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13. MAHTOUTABAD I (KONAR SANDAL SOUTH, JIROFT): PRELIMINARY EVIDENCE OF OCCUPATION OF A HALIL RUD SITE IN THE EARLY FOURTH MILLENNIUM BC

Massimo Vidale and François Desset

Introduction

Rescue excavations carried out from 2006 to 2009 at the site of the plundered graveyard of Mahtoutabad (near Konar Sandal South), revealed the remains of three successive settlements dating to the fourth millennium BC. The earliest phase of occupation, *Mahtoutabad I*, lies above the virgin soil, at a depth of about 3.5–4 m below the present surface and was radiocarbon dated to the late fifth–early fourth millennium BC. The second phase, *Mahtoutabad II*, above the remains of the first settlement, is represented by a thick series of sediments that are attributed, on archaeological considerations, to the last centuries of the first half of the fourth millennium BC. The occupation labelled *Mahtoutabad III*, limited to secondary deposits in a restricted area of the site, is distinguished by ceramics that are linked, on stylistic-morphological grounds, to the *Middle* and *Late Uruk*-related pottery assemblages of the central-eastern Iranian Plateau. *Mahtoutabad IV*, finally, is the large cemetery of the third millennium BC. This paper briefly describes the stratigraphy of the site, identifying some crucial information on the third-millennium graveyard. It then focuses on the archaeological record of the earliest phase, *Mahtoutabad I*, and discusses its cultural links with contemporary ceramic assemblages in the same general geographic area.

In contrast to some of the more intensively explored regions of Iran, the south-east has seen relatively limited investigation. Following Aurel Stein's (1937) initial discovery of various major sites (e.g. Shahr-i Sokhta), the 1960s and 1970s saw excavations and

surveys carried out in various regions including the Bard Sir (Tal-e Iblis; Caldwell 1967), Sistan (Shahr-i Sokhta; Tosi 1968), Shah-Maran and Daulatabad (Prickett 1986), Soghun (Tepe Yahya; Lamberg-Karlovsky 1970; Beale 1986; Potts 2001), and Shahdad (Hakemi 1997). Many of these regions, however, are considerable distances apart and there are numerous areas that have not been explored intensively (Fig. 13.1). More recent archaeological investigation in the Halil Rud region highlights the importance of south-eastern Iran during the third millennium BC (e.g. Madjidzadeh 2008). This contribution will mainly present what we now know about the Halil Rud region in the early fourth millennium BC, in light of the preliminary finds at Mahtoutabad, which was undoubtedly one of the main burial grounds of the nearby third-millennium BC urban centre of Konar Sandal South.

The state of research on the Halil Rud

Initially discovered by Stein (1937), the site complex of Konar Sandal (Fig. 13.2) became very famous in 2002/2003, after news of the plundering of the Halil Rud graveyards and the recovery of many stolen antiquities spread throughout the archaeological scene and made a deep impact on the media (e.g. Madjidzadeh 2003a, 2003b, 2003c; Amiet 2002; Forest 2003; Pittman 2003; Perrot 2003; Perrot and Madjidzadeh 2003, 2004, 2005, 2006; Covington 2004; Lamberg-Karlovsky 2004; Lawler 2004, 2010; Cultural Heritage News Agency 2006). Information that

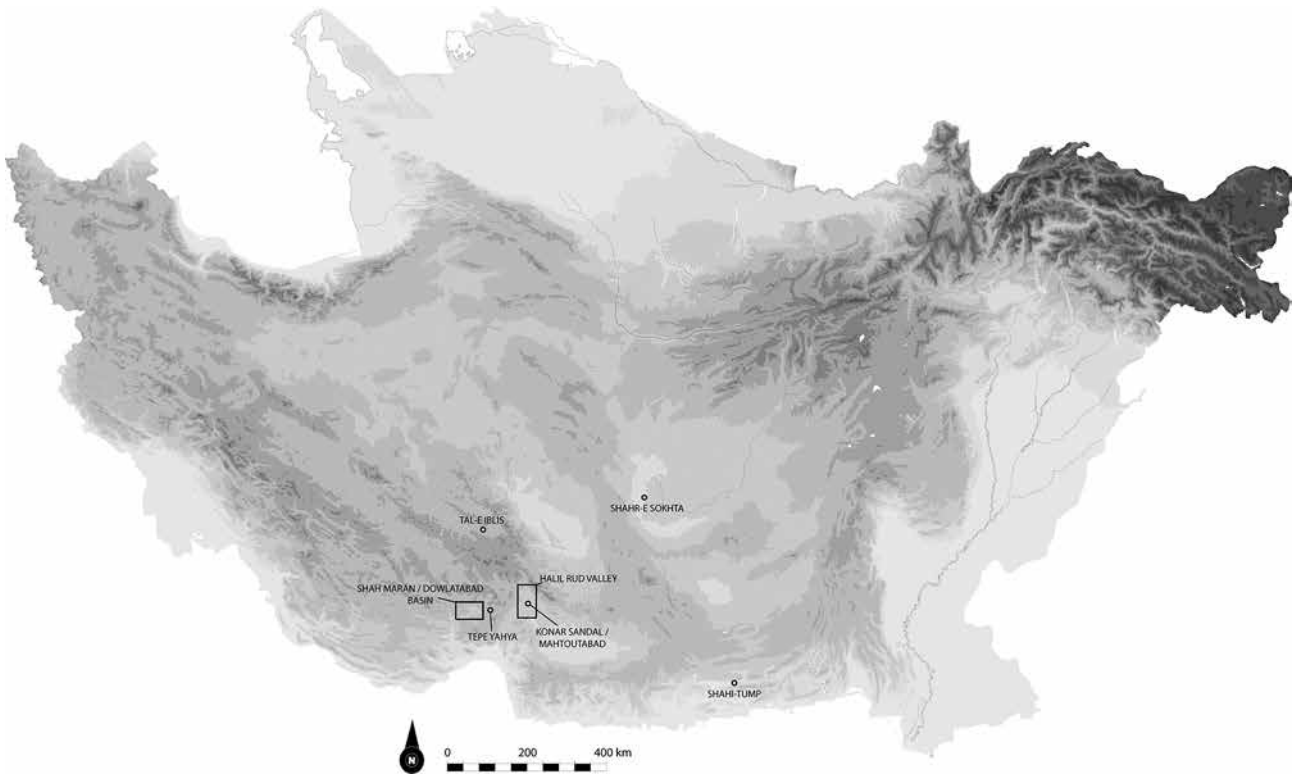


Figure 13.1. Schematic map of Iran with the location of the Halil Rud valley (F. Desset).



Figure 13.2. The area of the Konar Sandal sites, with the location of the Mahtoutabad looted site (F. Desset).

circulated from 2003 onwards was poor and biased but the sudden and unexpected discovery strongly suggested – although indirectly – that the Halil valley was the core of the production and probably of the distribution of the already famous so-called “intercultural style/*série ancienne*” carved chlorite artefacts (see Miroshedji 1973; Kohl 1975, 1978, 2001; Pottier 1984; Amiet 1986; Lamberg-Karlovsky 1988; Pittman 1990; Zarins 1978; Aruz 2003).

The consequences of the discovery of the Halil Rud valley archaeological sites are manifold. First, Tepe Yahya, the only ascertained manufacturing centre of these artefacts (Lamberg-Karlovsky 1970, 1988; Kohl 2001), is more likely to be interpreted as only one of the many possible locations where manufacturing was performed, near the still poorly known chlorite mining areas of the Kerman region.

Second, the sites of the Halil Rud valley now appear as important markets for such goods, as they seem to have been required en masse for the funerals of local elites (see below), and were not simply specialised suppliers for western demand. Labels such as “intercultural” or “trans-Elamite style” should thus be abandoned and we should rather refer to the specific style of the “Halil Rud culture” and, perhaps even more importantly, to its evolution in time.

Third, the label of “secondary state formation” (Kohl 2009) frequently applied to the Bronze Age social evolution of this part of south-eastern Iran should be at least quarantined, given the very initial stage of local scientific surveys and the reliable reports from the macro-region of hundreds of newly discovered prehistoric sites. The list of new sites includes an unbroken sequence from the late Neolithic and Chalcolithic (in the northern mountainous stretches of the Halil valley) and the Bronze Age, down to the Iron Age (unpublished materials and reports shown to the authors by Nader Soleimani). The hypothesis of an autochthonous civilisation needs to be substantiated, however, by further field research. In fact, to date topographic information is very partial, the results of local surveys have not yet been published, and the real extent and full archaeological sequence of the Konar Sandal site complex and its surroundings are still elusive.

Nonetheless, recent contributions are shedding important light on this early urban core area. These include an updated preliminary study of the human geography of the Halil Rud valley (Fouache 2009; Fouache *et al.* 2005), a largely factual preliminary report on the first seasons of excavation at the Konar Sandal sites (Madjidzadeh 2008), and a substantial volume in Farsi (Madjidzadeh 2004; at present being translated into English) entirely dedicated to the preliminary results of Madjidzadeh’s project. This volume contains many specialist papers on the excavated architecture, ceramic and lithic studies, geomorphology, archaeo-zoology, and archaeo-

botany that positively anchor the third-millennium BC site of Konar Sandal South to the archaeology of contemporaneous cultures and civilisations.

Other efforts have identified relationships between the ceramic industries of the Halil Rud valley and the Arabian Peninsula (Potts 2005), wrestled with the extraordinary iconography of the chlorite artefacts (Perrot 2003, 2008; Perrot and Madjidzadeh 2003, 2004, 2005, 2006; Winkelmann 2005), and considered the surprising find of four tablets with an unknown writing system (Basello 2006; Madjidzadeh 2012; Desset in press). On the basis of this growing evidence, Steinkeller (1982, 2012) has proposed that the Halil Rud valley probably had a central role in Marhashi, a frequently quoted eastern polity in Mesopotamian texts (*contra* Francfort and Tremblay 2010, who would rather locate Marhashi in the Oxus region).

History of the excavations at Mahtoutabad: Trenches I–V

In 2004, Massimo Vidale was appointed by Youssef Madjidzadeh to direct the excavation of the first test trenches at Mahtoutabad. Funding was provided by IsIAO, Rome, the Italian Ministry for Foreign Affairs (MAE), and the Halil Rud Archaeological Research Project (HARP). Our first campaign at Mahtoutabad took place from January to February 2006, the second between November 2006 and February 2007, with the final phase being carried out under Iranian direction. At the end of November 2006, Trench I was enlarged on the north side with an additional exposure of 20 × 10 m (Trench IV; see Fig. 13.5). Here, in January–February 2007 Ali Daneshi unearthed part of the earliest deposits so far identified at Mahtoutabad. Excavation was then halted for two years.

When François Desset joined the team in January 2008, the workers were on strike for higher pay and it was impossible to excavate, so we took the opportunity of mapping the site in detail with a total station. The fourth and for the moment most recent campaign took place in January 2009, when Vidale was asked by Hassan Fazeli Nashli, then Director of the Iranian Centre for Archaeological Research, to continue the excavation in collaboration with Nader Soleimani of the Kerman Miras Farangi. Expenses for these final seasons were shared by the Italian and Iranian teams. At the time, the excavations at KSS had been suspended for lack of proper funding, and the small trenches excavated at the cemetery were the only active operation in the region.

The last season was quite successful, as we completed the excavation of the northern sector of Trench I, where we finally ascertained that the earliest deposits belonged to a single, large *Mahtoutabad I* semi-subterranean structure, and finally located the only undisturbed third-millennium BC (*Mahtoutabad IV*) burial ever found in this cemetery, which was

situated in a collapsed catacomb-like grave similar to those well-known at Shahr-i Sokhta.

Mahtoutabad IV: the third-millennium graveyard

The geomorphology of the alluvial plain of Konar Sandal and its mountainous borders has been comprehensively described by Fouache *et al.* (2005) and Fouache (2009). The cemetery of Mahtoutabad (28°27'20" N; 57°47'26" E) lies about 1.4 km south-east of the Konar Sandal North Tappeh and 1.3 km north-east of the Konar Sandal South Tappeh (hereafter KSS) (Fig. 13.2).

Today, the surface of Mahtoutabad, around the area affected by the looting pits, shows the signs of recently abandoned cultivations, including old, washed-off ploughed fields and small irrigation furrows, which are situated in a residual landscape with low shrubs, tamarisks and, on the riverbanks, thick reeds. The uppermost alluvial layers in the cemetery site can only be generically ascribed to late proto-historic, historic, and more recent times. They were exploited for agricultural activities, as shown by the wavy ploughing interface recorded in the top of the section (see Fig. 13.7). Here, the large robbing pit at right and the earthen piles nearby are the dumps of the mass looting of 2001.

The graveyard, which is now completely ransacked

(Fig. 13.3), was undoubtedly used by the Konar Sandal urban community, although perhaps only for a short period of time during the second half of the third millennium BC. It grew on the bank of the Halil River, which probably flowed west of the ancient burial ground (Fouache *et al.* 2005). The site's topography and the materials abandoned by the looters near their shafts suggest that the richest burials were those placed on the most elevated part of the burial ground. The natural bank, at the time, might have risen 2 m or more above the surrounding floodplain, and this would have been enough to protect the graves from the most immediate risks of flooding. The trampling surface of the graveyard, *Mahtoutabad IV*, is marked by layer 110, a 15–20 cm-thick horizontal layer that contained a certain amount of broken bowls and small jars of the mid-third millennium BC. We were able to ascertain that the pits and disturbances presumably linked to the graves were actually cut from this horizon.

The bank in which the graves were dug was formed by thick and very compact layers of locally derived light brown silt, including lenses of sand and occasional layers of coarse gravel. It gradually slopes eastwards, towards the present bed of the Halil. At some point in the past, the area was intensively flooded and the bank was entirely sealed by new alluvial layers.

Nothing was visible on the surface before a



Figure 13.3. A general view of the site of Mahtoutabad showing its very disturbed surface (photo M. Vidale).

ruinous flood in spring 2001 cut through the ancient riverbank and most probably brought to light the first graves and their treasures. This event is marked on the surface by a 10 cm-thick layer of loose, dark grey sand that is visible across an area of several hectares. This sand is still easily recognisable below the piles of earthen debris left by the looters during their months of repeated digging. The fact that no less than three major superimposed phases of occupation were actually invisible on the surface emphasises how arbitrary quantitative estimates of settlement and demographic trends of a region can be unless they are accompanied by geomorphological analysis to map the alluvial covering process and a strategy

of sub-surface testing.

While tunnelling for antiquities at a depth of 3–4 m below the present surface, the local farmers came across archaeological layers rich in painted and unpainted ceramics. These sherds, often decorated with highly visible patterns and colours, were later ascribed to *Mahtoutabad I*, the earliest phase of occupation at the site so far discovered. Widely scattered on the surface by looting, these unmistakable sherds could easily be mapped and show that this early settlement extended for about 1.5 ha (Fig. 13.4).

A surface survey of the site in January 2008 also allowed us to delimit the extent of the third-millennium BC graveyard: for this purpose we

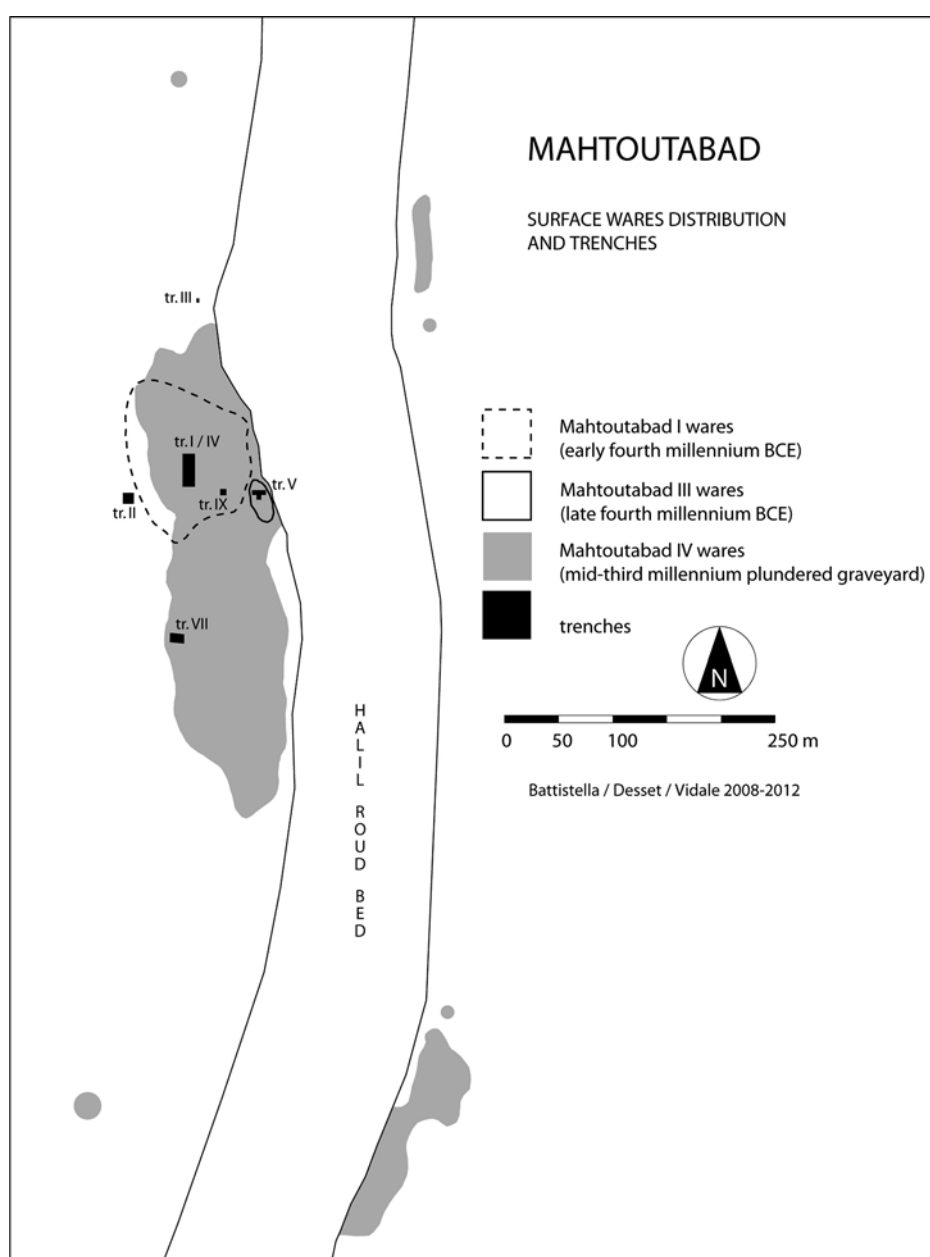


Figure 13.4. Map of Mahtoutabad, showing the location of the excavated trenches, the original extent of the graveyard, and the probable limits of the Mahtoutabad I and Mahtoutabad III local deposits (E. Battistella, F. Desset, and M. Vidale).



Figure 13.5. Mahtoutabad, 2006–2009: map of Trench I with the northern extension dug in winter 2006 (Trench IV), but regularly excavated in January 2009. The light grey areas are the pits excavated by looters. The darker areas show the location of the disturbed green floor of the Oval Hut; the only undisturbed third-millennium BC grave so far located in the cemetery was found immediately to the east (F. Desset).

mapped the pits that had large third-millennium BC sherds with fresh fractures dumped nearby. By our calculation, the cemetery measured approximately 400×150 m (Fig. 13.4), not less than 6 ha. It probably also extended to the opposite side of the present bed of the Halil, which cut through the graveyard at a later time. Using a very conservative estimate of two graves for every 100 m^2 , we calculate that at least 1000 graves

were looted at Mahtoutabad. As our main operation showed (Trenches I/IV) in the core of the cemetery, however, there were nine robbing pits or more per 100 m^2 , and most of these had evidently hit a grave (Fig. 13.5). Although it is unlikely that there was an even distribution of graves within the cemetery, the total number of destroyed graves might originally have been almost double.

Feeling as though we were walking in the footsteps of Flinders Petrie at Abydos, we spent two seasons mapping and collecting artefacts on the disturbed surface (e.g. pottery, beads, inlay pieces, and metal objects and fragments), often excavating and systematically sieving the looting debris. On this basis, we were able to identify a small cluster of very rich graves containing copper weapons; hundreds of lapis lazuli, turquoise, and gold micro-beads; and dozens of chlorite and copper vessels that had been plundered in the south-western edge of the cemetery which, as stated above, is the most elevated part of the site.

While the results exceed the scope of this paper and will be published in the final report, it is important to stress that in this way we recovered an abundance of small fragments of carved chlorite vessels broken *in situ* and lost by the robbers. They display the majority of the most important Halil patterns (basket weave, embricated design, door pattern, snakes, date palms, scorpions). We also found many tiny inlay pieces (in mother-of-pearl, white limestone, turquoise, and red limestone) that had fallen from these vessels when they were stolen. Although recovered from disturbed contexts at the mouth of and inside the pits, these objects were associated to Emir grey wares and other distinctive third-millennium BC ceramic types, and scientifically demonstrate beyond any reasonable doubt that this cemetery is one of the sources of the mass of chlorite artefacts lost to the market; they also positively link the cemetery to the mid-third-millennium BC contexts excavated at KSS Tappeh, where carved chlorite artefacts with the same motifs were found in primary stratigraphic contexts (Madjidzadeh 2008).

Ultimately, the results show how misleading and one-sided it is to insist on treating the Halil Rud discovery, with all its problems, as a confused and dubious “Jiroft question” (e.g. Muscarella 2005, 2009). At present it seems more urgent and relevant to learn what the KSS sites are, rather than what “Jiroft” is not.

Mahtoutabad III

On the surface we recovered a large assemblage of *Mahtoutabad III* (Uruk-related) material in Trench V (Fig. 13.4), near the river (this settlement phase is not represented in the sequence of Trench I – see below). In 2007 and 2009 we dug a surface measuring in total about 100 m², with the 2009 excavations being directed by Nader Soleimani. These ceramics were in a secondary context of deposition, embedded in alluvial layers alternating with thin aeolian layers. The stratigraphy suggested a period of drought, suddenly interrupted by two or three flood episodes. No architectural remains were observed in the excavated area, but many vessels were complete or almost complete, suggesting that the materials had been eroded in a nearby location.

The pottery assemblage includes hundreds of sherds of bevel-rim bowls and coarse low-sided trays, flowerpots, globular jars with combed shoulder and staff-like handles, a few tall jars or bottles with downward-bent shoulder spouts, and three sherds of biconical vessels with nose-like lugs on the shoulder. There were also three fragments of terracotta sickles of unmistakable western fashion. Painted fragments (2–3% of the total) were limited to a set of small fine pots and truncated cone-shaped bowls stylistically similar to some contemporary assemblages of south-eastern Iran. The same deposits also contained several fragments of jar stoppers of unbaked clay (two with seal impressions) and two fragments of two different large weights in travertine, suggesting the performance of administrative activities. As no carbon survived in the flood layers, and the animal bones found had no surviving protein content, stylistic comparisons would place *Mahtoutabad III* to the mid- to late fourth millennium BC. Details and implications of this assemblage – the easternmost of this type so far found on the plateau – will be discussed in another report (Desset and Vidale, in preparation).

Mahtoutabad II

This settlement phase is represented by a sequence of horizontal layers extending below the third-millennium graveyard in its northern extension for about 2–3 ha, with a maximum thickness of 1.1 m. These layers appear to have been gradually deposited as a series of open-air trampling surfaces, rich in small-sized potsherds with a few smaller bones and lithics (see below). No architectural feature was uncovered in the excavated area. The *Mahtoutabad II* pottery has no apparent link or similarity with the *Mahtoutabad III* Uruk-related assemblage, a fact that obviously enough retouches on the old question of its “intrusive” nature across the Iranian Plateau. The repertoire of *Mahtoutabad II* pottery forms and decoration closely corresponds to many *Aliabad* ware specimens originally published as Iblis IV in Caldwell 1967. The *Mahtoutabad II* layers contain, among the most recognisable forms, tall conical footed vases with sturdy walls and thick ring feet; bowls and larger hemispherical basins with rims underlined by a deep groove; and small globular jars with short vertical rims. The rather coarse vessels are made combining coil building, probably moulding, and wheel throwing; the external surfaces are frequently heavily trimmed with the use of vertical movements. The painted decoration (recorded in about 15% of the sherds) is dark brown on buff, but many sherds show bichrome or even three-chrome patterns (variously combining black, light reddish brown, and white or greenish white). The motifs are rather simple: vertical hatched and wavy bands,

concentric festoons (often filled with white dots), and lozenges, always traced with thick brushes. The patterns are rather irregular and freely occupy the outer and inner surface of the vessels. The pottery, as a rule, is well fired in oxidising or partially oxidising conditions, resulting in buff or pink-coloured pastes.

The pottery found in the *Mahtoutabad II* layers is

clearly an evolution and from a technical viewpoint, a simplification of the earlier *Mahtoutabad I* wares (see below). Unfortunately, the study of this material is still at a very preliminary stage and we cannot include a detailed description; the rest of the article focuses on the evidence of the earliest occupation phase, *Mahtoutabad I*.



Figure 13.6. *Mahtoutabad*: a general view of Trench I during excavation, winter 2006–2007. The *Mahtoutabad I* levels were exposed in the deepest test trench, at the top, at a depth of about 4 m from the surface (photo M. Vidale).

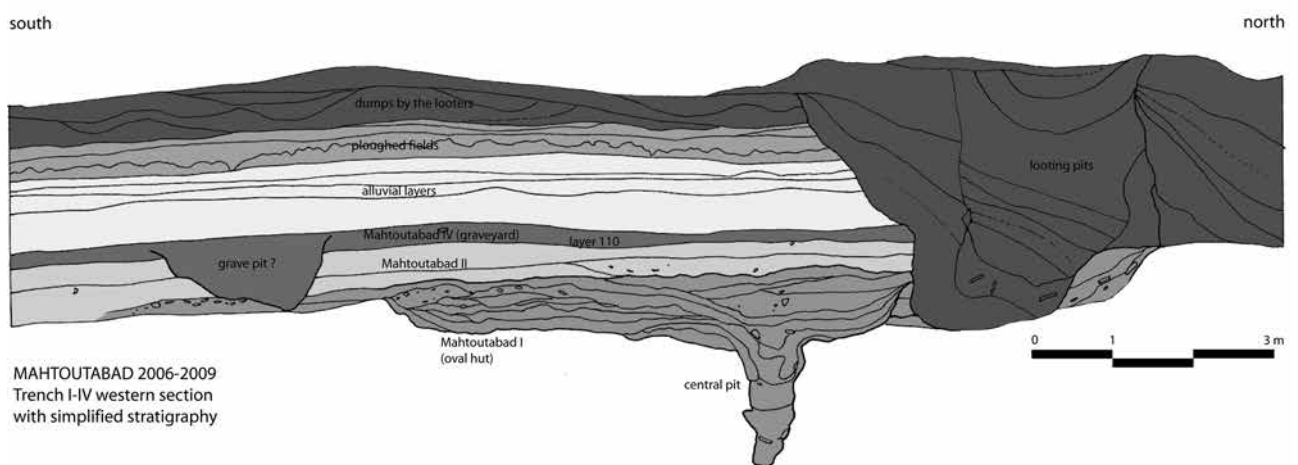


Figure 13.7. The western north–south section of Trenches I–IV, showing the sequence of the *Mahtoutabad I* (Oval Hut), II, and IV (the third-millennium BC graveyard) occupation phases. The sequence is overlain by alluvial layers due to later floods and by the signs of later, possibly recent, agricultural activities. Finally the section shows a large pit and the debris piled up by the grave looters in 2001 (M. Vidale and F. Desset).

Mahtoutabad I

Trench I was dug in the centre of the cemetery to explore its stratigraphy (Fig. 13.5), find the context of the sherds predating the third-millennium BC graves, and ascertain whether anything was left of the burials so extensively impacted by the robbing pits (Figs 13.6 and 13.7). The trench measured 11 m (east–west) × 10 m (north–south). In the first two seasons, we dug through the *Mahtoutabad II* layers, until we reached the early fourth-millennium BC layers at a depth of 3.5–4 m below the present surface, in a limited strip of 10 × 1 m along the western side (Fig. 13.7, upper right wall). The ceramic transition from *Mahtoutabad II* to *I* was gradual but evident. For example, the lowermost layers of the *Mahtoutabad II* settlement were excavated with artificial cuts 10 cm thick and as we went deeper we observed a constant increase of painted decoration, from about 15% of the *Mahtoutabad II* series to about 35% on top of the *Mahtoutabad I* filling. The narrow exposure on the west side of Trench I uncovered a green clay layer with a deep conical pit lined with silty clay in the centre, containing a number of well-preserved vessels and lithic tools.

Between November 2006 and January 2007 Ali Daneshi cleared a wide extension immediately north of Trench I in our absence (labelled Trench IV). He found that the green clay layer was actually the northern part of a large arc-shaped floor supporting fireplaces and abundant pottery, among which large sherds of storage jars, apparently dumped and crushed *in situ*. The area enclosed in Trench I was further dug in the last season (2009), reopening the eastern part of Trench I. At the end of January 2009 we had thus exposed at different times about half of what may be interpreted as an oval green-coloured floor (layer 302 in Fig. 13.5) studded with dumped artefacts and large bones, which belongs to a single large semi-subterranean structure, not less than 9.5 m long (from north to south) and possibly 8 m wide if the western unexcavated part is symmetrical (Fig. 13.5).

We labelled this structure, somewhat optimistically, the “Oval Hut” (sometimes expediently referred to as the “green layer” due to its very bright colour) but in fact, pits and tunnels have severely damaged its integrity, to the point that our reconstructions are partially conjectural. The deep clay-lined pit (feature 312 in Fig. 13.5), at least in its first stage of construction, might have been the seat of a large central supporting pole. Later, the post was removed and the central hole might have been temporarily used as a storage pit, because when its basal filling was further explored, we found other large pottery fragments, two complete conical vessels, and a large lozenge-shaped artefact in unbaked clay of unknown function.

The stratigraphic sequence of Trenches I–IV is illustrated in the western section illustrated in Figure 13.7. It shows that the cavity (feature 312) of the semi-

subterranean Oval Hut (*Mahtoutabad I*) was originally lined at the edges with fine green silt. Its original depth would have been 0.8–1 m below its surrounding level. While the Hut or its cavity was still in use, the central pit and the floor were gradually filled with superimposed trampling surfaces, alternating with small-scale silty colluvial deposits and local floor restorations. In the northern side of the Hut’s floor, a raised bench, made of fine greyish clay and probably supported by a series of small vertical logs, was related to these surfaces but is not represented in the Figure 13.7 section. At least three fireplaces were used, probably at different periods, in various areas of the hut.

Mahtoutabad I: the pottery

A preliminary inspection of the pottery from the filling levels in the Oval Hut shows that the most common forms can be attributed to four groups as follows: 1. truncated cone-shaped basins, large basins, and cylindrical jars; 2. sub-globular restricted jars and pots; 3. hemispherical bowls; and 4. conical footed vases (Fig. 13.8). The first two groups are distinguished by one or more horizontal ridges running below the mouth and belong to the ceramic class labelled “ridged ware” in the Tal-e Iblis report (Chase *et al.* 1967a: 182, 184); the other two belong to a type of fine painted ware which is reported and preliminarily described here for the first time.

1. *Basins, large basins and cylindrical jars* (Figs 13.8–13.10). These open vessels were made on a potter’s wheel or similar device, by pressing and joining series of coils, which are visible in the rough unmodified external surfaces. In contrast, the interior frequently shows rotating marks. Basins and bowls, and the lower parts of jars, were thus assembled inside large open moulds, as indicated by sandy or dry clayey exterior surfaces and patterns of cracks, while the interior was smoothed with regular movements. The rim protruded from the mouth of the mould and often received one or more applied parallel ridges (hence ridged ware). The coarse incised line that runs below the rims of similar forms in the subsequent *Mahtoutabad II* pottery are a simplified version of the same ridges. The ceramic body is yellowish to pale brown (5YR 7/3 to 10YR 7/4). Large basins or open-mouthed cylindrical jars (from 60–80 cm and larger) were painted on the exterior with broad horizontal or oblique bands (e.g. Fig. 13.9), grey or dark reddish brown (10YR 5/1, 5YR 3/5), turning to olive (5Y 5/3) on the frequent over-fired specimens.
2. *Sub-globular restricted jars*, medium-sized and sometimes very large (Figs 13.8, 13.11), were fashioned with strips or horizontal slabs of clay (for the largest storage containers) or coils (for restricted pots), while the vessels were rotated on a slow wheel. Sub-globular restricted pots were then

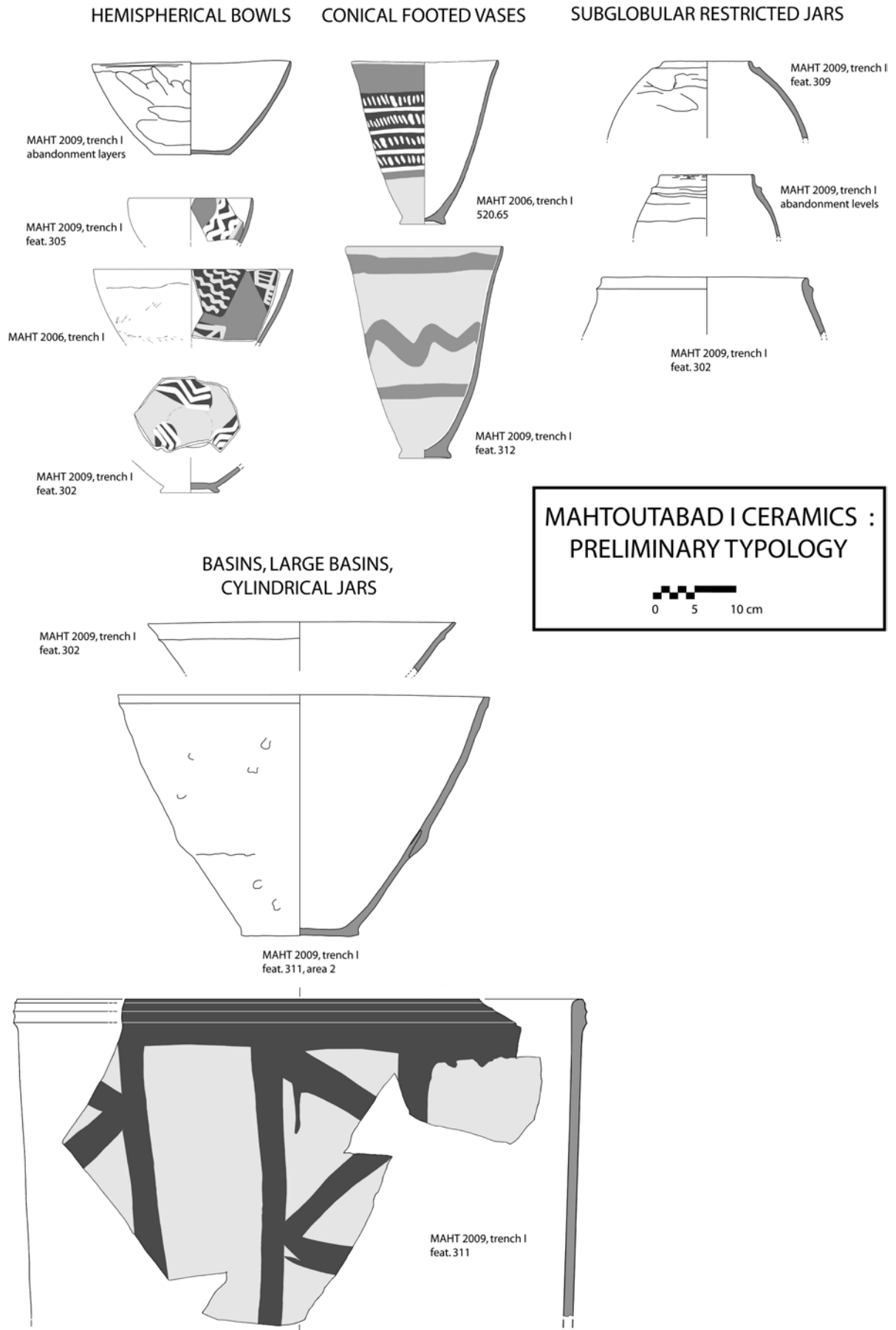


Figure 13.8. Mahtoutabad I preliminary ceramic typology (drawings R. Micheli, E. Battistella, F. Desset, and M. Vidale).

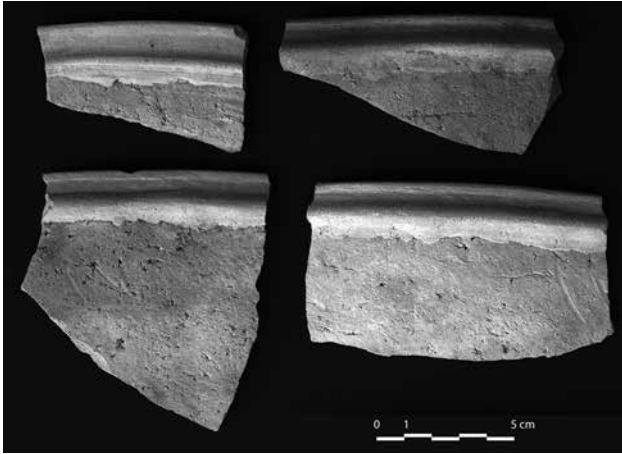


Figure 13.9. Mahtoutabad I: examples of ridged ware open bowls and basins (photo M. Vidale).

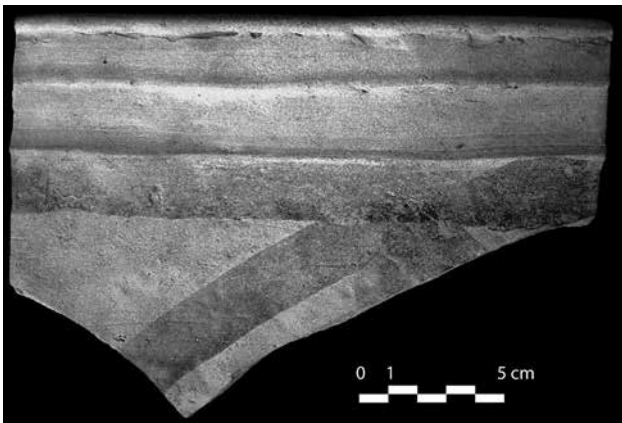


Figure 13.10. Mahtoutabad I, ridged ware: a rim sherd of a large sub-cylindrical jar or basin externally painted with broad vertical and oblique lines (photo M. Vidale).



Figure 13.11. Mahtoutabad I: from the disturbed floor of the Oval Hut. A small- to medium-sized globular restricted pot painted with thick circles (photo M. Vidale).

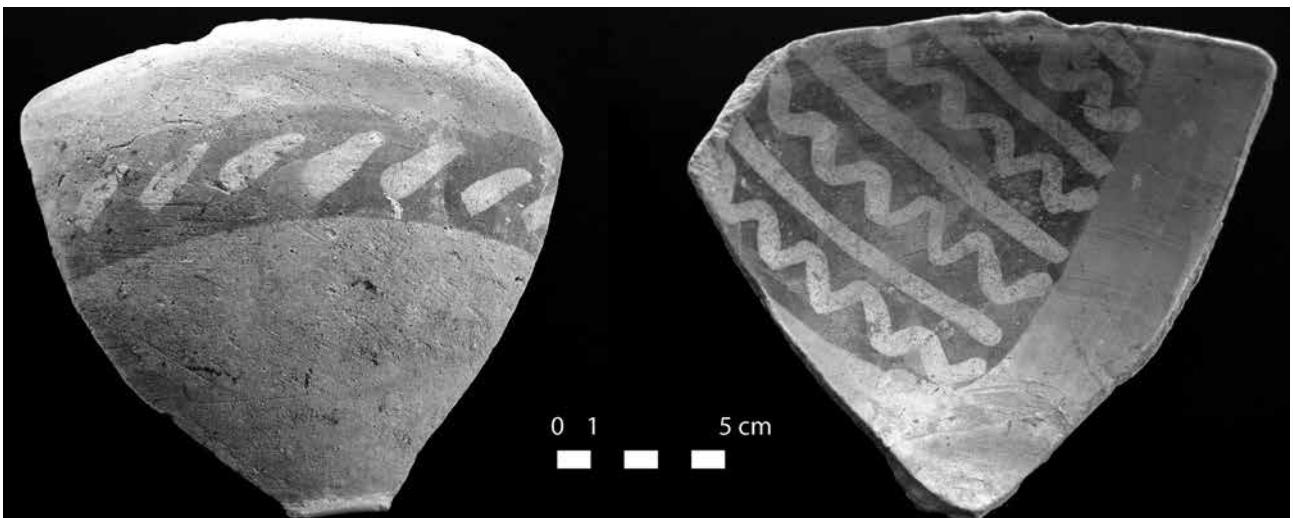


Figure 13.12. Mahtoutabad I: an example of a hemispherical bowl, found in the filling of the central pit of the Oval Hut (photo M. Vidale).



Figure 13.13. Mahtoutabad I: three conical footed vases painted in white over black and brown-red backgrounds, found in the filling of the central pit of the Oval Hut (photo M. Vidale).

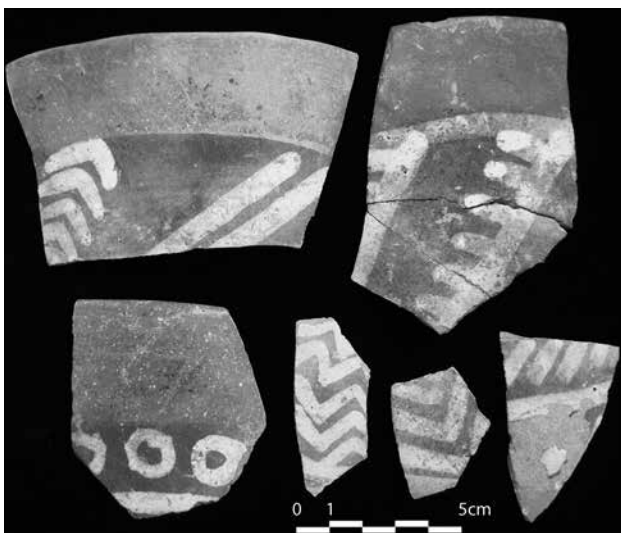


Figure 13.14. Mahtoutabad I: sherds of conical footed vases showing various geometrical designs (photo F. Desset).

trimmed, but not turned, at the base with a blade-like tool. The exterior was often painted with thick circles (e.g. medium-sized specimens in Fig. 13.11). The ceramic body is whitish (10YR 8/2) to very pale brown (10YR 8/3), the pigments approximating grey-olive shadows (10YR 5/1 to 5Y 4/3).

3. Hemispherical bowls (Figs 13.8, 13.12) were carefully fashioned by joining coils thinned and shaped on the potter's wheel. The outer surface was trimmed after partial drying with secure vertical movements, making the walls much thinner. They often bear a ring-foot that was fashioned on the bottom of the vessel while it was upturned on the potter's wheel. Painted decoration involved the application of black, white, and red pigments that resulted in brightly contrasting patterns, as in the fourth group. The ceramic body's colour varies from pink (5YR 8/3, 7/3) to light reddish brown (5YR 6/3). The black bands are defined in the Munsell code as shadows of dark grey, dark reddish grey, or reddish grey (5YR 4/1, 4/2, 5/2); the pigments of the designs are white (5Y 8/1, 8/2) to pale yellow (5Y 8/4), while the red slip is a uniform yellowish red (5YR 5/6).
4. Conical footed vases (Figs 13.8, 13.13–13.15) are fine, elegant vessels, clearly ancestral to the sturdy, less curved conical footed vases of *Mahtoutabad II*. They were made with the same forming sequence (coil building and thinning on the potter's wheel; partial drying; vertical trimming; upturning and centring on the wheel; wheel-fashioning of the ring foot) and painting with the same pigments and techniques used for hemispherical bowls. Some

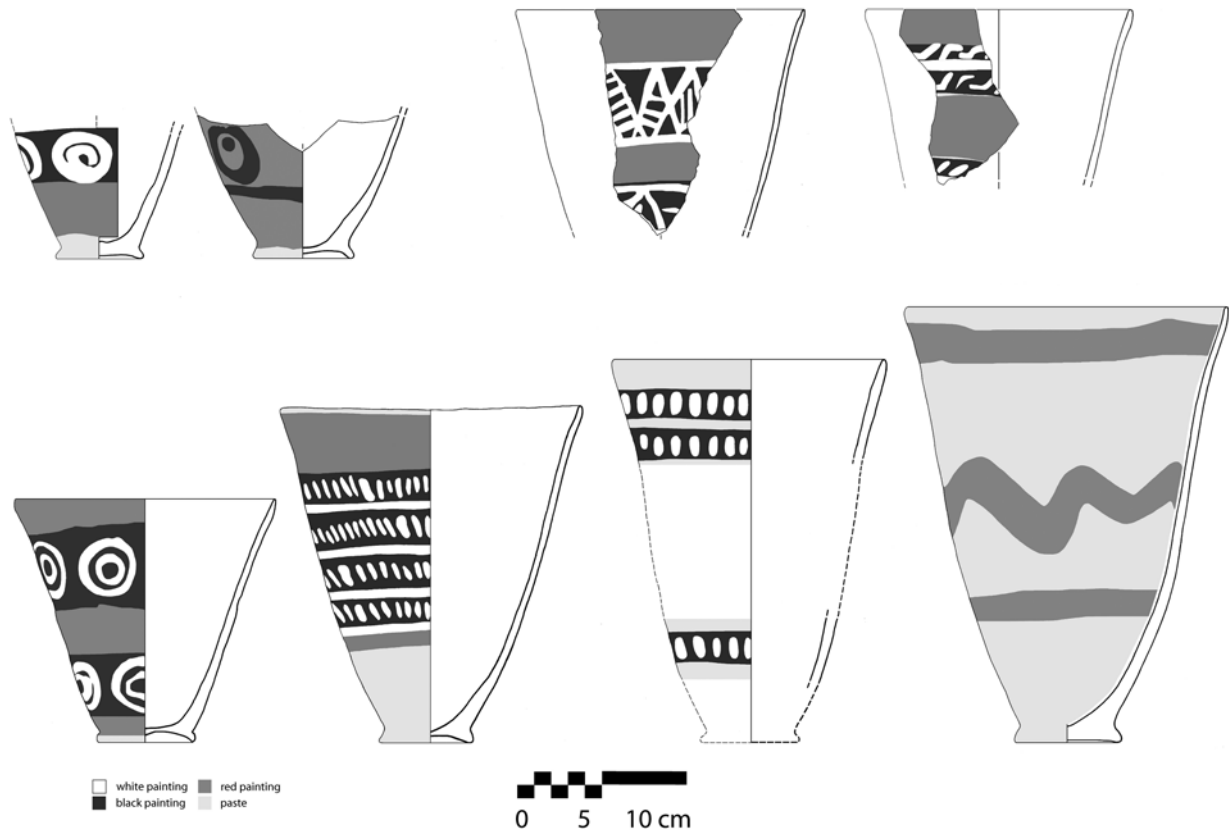


Figure 13.15. Mahtoutabad I ceramics, including several examples of conical footed vessels painted in white over black and red backgrounds (drawings R. Micheli, E. Battistella, and M. Vidale).

conical footed vases, moreover, were more simply painted in brown over a plain buff paste. In the three-colours technique (black, red, and white), the chromatic contrast creates interesting visual patterns, thanks also to a geometric repertory so far estimated to about 60 basic design elements (e.g. plain, stepped and wavy lines, fish-bone designs, meanders, dots and segments, stars, lozenges, triangles, circles, spirals, and many others; Figs 13.14–13.15).

From a technical viewpoint, the creation of permanent pigments with such contrasting colours in a kiln demands skill and many manufacturing hours. According to our preliminary studies, no less than three different stages of firing were involved, including the inversion of the atmosphere within the kiln (Vidale *et al.*, ongoing research). Such technology probably depended on the experience and skill of a long-established tradition, although the evidence for this has not yet been found in the Halil Rud valley. In fact, we are dealing with a very efficient, standardised manufacturing technology variously combining coiling, moulding, trimming, wheel forming, and an excellent control of the firing atmospheres which doubtless required well-designed kilns. It is possible that hemispherical bowls and conical footed vases, so

similar in form and decoration, were used to present and consume solid and liquid substances in the same dining contexts.

This attractive polychrome ware and its industry may have played an important role in technological exchange and more generally in the east–west interaction between the south-eastern margin of the Iranian Plateau and Baluchistan. In fact, it has been found in the Shah Maran-Daulatabad basin (Prickett 1986: fig. III.11.B, E, F, and I) while more recently, a small number of unmistakable sherds painted red, black, and white with the same designs were found at Shah-i Tump (Period IIIa), in the Pakistani Makran, in contexts preliminarily dated to the second half of the fourth millennium BC (Mutin 2007, this volume).

Conical footed vases generically resemble the tall conical vessels or beakers of northern Baluchistan (Pakistan) of the *Kechi-Beg* polychrome style (second half of the fourth millennium BC; see Jarrige *et al.* 1995) and the abundant production of similar vessels (fourth millennium BC) at sites in Pakistani Makran (Mutin 2007; Didier 2007), sometimes bearing similar white and red designs.

Finally, it is also important to mention that in the *Mahtoutabad I* assemblage we also recovered what appear to be a number of *Lapui* plain red ware sherds, quite different from the rest of the assemblage. *Lapui*

red ware is usually attributed in Fars to the first half of the fourth millennium BC (Kur River Basin and Mamasani; Sumner 1988; Potts *et al.* 2009: 9; Petrie *et al.* 2009: 174–75), although it has been noted that *Lapui*-like wares have also been observed at Tepe Yahya and Tal-e Iblis (Beale 1986; Sumner 1988: 28–29; Petrie 2011, 2013; Mutin, this volume).

Other artefacts and industries

Obviously enough, what we excavated is too little, partial, and damaged for us to say much about the architectural forms and use of the settlement. Nonetheless, as noted above three fireplaces, which were possibly used in different events, were found on the floor of the structure. The nearby dumping of bovine bones (*Bos* sp.; M. Mashkour, personal communication), of broken large coarse chaff-tempered pans, and large of storage jars smashed *in situ* that can be refitted, suggests that domestic activities were being carried out.

Along the edges of the Oval Hut and on its floor, we recovered substantial amounts of light green frothy and fragile slag fragments. XRD analysis showed the presence of quartz, feldspars, diopside, cuprite (in two out of three samples), and traces of calcite. Feldspars and diopside, which are probably high-temperature products, and cuprite (Cu_2O) all point to copper metallurgy. Together with these glassy slags, we collected some thick chaff-tempered wall fragments or linings of small- to medium-sized ovens. There were also pieces of cylinder-like bars that might have been parts of suspended grids from a kiln.

On the occupation layers above the floors of the Oval Hut, we also found the vitrified fragment of a ceramic mould used for casting copper bars. Nearby was a cuprous alloy object, potentially a casting, which fitted exactly in the cavity of the mould. XRD analysis of its slagged surface reveals – besides quartz, diopside, feldspars, and calcite – the presence of cerussite (lead carbonate, PbCO_3), suggesting that copper could have been alloyed with lead. These artefacts, exported with the permission of ICAR for archaeometric study, were analysed by Christopher P. Thornton and Thilo Rehren in the Wolfson Archaeological Science Laboratory at the UCL Institute of Archaeology (complete report to be published in the final excavation volume).

The mould was made with a poorly levigated ceramic with heavy chaff temper containing a significant amount of angular quartz grains and iron oxide inclusions to ensure thermal expandability. Its slagged end contains copper and copper-sulphide prills in a cuprite-rich glassy matrix. In the bar-like ingot, XRF found a greater than 93 wt% Cu as well as ~1 wt% Pb and >0.5 wt% As. In sum, Thornton and Rehren conclude that while the metallurgical remains require further analysis, it is clear that the smelting

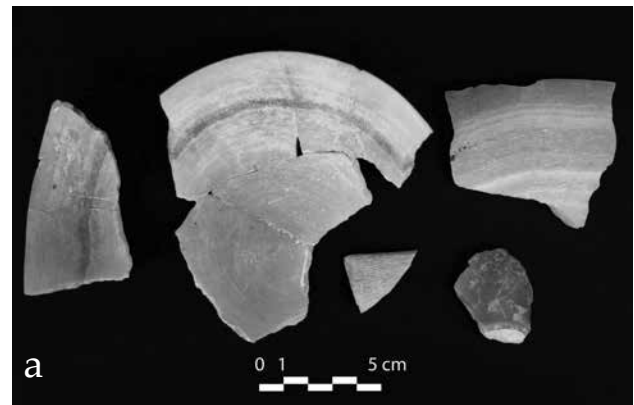


Figure 13.16/a. Mahtoutabad I: fragments of finished and unfinished alabaster vessels and the lens-shaped white agate polisher (lower right) found by Ali Daneshi in January 2007 in the northern extension of the Oval Hut. The smaller triangular sherd left of the polisher is clearly unfinished (photo M. Vidale); b. Mahtoutabad I: lateral view of the white agate tool used to give the alabaster vessels their final polish (photo M. Vidale).

of copper sulphides occurred somewhere on site, probably in copper refining, as did casting in moulds (possibly performed in the Oval Hut or nearby). The ores used appear to have contained minor amounts of lead and arsenic, which would have produced a useful alloy for casting.

The floor also contained fragments of finished and unfinished stone vessels and a unique lens-shaped white agate polisher, which indicates that alabaster

Table 13.1. Calibrated radiocarbon dates from Mahtoutabad I layers.

Sample number	Radiocarbon age BP	Calibrated range BC (2 sigma)	Probability
LTL 4244A	5284 ± 45	4240–3990 BC	95%
LTL 4240A	5038 ± 40	3960–3710 BC	95%
LTL 4239A	4805 ± 45	3700–3380 BC	95%
LTL 4241A	4745 ± 45	3640–3370 BC	95%

Table 13.2. Calibrated radiocarbon dates for Iblis IV.

Sample number	Radiocarbon age BP	Calibrated range BC (2 sigma)	Probability
P-927 (end of Iblis III)	5570 ± 60	4540–4330 BC	95%
P-928 (early Iblis IV)	5430 ± 60	4440–4050 BC	95%
P-929 (end of Iblis IV)	4680 ± 60	3640–3350 BC	95%

Table 13.3. Archaeological and chronological correlation between the archaeological sequences of Tal-e Iblis and Mahtoutabad, Trench I.

4540-4330 BC	Iblis III stratigraphic continuity		Mahtoutabad I (white painted on brown background)	4240-3990 BC 3960-3710 BC 3700-3380 BC 3640-3370 BC
4440-4050 BC	Iblis IV : early Aliabad (without any Middle / Late Uruk related material)	————— same ceramic —————	Mahtoutabad II (red/brown painted on light past/slip)	
3640-3350 BC	Iblis IV : Aliabad (local and Middle / Late Uruk related material)		Mahtoutabad III (only Middle / Late Uruk related material)	

vessels were polished *in situ* (Fig. 13.16/a–b). Within the Oval Hut and its fillings, there were some unretouched chert flakes, probably debitage, but no formal tools. Several scrapers made from retouched ceramic sherds found during excavation were also an important component of the local tool kits, although their precise function remains unclear.¹

Other small finds include a piece of a thick stone mortar of a peculiar yellow jasper breccia, two limestone beads, and several unbaked clay artefacts, among which a bull figurine and two biconical beads. In short, it appears that the inhabitants of the Mahtoutabad I Oval Hut were involved in small-scale metallurgical activities, the production of alabaster vessels, the knapping of chert, and in one or more unknown processing activities involving the manufacture and use of scrapers or choppers made by

flaking large potsherds.² Thus far, there is no record of administrative activities in the form of tokens, seals, or seal impressions.

Absolute dating

Four radiocarbon dates were obtained from charcoal gathered from Mahtoutabad I layers. The samples were processed at the AMS facility of CEDAD, University of Lecce (Italy) and have been calibrated using OxCal 4.1.3 (Table 13.1).³

The dates for Mahtoutabad I match the stratigraphy well. Apparently, there was a short chronological gap, perhaps a local abandonment, between the green layers of the first floor (LTL 4240A, 3960–3710 BC) and the layers just above (LTL 4239A and LTL 4241A, around 3700–3370 BC).

