly, a house has the potential to transcend generations. Houses are sources of identity and – albeit not emphasized by Lévi-Strauss – include a physical structure that signifies a group and its continuity in a particular place (Blier 1994; Gillespie 2000; Banning 2010, 80-81; Hodder and Pels 2010, 181).

Importantly, most if not all house societies are those that can be described as "middle-range, nonclass societies" (Gillespie 2000, 478). González-Ruibal (2006, 145-146) argues that the strategies typical of house societies can only be found where there is a hierarchical order or an egalitarian one that is in the process of being transformed through subverting the logic of kinship as a fundamental organizing principle. Little in the evidence we have from Monjukli Depe points in the direction of a hierarchical social organization or one in which certain houses accumulated greater wealth and power than others, although the unusual features of House 14 – wall paintings, having been burned down with no subsequent construction on the spot, a high density of the otherwise unusual clay rings and of figurines – could be interpreted as such. Although houses do seem to have been the loci of a broad spectrum of activities, including some with potential ritual character as González-Ruibal expects for house societies, the neighborhood seems to have been of considerable significance as well, as it was on this larger scale that feasting events took place (Chap. 7). There does not seem to be any reason to think that what we have referred to as a neighborhood itself constituted a house in the Lévi-Straussian sense.

Ian Hodder has argued for the existence of "history houses" at Çatalhöyük. They consist of a long sequence of houses built on the same spot without a break, substantial numbers of burials in one of the later structures in the sequence, and a degree of elaboration, although not necessarily more so than other houses (Hodder and Pels 2010; Hodder 2016). They played a key role, he suggests, in memory and history-making connected to social changes that were part and parcel of the Neolithic, "a necessary component of the temporal depth that becomes essential in societies that increasingly depend on delayed returns for labor input" (Hodder 2016, 5). Hodder links the ideological realm and memory to basic economic practices and claims a symmetrical growth of temporal horizons in the Neolithic. A widening future economic horizon (what is expected to be available for consumption) finds its correspondence in a deepening of past experiences.

How widespread were these practices involving an unusually strong and sustained commitment to a circumscribed space, i.e. a house? With respect to Monjukli Depe, we have already seen that in the sphere of production, duration in terms of the recurrent use of tools was often unimportant – an expectation of a future use of means of labor was limited. However, the same was not necessarily the case for house construction and use.

Still, a "history house" model is not a good fit with the evidence we have for Monjukli Depe in the Meana Horizon and, judging by the stratigraphic evidence from profiles (Chap. 2), nor is it so for the Neolithic occupation. There is only one case of an uninterrupted sequence of houses with similar plans (Houses 20 – 9 – 1). In one other case where one house follows another (Houses 12 – 2), they seem to differ considerably in plan. Even in the sequence of Houses 20 – 9 – 1, there are significant changes in layout, in particular in the arrangement of buttresses. Elsewhere, house sequences are interrupted by other uses (exterior surfaces – House 10 – Eastern Midden – House 18), completely supplanted by other uses (House 14 – exterior area – Eastern Midden; House 7 – Eastern Midden). In the case of House 14, the memory/history element may have worked in the opposite direction. Memory of the house remained vivid through an avoidance of reusing the space for subsequent buildings and especially because of burial MDB 11, which was set on a buttress already covered in 70 cm of ash when the pit for this burial was dug (Chap. 8). This latter example suggests that memorialization through architecture can work by way of discontinuity just as much as by continuity. Another interesting aspect of Monjukli Depe's architectural temporalities is the unusual persistence of some houses, albeit punctuated by partial destructions and rebuilding: Houses 3 and 4 existed throughout the Aeneolithic occupation. All in all, there are far more indications of changes in uses of space over time than continuities of the kind noted at Çatalhöyük. Even if there was intergenerational transmission in a house sequence, there is no reason to see it as characterized primarily by an explicit interest in continuity.

Dwelling as a Kulturtechnik

Although neither a house society nor the notion of history houses fits the case of Monjukli Depe in the Meana horizon, there are still numerous indications that the house bore major significance in the lives of the villagers. As frames for social units, houses appear at first sight to be inflexible, with an astonishing formal continuity that reaches back to earlier Neolithic architecture known from other sites in the Kopet Dag foothill zone (Bernbeck and Pollock 2016) but that can also be observed later, as at Dashlidji Depe from Namazga I times (see Kohl 1984, 79-81; Müller-Karpe 1984, 44-46). They cement a social system through their specific affordances, enabling a routinized daily life while limiting other possibilities, such as substantial growth of kin units in terms of increasing numbers of individuals or the amassing of material wealth.

In addition to the consistency in their general physical form, the attention paid to house fittings and maintenance and the connections between burials and houses as well as between animals and houses all point toward the house's centrality in the social life of the community. However, installations and their location in houses provide us with some clues for different ways of inhabiting houses or kinds of "dwelling practices," leading us to ask to what extent individual houses differ from each other in terms of habitation. We take our inspiration for this issue from an unrealized project by Walter Benjamin and Bertold Brecht who conceptualized different styles of dwelling. These included a *Gastwohnen*, which is framed by an attitude of ephemeral use of a house's *intérieur*, or *Hausen*, a destructive dwelling that ends up eroding the inner spaces during use, as well as other kinds of dwelling practices (see Marx 2017). These concepts were formulated for 20th century Europe and cannot be simply generalized. On the other hand, it would be wrong to assume, in a Bourdieuian fashion, a monotonous and unified dwelling in all non-western societies.

In an earlier examination, we came to the conclusion that a relatively standardized house layout at Monjukli Depe did not correspond to similarly standardized practices inside them (Bernbeck and Pollock 2016). The interiors of most houses have an ambiguous spatial structure. The visual regime allows the gaze to wander almost anywhere except into small corners behind buttresses, giving them the visual structure of a single room (see below). However, the regularity of the opposing buttresses divides houses into two distinct spaces, further emphasized by a small height difference between the lower front and the upper back section. But can we go further and identify house-specific dwelling styles? A detailed answer to this question of dialectical relations between the material conditions of inhabiting a space and the practices enacted under such conditions must remain open until the microarchaeological evidence from house floor samples is fully analyzed. Here we can only show the longer-term conditions that the inhabitants of houses created through the locations of specific kinds of installations. In our analysis, we refer only to houses of which more than half of the total surface was excavated. We include a number of relevant elements out of the available repertoire of *intérieurs*: bins and their location, benches, fireplaces and ovens, the type of buttresses, wall decorations, and corner deposits (Table 14.2).

One of the most important social features in a house was likely the hearth or fireplace. These installations were sometimes placed in the center of rooms, sometimes next to walls. While a central placement would have allowed people to sit around them, affording commensality and face-to-face communication, constructing such an arrangement was likely difficult, as a duct for smoke above the fireplace would have been necessary.

Corner deposits contained objects that mostly remained hidden from persons who did not know the house well. The presence of corner deposits in 10 houses – all of those that were substantially excavated – is another sign of the symbolic attachment between people and houses. Corner deposits generally consisted of bones, horns, and/or stones covered with plaster or stuck between crevices in corners. The stones varied markedly in quantity, size, and degree to which they were worked, if at all. Stone balls, hammerstones, polishing stones, and grinding slabs are each present in two or more corner deposits; several other stones show unusual working or usewear traces (Öğüt, pers. comm., 2017). No exotic materials were found in corner deposits, although such things are present in

House	Buttress	Corner deposit	Location fire installation	Bin	Bench	Symbolic decoration	*"Dwelling style"*
2	SB	2	w				A
4	SB	2		x			A
10	SB	5	w	cb	x	h (2x)	A
1	TB	1	(c), w	(x)	x	pt	B?
9	TB	1	c, w		x		B
14	TB	1	c	cb		pt, h	B
3	TB	1	w	cb	x*		?

Table 14.2. Installations, decorations and corner deposits in houses at Monjukli Depe; cb = rounded corner bin next to buttress; c = center of room; w = next to wall; d = deep; s = shallow; TB = T-shaped buttress; SB = simple buttress; pt = painted buttress or socle; h = horn core; parentheses = likely; A, B = dwelling styles (cf. text).
* The installation in House 3 is described as a platform but could have served as a bench.

Monjukli Depe (e.g., lapis lazuli, copper, chalcedony, chert); rather, both stones and animal bones are common occurrences in the settlement. The bones and horns draw on human-animal relations, whether of hunting and thus a mastery over life and death, or domesticity, while the stones include those connected to processing of crops as well as working other stones or materials into objects. It was presumably the connection between a particular person or persons and a specific object that was crucial for the decision to incorporate something into a corner deposit. Doing so created a very specific kind of memory that was bound literally and figuratively to the house, thereby becoming part of this "container for living." It would be of considerable interest to know whether the multiple corner deposits found in some houses (2, 4, 7, and 10) were placed there at the same time or sequentially; unfortunately, this could not be ascertained, any more than we could determine whether the corner deposits were set in place when a building was constructed or at some point(s) later during the use of the house.

Whatever hiding meant, it occurs in different frequencies in different buildings. Interestingly, houses with two or more corner deposits do not have central fireplaces, suggesting that places that promoted house-internal communication and hiding of things tend to be mutually exclusive. Of the houses listed in Table 14.2, those with more than one corner deposit all have simple buttresses. Whether there was some kind of explicit distinction between the two types of buttresses must remain an open question.

Based on these comparisons, we can preliminarily identify two groups of houses with different "dwelling affordances." Group A, consisting of Houses 2, 4, and 10, tends towards an "exclusionary dwelling," based on the fact that the number of corner deposits and thus hiding places for objects not visible to outsiders, was higher than in the other houses. They lack inclusionary interior features: places for intensive communication (hearths in the middle of the room) are absent. All houses of this group have simple buttresses. Group B consists of Houses 1, 9, and 14. They share not just central fireplaces but also T-shaped buttresses. These houses might be seen as having a set of affordances that tended towards "shared dwelling." Obviously, the differences amount to no more than a framing for practices performed in these houses. This issue needs to be further elaborated using data on past practices carried out in these houses. Tentatively, we can conclude that even in such a small village with perhaps ten to twenty co-existing houses, there were materially distinct modes of living that were spread out in a network-like fashion. Similar dwelling modes do not occur in adjacent houses nor do they constitute neighborhoods.

The issue is more complex than just dividing houses into those with a setting geared towards communication and those tending more towards exclusionary dwelling. Houses 3, 10, and 14 stand out from the rest because they have rounded corner bins (Figs. 2.23, 4.8, 5.1), and in two, if not all three houses, horn cores were found next to walls and/or buttresses in a position that suggest that they had been hung higher up. Symbolic decoration and corner bins cannot be easily brought into any functional connection. In contrast to the spatial distribution of dwelling modes, it is interesting to note that these three houses (3, 10, 14) are adjacent to one another, although Houses 10 and 14 did not exist at the same time.

Not all features and finds in houses can or should be interpreted as the result of styles of dwelling. For example, Rol has discussed the locations of burials in the settlement, observing that "most bodies seem to have been deliberately placed against, under, or immediately next to walls," even if the interments took place in outdoor spaces (Chap. 8, 222). She suggests that this positioning emphasizes connections to houses, whether past (e.g., the burial of MDB11 directly on top of a buttress of the no longer occupied House 14), present, or planned future houses (in the case of burials as “foundation deposits”). Nonetheless, it should not be forgotten that many members of the village must have been buried outside the settlement or not at all. Perhaps those interred in the settlement were those with special relations to house units.

Another interesting feature of dwelling is that some animals were allowed into houses. As already mentioned, pawprints found in the plaster surface of floors in Houses 1 and 10 indicate that dogs were permitted into some if not all residences. Although other animals most likely never went alive into a house, three major domesticates as well as wild animals did gain entry to people’s dwellings in other forms. Animal horns were placed with some frequency in corner deposits, and others probably hung on walls or buttresses. Animal bones were another common element of corner deposits, tending to occur in those where horns were not present. Mandibles are found in several such deposits, potentially serving, Eger suggests, as a kind of feasting trophy (Chap. 7). The placement of animal parts in particular locations in the house brought those animals and specific connections to them into the domestic sphere, testifying to their being part of a *Mitwelt*. A related way in which animals were integrated into the domestic context was through the presence of small clay zoomorphic figurines and clay horns that reinforce in a different medium the meaning of animals and perhaps especially their “hornedness” for the Monjukli Depe villagers (Chap. 12).

The distribution of animal parts in houses was uneven. In particular, the occurrence of zoomorphic figurines and clay horns changes dramatically over the course of the Meana Horizon occupation, from a sole concentration inside a single house (14) in Stratum IV to clustering predominantly in one house (9) in Stratum III and finally to a widespread distribution across most houses and outdoor spaces in Strata II and I. How these patterns can be interpreted is an open question; there is, for example, no simple correspondence to the distribution of animal horns or bones in the houses. In one way or another, there seems to be a sort of “democratization” of access to miniaturized representations of animals over time. Perhaps the concentration of figurines and clay horns associated with House 14 and afterwards House 9 points to some specific significance of these buildings. However, the particular process of destruction of House 14 by fire and consequent deep ashy fill with excellent preservation qualities could have significantly influenced this picture.

Regimes of visibility at Monjukli Depe

An overemphasis on the visual in archaeology has been one of the core criticisms made by an archaeology of the senses (Van Dyke 2006; Day 2013; Hamilakis 2013). While attentiveness to multisensoriality is of undoubted importance in enriching our perceptions of the past, the visual in all of its facets should not be downplayed. Dialectics of seeing and being seen have been a source of reflection in many contexts, from Plato’s cave parable to modern philosophy and anthropology (e.g., Sartre 1957, 252-302; Lacan 1978; Thomas 1991). In archaeology, their full exploration as a complex *regime*, or as a kind of *dispositif* (Foucault 1980, 194-196), has been rarely pursued.

Visual regimes are eminently political in several ways. First, “power is where the disposal over the relationship of public and secret, visible and invisible is located” (Münkler 2009, 26).[209] Obviously, this is true for people as well as for things. Visibility regimes always entail not just being able to observe, to make visible, but also to render *in*visible. That seeing is closely related to knowing has become a self-evident truth. Investigating visual regimes can aid in elucidating boundaries of knowledge. In well-documented cases, different kinds of culturally specific gazes can be identified, as shown for European art by John Berger (1972) and by James Scott (1999) for states of high modernity. Finally, one should not forget that any investigation of regimes of visibility is itself driven by a desire to make visible and by that, to acquire knowledge and thus control over past people and their lives (Hempel et al. 2010). Here we consider some elements of regimes of visibility as structuring principles in village life at Monjukli Depe.

Visibilities/invisibilities at Monjukli Depe: structures of “privacy”

How much and what could people in Monjukli Depe see or what could they not see, if they were members of the village or visitors from elsewhere? Answering this question can contribute to revealing power relations within the village. Today these relations might be phrased in terms of “private/domestic” vs. “public” space. However, this terminology has problematic gendered associations that have been critiqued by feminist anthropologists and archaeologists (e.g., Rosaldo 1980). We use instead the terms “household” and “collective” spaces and understand “household” in an expansive way (see Hendon 2006).

In the most extensively documented level, Stratum I, Monjukli Depe was composed of a number of different kinds of spaces: houses, the “Eastern” and “Central Middens”, the paths between the houses such as “Berdiev Street”, agglomerations of cubicles that were likely for storage, and a variety of special-function spaces such as the ovens in the north of the village. An analysis on a human

209 Authors’ translation of “Macht ist dort, wo die Verfügung über das Verhältnis von öffentlich und geheim, sichtbar und unsichtbar angesiedelt ist”.

scale starts best with the principles underlying Hillier and Hanson's (1984) space syntax. This method includes a visibility assessment through "isovists" as conceptualized by Michael Benedikt (1979). It supposes regularly spaced points where a person's visual possibilities within a 360° field are assessed against potential limits to visibility such as buildings and other material blockages. Isovist analyses can be highly useful for comparative purposes when based on quantitative data (e.g. Batty 2001). Here we employ only a simple model to reveal different types of fields and their relations to each other. For that purpose, we have constructed isovists in five places: (1) House 2, (2) House 22, (3) the middle of the Eastern Midden, (4) a point just west of Gate 1 in Berdiev Street, and (5) a spot in Berdiev Street at the western entry to the village (Figure 14.2). The analysis reveals two main visibility patterns, a "comprehensive" and a "linear" one.

In contrast to many contemporary houses in other regions of Western Asia, those from Monjukli can be characterized as having comprehensive visibility schemes. This is particularly clear in the case of House 22, but also for House 2. We alluded already to the apparent attempt to create a division of internal space into two more or less equally sized segments[210] divided by a low step that ran between the opposing buttresses. This was achieved without turning the building plan into a two-room arrangement. There was not much that was hidden to a person standing in one part of the house – providing that spaces were not curtained off with textiles or mats – apart from something – such as a bin – or someone situated directly behind a buttress. In other words, houses offered little or no "retreat" space; one could be seen from almost everywhere, even when a person stood or sat in a corner (see House 22, Fig. 14.2). There are exceptions: in their later manifestations some houses (1, 3) had internal divisions probably connected to a functional change into storage structures.

A comprehensive visibility existed in two other spaces, the Eastern and the Central Midden. These seem to have been gathering places for larger groups. Importantly, both houses and communal feasting spaces were closed off from other collective kinds of spaces, producing a stark difference between an almost unrestricted power of observation – passive as well as active – inside them and efforts at impeding visibility from the exterior. Thus, we find seclusion via walls and doors together with maximum visibility inside the "household" as well as in the "collective" realm. This two-tiered visibility regime promoted communication on two levels, at the same time sharply restraining the potential for obfuscating them. It indicates a degree of distanced social relations between households within the village, paralleling the limitations on visibility between them.

Houses seem to have had no more than one doorway. Where doorways were found, they were low and narrow. Entryways through the roof cannot be excluded but seem unlikely: the opposing, solidly built buttresses presumably supported a roof beam and likely a pitched roof. Large windows high up in the walls are a possibility, as is the case in a Neolithic house model recovered from Sang-e Chakhmaq (see Chap. 2), and opening(s) of some sort would certainly have been necessary to allow smoke from fire installations to escape. Windows or roof openings would have offered light as well, altering the perception that interiors of houses were mostly dark apart from the light afforded by a hearth, fireplace, or oven. However, none of these options would have afforded an easy or unobstructed view into the house from outside. Moreover, door sockets in some houses (2, 16, and possibly 11) imply the existence of doors that could close off access but also a view into the interior.

Similarly, the gate to the Eastern Midden blocked visibility – either into the village coming from the east or of the Eastern Midden coming from the west. Of the five door sockets associated with the gate, four were found on its eastern side, implying that an attached door leaf most likely opened into the midden. There are no indications of how the door was kept shut, from which side it could have been locked, and at what intervals it was open. However, in the history of the gate there must have been a change, indicated by the placement of a door socket on the western side during the middle phase of the gate's use and its removal in the latest phase. The flagstones leading up to the gate in the street would have left no doubt that something important was hidden behind it – even when, or especially when, the door was closed. In this way, something invisible was made hyper-visible. Why would a feasting space be closed off? Were feasts held behind closed doors? This seems unlikely for cases such as Monjukli Depe: feasting is participated in by multiple people and is generally meant to be seen or otherwise noticed by the neighborhood, community, or even by people invited from other villages in the region (Chap. 7). Articulated vertebrae of cattle and wild and domestic sheep point to wasting of meat that would have remained visible – and probably also have smelled – for at least a short time after the feast was over. Not only the quantities but also the tastes would have been special: in addition to meat of the domestic triad (sheep, goat, cattle), unusual hunted game was present, including onager, gazelle, wild sheep, and wild pig. These were feasts for multiple senses and many people.

Isovists in Berdiev Street produce a completely different picture from that in the Eastern Midden, with nearly linear, very narrow sight paths. The houses

210 The lower sections of houses tend to be approximately 0.3-0.5 m narrower than the upper portions.

Fig. 14.2. Plan of Monjukli Depe, Stratum I, with isovists from five positions.

Table 14.3. Overview of the visibility regime in Monjukli Depe, Stratum I.

	comprehensive visibility	linear visibility	observable invisibility	unobservable invisibility
collective sphere	X	X	X	
household sphere	X			X

bordering on streets (Fig. 2.46) would have presented blank walls to a person standing in the street, with few or no cracks between them for someone to look into the spaces behind the houses. Taking positions 4 and 5 on the plan, it is clear that one could not even see very far into the long and fairly straight Berdiev Street, because single houses had slight protrusions and recesses.

Overall, the architecture and village plan of Monjukli Depe can be understood as a regime of visibility that included a two-tiered type of "comprehensive visibility" that crossed the divide between household and collective spaces, while collective spaces themselves were composed of both "comprehensive" and "linear" visibilities (Table 14.3). However, there are two more elements to consider. One was already alluded to with respect to Gate 1 – the visualization of the invisible. A number of buildings in Monjukli Depe can be interpreted as storage structures. Storage conjures up something hidden – what is stored and how much is difficult for others to assess, unless there are communal structures. Apart from a possible exception of the later phases of House 3, storage contexts in the Monjukli Depe village all seem to have been associated with individual houses: annexes such as the one attached to House 7 that was used for wheat, straw, and/or threshing remains; small cubicle-like constructions attached to Houses 3, 4, and 24; or small bell-shaped pits, such as those associated with the earliest phase of House 8. Neither pits nor annexes were found in every house, raising the question of how storage of crops and their byproducts was organized in those cases. Furthermore, other materials were also stored, for example, tools as indicated by the assemblage found on the floor of a bin in House 3 (Fig. 2.23). All of these elements are part of a delayed-return economic logic. There are no indications for supervision of the closing of these structures: as previously mentioned, no seals or sealings were found, the materialized items of control that were in use in contemporary Mesopotamia and in the late 5th millennium Bakun period in southern Iran.

A different kind of invisibility is one that is itself hidden, a space that is imperceptible unless one knows about it. Corner deposits are characteristic for such invisibilities at Monjukli Depe. These "unobservable invisibilities" should be differentiated from clearly recognizable ones: a door is a visual and tactile marker of the (temporarily) invisible, while an object hidden under a layer of clay in a corner may hide its very invisibility.

In our understanding, corner deposits were deliberate caches of meaningful things or things that produced meaning by being bundled in a designated space (Pauketat 2013; Brzezinski et al. 2017). For most of them, their contents were no longer visible once emplaced, concealed behind mud plaster or a stone. In other cases, the hidden quality was apparently less important, as some of the objects could still be seen. The placing and bundling seem to have been the crucial elements along with the knowledge that they were there, whether or not they were visible to the house's occupants. However, these unobservable invisibilities were not tied to a socioeconomic function, as is the case with those that remain observable.

Color regimes

Visibility regimes also include the strategic use and manipulation of colors. Without entering the problems of color philosophy (Quine 1948), we can differentiate two practices within a culture of coloring at Monjukli Depe: the selection of raw materials of a particular color out of which to make jewelry, chipped stone blades, etc., and the production of pigments to alter the existing colors of raw materials. Selecting colors that are naturally associated with specific materials can be seen in the many beads made from limestone, showing a preference for white, but particularly in the (rare) occurrence of objects made from lapis lazuli with their startlingly blue color. Copper pins – some perhaps worn, others used as needles – would have been a source of warm reddish to gold colors. Copper, the lapis lazuli beads, but also the choice of chalcedony for a substantial part of the chipped stone assemblage reveal the value attributed to glossy surfaces, not just color.

In many houses, floors and walls were covered with pigmented plaster, usually in reddish tones but sometimes white. The one example of wall painting, on a buttress in House 14, was executed in red pigment. Meana Horizon pottery tended toward reddish hues produced by a red wash (Chap. 10). In contrast, the standing stones at Gate 1 and at the other end of Berdiev Street were white, as were door sockets. Occasionally, as in House 10, there was a combination of colors, with white walls and red floors; in other houses, there was a succession of different colored plasters, as on a buttress in House 15. A similar combination can be found in some burials, for example in MDB11, where the buttress on top of which the deceased was placed was first coated with white plaster on the upper surface and then with red ocher (Chap. 8). Interestingly, these color coatings were not always meant for display: white-coated bricks were set in a red mortar in House 10, something that would only have been visible during a brief period of construction before being covered by plaster (Chap. 4). Another case of obscuring a pigmented surface is the red floor in House 2, which was covered at some point, maybe soon after application, by a reed mat, the impressions of which we found. Red ocher was common in burials, again a visual effect destined to remain invisible.

Color preferences, whether in the form of specific raw material choices or the addition of pigments, were dominantly red and white. This color scheme produced perceptual extremes at two ends of the overwhelmingly predominant natural colors in the surrounding environment that were mostly browns, apart from the greens of plants. Items of personal adornment, primarily beads, partook to some extent of a similar color palette, with the overwhelming majority made out of whitish stone. However, coloring was apparently most important in the world of containers, whether these were house interiors, graves, or pottery vessels.

Size and visual perspectives

In her analysis of the Meana Horizon pottery from Monjukli Depe, Schönicke considers what she calls the visual affordance of the vessels (Chap. 10).[211] By this she refers to the markedly different ways in which the painting on a vessel would have appeared, depending on the angle and distance from which a viewer regarded it. These reflections are of particular relevance for the Monjukli Depe pottery if, as suggested, many of the Meana Horizon vessels were used as lids rather than as containers on their own. In that case, their painted designs would have been seen mostly from the base down the exterior or from the side "upside down".

The notion of visual affordance can be extended to other realms as well. A striking aspect of some elements of material culture in Monjukli Depe, most especially beads but also significant portions of the chipped stone assemblage, is their smallness. Beads are rarely more than 1.5 cm in maximum dimension and generally tinier. Among the lithic assemblage, an overwhelming proportion of the tools made out of translucent chalcedony were microlithic and often worked with almost microscopic retouch, pointing to the visual acuity of the makers as well as that of the viewers. It is also relevant to ask where the production of these objects took place. It hardly seems possible that they were made within the confines of houses that, almost regardless of how many upper windows they may have had, would not have been well lit. If such work were conducted in outdoor contexts, might we imagine that the person(s) fashioning them were watched with some fascination by others who lacked their skills?

It is perhaps unlikely that those who did not make beads or microlithic stone tools inspected them in minute detail; rather, it may have been the general gestalt of such objects – a string of beads or a tool in use – that was noticed. Still, and perhaps especially if the production of these things was open to view, there may have been a certain pride in wearing or using things of such small size that required such precision in their manufacture. In other words, rather than thinking of people as having been frugal with scarce material, tiny beads and tools may have showcased their makers' skills and the time they spent in making these things.

Implications of visual regimes for social relations

We have suggested that the visibility regime of Aeneolithic Monjukli Depe displays a complex structure of interlocked comprehensive and starkly reduced fields of sight that characterize collective and household spaces. Some things were displayed openly, sometimes with a sense of the spectacular, such as the horns of animals that hung on house walls. However, compared to contemporary traditions in the Iranian highlands and beyond, such visual demonstrations remain modest. They need to be seen in the context of relatively frequent and diverse attempts to create "unobservable invisibilities" in the form of corner deposits and hidden color schemes within walls. It is difficult to assess the social and cultural background of such practices, but they might imply a certain amount of mistrust within a community; they fit with the careful closing off of particular collective community spaces, which is an unusual phenomenon not only for this time period. However, these practices had no apparent effect on the political economy of the village: there are no signs of property control, as is the case in fifth millennium southern Iran.

Outlook: subjectivities and subjectivation at Monjukli Depe

Regimes of visibility feed into regimes of subjectivation. The ever-present gaze of others reinforces socialization in specific directions, while possibilities to escape the gaze may permit unexpected as well as unwanted shifts. The latter include but are not limited to attempts to distinguish oneself or one's group from others. There is little sign that this happened to any substantial degree during the occupation of Monjukli Depe, raising the question of what other social strategies were in place that enabled the villagers to maintain a largely non-hierarchized community. The similarity of houses

211 While the original definition of affordance was based on reflections on visual perception (Gibson 2015 [1979]), the concept has moved so far into the realm of other bodily practices (Knappett 2004; Keßeler 2016) that the adjective visual is warranted.

amounts to a modular repetition of a single visibility regime. It was supposed to shape people who had very similar expectations when moving within and through houses.

Houses at Monjukli Depe were material frames of a complex and ambiguous kind despite their simple overall plan. In terms of visibility, they were unstructured entities, whereas kinetically there was a border between the two halves as one moved up (or down) a step from one section to the other. If materiality frames subjects, one of the most important differences within the Aeneolithic community of Monjukli Depe might have been practices related to heat and light, as in this regard the houses are quite heterogeneous. Sometimes a fire installation was located in the middle of a room, sometimes in the front or back part. Furthermore, there is a phenomenon that sets this site (and perhaps others in its surroundings) apart from better known regions such as the highlands of Iran at the same time: fire installations are designed for keeping glowing coals. This is at face value a practical issue and may be due to lifeways in which fire played a particularly important role. It could in principle be due to different tastes (in food or cooking practices). It might also be related to the relative darkness of house interiors or to a simple cultural habit that had already established itself in Neolithic times.

In the end, the Aeneolithic village at Monjukli Depe exhibits a complex mix of uniform material frames and considerable flexibility in the ways people engaged with these frames and lived their lives within them. The construction of visual regimes that restricted visibility outside the house in various ways may have been a crucial enabling element in later forms of subjectivation that allowed inequalities to grow and ultimately led to hierarchically structured societies in the later Aeneolithic and Bronze Ages.

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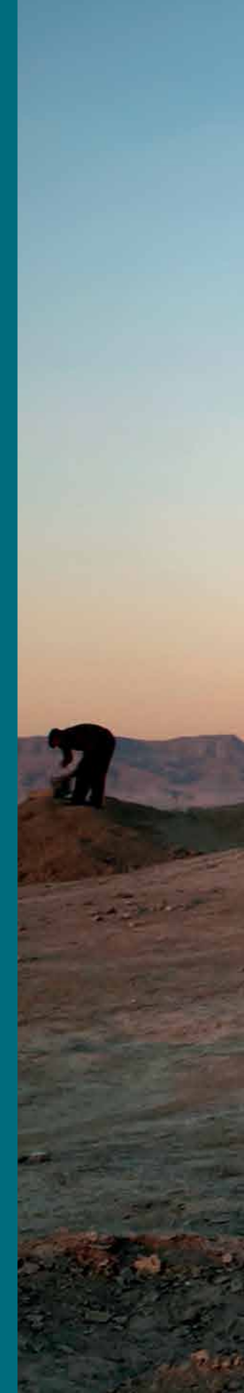
LOOKING CLOSELY



Soviet archaeological research in southern Turkmenistan revealed a series of small Late Neolithic and Aeneolithic villages strung along the streams that emerge from the Kopet Dag and water the narrow foothill zone separating the mountains from the Kara Kum desert. A commonly accepted premise of their work was that these communities garnered their technological knowledge if not their populations from regions to the south and west in present-day Iran.

Since 2010 we have reinvestigated one of these sites, the small Late Neolithic and early Aeneolithic village of Monjukli Depe. Our research examines microhistories of cultural techniques as a source of insights into long-term and spatially extensive change as well as internal variations and similarities in material practices. This volume presents results of this work. A Bayesian modeling of 14C dates demonstrates a long hiatus between the Neolithic and Aeneolithic strata of the site as well as a hitherto unattested very early Aeneolithic phase ("Meana Horizon"). A sequence of densely built, well preserved Aeneolithic houses exhibits marked similarities to earlier Neolithic architecture in the region. Despite overall standardized plans, the houses reveal significant variations in internal features and practices. Similar flexibility within a set of common dispositions is evident in burial practices. Very limited quantities of pottery offer a stark contrast to the frequent occurrence of spindle whorls, indicating a substantial production of thread, and to a large and varied assemblage of clay tokens. A wide variety of fire installations attests to routinized handling of fire, which did not prevent at least one building from succumbing to a conflagration. Animal herding was heavily based on sheep and goats, while cattle figured prominently in feasts.

The Meana tradition at Monjukli Depe exhibits significant structural similarities to other early village societies in Western Asia and will make this volume of interest to scholars working on similar times and contexts.

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